

Critical Review: 'Late Talkers': What Can We Expect?

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This critical review examines two specific questions with regards to 'late talkers': to what extent does the identification of a 'late talker' contribute to the diagnosis of a language impairment and what are the language and related outcomes of 'late talkers'. A total of 5 longitudinal cohort studies were examined to answer the 2 questions. Research provides support demonstrating that the majority of 'late talkers' go on to develop language within the normal range, however, they perform significantly below typical language developing children. Clinical implications and future research are discussed.

Introduction

Delays in speech and language development affect approximately 5-8% of preschool-aged children and are one of the most frequent reasons for referral to speech and language services (Rescorla, 2011; US Preventive Services Task Force, 2006). Difficulties associated with early communication delays may or may not persist into later ages as language development varies with both the timing and level of acquisition (Dale et al., 2003). However, for those children with language delays that persist, an initial early delay may be the first clinical indicator (Ellis and Thal, 2008). The problem for clinicians is how they determine which language delayed children on their caseload will receive treatment; at which point does language development move from an undefined gray zone of developmental variance to a 'black and white' distinction of normal and impaired.

As early as 2 years age, otherwise typical developing children (i.e. no primary condition, e.g., hearing impairment, global developmental delay, etc.) with less than 50 words in their vocabulary and no word combinations are generally referred to as 'late talkers' (Rescorla, 2011; Roos and Weismer, 2008). At this age, the term 'late talker' is used for more descriptive purposes as children are too young to be reliably diagnosed with a language impairment (Rescorla, 2011). However, children 4 years of age and above who meet the same criteria as 'late talkers' discussed above, can be diagnosed with specific language impairment (SLI) (Rescorla, 2011). Important questions that need to be addressed for clinicians are to what extent does the identification of a 'late talker' contribute to a later diagnosis of SLI, and what are the language and related outcomes of 'late talkers'?

Objectives

The primary objective of this paper is to critically evaluate existing studies examining the outcomes of 'late talkers'. Two specific questions were investigated: i) to what extent does the identification of a 'late talker' contribute to a diagnosis of SLI, and ii) what are the language and related outcomes of 'late talkers'?

Methods

Search Strategy: Journal articles related to the questions of interest were located using the following computerized databases: PubMed and Scopus. A variety of search strategies were employed using the following connected key terms: (late talker), (early language delay), (language impairment) and (outcome).

Additional related studies were obtained from the reference lists of previously searched articles.

Selection Criteria: Articles selected for inclusion in this study were required to identify 'late talkers' around the age of 2 and examine at least one language outcome measure at or after the age of 4.

Data Collection: Results of the literature search yielded 5 longitudinal cohort studies that met the above criteria.

Results

Question 1: *To what extent does the identification of a 'late talker' contribute to the diagnosis of SLI?*

Dale, Price, Bishop, and Plomin (2003) examined the possibility of predicting which 'late talking' children at age 2 would go on to have significant language

difficulties at age 4. Using parent reported data from a large-scale longitudinal cohort study (8,386 twins), the authors identified 802 children (9.6% of total sample) as having an early language delay (ELD) (i.e. 'late talkers') at age 2. The authors used a criterion of vocabulary scores below the 10th percentile of the total sample on the MacArthur Communicative Development Inventory (CDI). Children's language outcome at age 4 was categorized as significantly impaired (i.e. SLI) if they scored at or below the 15th percentile on at least two of three language measures from the CDI (vocabulary, grammar, and abstract language). At age 4, 746 children (11.5% of the total sample) met criteria for significant language impairment, of which 34% had been delayed at age 2. Of the original 'late talker' group with 802 children, 254 (40.2%) went on to be categorized with a significant language impairment at age four. This is compared to 492 children (8.5%) of the TLD group at age 2 who went on to be categorized with significant language impairment at age 4.

This study qualifies as level II evidence demonstrating largely supportive evidence that two-thirds of 'late talking' children at age 2 will go on to develop typical language by 4. Positive factors of this study were that the study design was appropriate for investigating the research question and that the authors used a valid standardized clinical tool to measure language with the CDI. However, methodological factors may have limited the impact of this study. Firstly, this study used only data from twins. As twins have been associated with early language delays, generalization of the results may be poor (Dale et al. 2000). However, the proportion of 'late talking' children at 2 who went on to develop typical language by 4 is comparable to other studies that used only single-born children (Rescorla et al., 2000). Secondly, criteria levels that were used for the categorization of 'late talkers' at age 2 as well as 'language impairment' at age 4 were set in order to obtain a large enough effect size to run analysis in another related study (on developmental genetic analysis of language delay, see Bishop et al., 2003). Had the authors used more stringent criteria levels to determine impairment at ages 2 and 4, it is possible that the prognostic outcome of 'late talkers' may be different from what is reported here.

