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Young children's narrative skill: concurrent and predictive associations with emergent literacy and early word reading skills

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Abstract Narrative skill is included in emergent literacy frameworks and believed to be important for children's early reading development. Yet, empirical evidence concerning associations with other emergent literacy skills and later word reading skills is limited. We comprehensively assessed the emergent literacy skills of 3- to 5.5-year old children (n = 243), along with their word identification and decoding skills 2 years later. Narrative skill was modestly associated with all measures of emergent literacy. Narrative skill predicted word reading skills in univariate models but not after accounting for other emergent literacy skills. Further analyses showed that associations between narrative and word reading skills were fully mediated by other emergent literacy skills. When considered in light of prior work indicating associations between narrative skill and reading comprehension, these indirect associations between narrative and early word reading suggest a second pathway by which narrative skill may support reading development.

Keywords Narrative skill · Emergent literacy · Early reading development

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Introduction

Young children's emergent literacy skills are considered foundational for development of conventional reading skills (Scarborough, 2001; Teale & Sulzby, 1986; Whitehurst & Lonigan, 1998), and substantial evidence indicates that many skills included in emergent literacy frameworks, such as letter knowledge, phonological awareness, and vocabulary, are important contributors to later word reading abilities (National Early Literacy Panel, 2008). These theoretical frameworks also include other emergent literacy skills, such as narrative skill, that are believed to be important for young children's early reading development (Mason & Stewart, 1990; Sénéchal, LeFevre, Smith-Chant, & Colton, 2001; Whitehurst & Lonigan, 1998).

Narrative skill is defined as the ability to orally present a series of events in a temporally coherent fashion as required to generate or retell a story (Engel, 1995; Hughes, McGillivray, & Schmidek, 1997). Conceptually, narrative skill includes elements of both macrostructure (i.e., global features, such as the ability to organize ideas to follow traditional story structure) and microstructure (i.e., specific features of the language used to convey ideas, including use of decontextualized language and grammatical complexity) and thus indicates not only a sense of story organization (Roth, 2000) but also facility with oral language at both the discourse and word levels (Bourg, Bauer, & van den Broek, 1997; Harris & Schroeder, 2012; Heilmann, Miller, Nockerts, & Dunaway, 2010). With respect to early reading, narrative skill is theorized to be a bridge between oral language and printed text (see NICHD Early Child Care Research Network, 2005; Snow, 1983, 1991) and anchored in children's exposure to stories and early interactions with print (Sénéchal & LeFevre, 2001, 2002). For all of these reasons, narrative skill has been set forth as an important component of emergent literacy that supports children as they learn to read. However, although empirical work indicates relations between narrative skill and listening comprehension (Bourg et al., 1997), expressive and receptive vocabulary (Heilmann et al., 2010), story grammar (Harris & Schroeder, 2012), and later reading comprehension (Boudreau, 2008; Dickinson & McCabe, 2001; Dickinson & Tabors, 2001; Griffin, Hemphill, Camp, & Wolf, 2004), far less is known about narrative skill as it relates to children's emergent literacy or early reading skills, and empirical evidence concerning these associations is limited. Thus, the purpose of the present study was to examine narrative skill as it is associated with other emergent literacy skills, and, in particular, to examine predictive associations between narrative and early word reading skills after accounting for the contribution of other emergent literacy skills.

Narrative and emergent literacy

Given its inclusion in various emergent literacy frameworks, we might expect associations between narrative skill and other emergent literacy skills. Emergent literacy skills are frequently interrelated, given that these are often supported via the same types of early language and literacy experiences (Dickinson & McCabe, 2001; Lonigan, Burgess, & Anthony, 2000). Narrative skill is supported through children's

verbal interactions with adults, which also support language development more generally and children's early understandings about letters and print (Dickinson, 2011; Dickinson & Tabors, 2001; Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002; Justice, Pullen, & Pence, 2008; Treiman et al., 2015; Zimmerman et al., 2009). Shared book reading provides a particularly important context for supporting children's narrative skill and also provides opportunities for children to learn about conventions of print, letter knowledge, letter-sound correspondences, vocabulary, and other aspects of language (Justice, McGinty, Piasta, Kaderavek, & Fan, 2010b; Neuman, 1996; Sénéchal & LeFevre, 2002; Zevenbergen & Whitehurst, 2003). Moreover, narrative skill allows children to access story structure and may thereby promote engagement with books and print (Sénéchal & LeFevre, 2001).

Although concurrent associations between young children's narrative and other emergent literacy skills has not been a focus of previous work, a handful of studies suggest interrelations among these skills. For example, Snow, Tabors, Nicholson, and Kurland (1995) showed positive associations between kindergarteners' narrative skill and their writing skills, letter knowledge, phonological awareness, and knowledge of print conventions. Similarly, Tabors, Roach and Snow (2001) found associations between narrative skill and kindergarteners' letter name knowledge and knowledge of print conventions, and Hipfner-Boucher et al. (2014) demonstrated positive associations between preschoolers' narrative skill and their letter name knowledge and phonological awareness, including unique associations with phonological awareness above and beyond other predictors. Interestingly Hipfner-Boucher et al. (2014) interpreted these findings by positing common structural and processing demands of children's narrative and phonological awareness skills, a premise which is supported in other studies as well (Cooper, Roth, Speece, & Schatschneider, 2002; McKeough et al., 2008).

