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Oral language at school entry: dimensionality of speaking and listening skills

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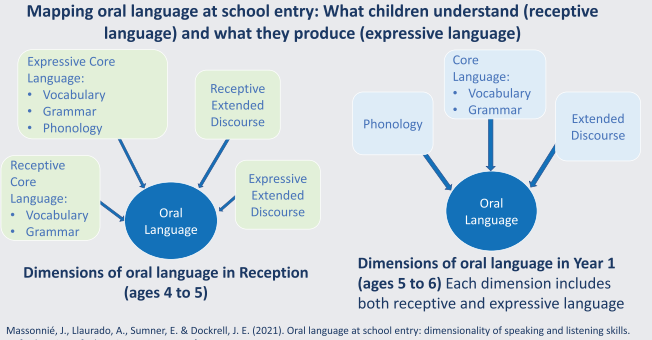
ABSTRACT

There has been a resurgence in concern about the levels of pupils' oral language skills at school entry. To support and develop these skills effectively an understanding of the key components of oral language is required. We examined the oral language skills of monolingual children in Reception (M_{Age} = 57.9 months; n = 126) and Year 1 (M_{Age} = 69.07; n = 124) classes in England. Children were recruited from schools that were representative of London primary schools and were assessed on measures designed to tap phonology, core language skills (vocabulary and grammar) and discourse skills, both in the receptive and expressive modalities. Using confirmatory factor analyses, we examined the associations between oral language skills by component and modality for each age group. Oral language was best represented by four dimensions in Reception (receptive core language skills, receptive discourse, expressive core language skills, and expressive discourse). By contrast in Year 1, three dimensions were identified, irrespective of modality: phonology, core language skills and discourse. Our data speak to the importance of capturing these dimensions in assessments and teaching and monitoring their development at school entry. The results also highlighted the foundational role of discourse skills at the start of school.

KEYWORDS

Oral language; phonology; vocabulary; grammar; discourse; confirmatory factor analyses



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Oral language skills have been described as a condition for learning; conceptualised as a tool for gaining knowledge and for social engagement (Alexander, 2013; Wilkinson, 1968). Oral language underpins text decoding, reading comprehension (Nation et al., 2004) and written text production (Dockrell et al., 2019). Yet schools provide pupils with variable language learning opportunities (Pelatti et al., 2014) and professionals in education contexts are challenged in how to meet children's language learning needs (Dockrell et al., 2017).

The importance of oral language in the school curriculum has varied over the years. The publication of the Bullock report in 1975 was a key step in raising public awareness about the spoken language experience of children in school (Bullock, 1975). Oral language is now included as a primary area in the English curriculum for the early years (Department for Education, 2021) and primary school years (Department for Education, 2014). However, the importance of focussing on oral language in schools has been debated and the implementation of oral language instruction in the curriculum has not always been consistent (Jones, 2017). Recently, the UK Oracy All-Party Parliamentary Group (Oracy All-Party Parliamentary Group, 2021) has supported calls to embed explicit teaching of oral language across the curriculum and has argued that there is a need to prioritise oral language in education (see also Kaldahl, 2019). A necessary prerequisite in meeting these objectives is to capture the key components of the language system.

Children who enter school with small vocabularies and limited grammatical skills (Levine et al., 2020) experience difficulties in accessing the curriculum and have lower levels of attainments. Poorer language skills are associated with family socio-economic background (Ginsborg, 2006; Hart & Risley, 2003; Hoff, 2013) and are evidenced in children who do not speak the language of instruction (Hoff, 2013) and those with developmental difficulties (Conti-Ramsden et al., 2009). Although there is variability in development within these populations, different aspects of oral language are compromised.

There are three strands of research that have focused on the language skills of young children of school age: (1) studies which focus on developmental disorders (Conti-Ramsden et al., 2001; Snowling & Hulme, 2011) (2) interventions for children at risk (Dockrell et al., 2010; Fricke et al., 2013) and (3) attempts to capture the dimensionality of oral language through development (Bornstein et al., 2016). Studies that have examined children with developmental disorders speak to the importance of distinguishing between difficulties with phonology and other aspects of oral language (Bishop & Snowling, 2004), while intervention studies have emphasised the potential of enhancing poor language skills in young children (Hulme et al., 2020). However, intervention studies designed to ameliorate language delays and difficulties are not necessarily based on current conceptualisations of the oral language system and have variable efficacy (Dobinson & Dockrell, 2021; Hulme et al., 2020). Monitoring and supporting the oral language skills of children in classrooms requires a description of which language skills are important at which points in development. Studies which have explored the dimensionality of oral language have focussed on four foundational dimensions: phonology, vocabulary, grammar and discourse skills.

Oral language skills

Phonological skills – the perception of and ability to manipulate the sound units that are part of a given language – are key to mastering word decoding (Ehri et al., 2001). Phonological skills are a key component of the early years curriculum in England (Department for Education, 2021; Rose, 2006). In children from four to six years of age phonological skills have consistently been identified as a language dimension separate from vocabulary, grammar and discourse skills when these measures have been included in English-speaking (Anthony et al., 2014; Foorman et al., 2015) and also Greek populations (Mouzaki et al., 2020). However, the correlation between phonology and the other components of oral language varies from moderate (Mouzaki et al., 2020) to high (Foorman et al., 2015).

Growth in oral language during early childhood reflects a continuous development of lexical representations (vocabulary) and the development of an implicit understanding of the rules of grammar: skills which have been described as core language components (Karlsen et al., 2021). For both vocabulary and grammar, comprehension is generally more advanced than production, although the drivers of this difference remain underspecified (Dockrell & Marshall, 2015). Whether vocabulary and grammar represent different language systems with their own developmental rules and mechanisms of acquisition is a matter of debate (Bates & Goodman, 1999; Pinker, 1997). Recent research has suggested that vocabulary and grammar skills are strongly correlated in the early years of language development (Karlsen et al., 2021; Language and Reading Research Consortium; Language and Reading Research Consortium, 2015, 2017; Tomblin & Zhang, 2006), but are more differentiated in later primary school (at around 10 years of age) (Brinchmann et al., 2019; Tomblin & Zhang, 2006). Vocabulary and grammar contrast with discourse skills, which require the integration of multiple sentences into a coherent mental representation.

