

Predictors of success with writing in the first year of school

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Language and literacy skills are instrumental to success at school and early success with writing is a key factor in literacy development. By eight years of age, children spend up to half of their school day engaged in writing tasks suggesting that those who find learning to write difficult may be disadvantaged. The ability to hear and record sounds in sequence and writing vocabulary are two ingredients necessary for early writing success. In this study we examine the relationship between language skills at school entry and two outcome measures related to phonemic awareness and writing vocabulary at June and December for children (n=60) in the first year of school. We analysed data collected using standardised instruments and investigated both bivariate and multivariate relationships. The findings suggest that oral language development is a strong predictor of children's ability to hear and record sounds in the first six months of school and writing vocabulary development in the first year. Although oral language development and phonemic awareness have been linked before in previous studies, we establish a clear relationship between these two areas with respect to early writing development. We conclude the paper by considering the study's implications for teachers, parents and researchers.

Introduction

The discussion in this article will focus on the contribution of children's oral language control to the development of children's ability to hear and record sounds in the first six months and their writing vocabulary development in the first year of school. There have been studies which link oral language development, phonemic awareness and success with literacy (see, for example, Ukrainetz, Nuspl, Wilkerson & Beddes, 2011). However, in this article, we report on a study that examined the ability of children to move from phonemic awareness to being able to successfully isolate and record sounds within spoken words and write these onto the page in correct sequence. We contend that oral language, along with the ability to hear and record sounds and vocabulary development, are important to writing development, which is in turn important for literacy development and success at school more generally. We will argue for a greater recognition of the relationship between success with writing and overall literacy success. We will specifically examine the contributions of the ability of children to hear and record sounds and writing vocabulary to early writing development. Having made these connections we will then argue that, based upon the findings from this study, oral language is a strong predictor of children's ability to hear and record sounds in the first six months and writing vocabulary development in the first year of school. We begin the paper with the literature review then move to a discussion of the study, its tools and the methods applied. Finally, we finish with a discussion of the findings, limitations and further scope for research and a conclusion.

Review of relevant literature

The review of literature includes a discussion of relevant literature pertaining to literacy learning, oral language development, writing, phonemic awareness and writing vocabulary development.

Becoming literate

A literate person has a repertoire of ways of making meaning whereby “written-linguistic modes of meaning interface with oral, visual, audio, gestural, tactile and spatial patterns of meaning” (Kalantzis & Cope, 2012, p. 2) and understands how to apply these processes flexibly in “different cultural, social or domain specific situations” (Kalantzis & Cope, 2012, p. 1). Those who are literate take their mastery of these processes for granted, but those who are not may be excluded from much in today’s world. Literacy is a process: it is something people do and learn by engaging in communicative interactions with other people in social settings and activities (Comber & Reid, 2007). Within a literate society, an individual’s control over literacy is strongly linked to his/her ability to fully engage within that society. Early success with school literacy often leads to future success, a positive attitude towards school literacy and to school in general. Alternatively, a poor beginning may lead to frustration, avoidance and a negative attitude towards school literacy and school in general (Arnold & Doctoroff, 2003). Emergent literacy is a term sometimes used to describe children’s interdependent understandings of oral language, reading and writing, that develop prior to formal reading and writing instruction (Cabell, Justice, Konold & McGinty, 2011). Emergent literacy skills serve as precursors to skilled and fluent reading and writing (Whitehurst & Lonigan, 1998). Cabell et al. (2011) argue that emergent literacy skills are separated into “two distinct, albeit interrelated, domains that relate to subsequent reading achievements: oral language and code-related skills” (p. 2). We argue that emergent literacy skills also contribute to subsequent writing skills, which are in turn linked to reading success and literacy achievement more generally.

Spoken or oral language development

Spoken or oral language develops before the language abilities of reading and writing (Pugh, Frost, Sandak, Gillis, Moore, Jenner & Mencl, 2006). Oral language development, both receptive and expressive, is closely aligned with early literacy development (Cooper, Roth, Speece & Schatschneider, 2002). Oral language has also been linked to decoding early in the reading process (National Early Literacy Panel [NELP], 2008), reading comprehension later in the reading process (Storch & Whitehurst, 2002) and also verbal intelligence and writing (Shanahan, 2006). The oral language associated with literacy, according to Watson (2001), facilitates “the acquisition of literacy-related skills and success in formal education” (p. 43). Of interest to the study reported here, is the relationship between a child’s oral language at the start of formal schooling and the development of a written vocabulary in the first year of school.