However, some studies show less consistent findings concerning associations between narrative and other emergent literacy skills. Boudreau and Hedberg (1999), for instance, found few associations between narrative skill and measures of phonological awareness, letter knowledge, letter-sound correspondence, and conventions of print. Others have suggested that narrative may be more closely related to measures of linguistic competence (Catts, Fey, Zhang, & Tomblin, 1999; Sénéchal & LeFevre, 2014). For example, (Blankman, Teglasi, & Lawser, 2002) found that children's storytelling ability more closely overlapped with oral language skills than with reading skills, and other research suggests narrative skill to be a mediator between oral language and emergent literacy skills for African-American children (Gardner-Neblett & Iruka, 2015). In general, many studies examining interrelations among emergent literacy skills have not included narrative measures (e.g., Lonigan et al., 2000; Sénéchal & LeFevre, 2002), perhaps due to the time-consuming nature of capturing and coding children's narratives (cf. Justice, Bowles, Pence, & Gosse, 2010a), and contrasting views of narrative in relation to other emergent literacy skills leave us without a clear understanding of how these skills are associated.

Narrative and early reading outcomes

Narrative is included in emergent literacy frameworks because it is considered a key contributor to reading development (Gardner-Neblett & Iruka, 2015; Reese, Suggate, Long, & Schaughency, 2010; Wellman et al., 2011). Studies examining associations between narrative and early reading skills have generally focused on relations with reading comprehension (see Sénéchal & Lever, 2014). Yet, narrative might also predict early word reading skills, such as word identification and decoding. Such associations might be anticipated based on conceptual and empirical literature linking aspects of oral language to later word reading. Vocabulary, for instance, is noted as contributing to not only comprehension but also word reading given the importance of consolidated word knowledge for identifying printed words (Perfetti, 2007; Verhoeven, van Leeuwe, & Vermeer, 2011). In fact, recent research shows that vocabulary skill is related to children's reading comprehension through its associations with both listening comprehension and word reading (Language & Reading Research Consortium, 2015b). More complex oral language skills, including narrative, are expected to support children's continued vocabulary development as well as other emergent literacy skills that are anchored in language, such as phonological awareness, and may also promote children's interactions with storybooks and print (Dickinson, Golinkoff, & Hirsh-Pasek, 2010; Hipfner-Boucher et al.2014; Sénéchal & LeFevre, 2001). Empirical evidence shows that young children's oral language, generally, predicts their subsequent word identification and decoding skills (National Early Literacy Panel, 2008) and that these associations may be indirect, with oral language influencing children's later word reading skills through early associations with code-related emergent literacy (e.g., letter knowledge, print concept knowledge, phonological awareness; Kendeou, van den Broek, White, & Lynch, 2009; NICHD Early Child Care Research Network, 2005; Storch & Whitehurst, 2002). Similar associations may be evident for narrative, given potential links with other emergent literacy skills and the premise that narrative helps to bridge oral language and printed text (Gardner-Neblett & Iruka, 2015; NICHD Early Child Care Research Network, 2005).

In the literature to date, some studies suggest positive associations between narrative skill and children's early word reading skills. For example, Griffin et al. (2004) demonstrated that the length and quality of children's oral narratives at age 5 predicted their abilities to orally read and comprehend passages of text at age 8. Expanding this work, Reese et al. (2010) conducted two studies to assess associations of narrative and later word reading skills, measuring the quality of 6-year-old children's oral narratives and examining concurrent and longitudinal associations with decoding and oral reading abilities over a span of one to 2 years. Aspects of children's narrative skill were positively associated with both decoding and oral reading skills at the one-year, but not the two-year, follow up. Moreover, in their second study, narrative skill uniquely predicted concurrent and future oral reading skill after controlling for vocabulary and decoding abilities. Wellman et al. (2011) also found that young children's narrative skill predicted school-age reading abilities, including word identification, decoding, and reading comprehension. More specifically, elements of children's skill with narrative macrostructure predicted

word identification and reading comprehension, whereas microstructure predicted decoding. Additional work by Armand, Lefrançois, Baron, Gomez, and Nuckle (2004) suggests that providing opportunities for children to improve their narrative skill, through shared book reading and explicit teaching of story grammar and vocabulary, leads to improved word reading outcomes. Notably, associations between children's narrative and word reading skills have also been documented for those speaking languages other than English, such as Spanish (Barra & McCabe, 2013; Miller et al., 2006).