Ellis and Thal (2008) summarized their large-scale, longitudinal study of 577 unselected, single-born children whom they followed from 16 months to 6 years of age. Children were administered the CDI at 16 months and were categorized into one of three groups: 81 'late talkers' (14%), 35 'late comprehenders' (delayed expression and

comprehension of language; 6%), and 461 children with TLD. At 6 years of age, all children were assessed by a speech-language pathologist. The results of the assessment categorized 13 children (2.2%) of the total sample with a SLI. Of these children, 3 were 'late talkers' at 16 months (3.7% of the original 'late talking' group), 3 were 'late comprehenders' (8.5% of the original group), and 7 were typical language (1.5% of the original group). The authors concluded that their results suggest that early delays to comprehension and/or expression convey a greater risk for future impairment, with comprehension delays potentially being a stronger predictive marker.

This study qualifies for level II evidence demonstrating compelling evidence nearly 95% of children identified with an early language delay (comprehension and/or expression) will go on to develop typical language at age 6. This is supported by the appropriate use of clinical assessments as well as a trained professional to administer the tests. Although the delayed groups do demonstrate a greater risk for future impairment, the observation that the vast majority go on to develop typical language cannot be discredited.

Rice, Taylor and Zubrick (2008) conducted a prospective, longitudinal cohort study with 1,880 single-born children. The aim of their study was to compare the language outcomes at age 7 for 'late talkers' versus children with TLD. The 'late talking' group was composed of 128 children (7% of total sample), and a control group of 109 children was randomly selected from a pool of 765 children who matched the 'late talking' group on maternal and family characteristics. 'Late talkers' were identified from two expressive language subtests: vocabulary size from the Language Development Survey (LDS) (which includes 300 of the most common words in early developmental vocabulary) and word combinations from the Ages and Stages Questionnaire (ASQ). Criteria for 'late talkers' was fewer than 70 words on the LDS (< 15th percentile) and no word combinations on the ASQ. Language outcome measures were assessed at age 7 and revealed that all 'late talkers' scored within the normal ranges on all language measures at age 7.

This study qualifies for level II evidence demonstrating compelling evidence that 'late talking' children go on to develop language within normal limits by 7 years of age. Strengths of this study that lend compelling support to the aforementioned findings are based on the selection of participants (for both 'late talkers' and matched controls) that

excluded those with a primary condition that may influence language and use of valid clinical assessment tools. With that being said, it would have been helpful if the authors had been more descriptive and reported on the individual development of children's language, such that their specific language trajectory was reported. Reporting on individual trajectories is important because previous research reviewed in this article demonstrate that some 'late talkers' go on to develop typical language while others demonstrate clinical impairments. This research also shown that some TLD children go on to develop SLI.

Paul, Murray, Clancy and Andrews (1997) conducted a longitudinal cohort study that followed two groups of children from 2 years of age up to 7 years of age. The first group was composed of 'late talking' children who met criterion based on parental reports of 50 or fewer words on the LDS. The second group was composed of 27 TLD children who scored greater than 50 words on the LDS and matched the 'late talking' group on age, socioeconomic status (SES), sex, birth order, and performance on the nonverbal items from the Bayley Scales of Infant Development. At 7 years of age, the original 'late talkers' were subdivided into two groups based on their performance on the Developmental Sentence Scoring (DSS) (an index of expressive language): those who scored below the 10th percentile were categorized as language impaired while those who scored above were categorized with a history of 'late talking' ('recovered late talkers'). All children from the TLD scored above the 10th percentile at 7 years of age. Of the original 32 'late talkers', 5 (16%) were identified with a language impairment, while 27 (84%) developed expressive language within normal limits.

This study qualifies for level II evidence demonstrating compelling evidence that the vast majority of 'late talking' children go on to develop language within normal limits by 7 years of age. Strengths of this study that lend compelling support are based on the selection of participants that included controls matched to 'late talkers' in a number of areas and the exclusion of those with a primary condition. In addition, the authors used the DSS, which is a valid clinical assessment with standardized norms, along with established clinical cutoffs to categorize children with impairments, which would be representative of clinical populations.

Rescorla (2002) conducted a longitudinal cohort study that followed two groups of children from 2

years to 6 years of age. A group of 40 'late talkers' were recruited who met criteria based on scoring at least 6 months below chronological age (CA) on the Reyell Expressive Language Scale and having less than 50 words in vocabulary as assessed with the LDS. The second group was composed of 39 comparison children who matched the 'late talkers' on SES and nonverbal cognitive ability. Children from both groups all scored within normal limits on the Bayley Mental Development Scale and had CA appropriate performance on the Reynell Receptive Language Scale. At the age 6 follow up, there were 34 'late talkers' and 32 TLD children available for assessment. All tests were administered by a licensed and certified school psychologist or a speech-language pathologist. They noted 6-17% of 'late talkers' (approximately 2-6 children) manifested SLI at the age 6 follow up (the lower estimate was based on scoring below the 10th percentile on 2 Test of Language Development [TOLD-P] subtests while the higher estimate is based on clinical impression of a conversational sample). The lower score is more in line with previous research reviewed in this article.

