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From infancy to adolescence: The longitudinal links between vocabulary, early literacy skills, oral narrative, and reading comprehension



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ABSTRACT

Previous research suggests that (a) individual differences in reading and language development are stable across childhood, (b) reading and vocabulary are intertwined, and (c) children's oral narrative skill contributes to later reading comprehension. Each of these three phenomena is assessed using a longitudinal design spanning 15 years, from when children were 19 months old until they were 16 years old. Alongside measures for maternal vocabulary, a host of language and (early) reading measures, including vocabulary, early literacy development, oral narrative skill, and reading comprehension, were administered across eight time points to a sample of 58 children. Specific early language and reading skills were generally strongly correlated over time. Reading comprehension at age 12 was predicted by vocabulary at 19 months and emergent literacy at school entry. Vocabulary at 19 months of age predicted early literacy skills prior to school entry and reading comprehension at age 12 years, as did school entry literacy skills. Controlling for maternal and infant vocabulary, children's oral narrative skill around school entry related uniquely to reading comprehension 10 years later. Findings provide new evidence for the long-term interplay between early language, literacy, and later reading and vocabulary development.

1. Introduction

In recent decades, three findings have been instrumental in shaping understanding of reading development. First, research has shown that children's relative reading performance in kindergarten predicts later reading (Phillips, Norris, Osmond, & Maynard, 2002), in some instances explaining large amounts of variance (Blatchford & Plewis, 1990; de Jong & van der Leij, 2002; Juel, 1988; Kirby, Parrila, & Pfeiffer, 2003). Second, research has come to better understand that reading is a collaborative venture at the skill level, with successful reading also requiring language skills (Aram, 2005; Catts, Fey, Zhang, & Tomblin, 1999; Scarborough, 2001; Storch & Whitehurst, 2002). Lastly, work on the language precursors of reading has expanded from simple vocabulary assessments to include linguistically richer facets, such as children's oral narrative skill (Dickinson, McCabe, Anastasopoulos, Peisner-Feinberg, & Poe, 2003; Reese, Suggate, Long, & Schaughency, 2010).

The purpose of the current paper is to expand findings in each of these three areas using data from a longitudinal study providing regular vocabulary assessments from children as young as 19 months through to 16 years. Early literacy measures were also collected at ages 4 and 5–1/2, and reading comprehension measures were collected at ages 12 and 16 years. Furthermore, children's oral

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narrative retelling skill was assessed prior to and after school entry, and to account for home factors, maternal vocabulary was included as a control variable. Accordingly, we test links between early literacy skills, vocabulary, oral narrative skill, reading fluency, comprehension, and vocabulary in adolescence.

1.1. Reading development

1.1.1. Early literacy and reading development

Early literacy skills, sometimes referred to as emergent literacy skills, are those that are inherently involved in reading development, but that are present before reading skill itself develops (Lonigan & Shanahan, 2008). Early literacy skills include important precursors of word reading, such as letter knowledge (i.e., being able to recognize and name letters), knowledge of letter-sound correspondences (e.g., being able to match the sound /m/ with the letter “m”), phonemic awareness (e.g., segmenting the word “mat” into /m/ /a/ /t/), and concepts about print (i.e., knowledge of reading conventions, text directionality, book structure), and handwriting (writing letters and words) (Dickinson, Golinkoff, Hirsh-Pasek, Neuman, & Burchinal, 2009; Molfese, Beswick, Jacobi-Vessels, Armstrong, Culver, & White et al., 2011; Snow, Burns, & Griffin, 1998; Whitehurst & Lonigan, 2001; Whitehurst & Lonigan, 1998). Together, these skills equip children with the mechanics of learning to read, enabling them to decode text and orient their way through books and texts.

Research studies and syntheses consistently find that early literacy skills predict reading development in the early grades (Lonigan, Schatschneider, Westberg, & The National Early Literacy Panel, 2008). However, the strongest kindergarten and first-grade predictors of reading appear to be letter and word decoding performance (Blatchford & Plewis, 1990; Kendeou, Van den Broek, White, & Lynch, 2009; Lonigan et al., 2008; Scarborough, 1998; Schatschneider, Fletcher, Francis, Carlson, & Fooman, 2004; Speece & Ritchey, 2005). Yet longer-term research from kindergarten to the later grades is scarce (cf. Blatchford & Plewis, 1990).