A few studies examining associations between narrative and early word reading skills contradict the results reported above. Roth, Speece, and Cooper (2002) found that kindergarteners' narrative skill, as assessed with a measure of macrostructure, did not predict later word reading, decoding, or comprehension after controlling for initial skill levels in these areas as well as other emergent literacy skills such as print and phonological awareness. Similarly, Snow et al. (1995) found no significant concurrent associations between first graders' narrative and reading skills and a significant positive association between narrative and only one of two early reading outcomes. Work by Lynch et al. (2008) also suggests inconsistent associations between measures of narrative and word decoding. Notably, many studies examining associations of emergent literacy skills to later reading have not included narrative measures or have not utilized these in predicting early word reading (e.g., Sénéchal et al., 2001; Storch & Whitehurst, 2002) and, perhaps for this reason, narrative was not included as one of the discrete predictors in the National Early Literacy Panel's (2008) meta-analyses summarizing the knowledge base concerning early predictors of later reading skills. Thus, more work is necessary to understand contributions of narrative skill to children's early word reading development.

Contribution and purpose of the current study

The available literature provides limited insight into the ways in which narrative relates to other emergent literacy skills and early word reading. Although narrative has been included in emergent literacy frameworks (Mason & Stewart, 1990; Sénéchal et al., 2001; Whitehurst & Lonigan, 1998), most of the literature drawing on these frameworks does not include narrative as a variable of interest, and much of the available narrative research has relied on relatively small samples or special populations of children which restricts generalizability (e.g., Boudreau & Hedberg, 1999; Griffin et al., 2004; Wellman et al., 2011; see "Appendix" for descriptions of prior study samples). In addition, investigations attempting to link narrative skill with emergent literacy and later word reading skills vary greatly in how narrative is measured (see "Appendix"), with most studies utilizing a measure that only partially represents the construct (e.g. macrostructure only) and many utilizing experimental measures that are not available for use in other studies, restricting replicability. Importantly, with two exceptions (Reese et al., 2010; Roth et al., 2002), studies examining longitudinal relations with early word reading have not accounted for other emergent literacy skills and, to our knowledge, no studies have

considered whether narrative skill contributes indirectly to early word reading through its associations with other emergent literacy skills.

In the current study, we add to the extant literature by (1) examining concurrent associations between narrative skill and other emergent literacy skills included in theoretical frameworks, (2) examining predictive associations between narrative skill and children's early word reading skills (i.e., word identification and decoding) when considered univariately and after accounting for the contribution of other emergent literacy skills, and (3) directly testing whether any associations between narrative skill and early word reading skills are mediated by other emergent literacy skills. In our contemporary examination of these aims, we address three particular limitations of the available literature. First, we increase the generalizability of results by utilizing a large sample involving typically developing learners. Second, we use a psychometrically sound measure of narrative skill that represents both the microstructure and macrostructure aspects of the construct and is available to other researchers. Third, we included a comprehensive set of emergent literacy measures that directly map to emergent literacy frameworks and are therefore not only able to fully address associations between narrative and emergent literacy skills but also isolate the distinct direct and indirect contributions of narrative skill to early word reading skills over and above a full complement of emergent literacy skills.

Method

Participants

The study involved 243 U.S, children who completed a longitudinal study over two school years. At study entry, children were between the ages of 3 and 5.5 years (M = 4.28 years, SD = 0.65). Caregiver consent materials were distributed by research staff at childcare, school, and community (e.g., public library) sites in two Midwestern states. All children with signed consent forms who met eligibility criteria (i.e., proficient in speaking and understanding English, free of significant medical/developmental disabilities) were enrolled in the study.

Fifty-six percent of children were male. The majority were White/Caucasian (60%); 18% were Black/African American, 3% were Asian, and 17% were multiracial (2% unreported). Seven percent were Hispanic or Latino. Caregivers' highest degrees earned included a high school diploma (25%), associates degree (7%), bachelors degree (25%), masters degree (26%), or doctoral degree (9%); 6% did not have a high school diploma. Thirty percent of children's caregivers reported annual household incomes less than $25,000; 21% reported incomes of $25,000–$75,000, and 38% reported incomes greater than $75,000 (11% unreported). Children lived primarily in urban (36%) or suburban (51%) areas (6% rural; 7% unreported). Most were enrolled in childcare/preschool (96%), with a few children enrolled in kindergarten (1%) and others not enrolled in childcare/school (3%). Four percent had identified disabilities.

Procedures and measures

Trained research assistants assessed children individually in quiet locations at a research laboratory or at their respective childcare, school, or community sites. At study entry, each child completed an assessment battery that included multiple measures of emergent literacy skills; this included the skills represented in emergent literacy theoretical frameworks (Sénéchal et al., 2001; Whitehurst & Lonigan, 1998). Approximately 2 years later, children completed additional assessments including those measuring their early word reading skills.