This study qualifies for level II evidence demonstrating again that the majority of 'late talkers' (83-94%) go on to develop language abilities within normal limits by 6 years of age. Strengths of this study that lend to support of its findings are the appropriate study design, selection of participants, use of a matched control group, use of valid clinical measures and impairment criteria, and employment of professionals to administer the tests.

Question 2: *What are the language and related outcomes of 'late talkers'?*

The Rice et al., (2008) cohort study assessed language outcome measures of children at age 7 using a variety of measures, including the TOLD-P3, Peabody Picture Vocabulary Test – III (PPVT-III), Wexler Test of Early Grammatical Impairment (TEGI), and a spontaneous conversation sample that was transcribed and analyzed. Although all 'late talkers' had language abilities within normal limits, in comparison to the TLD group, the 'late talking' group scored significantly lower on tests of general language ability, syntax and grammar; but not on semantics or vocabulary.

Paul et al. (1997) assessed a number of outcome measures using a variety of tests, including the TOLD-P2 for language, Lindamood Auditory Conceptualization Test for phonemic awareness, Peabody Individual Achievement Test for school achievement, and the McCarthy Scales of Children's

Abilities for nonverbal cognitive ability. An appropriate Kruskal-Wallis nonparametric Analysis of Variance (ANOVA) was used in order to detect differences in performance between the three groups of differing sizes. The TLD group performed significantly better than the 'late talkers' (including those that had 'recovered'). No other significant difference in expressive language was noted between the two 'late talker' groups. 'Recovered late talkers' performed no differently than the TLD group on all remaining measures. The 'late talkers' who went on to be language impaired performed significantly worse than the TLD and 'recovered late talker' group on all other measures except for receptive language and spelling.

Rescorla (2002, 2005, 2009) followed up with both groups of children once a year from ages 6 to 9 and again at ages 13 and 17 to assess their language and other related abilities. Rescorla used the most current and appropriate clinical tools to measure numerous language and language related abilities, including expressive language, receptive language, grammar, vocabulary, sentence formulation, verbal memory, phonological awareness, rapid automatic naming, reading, spelling, and academic achievement. Appropriate statistical analysis using independent t-tests were conducted to compare language measures at each age, as not all children were available for assessment at each follow up age. Consistent with other authors, the majority of 'late talkers' from Rescorla's study performed within average ranges on all measures. The percentage of 'late talkers' who scored below the 10th percentile at any given age was never greater than 10% of the group (approximately 2-4 children). However, when compared to the TLD group, the 'late talkers' performance was significantly poorer in the areas of vocabulary, grammar, phonology, listening comprehension, verbal memory and reading.

These three groups of studies provide compelling evidence that shows even though most 'late talkers' go on to develop language abilities within normal limits by school-age, their language abilities are significantly below those of TLD children. Furthermore, Rescorla's study demonstrated that these weaknesses are persistent even up until the age of 17. Support for this level of evidence is provided by the authors' use of valid clinical assessment tools and appropriate study design.

Discussion

The purpose of this review was to investigate two specific questions about 'late talkers'. In response to

the first question, to what extent does the identification of a 'late talker' contribute to a diagnosis of SLI, studies show that 2/3rds to 100% of 'late talkers' will go on to develop language abilities within the normal ranges. However, if the Dale et al., (2003) results are dropped (as they were the only study to not use appropriate clinical cutoffs to define impairment), the proportion of 'late talkers' who go on to develop normal language increases to 83-100%. These results indicate that the identification of a 'late talker' does not contribute to a language impairment for the vast majority of children. In response to the second question, what are the language and related outcomes of 'late talkers', studies describe that even though 'late talkers' go on to develop language within the normal ranges, they continue to perform significantly below children with TLD.

The results reported in this review support Rescorla's theory of a 'language endowment spectrum'. That is, that language, like intelligence, can be thought of as existing along a continuum that is composed of a number of interrelated but specific abilities. Although most 'late talkers' would not be identified with a true pathology (i.e. SLI), they do demonstrate a language weakness that is below the mean on the language spectrum. The language weakness in 'late talkers' is persistent up until age 17 and likely beyond (Rescorla, 2009). Furthermore, this weakness could have broad implications for academic and vocational achievement and needs to be further researched. It is imperative that future research incorporate descriptions of individual trajectories so that potential predictors for those children with persistent delays may be developed.

Clinical Implications

The results of these studies have important clinical implications. First, both parents and clinicians should be comforted to note that most children with early delays will go on to develop language abilities within normal ranges. Second, these findings are only applicable to language delayed children without a primary condition. Therefore, the importance of early language screening and/or assessment remains and should not be devalued because the identification of language delays may be indicative of a primary condition. Third, although children with early language delay go on to perform within normal ranges, they none-the-less perform at levels below those with TLD. The language weaknesses present in this group cannot be ignored and these children should be considered for services and programming that may serve to improve their abilities.

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