1.1.2. Reading comprehension

It is generally accepted that the main purpose of reading is to comprehend what is read (Speece & Ritchey, 2005). Reading comprehension in its simplest form is defined as being able to read a given text fluently and to understand at a reasonable level what was read (Stuart, Stainthorp, & Snowling, 2008). At a deeper level reading entails much more, such as being able to derive meaning from sentences containing unfamiliar vocabulary items, and thereby acquire meanings of unfamiliar words (Swanborn & de Glopper, 2002), reflect upon the meaning of text, and acquire knowledge from reading (Biemiller, 2006).

1.2. Vocabulary and reading development

Vocabulary is important for reading in at least two ways: firstly for phonological recoding, and secondly for reading comprehension. Phonological recoding occurs when individual phonemes (/r/ /u/ /f/ from “r-ou-gh”) have been correctly decoded but then need to be combined into the correct lexical item (into “rough”). Evidence exists that vocabulary plays a role in word reading skills at both the early stages of learning to read (Suggate, Reese, Lenhard, & Schneider, 2014; Tunmer & Chapman, 2012a, 2012b), and later with older children (Dickinson & Porche, 2011; Oakhill & Cain, 2012; Ricketts, Nation, & Bishop, 2007). Evidence for the relationships between vocabulary and reading in the first two grades is a bit more equivocal (Lonigan et al., 2008; Muter, Hulme, Snowling, & Stevenson, 2004), with the correlation potentially attenuated by the constrained vocabulary of the instructional texts typically assigned to children beginning to read (Biemiller, 2006).

In terms of reading comprehension, the Simple View of Reading (Gough & Tunmer, 1986) postulates that meaningful reading comprises decoding and linguistic comprehension skills (Stuart et al., 2008). This model emphasizes the role that vocabulary plays in reading (Tunmer & Chapman, 2012a). Studies additionally show that a host of cognitive and psychological variables are also important in reading (Cartwright, 2012; Conners, 2009; Ferrer, Shaywitz, Holahan, Marchione, & Shaywitz, 2010; Joshi, Tao, Aaron, & Quiroz, 2012; Kirby et al., 2003; Preßler, Könen, Hasselhorn, & Krajewski, 2014). However, the core premise that reading and language strands determine reading comprehension has been widely adopted (e.g., Scarborough, 2001; Whitehurst & Lonigan, 1998).

In terms of the language strand of reading comprehension, more than just vocabulary is required, with broader aspects playing a role, such as morphology (Nagy, Berninger, & Abbott, 2006), listening comprehension (Nation & Snowling, 2004; Speece, Ritchey, Cooper, Roth, & Schatschneider, 2004), and possibly also oral narrative skill (Griffin, Hemphill, Camp, & Wolf, 2004; Hester, 2010). For instance, children with reading difficulties also have difficulties producing coherent and complex oral narratives (e.g., Bishop & Adams, 1990; Westerveld & Gillon, 2010). However, to date, most studies with typically developing children have used vocabulary as the sole measure of language skills (Dickinson et al., 2003).

1.3. Contributions of reading and language to later reading comprehension

The developmental interaction of reading and language is fundamentally interesting for two reasons. First, as outlined, this research informs understanding of which skills are necessary for reading at which grade level. For example, early years education may differ on whether emphasis is placed on decoding or language skills (e.g., Dickinson, Golinkoff, & Hirsh-Pasek, 2010; Lonigan & Phillips, 2012), such that a deeper understanding of the long-term links between reading and language might inform this debate. Second, researchers have long posited the existence of reciprocal effects, whereby engaging in reading improves language and vice versa (Quinn, Wagner, Petscher, & Lopez, 2015; Ritchie, Bates, & Plomin, 2015; Stanovich, 1986). Conceivably, children who have greater language skill may be better able to decode orthographically irregular words (Nation & Coxsey, 2009) and conversely,

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