Writing

Early writing is closely related to early language development and also offers a window into the development of early school literacy processes more generally. By eight years of age, school children spend up to half of their day engaged in writing tasks (McHale & Cermak, 1992) disadvantaging children who find learning to write difficult (Mayes & Calhoun, 2006). Yet, children's early writing competence has received much less attention than has emergent reading and reading-related processes (Whitehurst & Lonigan, 2001). This is, according to Elbow (2004), because "people think of listening and reading, not talking and writing, as the core activities in school" (p.10).

Bromley (2007) describes writing as a means of expressing or communicating in print, which involves the interaction of cognitive and physical factors, while Love, Burns & Buell (2007) argue that writing promotes social, emotional and cognitive development. Writing may be understood in terms of authorial and secretarial roles (Peters & Smith, 1993). The authorial role relates to the organisation of ideas and information to communicate with an audience and is influenced by oral language and vocabulary knowledge. It is this relationship among oral language, vocabulary development and the authorial roles of writing that is of interest to the study reported here. The secretarial role of writing focuses on the surface features of written text, with close attention to spelling, handwriting and punctuation. There are two aspects of the secretarial role of interest to this study: the first is children's ability to hear and record sounds in words, which is closely linked to phonemic awareness and invented spelling behaviours; and the second is children's ability to spell the words that make up their writing vocabulary. It is therefore the contribution of writing to literacy more broadly and the predictive role of oral language in children's ability to hear and record sounds and writing vocabulary development that are the focus of this study.

Phonemic awareness and the alphabetic system

As Ukrainetz et al. (2011, p. 50) define, phonemic awareness as "the understanding that spoken words can be separated and manipulated as minimally contrastive sound units". Phonemic awareness is recognised by many as a necessary but not sufficient condition for learning to read (Dickinson & Snow, 1987; Ehri & Roberts, 2006) and spelling in alphabetic print systems (Ehri & Roberts, 2006; Richgels, 2001; Ukrainetz et al., 2011). While some young children demonstrate phonemic awareness at a very young age, before they engage in using this knowledge to spell words they wish to write, Read (2009, p. 263) argues that "for many, if not most people, it is learning to read and write alphabetically that stimulates phonemic awareness, rather than the other way around". Whether phonemic awareness is a precursor for writing (spelling) or is developed through the process of invented spelling is not of concern to the study reported here. However, there are three relevant issues, namely, importance of phonemic awareness to writing (i.e., children's ability to hear and record sounds in words they wish to write), the importance of writing to literacy learning more generally, and the relationship between oral language at the start of formal schooling and the application of phonemic awareness to spelling in the first year of school.

Clay (2013, p. 116) measured the ability of children to hear and record the sounds in words using a simple dictation task which is “scored by counting the child’s representation of the sounds (phonemes) by letters (graphemes)”. According to Clay (2013), New Zealand children in the 5-5.50 year age range scored a mean of 15.6/37 graphemes (SD=11.6), in the 5.51-6.0 year age range they scored a mean of 23.6/37 (SD=10.5) and in the 6.01-6.50 year age range they scored a mean of 30.7/37 graphemes (SD=8.4). This demonstrates the growth in children’s ability to hear and record the phonemes with appropriate graphemes.

Writing vocabulary

Oral vocabulary at kindergarten is well recognised in regard to the role it plays as a predictor of reading comprehension from grade three onwards (Biemiller, 2006; Storch & Whitehurst, 2002; Weizman & Snow, 2001). The importance of vocabulary to early writing development is not so widely recognised. However, Clay (1975) noticed in one of her early research studies that the more competent children in early years’ classrooms made lists of the words they knew how to write. She went on to incorporate this ‘inventory principle’ in her Reading Recovery Early Intervention (Clay, 2002).