Narrative skill

Children's narrative skills were measured using the Narrative Assessment Protocol, second edition (NAP-2: Bowles, Justice, Khan, Piasta, Skibbe, & Foster, 2018). The NAP-2 is the result of a psychometrically-rigorous redevelopment of the original NAP (Justice et al., 2010a). Similar to other narrative measures (e.g., Test of Narrative Language; Gillam & Pearson, 2004; Renfrew Bus Story; Glasgow & Cowley, 1994) and procedures utilized in previous studies (e.g., Boudreau & Hedberg, 1999; Catts et al., 1999; Reese et al., 2010), the NAP elicits narrative via a story retell task. Importantly, however, the NAP-2 overcomes limitations inherent in previous measures. NAP-2 codes aspects of both narrative microstructure (e.g., use of conjoined adverbial phrases, gratuitous terms, interrogative sentences, tier two verbs) and macrostructure (e.g., use of a conventional opening, identification of main character, identification of sub-goals and resolution) from children's retellings of an unfamiliar wordless picture book. NAP-2 items were identified via an exhaustive search of the literature, vetted by experts on children's narrative development, and subjected to a rigorous validation process utilizing factor analysis and Rasch analysis (Bowles et al., 2018). Rasch (1960/1993) analysis is a form of item response modeling that offers a strong validation approach (Fisher, 1991), including evidence of interval measurement (Perline, Wright, & Wainer, 1979). For more details on Rasch analysis, see Bond and Fox (2015). For the present study, the final version of the NAP-2 was administered (materials and training available at https://www.narrativeassessment.com). Retellings were audio-recorded in the field and coded in the lab by trained research assistants. Exact agreement, assessed with double scoring of 10% of the narratives, was .85, and the reliability of the measure was .81 as computed via Rasch analysis using Winsteps (Linacre, 2015). Raw scores were converted into IRT-based scaled scores with a mean of 20 and standard deviation of 2.

Language/syntactic awareness

Children's receptive and expressive language skills, including semantic and syntactic knowledge, were assessed via the three core subtests of the Clinical Evaluation of Language Fundamentals Preschool-2 (CELF-P:2; Wiig, Secord, & Semel, 2004). The Expressive Vocabulary subtest measures children's abilities to name objects, actions, and people. The Sentence Structure subtest measures

children's abilities to understand sentences of increasingly complex syntax. The Word Structure subtest measures children's abilities to use increasingly complex syntactical constructions, including pronouns, noun forms, verb tenses, and prepositions. Internal consistencies for the subtests range from .82–.83 (Wiig et al., 2004). Raw scores for each subtest were used in analyses.

Conventions of print

Children's knowledge of conventions of print was measured using the Preschool Word and Print Awareness assessment (PWPA; Justice, Bowles, & Skibbe, 2006). This assessment requires children to demonstrate knowledge about 14 print concepts (e.g., print versus pictures, print directionality) within the context of a shared storybook reading. Reliability computed via IRT analyses was .74 (Justice et al., 2006). Per the PWPA protocol, raw scores were converted to IRT-based scaled scores with a mean of 100 and standard deviation of 15.

Letter knowledge

Children's letter name knowledge was measured using the Quick Letter Name Knowledge assessment (Tortorelli, Bowles, & Skibbe, in press). This assessment consists of four parallel forms, each with 8 letters, that are equivalent in difficulty based on IRT analyses; one form was randomly selected for administration to each child. Children are asked to identify the uppercase and lowercase letters. IRT-based reliability of the forms averaged .91 (range .89–.92; Tortorelli et al., in press). Raw scores (range of 0–8) were converted to IRT-based scaled scores with a mean of 20 and standard deviation of 2.

Phonological awareness

Children's phonological awareness skills were measured via the Phonological Awareness subtest of the CELF-P:2 (Wiig et al., 2004). The subtest requires children to detect and produce rhymes, blend compound words and syllables, and segment sentences and syllables. Internal consistency ranges from .88–.89 for children ages 4–5 (Wiig et al., 2004), and raw scores were used in analyses.

Letter-sound correspondence

Children's letter-sound knowledge was measured using the Letter Sound Short Forms (Piasta, Phillips, Williams, Bowles, & Anthony, 2016). Each short form contains six letters, shown in both uppercase and lowercase, for which the child is asked to give the corresponding sound. All short forms are equivalent in difficulty based on IRT analysis; one form was randomly selected for administration to each child. Reliabilities computed from IRT analyses ranged from .89–.91 across forms (Piasta et al., 2016). Raw scores (range of 0–6) were converted to IRT-based scaled scores with a mean of 20 and standard deviation of 2.

Early word reading

Children's early word reading skills were measured using two subtests of the Woodcock-Johnson Tests of Achievement-III (Woodcock, McGrew, & Mather, 2001, 2007). Children's word identification skills were measured using the Letter-Word Identification subtest, in which children are initially asked to identify letters and then read increasingly difficult words. Children's decoding skills were measured using the Word Attack subtest, in which children are asked to read increasingly difficult pseudowords. Split-half reliability for children ages 3–5 ranges from .94–.99 on these subtests (Woodcock et al., 2001, 2007). Raw scores for each subtest were converted to IRT-based W scores for analyses.