Connected discourse, such as conversations or storytelling, is underpinned by vocabulary and grammar, but also relies on cognitive skills related to comprehension monitoring and inference-making (Silva & Cain, 2015). Core language skills and discourse skills are highly correlated in the first few years of instruction but a clearer differentiation has been reported from 6.5 years of age (Massonnié et al., 2019; Language and Reading Research Consortium, 2015, 2017). However, recent work with Norwegian children has identified that receptive core language skills can be differentiated from expressive language skills in children as young as four years of age (Karlsen et al., 2021). Comparable factors have also been identified in Greek-speaking children where a full differentiation between phonology, semantics, morphology (a component of grammar) and discourse skills appeared as early as four years of age (Mouzaki et al., 2020). There is thus emerging evidence in languages other than English that discourse skills can be identified as a separate component of the language system earlier than previously reported. However, generalising from these studies to English is challenging on both methodological and conceptual grounds. Firstly, the Norwegian data only examined core language skills in the receptive domain, not expressive language, and did not include a measure of phonology (Karlsen et al., 2021). Secondly, the languages differ in terms of their grammatical and orthographic features potentially impacting on developmental pathways. Greek is a language with a transparent orthography and a rich morphological structure

(Protopapas, 2017) whereas Norwegian has a different suffixation process which affects inflexional morphology (Ragnarsdóttir et al., 1999). Differences across languages and measures used limit the ability to generalise to children starting school in England.

Current models with English-speaking children have not incorporated phonology, vocabulary, grammar and discourse skills in a single model (Language and Reading Research Consortium, 2015, 2017; Lonigan & Milburn, 2017; Tomblin & Zhang, 2006). In addition, models with English-speaking children have not always consistently included both a measure of receptive and expressive skills, and no study has included a measure of expressive discourse skills. The distinction between comprehension (receptive) and production (expressive) is important and captured in the English National Literacy Strategy as 'speaking' and 'listening' (Department for Education and Skills, 2004) and in many standardised assessments of oral language (Dockrell et al., 2017), but the distinction between the two modalities has not been directly examined in models investigating the dimensionality of oral language. Previous models suggest that classifications based on language components are a better representation of the structure of oral language than classifications based on modality, but these models have not included measures of phonology or expressive discourse skills (Lonigan & Milburn, 2017; Tomblin & Zhang, 2006), nor have they consistently measured both expressive and receptive skills across components. Furthermore, studies with English-speaking children have included American children, who enter primary school a year later than in England. Schooling experience impacts on the structure of oral language by placing differential demands on the language components (Language and Reading Research Consortium, 2015). To summarise, there is a need to systematically explore the dimensionality of oral language skills across components and modalities in English-speaking children.

The current study

To further inform our understanding of language development in the early years of formal education and to capture the components and modalities which should be monitored at this point in development, the dimensionality of oral language was explored in children attending Reception and Year 1 classes in the United Kingdom. A comprehensive battery of reliable and valid measures assessing phonology, vocabulary, grammar and discourse skills in both the receptive and expressive modalities was used.

We conducted confirmatory factor analysis (CFA) to explore dimensionality. Based on the findings discussed above, we examined whether the structure of language abilities is captured by a single oral language factor for children in Reception and Year 1 classes, or whether the assessed oral language skills are better classified by component (phonology, vocabulary, grammar, discourse) and/or modality (receptive and expressive). We predicted that classifications based on language components would better represent the structure of oral language than classifications based on modality (Lonigan & Milburn, 2017; Tomblin & Zhang, 2006). We further predicted that phonology, core language skills and discourse skills would represent three dimensions of oral language. Given that the differentiation between language skills becomes more salient over development, we anticipated lower correlations between these three constructs in Year 1 compared to Reception.

Methods

Participants

Children were recruited from nine schools in London. Participating schools were broadly representative of primary schools in London where, on average, 17.8% of children are eligible for Free School Meals (M_{sample} = 14.12, *SD* = 9.04), 14.9% are eligible for Special Educational Needs support (M_{sample} = 10.91, *SD* = 5.39) and 50.1% have English as an Additional Language (M_{sample} = 36.22, *SD* = 17.65) (Department for Education, 2020). The Income Deprivation Affecting Children Index (IDACI) reflects the proportion of children aged 0 to 15 living in income deprived families. The average IDACI rank in London is 14,410, compared to 14,198 in our sample (*SD* = 9,112). Information about each individual school is provided in Appendix A.

Parental consent was obtained for 250 monolingual English-speaking children: 126 children in Reception (37.3% boys; *M* = 57.9 months, *SD* = 3.71, range: 49–65) and 124 children in Year 1 (47.6% boys; *M* = 69.07 months; *SD* = 4.15, range: 61–76). Children gave verbal assent to take part in the activities. Ethical approval was obtained from UCL IOE Research Ethics Committee (REC 1207).

Questionnaires asking about education levels and household income were returned by 72% of the parents. The majority of respondents reported completing higher education (43.3% have a degree; 41.2% a postgraduate degree). Of the remaining respondents, 3.9% reported GCSEs as their highest level of qualification, 6.7% had A-levels and 3.3% a vocational qualification. Household income was above £45,200 for 85.9% of the returned questionnaires. The average disposable income for the financial year ending 2020 in the United Kingdom was £36, 900 (O'Neill, 2021).

Overall, while the schools in our sample were representative of primary schools in London, families who participated in the study had higher levels of education and income than the average.

Measures

The measures were selected according to three main criteria. They: (1) tapped into the oral language skills of interest (phonology, vocabulary, grammar and discourse skills); (2) were suitable for use with children in Reception and Year 1; and (3) had good reliability and validity as reported by previous studies. This resulted in a choice of four tests: (1) The British Picture Vocabulary test Third Edition (BPVS-3) (Dunn et al., 2009); (2) the Clinical Evaluation of Language Fundamentals Second Edition (CELF-2) (Wiig et al., 2006; validated against the Preschool Early Literacy Indicator, Kaminski et al., 2014); (3) the Grammar and Phonology Screening test (GAPS) (Gardner et al., 2006; validated against the CELF and the Children's Test of Nonword Repetition; Gathercole & Baddeley, 1996); and (4) the Test for Narrative Language Second Edition (TNL-2) (Gillam & Pearson, 2017; validated against the Narrative Coding Scheme, Heilmann et al., 2010).

While these measures could be considered global measures they can nevertheless be partitioned into components based on the aspect of language they primarily tap. The specific tasks used for the present study are detailed below. Internal consistency

calculated with the Cronbach alpha on the sample is reported in Table 1. For all the CELF-2 subtests, administration instructions and discontinue rules were applied as per the manual (Wiig et al., 2006).

Phonology

GAPS, Non-words Repetition. Children were introduced to an alien and asked to repeat what the experimenter said to the alien. Eight non-words were presented, varying in complexity based on marked onset, rhyme and final consonant. An item was counted as correct if children repeated the entire non-word correctly. The sum score for all items was calculated (maximum: 8).

Vocabulary

Receptive Vocabulary

BPVS-3. Children pointed to the picture among four which represented the word spoken by the experimenter. The testing procedure was followed and the total score was calculated as per the manual's instructions (Dunn et al., 2009).