It needs to be emphasised that a writing vocabulary is different from an oral vocabulary. Developing a writing vocabulary requires a child to transfer words which exist in the head as un-verbalised formulations into a set of marks on paper; a transfer from a medium which is primarily aural to a medium which is primarily visual (Bromley, 2007). While growth in writing vocabulary has been connected with the classroom program (Clay, 2002) in the study discussed here we make a case for a link between oral language control at the start of school and children’s writing vocabulary at the end of the first year of school.

Children’s writing vocabulary is understood to be those words they know and can spell correctly. In the inventory process developed by Clay (2013), it is restricted to those words children can write correctly (spell) in a ten minute period. According to Clay’s study reported in the 2013 revised version of *An Observation Survey of Early Literacy Achievement on the Writing Vocabulary 10 minute task*, New Zealand children in the 5-5.50 year age range scored a mean of 12.68 words (SD=10.08), in the 5.51-6.0 year age range scored a mean of 22.22 words (SD=14.70) and in the 6.01-6.50 year age range they scored a mean of 29.97 words (SD=15.06). This demonstrates the growth in children’s ability to spell words that form what is referred to here as a child’s writing vocabulary (Clay, 2013).

The study

The research described in this paper forms one part of a larger study which focused on the teaching and learning of writing in ten Kindergarten classrooms in New South Wales (NSW), Australia. Kindergarten is the first year of formal schooling in NSW. The data specific to this paper were analysed with two aims in mind. The first aim was to examine children’s development using two language skill measures and a cognitive development measure of children just after school entry, and a measure related to children’s ability to

hear and record sounds in the words they wish to write and a measure of writing vocabulary. These two measures were applied in June and December in the first year of school. The second aim was to investigate the predictive ability of the measured language skills on change in measures of children's ability to hear and record the sounds in words and writing vocabulary through the second half of the first year of school.

Context

The study was conducted in a regional centre in NSW. Five of the schools involved in the study were situated in a regional city with 100,000 people and one school was from a small village 30 km outside the regional centre. Children usually start Kindergarten in NSW between 4.5 and 5.5 years of age although they may be a little older. They may or may not have attended pre-school or childcare prior to school. Some children in NSW enter school with a background supported by privileged preschool literacy experiences from home and early childhood settings that have prepared them well for school literacy while others do not (Hill, 2004).

Participants

Children (n=60) were randomly selected from six different state-run schools and across ten Kindergarten classrooms. While not constituting a representative sample of the state of NSW, the sample was broadly representative of the regional centre (in terms of socio-economic status of families and size of schools) where the research was conducted. Twelve of the 60 children were attending government schools which had a Priority Schools, classification to reflect the low socioeconomic status (SES) of the families at the school. The children ranged in age from 4.07 to 6.02 years in the first week of school. Twenty-six (43.3%) were girls and 34 (56.67%) were boys. All children spoke English as their first language.

Method: Procedure and instruments

Ethics approval was obtained from the university and the relevant school system authority. Parent permission and the children's agreement for participation were provided. All data collection was carried out by the senior researcher. Pre-testing occurred in the first two weeks of the school year. The Peabody Picture Vocabulary Test and the Record of Oral Language measured oral language development while the Who Am I? Developmental Test provided a measure of cognitive processing. These measures are described below.

- The *Peabody Picture Vocabulary Test* [PPVT-III] (Dunn & Dunn, 1997) is designed for persons aged 2 ½ through 90+ years. The receptive (hearing) vocabulary measure attainment for Standard English was applied. This test is a measure of a person's oral vocabulary. No reading is required by the participant. Participants are presented with a series of picture cards (4 pictures per card) and the tester states a word describing one of the words on a card and invites the participant to point to a particular object. The test stops once the participant makes eight errors in a row.

- The *Record of Oral Language* [ROL], (Clay, Gill, Glynn, McNaughton & Salmon, 2007) was designed to assist teachers to “observe aspects of a child’s control over oral language utterances and assess a child’s ability to handle selected grammatical structures” (p. 9). Participants are invited to repeat back to a tester sentences which increase in grammatical complexity. This process is recorded. The tester then analyses the participant’s responses for application of linguistic and morphological rules. This reveals the participants’ control over oral language structures.
- *Who Am I? Developmental Test* [WAI] (de Lemos & Doig, 1999). This assessment tool “assesses the cognitive processes that underlie the learning of early literacy and numeracy skills” (de Lemos & Doig, 1999: V). The three scales used were: copying (of geometric figures), symbols (the child’s awareness of these) and drawing (a picture of self).