Results

Descriptive statistics for all variables are presented in Table 1. Our first research aim concerned the concurrent associations of narrative and other emergent literacy skills. We examined correlations among these skills, presented in Table 1, and found that narrative skill was significantly and positively correlated with all other emergent literacy skills (*r*s from .203–.398). Notably, correlations among other emergent literacy skills ranged from .383–.767. We followed the correlational analysis by conducting an exploratory factor analysis and found that, despite the lower correlations involving narrative, all skills loaded onto a single factor (first eigenvalue = 4.592, second eigenvalue = 0.959, third eigenvalue = 0.726). The factor loading for narrative skill was .397, which was substantially smaller than the loadings of .704–.835 for the other emergent literacy skills.

Our second research aim concerned the associations between narrative skill and early reading. We examined the univariate associations among these skills via correlations, shown in Table 1. Narrative skill was significantly and positively, albeit weakly, correlated with both word identification and decoding (*r*s = .263 and .284, respectively). Next, we conducted hierarchical regression analyses to determine the unique contribution of narrative skill to early reading skills after controlling for other emergent literacy skills. Separate hierarchical regression analyses were conducted for word identification and decoding as outcome variables. In Step 1 of these models, we entered all non-narrative emergent literacy skills (measures of language/syntactic awareness, conventions of print, letter knowledge, phonological awareness, and letter-sound correspondence). In Step 2 of these models, we added narrative skill. Results are presented as Model 1 in Table 2. Non-narrative emergent literacy skills accounted for 48.5–49.6% of the variance in early reading skills. After accounting for these non-narrative emergent literacy skills, narrative skill was no longer associated with either word identification or decoding and only accounted for an additional 0.3–0.5% of variance in these outcomes.

Because narrative skill may be closely tied to children's language and was most highly correlated with a measure of expressive vocabulary in the current sample (r = .398), we reasoned that shared variance between narrative skill and other language skills might attenuate associations between narrative skill and early

Table 1 Correlations and descriptive statistics for emergent literacy and word reading measures

Measure	1	2	3	4	5	6	7	8	9	10	*M*	*SD*
1. Narrative skill	–	.398	.304	.342	.304	.203	.337	.268	.263	.284	18.84	2.16
2. Language/ syntactic awareness: Expressive vocabulary		–	.638	.747	.556	.505	.544	.527	.475	.484	20.75	7.54
3. Language/ syntactic awareness: Sentence structure			–	.675	.573	.383	.537	.446	.478	.502	13.92	4.46
4. Language/ syntactic awareness: Word structure				–	.601	.546	.648	.514	.490	.511	14.47	4.94
5. Conventions of print					–	.548	.564	.590	.569	.530	102.42	17.08
6. Letter knowledge						–	.491	.767	.585	.542	21.31	1.98
7. Phonological awareness							–	.558	.507	.492	10.87	6.93
8. Letter-sound correspondence								–	.642	.645	20.39	1.90
9. Early word reading: Word identification									–	.854	405.39	46.28
10. Early word reading Decoding										–	448.07	36.01

All correlations statistically significant at $p < .01$

reading outcomes. We therefore conducted additional post hoc analyses in which other language skills were not included. For these hierarchical regression analyses, we included conventions of print, letter knowledge, phonological awareness, and letter-sound correspondence in Step 1 and entered narrative skill in Step 2. Results, presented as Model 2 in Table 3, were similar to the original hierarchical regression results, in that narrative skill did not contribute to early reading skills even when other language skills were not included. Additionally, in order to compare the amount of variance accounted for by narrative skill versus other language skills, we conducted additional hierarchical regressions in which we entered conventions of print, letter knowledge, phonological awareness, and letter-sound correspondence in Step 1 and the language/syntactic awareness measures in Step 2; see Model 3 in Table 3. In these models, language/syntactic awareness skills accounted for a non-statistically significant 0.8% of the variance in word identification skills and a significant 1.9% of the variance in decoding. These are in comparison to the non-

Table 2 Summary of hierarchical regression analysis for narrative skill predicting word reading skills (model 1)

Predictors	Word identification			Decoding		
	R^2	ΔR^2	β	R^2	ΔR^2	β
Step 1	.496***			.485***		
Language/syntactic awareness						
Expressive vocabulary			.020			.008
Sentence structure			.139			.174*
Word structure			−.048			.020
Conventions of print			.199**			.141
Letter knowledge			.176*			.078
Phonological awareness			.062			.027
Letter-sound correspondence			.303**			.391***
Step 2	.499***	.003		.490***	.005	
Narrative skill			.060			.080

*$p < .05$; ** $p < .01$; ***$p < .001$

Table 3 Summary of post hoc hierarchical regression analysis for narrative skill predicting word reading skills (models 2 and 3)

	Word identification			Decoding		
Predictors	R^2	ΔR^2	β	R^2	ΔR^2	β
Model 2						
Step 1	.485***			.465***		
Conventions of print		.249***				.224***
Letter knowledge			.173*			.093
Phonological awareness			.088			.085
Letter-sound correspondence			.306***			.386***
Step 2	.489***	.004		.473***	.008	
Narrative skill			.069			.095
Model 3						
Step 1	.500***			.466***		
Conventions of print		.255***				.216***
Letter knowledge		.156*				.068
Phonological awareness		.099				.096
Letter-sound correspondence		.323***				.410***
Step 2	.507***	.008		.485***	.019*	
Language/syntactic awareness:						
Expressive vocabulary		.019				.007
Sentence structure		.118				.154*
Word structure		− .049				.040

*$p < .05$; ** $p < .01$; ***$p < .001$

significant 0.8 and 0.4% of variance in early reading outcomes, respectively, accounted for by narrative skill (Model 2).