The study originally included two additional measures of receptive vocabulary, the CELF-2 Word Classes subtest (Receptive section), for children aged 5–6, and the CELF-2 Basic Concepts, for children aged 3–4 (Wiig et al., 2006). Given the poor internal consistency of the Basic Concepts measure on our sample (α = .27) and to provide equivalence of reliable measures across both year groups, the CELF-2 Basic Concepts and the CELF-2 Word Classes subtests were not considered for subsequent analyses.[1]

Expressive Vocabulary

CELF-2 Expressive Vocabulary. Children were presented with a picture and asked to respond to a prompt from the examiner (e.g. 'What is this?'; 'What is he doing?') to generate a noun or a verb. There were 20 trials, scored as per the test manual. The sum score from all the performed items was calculated (maximum: 40).

Grammar

Receptive Grammar

CELF-2 Sentence Structure. Children pointed to the picture corresponding to a prompt sentence, among four alternatives. This task assesses understanding of grammatical conventions (e.g. prepositional phrases, copulas, infinitive, negation, etc.). One point was awarded per correct answer. The sum score from all the performed items was calculated (maximum: 22).

CELF-2 Concepts and Following Directions. This task measured children's ability to: (a) interpret directions of increasing length and complexity; (b) remember the names, characteristics and order of mention of pictures; (c) identify target objects from several choices. Children saw a series of pictures depicting animals in different settings and were asked to point to the animals in the order specified by the experimenter. The instructions increased in complexity over time. One point was given per correct answer. The sum score from all the performed items was calculated (maximum: 22).

Expressive Grammar

CELF-2 Word Structure. This task assessed the production of prepositions, plurals, possessive nouns, tense marking, copula, pronouns and derivational forms. Children finished a sentence started by the experimenter. Each item was scored 1 if the child used the target grammatical structure, and 0 otherwise. The sum score from all the performed items was calculated (maximum: 24).

GAPS Sentence Repetition. Children repeated a story, one sentence at a time. There were 11 sentences accompanied by a picture, capturing different grammatical constructs. One point was given for each sentence that was correctly repeated.

Discourse skills

TNL-2, Receptive and Expressive Discourse Skills

In the TNL-2 the experimenter alternated between asking children comprehension questions about three oral stories (Receptive section), and prompting children to retell or create their own stories (Expressive section). The three receptive tasks are referred to as Story Comprehension 1, Story Comprehension 2 and Story Comprehension 3, containing 14, 12 and 12 comprehension questions respectively. Most of the questions were scored either 0 (incorrect) or 1 (correct), but some were worth 2 or 3 points because they included two or three pieces of information. The maximum score was 20, 14, 13 for Story Comprehension 1, Story Comprehension 2 and Story Comprehension 3 respectively. Stories were supported with a picture and told by the experimenter. The three expressive tasks are referred to as Story Generation 1, Story Generation 2 and Story Generation 3 for consistency. Although, of note, the first story generation task was in the form of an oral retell (children retelling everything they remembered from Story 1) and the remaining generation tasks were produced by the child from a picture prompt.

Story Generations 1, 2 and 3 were audio-recorded using Audacity software and transcribed verbatim including any phonological and grammatical mistakes, repetitions, hesitations and pauses. The first and second authors used both the audio and the transcribed version of the narratives to score them according to the TNL-2 manual (Gillam & Pearson, 2017; maximum score of 31, 27 and 30 for the three generation tasks respectively). Utterances that were not related to the narrative prompt were not included. Interrater reliability was calculated with Cronbach's alpha for 20% of the narratives. Agreement was high (.90, .84 and .89, respectively).

Procedure

Children were tested individually in a quiet room at their school. Six experienced researchers, trained in the administration of the tests, conducted the assessments. The test battery was carried out over two separate sessions, to prevent fatigue effects (Session 1: GAPS, CELF-2; Session 2: BPVS-3, TNL-2). Breaks were factored in as required.

Table 1. Descriptive statistics for all measures (raw scores).

	n	*M*	*SD*	Min	Max	Skewness	Kurtosis	Cronbach Alpha
Phonology								
Non-words Repetition								
Reception	126	6.19	1.71	0	8	− .98	.87	.62
Year 1	123	6.71	1.45	3	8	−1.06	.26	.57
Vocabulary								
Receptive Vocabulary								
Reception	121	77.55	12.25	41	104	−.28	.24	.92
Year 1	124	89.50	12.80	53	124	−.05	.17	.93
Expressive Vocabulary								
Reception	126	25.29	6.27	6	36	−.77	.42	.75
Year 1	123	29.57	5.51	9	40	− 1.09	1.87	.71
Grammar Receptive								
Sentence Structure								
Reception	126	15.33	3.23	4	22	−.67	1.40	.67
Year 1	124	18.31	2.39	10	22	− .74	.45	.56
Concepts & Following Directions								
Reception	126	14.43	3.95	1	21	−.93	1.01	.75
Year 1	124	16.77	3.25	6	22	−1.00	1.67	.74
Grammar Expressive								
Word Structure								
Reception	126	16.83	4.36	4	24	−.92	.31	.81
Year 1	123	19.19	3.66	8	24	− 1.21	1.12	.79
Sentence Repetition								
Reception	125	9.36	2.08	0	11	−2.04	4.80	.77
Year 1	122	10.10	1.62	0	11	−3.37	15.05	.76
Discourse Receptive								
Story Comprehension 1								
Reception	123	7.27	3.29	0	14	−.17	−.74	.68
Year 1	123	8.68	3.60	0	16	−.20	−.66	.72
Story Comprehension 2								
Reception	123	7.67	2.91	0	14	−.21	−44	.72
Year 1	123	9.25	2.86	0	14	−.60	.17	.71
Story Comprehension 3								
Reception	123	5.22	2.49	0	11	−.12	−52	.68
Year 1	123	6.80	2.34	0	12	−.24	.14	.57
Discourse Expressive								
Story Generation 1								
Reception	123	7.15	5.33	0	24	.70	.27	.85
Year 1	123	10.18	5.60	0	25	.07	−.29	.80
Story Generation 2								
Reception	123	7.93	3.59	0	17	−.20	.22	.64
Year 1	123	10.34	4.89	0	22	−.25	−.14	.79
Story Generation 3								
Reception	123	9.63	5.45	0	24	.22	−.12	.83
Year 1	123	11.85	5.37	0	23	−.40	−.01	.80

Results

Data analysis

The data that support the findings of this study are available from the last author, upon reasonable request. Raw scores are provided in Table 1 and will be used in the following analyses.