Post and follow-up testing occurred in the participants’ first year of school in June and December. The researchers were interested in the participants’ phonemic awareness as it translated to spelling and their developing writing vocabulary mid-year and at the end of the first year of school. To measure these skills the following tools were adopted: Hearing and Recording Sounds in Words (HRSW) and Writing Vocabulary (WtgV) task. Both tools are taken from An Observation of Early Literacy Achievement (Clay, 2002) and are often used by teachers during the early years of schooling.

- *Hearing and Recording Sounds in Words* [HRSW] (Clay, 2013) requires the child to “listen to the sounds in words in sequence and to find letters to represent those sounds” (Clay, 2013, p. 116). This tool therefore demonstrates a child’s ability to use phonemic awareness and alphabetic knowledge in spelling tasks; to go from phoneme to grapheme in sequence.
- The *Writing Vocabulary* [WtgV] Task (Clay, 2013). In this task children are encouraged to write all the words they know. Scores are calculated based on the number of words correctly spelled within a limited time-frame (10 minutes).

The schedule of administration of the various instruments is displayed in Table 1, as well as the respective sample size for each administration.

Results

Correlations

An inspection of the correlations reported in Table 2, taken at the beginning of the Kindergarten year, revealed moderate to high correlations between the three predictor measures, the highest being between the PPVT and ROL ($r=.59$). Age was moderately correlated with WAI but had low or negligible correlations with the other measures. The PPVT was moderately related to all four outcome measures but showed stronger association with the phonemic measures than with the writing measures. By way of contrast, the ROL and the WAI were substantially correlated with all four outcome measures, with correlations typically in the .5 to .6 range.

Table 1: Data gathering timeline

	Timeline	Measures used
Pre testing (January)	Term 1 weeks 1-2	PPVT-III ROL WAI
Post testing (June)	Term 2 week 10	PostHRSW PostWtgV
Follow-up testing (December)	Term 4 weeks 8-9	FUHRSW [alternate form] FUWtgV

As might be expected the respective June and December measures were highly correlated, being .88 for the writing measures and .67 for the phonemic ones. These high correlations, particularly in the case of writing, testify to the reliability of the instruments used. As will be explained later, the somewhat lower value for the phonemic measures reflected the ceiling effects in the December administration. Moreover, the relationship between the phonemic and writing measures, at June and December, were shown to be quite high ($r=.87$ and $r=.66$). These results provide evidence of a developing ability to correctly spell words from a personal writing vocabulary and attempt to spell unknown words using graphemes to represent appropriate phonemes in sequence.

Table 2: Correlation matrix

Measure	Age	PPVT	ROL	WAI	PostHRSW	PostWtgV	FUHRSW	FUWtgV
Age	1							
PPVT	.262	1						
ROL	.174	.591*	1					
WAI	.379*	.391*	.474*	1				
PostHRSW	.265	.421*	.581*	.571*	1			
PostWtgV	.290	.299	.525*	.535*	.865*	1		
FUHRSW	.059	.499*	.522*	.563*	.789*	.674*	1	
FUWtgV	.209	.373*	.587*	.480*	.758*	.880*	.656*	1

* $p<.01$ (2-tailed)

Multiple regression analyses

A series of multiple regression analyses were undertaken using the post, follow-up and change measures as dependent variables. Table A (see Appendix) presents the descriptive statistics for the variables used in the study. Generally the skewness and kurtosis results for these variables were within the -1 and +1 range (Tabachnick & Fidell, 2001), the one exception being FUHRSW due to apparent ceiling effects, which are discussed later in the paper.