Our third research aim concerned whether associations between narrative skill and word reading skills were mediated by other emergent literacy skills. We conducted two multiple mediator analyses (Preacher & Hayes, 2008), one for each word reading outcome, in which narrative skill served as the independent variable of interest and all other emergent literacy skills were entered as mediators. Results are presented in Table 4. Aligned with our findings reported above, narrative skill had a significant total effect on both word identification and decoding but no direct effect after including the other emergent literacy skills in the model. However, narrative skill had significant indirect effects on both outcomes. The association between

Table 4 Direct and indirect associations of narrative skill with word reading skills as mediated by other emergent literacy skills

	Word identification			Decoding		
	Estimate	*SE*	*p*	Estimate	*SE*	*p*
Total effect[a]	5.856	1.442	<.001*	4.844	1.104	<.001*
Direct effects						
Narrative skill	1.302	1.200	.277	1.342	0.928	.150
Expressive vocabulary	0.022	0.501	.967	0.071	0.389	.856
Sentence structure	1.449	0.771	.062	1.397	0.596	.020*
Word structure	− 0.469	0.839	.577	0.123	0.648	.849
Conventions of print	0.548	0.205	<.001*	0.297	0.159	.063
Letter knowledge	4.322	1.950	.028*	1.611	1.512	.288
Phonological awareness	0.350	0.476	.463	0.070	0.369	.851
Letter-sound correspondence	7.251	2.139	.028*	7.207	1.654	<.001*
	Estimate	*SE*	95% CI	Estimate	*SE*	95% CI
Indirect effects						
Expressive vocabulary	0.029	0.730	[− 1.474, 1.439]	− 0.960	0.537	[− 1.236, 0.909]
Sentence structure	0.912	0.546	[0.019, 2.227]*	0.876	0.473	[0.078, 1.956]*
Word structure	− 0.364	0.753	[− 1.994, 1.041]	0.096	0.540	[− 0.938, 1.232]
Conventions of print	1.217	0.568	[0.255, 2.501]*	0.657	0.379	[0.027, 1.526]*
Letter knowledge	0.752	0.454	[0.098, 1.957]*	0.280	0.331	[− 0.224, 1.160]
Phonological awareness	0.377	0.510	[− 0.531, 1.514]	0.075	0.401	[− 0.701, 0.932]
Letter-sound correspondence	1.631	0.647	[0.603, 3.182]*	1.614	0.567	[0.689, 2.937]*
Total[b]	4.554	1.223	[2.271, 7.099]*	3.502	0.875	[1.824, 5.330]*

SE standard error, *CI* bias-corrected confidence interval based on 5000 bootstrap samples

[a]Total effect of narrative skill = direct effect + indirect effects

[b]Total indirect effect of narrative skill

*Statistically different from zero

narrative skill and word identification was fully mediated, with significant indirect effects through sentence structure, conventions of print, letter knowledge, and letter-sound correspondence. The association between narrative skill and decoding was also fully mediated, with significant indirect effects through sentence structure, conventions of print, and letter-sound correspondence.

Discussion

To our knowledge, this is one of the largest studies to include narrative in its comprehensive assessment of children's emergent literacy skills and longitudinally follow children as they begin to develop word reading skills. Moreover, our sample comprised mostly typically developing children who varied in terms of demographics and backgrounds (cf. Boudreau & Hedberg, 1999; Snow et al., 1995; Wellman et al., 2011). The sample of children was fairly representative with respect to the U.S. population in terms of race and disability status (U.S. Census Bureau, 2015), included those living in both urban and suburban areas, and included the full distribution of socioeconomic status as measured by education and income levels. As such, our results provide important insights into associations between children's narrative skill and their emergent literacy and early reading skills and also hold implications for educational practice.

Our first major finding was that children's narrative skill was moderately associated with all other emergent literacy skills, including language/syntactic awareness, conventions of print, letter knowledge, phonological awareness, and letter-sound correspondence, and that all skills were related to the same underlying construct. Our finding concerning associations between narrative and other emergent literacy skills is similar to previous reports of small to medium correlations from studies of children from low-income backgrounds (e.g., Snow et al., 1995; Tabors et al., 2001; see also Hipfner-Boucher et al., 2014; Lynch et al., 2008). This result suggests that lack of associations in other reports (e.g., Boudreau & Hedberg, 1999) may be due to small samples sizes with limited statistical power or a focus on children with language impairment. Additionally, the magnitude of associations among emergent literacy skills in the current sample is consistent with those reported in other studies (e.g., Hipfner-Boucher et al., 2014; Lonigan et al., 2000; Snow et al., 1995), lending credibility to our findings. Together, these results substantiate conjectures concerning general interrelations among skills included in emergent literacy frameworks.