There was a ceiling effect on the Non-Word Repetition and Sentence Repetition tasks. A proportion of children were not able to produce an oral narrative and scored 0 on the expressive discourse tasks (this proportion varies between 6.5% and 15% across tasks and year groups). One child exceptionally had the maximum

score at the Story Generation 1 task. Five children in Year 1 performed 3*SD* below the mean at the receptive vocabulary task. Across all the other tasks, a maximum of three children per year group performed particularly low compared to the rest of the sample (< 3*SD* below the mean). Outliers and children scoring 0 on the expressive discourse tasks were kept in the analyses because they are considered as part of the natural variation in abilities among monolingual children.

In total, 1.47% data points were missing in the Reception cohort, and 0.68% data points were missing in the Year 1 cohort. This was due to children being absent for a session, declining to participate in an activity, or administration error. Little's (1988) MCAR test was non-significant (Reception: $\chi^2(37) = 48$, $p = .106$; Year 1: $\chi^2(15) = 17.35$, $p = .298$), indicating that the data were missing completely at random. Correlations between all the raw scores are provided in Table 2.

Confirmatory Factor Analyses (CFA) were carried out on raw scores using MPlus 6.12. The maximum likelihood estimator was selected to deal with missing data (Enders & Bandalos, 2001), and the robust estimator was used because it does not assume normal multivariate distributions. CFA are theory-driven and allow to compare the six alternative models of the dimensionality of oral language highlighted in the introduction and summarised in Figure 1 (see Schreiber et al., 2006 for guidance on CFA diagrams).

Model fit was assessed with multiple indicators (Byrne, 2013; Wang & Wang, 2012). A non-significant χ^2, a Comparative Fit Index (CFI) >.95, a Tucker-Lewis Index (TLI) >.95, a Root Mean Square Error of Approximation (RMSEA) <.05 and Standardised Root Mean Square Residuals (SRMR) <.08 indicate good fit. A CFI >.90, a TLI >.90, RMSEA <.08 and SRMR <.08 indicate adequate fit. A significant χ^2 is not a reason by itself to reject a model given its high sensitivity to sample size (Wang & Wang, 2012) and should be interpreted in light of the other indices. As lower χ^2 values indicate better fit, the Satorra-Bentler Chi-Square difference test was used to compare nested models (MPlus, 2020). Non-nested models were compared using the AIC and BIC indicators, lower values indicating a better fit.

Table 2. Correlations between all the variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. NW Repetition		.22*	.38*	.25*	.30*	.51*	.57*	.23*	.15	.35*	.28*	.24*	.33*
2. Receptive Vocabulary	.25*		.59*	.56*	.60*	.56*	.31*	.45*	.20	.58*	.31*	.55*	.33*
3. Expressive Vocabulary	.23	.54*		.57*	.56*	.65*	.52*	.34*	.17	.56*	.39*	.53*	.38*
4. Sentence Structure	.22*	.49*	.42*		.65*	.57*	.46*	.33*	.09	.47*	.24*	.52*	.21*
5. CFD	.26*	.36*	.56*	.42*		.62*	.55*	.38*	.09	.54*	.27*	.48*	.27*
6. Word Structure	.33*	.45*	.55*	.43*	.62*		.60*	.44*	.20*	.57*	.36*	.56*	.37*
7. Sentence Repetition	.37*	.32*	.55*	.32*	.55*	.46*		.29*	.17*	.41*	.36*	.38*	.31*
8. Story Comprehension 1	.26*	.43*	.41*	.36*	.29*	.43*	.28*		.46*	.64*	.32*	.55*	.33*
9. Story Generation 1	.19*	.34*	.35*	.20*	.14	.30*	.17	.56*		.34*	.35*	.22*	.43*
10. Story Comprehension 2	.27*	.45*	.50*	.34*	.39*	.54*	.40*	.50*	.48*		.32*	.54*	.37*
11. Story Generation 2	.17	.30*	.25*	.15	.14	.31*	.18*	.17	.51*	.42*		.28*	.58*
12. Story Comprehension 3	.22*	.48*	.46*	.44*	.38*	.54*	.29*	.58*	.45*	.57*	.27*		.36*
13. Story Generation 3	.09	.20*	.25*	.09	.14	.23*	.25*	.27*	.54*	.36*	.63*	.30*	

NW: Non-Word Repetition subtest; CFD: Concepts and Following Directions.
Upper triangle: Reception; Lower triangle: Year 1. * $p < .05$.

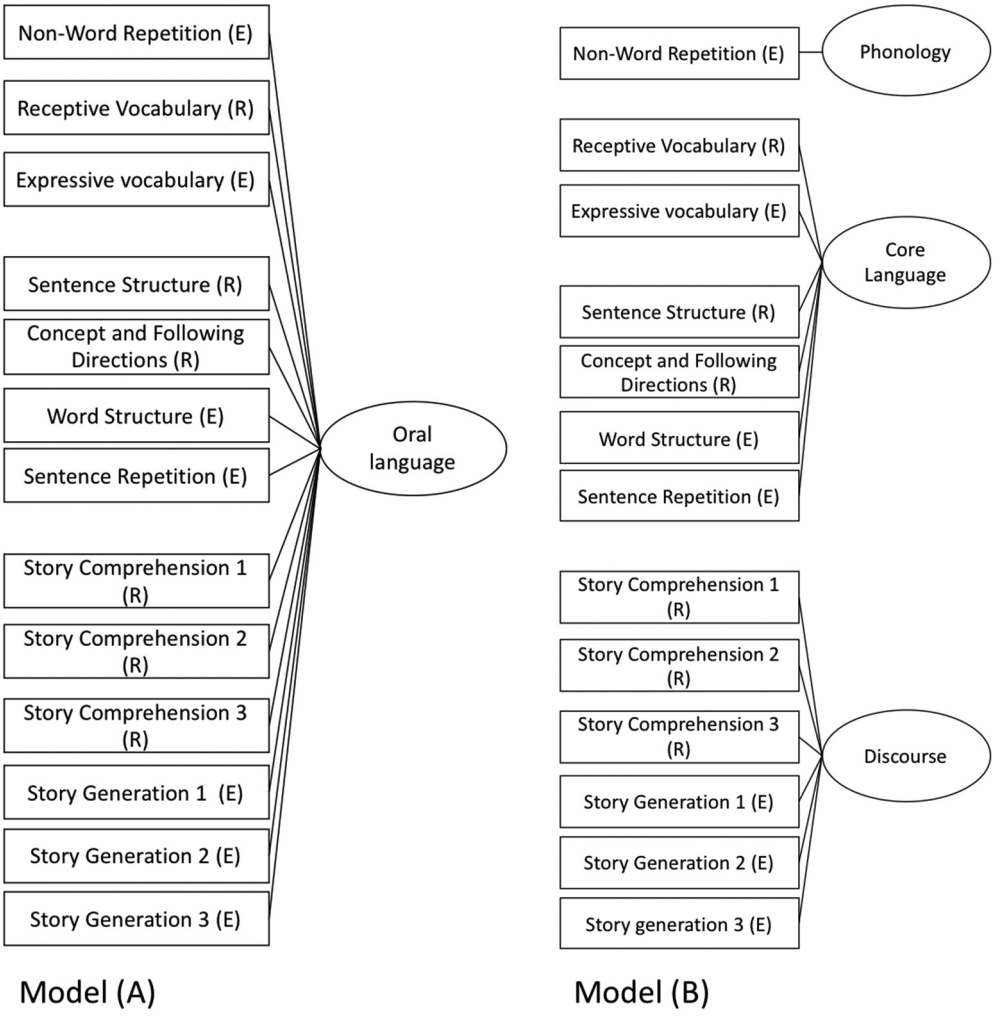


Figure 1. Alternative CFA models representing the dimensionality of oral language based on language components and/or modalities. (R): Receptive; (E): Expressive.