In order to exert some control over developmental differences, age was entered first in all of the regression models and then ROL, WAI, and PPVT were entered using the Stepwise method to allow these measures to be compared for their predictive capacity with respect to the various writing dependent measures. Although this strategy produced a slightly lower subjects-to-variable ratio below the optimal figure (see, for example, Tabachnick & Fidell, 2001), it was felt that because of the young ages of the participants this form of control was prudent.

Post and follow-up analyses

With the PostHRSW as the dependent variable, age was significant, and was followed by ROL and WAI accounting for 31% and 9.4% of the variance respectively. This gave a total adjusted R^2 for the model of .44. The PPVT did not enter but its partial correlation, after controlling for age, was .39. For the follow-up HRSW, age was not significant but ROL accounted for 31% of the variance and WAI 8%. The total adjusted R^2 for the model was .41. Once again, the PPVT did not enter although its partial correlation with the dependent measure, after entering age, was .36.

For the writing dependent measures (*viz.*, PostWtgV and FUWtgV), the post (*i.e.* June) and follow-up (*i.e.*, December) regression results were remarkably similar. In the case of the post measure, age was significant and accounted for 8.4% of the variance, ROL accounted for 24.6% and finally WAI entered and accounted for a further 8%. This gave an adjusted R^2 for the model of .377. The PPVT, which was moderately correlated with the dependent variable, failed to enter into the model. Its relationship was depleted when the ROL entered.

Using the follow-up writing measure as the dependent variable, age was no longer significant even though entered first. But, the pattern for the other independent variables remained very much as before. ROL accounted for 32.4% of the variance and WAI accounted for 4.8%, giving a total adjusted R^2 for the model of .383. And again, the PPVT failed to enter even though its initial partial correlation with the dependent measure, after controlling for age, was .35.

Change analyses

In order to examine the predictors of change in children's ability to hear and record the sounds in words and in writing vocabulary, gain scores were derived by calculating the difference between the follow-up and post scores for individual children in each area. Although the use of gain scores has sometimes been criticised in the literature (see, for example, Edwards, 2002), there are cogent arguments for their use when the potential predictors are correlated with the initial measure (see, for example, Rogosa & Willett, 1985; Tisak & Smith, 1994). This situation clearly applied to the measure of writing change (see Tables 2 and 3).

Table 3: Table of correlations between change measures and pre-test measures

Measure	ChangeHRSW	ChangeWtgV
Age	-.298	.154
PPVT	-.046	.378
ROL	-.283	.562
WAI	-.187	.404

For the change measure concerned with hearing and recording of sounds the two variables age and ROL accounted for approximately 15% of the variance which was shared almost equally between them. However, the beta coefficients for these two predictors were negative. This result is in marked contrast to the significant positive correlations found between the ROL measure and post and follow-up measures of HRSW (see Table 2). Further examination of the data showed substantial ceiling effects occurred on the follow-up HRSW measure. These effects were particularly prominent for children with high ROL scores and as a consequence the change measure had a small negative correlation with ROL scores. These results suggest that, insofar as the measuring instrument allows one to judge, there is a levelling of achievement in this area over this first year of schooling. This may be due to the effects of classroom instruction, as well as to ceiling effects arising from the instrument or from the constrained skill area *per se* (Paris, 2005).

In the regression analysis with change in writing vocabulary (ChangeWtgV) as the dependent variable, the effects for age were controlled by entering it first, even though it did not prove to be significant, accounting for less than one percent of the adjusted variance. The subsequent stepwise procedure resulted in the entry of the ROL measure and an R^2 change of .30, which was significant beyond the .001 level. Thus, this initial measure of oral language proficiency was found to significantly predict writing vocabulary skills at both June and December, as well as the gain achieved in this period.

Discussion

In relation to the first aim, the findings of the study show a close relationship between the ROL and PPVT. This might be expected given their basis in oral language; however, ROL measures children's development in terms of spoken grammatical structures whereas PPVT measures oral vocabulary. The WAI taps into different abilities such as figure recognition and reproduction and is more highly correlated with age compared to the other two measures which have a strong verbal component. As might be expected there are very high correlations between the post and follow-up measures in the respective areas, and there are high correlations between children's writing vocabulary and their ability to hear and record sounds in words. The latter relationship is consistent with the work reported by researchers such as Ehri and Roberts (2006) and Ukrainetz et al. (2011). Given the lower correlations with Age and the two language measures and the high correlations between ROL and the dependent variables, these results support the

importance of socio-cultural factors as determinants of school language learning. Moreover, the effects of age differences decline over this relatively short period of time.