As described in the literature review, narrative skill conceptually overlaps with other aspects of emergent literacy (Dickinson & McCabe, 2001; Gardner-Neblett & Iruka, 2015), with narrative macrostructure perhaps related to children's other knowledge about books and print and narrative microstructure theoretically linked to children's language skills. However, the modest associations between children's narrative and other emergent literacy skills found in this study are noteworthy because these suggest that the overlap between narrative and other emergent literacy skills may not be as large as expected; a substantial amount of variance in narrative skill is unshared with other emergent literacy skills. In addition, non-narrative

emergent literacy skills were generally much more strongly correlated with each other than with narrative skill. We note that this was not due to reliability issues, as the reliability for the narrative measure (.81) was in the same range as the measures of other emergent literacy skills. This result is particularly important with respect to the other language/syntactic awareness skills and supports perspectives that characterize narrative as somewhat distinct from other language skills, with relations between narrative skill and other measures of language weakening as children get older (Ebert & Scott, 2014; Language & Reading Research Consortium, 2015a). This finding aligns with current emergent literacy frameworks in which narrative is grouped with but delineated from other aspects of language (Mason & Stewart, 1990; Sénéchal et al., 2001; Whitehurst & Lonigan, 1998) and recent findings showing that the amount of variance in kindergarten emergent literacy skills accounted for by preschool narrative skill is relatively small for children who do not identify as African-American (Gardner-Neblett & Iruka, 2015).

A second major finding concerns the longitudinal associations between narrative skill, as an emergent literacy skill, and early work reading skills. We found that all emergent literacy skills individually significantly predicted children's word identification and decoding 2 years later, which substantiates the basic premise of emergent literacy frameworks in establishing associations between emergent and later literacy skills. These results align with extant literature showing moderate predictive relations for oral language, knowledge of print conventions/print awareness, and alphabet knowledge with early word reading outcomes (National Early Literacy Panel, 2008). A key finding is that narrative skill also longitudinally predicted children's early word reading outcomes, although this association was substantially weaker than for other emergent literacy skills. Importantly, these results replicate and extend those of Griffin et al. (2004) and Wellman et al. (2011) by using a large, more diverse sample of typically developing children along with a narrative assessment that is not study-specific and measures both macrostructure and microstructure. Our results also corroborate the positive associations found by Reese et al. (2010) and Snow et al. (1995) but are more consistent in documenting small, positive associations for both of our early reading measures.

Our results also show that narrative skill did not uniquely predict children's early word reading skills above and beyond other emergent literacy skills; rather, other emergent literacy skills fully mediated the association between narrative skill and early word reading skills. This is a new and important contribution of the study. With respect to the association between narrative and word reading skills after controlling for other emergent literacy skills, our results extend the prior work of Roth et al. (2002) by considering a full complement of other emergent literacy skills and confirm that their findings cannot solely be attributed to a lack of statistical power or a focus on narrative macrostructure in isolation of other aspects of narratives. Moreover, our results confirm that prior findings were not due to overlap between narrative and other language/syntactic awareness skills, an important consideration given the moderate-to-strong correlations between narrative scores and vocabulary in our and others' work (Heilmann et al., 2010). In fact, narrative and other language/syntactic awareness skills accounted for similar amounts of variance in word identification (0.8%) after controlling for other emergent literacy

skills, and narrative skill accounted for less variance (0.4%) than other language/syntactic skills (1.9%) in decoding.

The finding of indirect associations between narrative and early word reading skills in young children, as mediated by other emergent literacy skills, mirrors previous findings for oral language more generally (Kendeou et al., 2009; Storch & Whitehurst, 2002) and affirms the complex interconnections among these constructs (see also Dickinson et al., 2010). These results particularly highlight how narrative, specifically, may facilitate children's reading development. It may be that narrative skill facilitates children's development of other emergent literacy skills, which in turn facilitates children's early word reading skills. Developing narrative skills may help hone the metalinguistic abilities required for children to develop phonological awareness or attend to individual letters and sounds Hipfner-Boucher et al. (2014) and also provide context for, and access to, opportunities to build letter knowledge, print knowledge, and general familiarity with printed text (Sénéchal & LeFevre, 2001). Moreover, the indirect effect on early word reading skills may be a second pathway by which narrative skill may also facilitate children's reading comprehension, thus extending the empirical work linking narrative and comprehension skills (e.g., Boudreau, 2008; Dickinson & McCabe, 2001; Dickinson & Tabors, 2001; Griffin et al., 2004; Sénéchal & Lever, 2014). We caution that further research, using causally interpretable designs, is necessary to evaluate these proposed pathways, especially given that we measured narrative and all emergent literacy skills at the same point in time. Although at least one study (Armand et al., 2004) could be interpreted as showing word reading benefits as a result of narrative intervention, these benefits could also be attributed to other aspects embedded within the intervention, such as increased exposure to print via shared storybook reading. More research is necessary to fully understand how narrative skill may serve as a mechanism for developing emergent literacy, word reading, and reading comprehension skills.