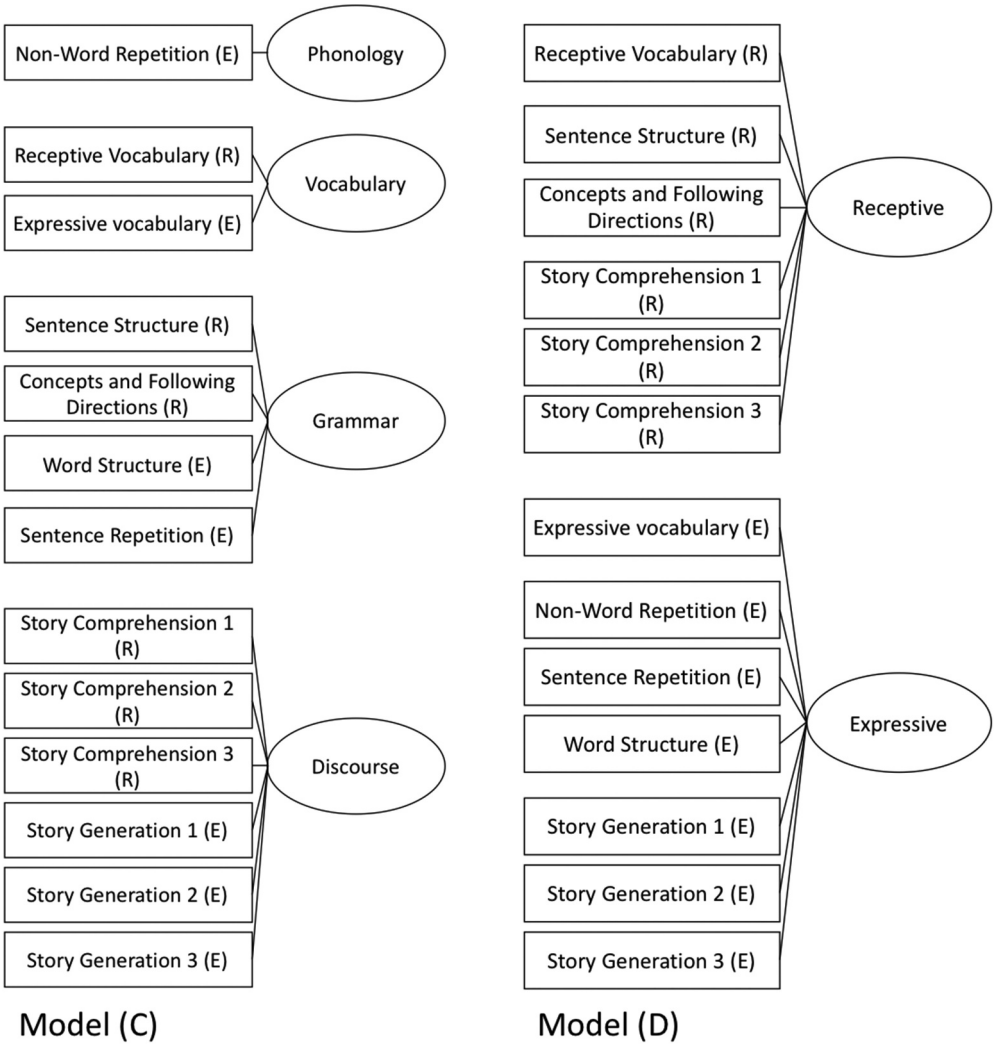
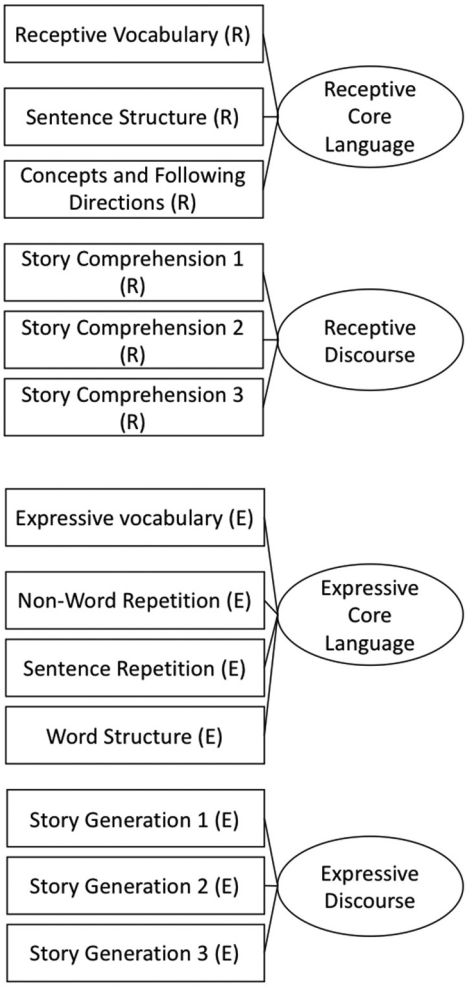


Figure 1. Continued.



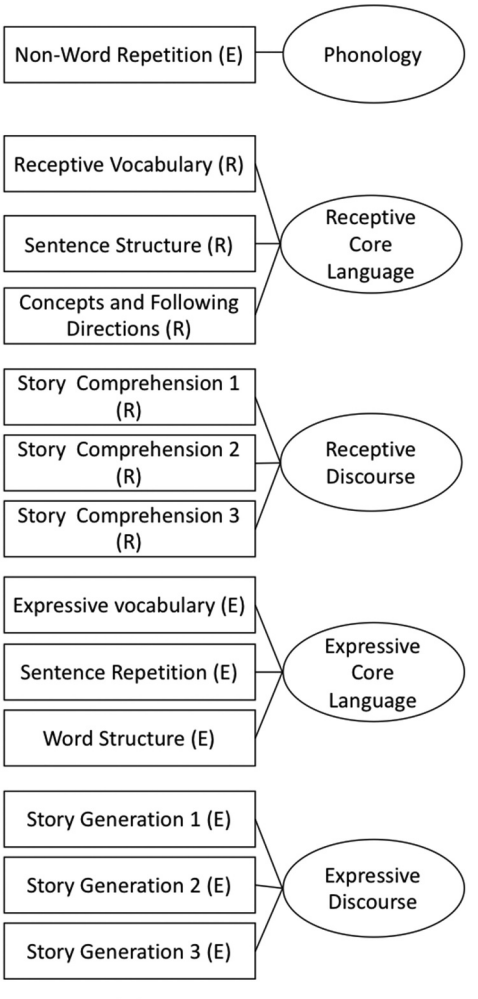


Figure 1. Continued.

Confirmatory factor analyses

All models initially had poor fit. Modification indices suggested by MPlus 6.12 were checked to identify any potential problem with the models' specification. As a result the residual covariance between: (1) The GAPS Sentence Repetition and Non-word subtests; (2) The TNL-2 Story Comprehension 1 and Story Generation 1, which correspond to children answering questions about a story, and then retelling it; (3) The TNL-2 Expressive Tasks[2] was taken into account (Byrne, 2013). Table 3 reports model fit indices for the six models and Table 4 reports model comparisons.

Reception

The unidimensional model (Model A) had an adequate fit. Models B, C, D, E and F all had a good fit to the data, and were better than Model A. Among the two nested models (B and C) separating language skills solely based on language components, Model C, which separated *Phonology, Vocabulary, Grammar* and *Discourse*, revealed a very high correlation between the *Vocabulary* and *Grammar* factors (r = .95), and was not better than Model B, which only separated *Phonology, Core language skills* and *Discourse*. Among the nested models separating skills based on language modality, Model E, which discriminated *Receptive Core language skills, Receptive Discourse, Expressive Core language skills, Expressive Discourse skills* was better than Model D, which only discriminated *Receptive* and *Expressive* skills (two factors that were highly correlated, r = .90). Model F, which further separated out *Phonology* did not have a better fit than Model E. AIC and BIC indicators, which allow comparisons across all models (nested and non-nested), indicated that Model E (in Figure 2) had the best fit to the data.

Table 3. Model fit statistics for the six alternative CFA models in Reception and Year 1.

	χ^2	df	CFI	TLI	RMSEA [90% CI]	SRMR	AIC	BIC
Reception								
A	106.65***	60	.94	.92	.08 [.05-.10]	.06	8281.49	8406.28
B	86.68**	58	.96	.95	.06 [.03-.09]	.05	8265.01	8395.48
C	82.66**	55	.96	.95	.06 [.03-.09]	.05	8266.76	8405.74
D	93.76**	59	.95	.94	.07 [.04-.09]	.05	8270.22	8397.86
E	71.25	57	.98	.97	.05 [.00-.08]	.05	8251.66	8384.96
F	63.09	54	.99	.98	.04 [.00-.07]	.04	8249.12	8390.94
Year 1								
A	106.78***	60	.93	.91	.08 [.05-.10]	.06	8106.16	8230.25
B	79.77*	58	.97	.96	.06 [.02-.08]	.05	8085.76	8215.50
C	74.17*	55	.97	.96	.05 [.01-.08]	.05	8086.24	8224.44
D	106.89***	59	.93	.90	.08 [.06-.11]	.06	8107.83	8234.74
E					No convergence			
F					No convergence			

CFI: Comparative Fit Index; TLI: Tucker-Lewis Index; RMSEA: Root Mean Square Error of Approximation; SRMR: Standardised Root Mean Square Residuals; *p < .05; **p < .01; ***p < .001.

Table 4. Model comparisons (Satorra-Bentler Chi-Square Difference Test).

	A/B	A/C	B/C	A/D	A/E	A/F	D/E	D/F	E/F
Reception	17.09***	22.35***	4.05	10.72**	30.75***	38.68***	19.99***	27.58***	7.57
Year 1	38.42***	36.04***	5.52	.28					