In considering our results, we acknowledge that these may be qualified by our election to measure narrative production rather than comprehension and also by eliciting narratives via retells of unfamiliar wordless picture books, the approach utilized by the NAP-2. Story retells are a common way of eliciting narratives (Griffin et al., 2004; Heilmann et al., 2010; Justice et al., 2010a) and are arguably more informative than a story generation task for young children, as children tend to produce longer narratives with more story elements during retelling tasks (Merritt & Liles, 1989). However, this means of elicitation may affect children's use of sophisticated and decontextualized language (e.g., vocabulary, appropriate linguistic devices marking character reference and perspective, temporal connectives) given that children are asked to repeat a story already told to them and are aware of shared knowledge of story events between themselves and the assessor. Yet, given alignment with previous studies that generated narratives in other ways (e.g., play task, retell of a child's favorite story; Griffin et al., 2004; Roth et al., 2002), we are more confident that the results of this study provide important insights concerning how emergent literacy skills, particularly narrative skill, may support children's later reading development. We conclude that narrative skill is modestly related to other emergent literacy skills and weakly but indirectly related to later word reading skills. Overall, the study provides empirical evidence indicating a need to consider

multiple pathways through which narrative skill may contribute to children's reading development.

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Appendix

Description of reviewed studies by sample, narrative measure, and outcomes examined

Study	Sample characteristics	Narrative measure (s)	Emergent literacy and/or word reading measures (s)
Armand et al. (2004)	*N* = 202, 4–6 year-olds, pluri-ethnic, low-SES	Narrative elicitation after storybook read aloud (macrostructure)	Word reading, spelling, narrative text comprehension, metaphonological skills
Barra and McCabe (2013)	*N* = 94, 4–6 year-olds, monolingual Spanish speakers, low-SES	High point analysis; narrative assessment profile	Word reading, spelling, reading comprehension
Blankman et al. (2002)	*N* = 42,8 year-olds, 85% Caucasian, 15% African American	TAT storytelling task	Oral language, decoding, comprehension
Boudreau and Hedberg (1999)	*N* = 36, 4–5.8 year-olds, monolingual English speakers, language impaired	"Frog where are you?" retelling task	Letter knowledge, letter-sound correspondence, phonological awareness, conventions of print, narrative structure
Cooper et al. (2002)	*N* = 52, 5–6 year-olds, 40.4% African American, 15.4% Asian American, 7.7% Hispanic, 36.5% Caucasian; 13% ELL, low-SES	Broad oral language measures	Phonological awareness, oral language, decoding
Gardner-Neblett and Iruka (2015)	*N* = 6150, 2–5 year-olds, 18% African-American, 13% Asian American, 23% Latino, 46% Eurpoean American, ELL, low- SES	PreLAS retelling task	Oral language and emergent literacy skills
Griffin et al. (2004)	*N* = 32, 5–8 year-olds, 100% Caucasian	Index of productive syntax (macrostructure)	Reading comprehension, written narrative ability, oral language
Hipfner-Boucher et al. (2014)	*N* = 89, 4–5.9 year-olds, monolingual English speakers	"Renfrew Bus Story" retelling task	Phonological awareness

continued

Study	Sample characteristics	Narrative measure (s)	Emergent literacy and/or word reading measures (s)
Lynch et al. (2008)	*N* = 298, 4 and 6 year-olds, 93% Caucasian, 7% Hispanic	Narrative recall task (macrostructure)	Decoding and comprehension
Miller et al. (2006)	*N* = 1531, 5–9 year-olds, ELL	"Frog where are you?" retelling task	Word reading and comprehension
Reese et al. (2010)	*N* = 33, 4 year-olds, 38% Hispanic, 48% bilingual, low-SES	Story comprehension and retell task (macrostructure)	Vocabulary, concepts of print, comprehension
Reese et al. (2010)	Study 1: *N* = 61, 6-year-olds; Study 2: N = 39, 7 year-olds, 90% New Zealand European	Narrative elicitation after storybook read aloud	Decoding and oral reading
Roth et al. (2002)	*N* = 39, 5–6 year-olds, 48% Caucasian, 45% African-American, 4% Other, low-SES	Story production task (macrostructure)	Word reading, decoding, comprehension
Speece, Roth, Cooper, and de la Paz, (1999)	*N* = 88, 5–6 year-olds, 42% African America, 33% Caucasian, 13% Asian, 10% Latino	Novel story production task (macrostructure)	Oral language, word identification, decoding, spelling, and comprehension
Wellman et al. (2011)	*N* = 60, 3–6 year-olds, language impaired	"Fox and bear story" retelling talk	Word identification, decoding, reading comprehension

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