**p < .01; ***p < .001.

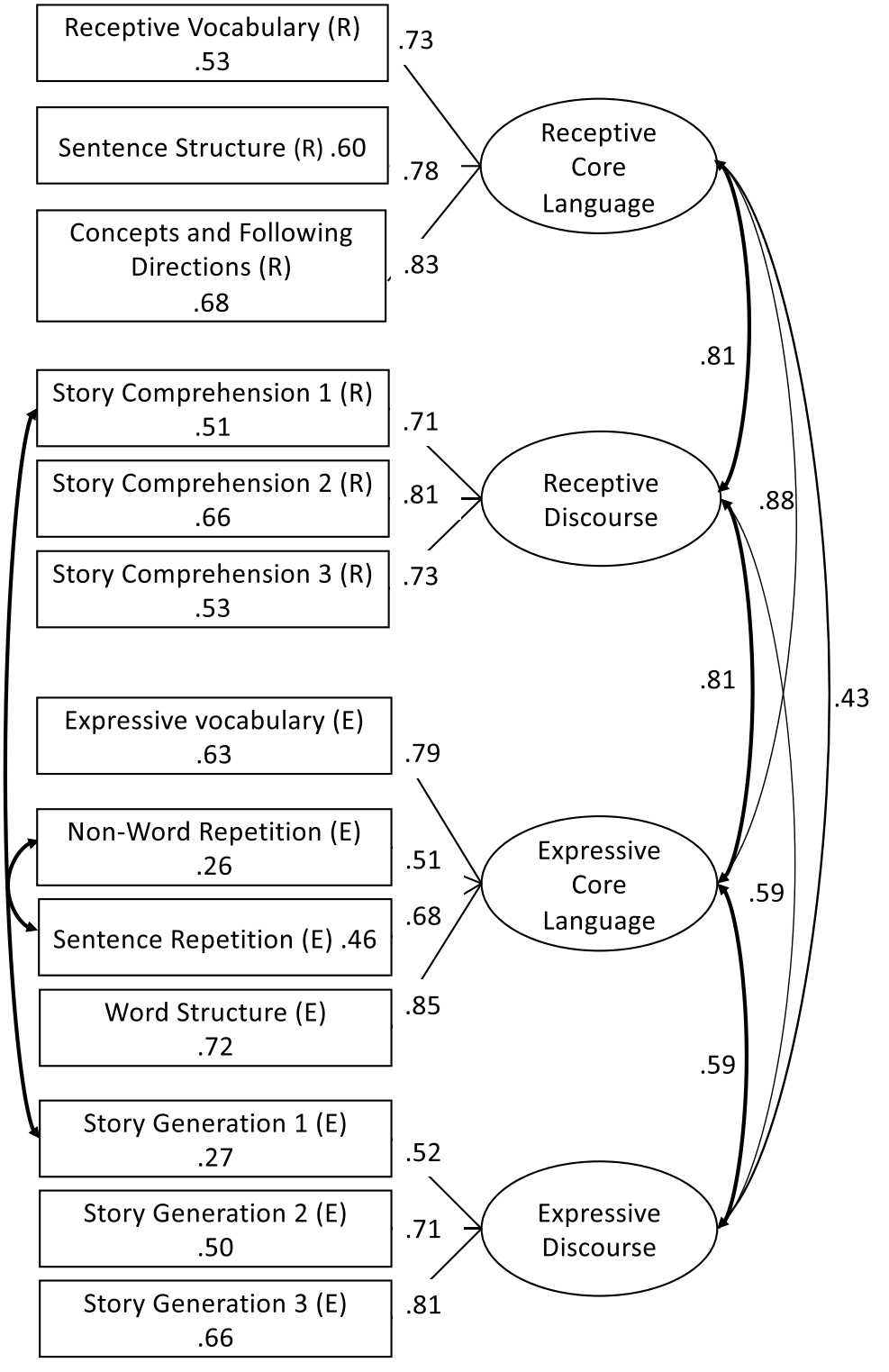


Figure 2. Best fitting model in Reception: all paths significant at the <.001 level.

Year 1

The unidimensional model (Model A) had an adequate fit. Model D, which revealed a very high correlation between *Receptive* and *Expressive* skills (r = .98), had an adequate fit but was not better than Model A. Models E and F, distinguishing language skills based on both language components and modalities, did not converge. Models B and C, based on language components, had a good fit, and were both better than Model A. Model C, which separated *Phonology, Vocabulary, Grammar* and *Discourse*, revealed a very high correlation between the *Vocabulary* and *Grammar* factors (r = .90), and was not better than Model B, which only separated *Phonology, Core language skills* and *Discourse*. Model B should therefore be preferred for the sake of parsimony (see Figure 3). Across all models, Model B had the lowest AIC and BIC values.

Discussion

An understanding of the key components of oral language is necessary to support children who struggle with oral language and to provide effective language learning environments that ultimately facilitate literacy and learning (Oracy All-Party Parliamentary Group, 2021). This study examined the dimensions of oral language in a cohort of typically-developing monolingual children in English schools at the beginning of formal education. Measures captured phonology, vocabulary, grammar and discourse skills. Both receptive and expressive skills were assessed to provide a comprehensive profile of children's language skills at this point in development.

We predicted that modality would not be a key factor in the representation of the structure of language. However, we anticipated that phonology, core language skills and discourse skills would represent three dimensions of oral language that would become more differentiated across age groups. Our data indicated that the relationships between language skills were best represented by a model distinguishing receptive core language, receptive discourse, expressive core language and expressive discourse in Reception. Language skills were therefore classified based on both components *and* modalities. To our knowledge this is the first time that it has been demonstrated that both oral language components *and* modality are central dimensions to capture at the start of formal education. By the age of six years (children in Year 1), the best model distinguished phonology, core language and discourse, but modality was no longer a significant factor.

In both cohorts, vocabulary and grammar were strongly correlated and grouped under the construct of core language skills, a finding which is consistent with previous research in English and Norwegian samples (Bornstein et al., 2016; Karlsen et al., 2021). Core language skills were distinguished from, yet highly correlated with, discourse skills. This is consistent with the results obtained from American samples of a similar age range (Language and Reading Research Consortium, 2015, 2017; Tomblin & Zhang, 2006). Whereas most correlations between core language skills and discourse skills were very high (> .80), in Reception, expressive discourse skills were unique in terms of their lower correlations with the other dimensions assessed.

This is a new finding and highlights the unique features and challenges of expressive discourse upon school entry. Children are expected to use expressive language for a wide range of functions in the primary classroom (Shiel et al., 2012), where verbal interaction is

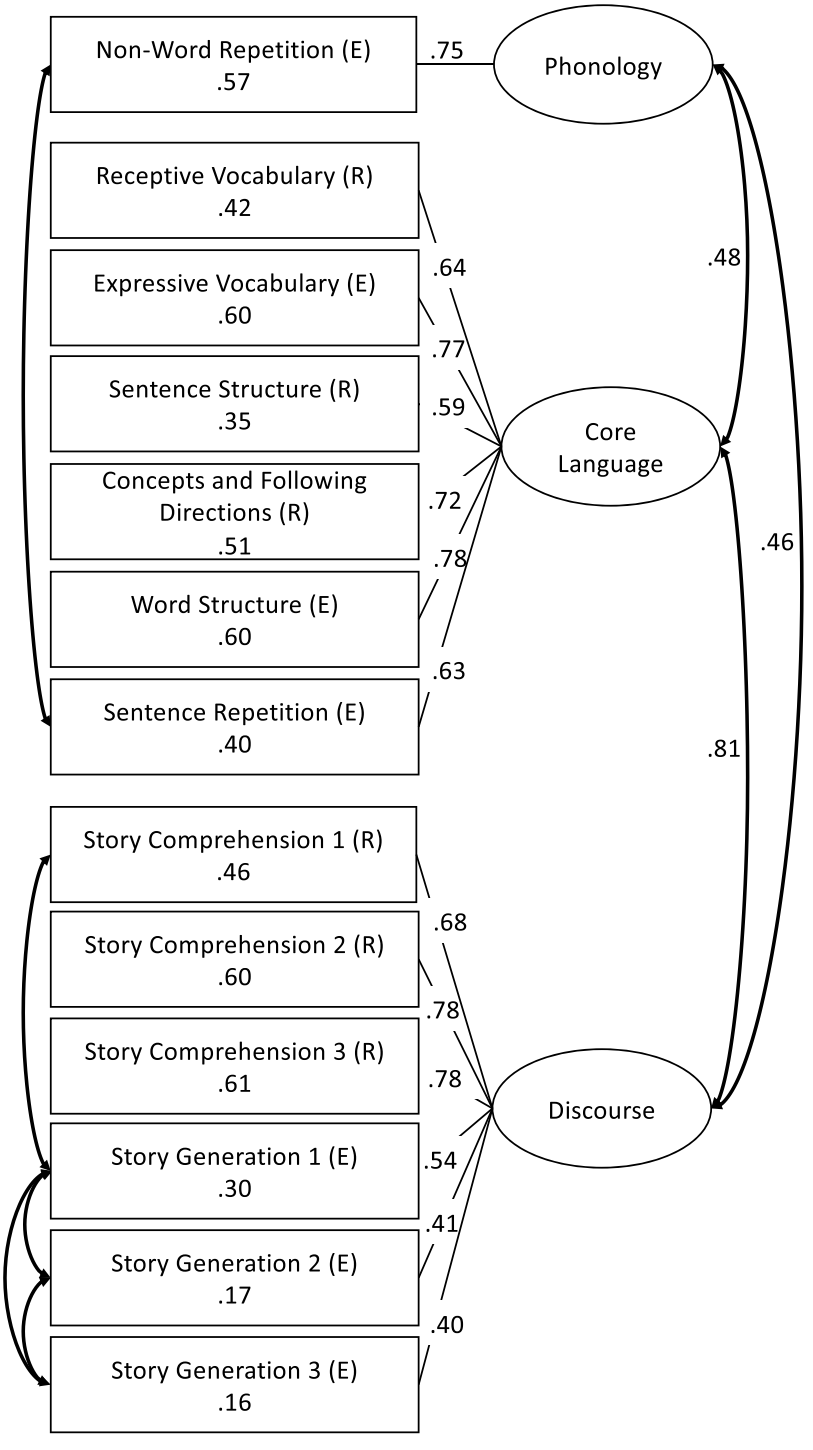


Figure 3. Best fitting model in Year 1: all paths significant at the <.001 level.

a key tool for learning across the curriculum (Alexander, 2013). Creating a narrative is a more decontextualised use of language than conversation (Curenton & Justice, 2004; Snow, 1991). It requires the child to use language precisely to create and continually update a story line, while accessing specific knowledge about phonology, vocabulary and grammar. Between 4 and 5 years of age, expressive discourse skills improve (Lindgren, 2019; Schneider et al., 2006), but their improvement will be impacted by effective language learning opportunities. It has been argued that more emphasis should be placed on professional training focused on supporting classroom language interactions that facilitates such extended discourse (Jacoby & Lesaux, 2014). Teachers also use spoken language to assess learning and their perceptions of expressive language ability have been significantly correlated with their perceptions of a child's overall development (Vega et al., 2018). There is also evidence that teachers adjust the complexity of their language in response to the language used by their pupils (Justice et al., 2013), whereby children's expressive language may predict the quality of language provision they receive. A focus on the development of expressive language skills is, thus, consistent with evidence from educational settings and our model of language skills at this point in development.

Implications for monitoring and supporting language development

Expressive discourse skills are fundamental for the development of literacy skills (Kim & Schatschneider, 2017), and evidence-informed resources which support teachers and schools to develop these discourse skills upon school entry are an important step for the development of children's literacy skills. Oral narratives can be elicited by encouraging children to share life events and personal stories. Asking open-ended 'how' and 'why' questions when reading a book or commenting on everyday life situations promotes both the use of extended discourse and consciousness of how supplementary information enriches communication (Petersen & Spencer, 2016; Pinto et al., 2015). Specific pedagogical approaches have been developed to support the development of story elements in children's narratives (e.g. character, setting, initiating event, response, consequence), to help them tell and retell stories (Gillam et al., 2014; Spencer & Petersen, 2018) and specific assessments have been designed to help teachers to evaluate the quality of children's narrative production (Justice et al., 2010; Petersen & Spencer, 2012).

Limitations of the current study

In our models, phonology was included in the same factor as expressive vocabulary and grammar in Reception, but was a separate oral language factor in Year 1. These results differ from data from Greek-speaking children where phonology represented a separate dimension in children as young as four years old (Mouzaki et al., 2020). The morphological complexity of the Greek language may make phonology more salient at an earlier age. These differences highlight both the importance of capturing similar dimensions across different languages and testing language models across different languages. Alternatively (or in addition), the choice of tasks might have impacted the results. In our study, phonological processing was measured using a non-word repetition task which required children to accurately perceive and repeat phonemes. Receptive and expressive skills were both combined in the same task, instead of being measured in two separate tasks, as

we did for the other language components. The task was performed well by the majority of children, reflecting the emphasis on phonics in the current English national curriculum. In Mouzaki et al. (2020)'s study, three tasks were used to measure phonological awareness, which is the ability to isolate and manipulate phonemes within words. The relationship between phonological awareness and oral language skills – specifically vocabulary development – has been demonstrated in children in early primary school (Cooper et al., 2002; Hipfner-Boucher et al., 2014). The present findings could be further extended with a more comprehensive assessment of phonology which includes both phonological awareness and processing measures.

Furthermore, our sample included monolingual children with no reported developmental difficulties attending schools which reflected average demographic factors. As such our data may not generalise to children who are disadvantaged or experiencing developmental challenges. Nonetheless the data provide an indicative benchmark to guide teaching and assessment. The current data set is also cross-sectional. To establish benchmarks for development longitudinal data are required to guide teaching and inform the identification of children who are struggling with oral language (Schmitt et al., 2017). Future studies should include diverse samples and track development over time.

Conclusions

To our knowledge this is the first study to capture the components of the language system as children enter formal education in England. The current data have implications for theory and practice. From a theoretical view the results point to the importance of considering both expressive language and receptive language when modelling language components. This distinction has not been clearly articulated in the data capturing language dimensions to date, despite the fact that it often underpins the identification of children with language learning difficulties (Bishop & Donlan, 2005). An evidence-informed model of oral language skills supports the development of a comprehensive oral language curriculum and can provide teachers with the information they require to develop teaching and learning activities. As we have demonstrated, oral language skills are multidimensional and a curriculum which emphasises quality language instruction across these components should support accelerated language growth (Justice et al., 2008).

The present study provides new data which extends our understanding of the differentiation between core language skills (vocabulary, grammar) and discourse skills for children as they enter formal education in England. The inclusion of both receptive and expressive measures captured the specificity of expressive discourse skills in Reception. These data point to the types of language skills which should be embedded and monitored in classrooms to enhance the development of oral language skills which underpin reading and writing.

Notes

1. Leaving these subtests in the analyses did not change the conclusions.

2. This was done for all models except Models E and F which group all three variables in a common factor.

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Appendix A Socio-demographic characteristics of the schools in the sample.

	IDACI Rank	% FSM	% SEN	% EAL
School 1	16,699	7.9	12.1	16.8
School 2	7604	25.9	24.5	74
School 3	5594	16.2	7.9	39.3
School 4	31,672	5.7	7.5	32.7
School 5	20,068	3.2	10.2	18.3
School 6	4992	16.4	11.4	23
School 7	17,178	13.4	9.4	35
School 8	18,970	8.6	7.1	37.8
School 9	5011	29.8	8.1	49.1

% FSM: Children eligible for Free School Meals; % SEN: Percentage of children eligible for Special Education Needs Support; % EAL: Percentage of children having English as an additional language