In order to identify more accurately the contribution of the predictor variables, age was used as a covariate in all the analyses. However, although it proved to be significant in both the post outcome measures taken in June, it was not significantly related to the follow-up measures or to the two gain measures. After controlling for the effects of age the ROL measure generally accounted for about 30% of the variance in the phoneme to grapheme writing dependent variables, including the change in writing scores. The one exception was the somewhat lower but still substantial result for the initial writing measure (PostWtgV). Taken together, these findings add support to previous research findings that highlight a strong relationship between oral language and writing development (see, for example, Shanahan, 2006).

In spite of its relatively simple nature, the WAI measure proved to be a useful supplementary predictor for both the post and follow-up measures. This suggests that it is identifying relevant competencies which are not encompassed in the ROL measure. Given the higher correlations between Age and the WAI measure, as well as the nature of the tasks involved, it is interesting to speculate on this result. Possibly the WAI incorporates memory and cognitive organisational skills, which facilitate phonemic and writing performances.

The results of the multiple regression analyses for FUHRSW and the change measure for HRSW scores emphasised the ceiling effects which occurred in the follow-up data collection. Clearly some of the children had mastered all of the hearing and recording sounds in words skills being tested by the instrument employed.

These results point to the important functions that oral language and certain forms of cognitive processing play in the development of children's ability to hear and record sounds in the words they want to write and writing vocabulary development. These findings clearly have implications for those working with and caring for children. For example, parents/carers and teachers should be talking to their children, reading to them and strongly encouraging them to engage in writing and drawing activities. Such engagement seems to be linked to phonemic skill and writing vocabularies. Even before formal schooling begins children should be experiencing a range of activities, using simple technologies such as pencil and crayon through to sophisticated technologies such as computers, in order to build their phonemic skills and vocabularies. Indeed given the small but persistent influence of the WAI, it may be that such activities encourage the development of cognitive skills, which are separate from the more traditional oral language ones.

It is also interesting to note that the findings indicate that age has a diminishing effect over children's ability to hear and record sounds in words and writing vocabulary development during the first year of formal schooling. That is, although students begin school at various ages, in this case between 4.5 and 5.5, such an age difference is less obvious in the second half of the first year of school. This suggests that, at the first half of

the year with a teacher at the helm, younger children, on average, progress reasonably quickly in relation to their older peers.

It is important to recognise the limitations inherent in the study. First, the relatively small sample size brings into question the generalisability of the study's findings. However, the sample was carefully chosen so as to include students across different schools and different classrooms, and therefore has arguably controlled for individual teacher effects. Nevertheless, a larger and more inclusive sample of students, including students from different jurisdictions (other Australian states and territories), would be an appropriate target sample for a follow-up study. Second, because a ceiling effect appeared in the follow-up testing using the HRSW, it might have been more beneficial to have administered this instrument and the other instruments earlier. Conceivably this would have avoided the occurrence of the ceiling effect. Further investigation using the HRSW is needed to explore this or perhaps another measure needs to be sourced.

Conclusion

Success in literacy is essential for success at school and in life generally and the important role of writing in literacy is often overlooked. Reading tends to be the focus of many teachers and is still the most talked about in the press and has more research devoted to it than writing (Huot & Perry, 2009). Writing appears to be harder for teachers to teach and is often neglected (Turbill & Bean, 2006). Most parents understand the importance of reading to young children but are not always aware of the importance of encouraging drawing and writing before children begin school. Writing may therefore not be encouraged by parents even if they read to their children.

Control over the grammatical structures of spoken language, phonemic awareness, the ability to hear and record sounds in words and the development of a writing vocabulary are all critical to young children's writing development. The results of this study shed some light on the relationships between these various developmental areas. The study has also provided a solid foundation for further writing-based research in the early years of schooling.

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Appendix: Descriptive statistics for the variables in the study

Variable	N	Mean	SD	Skewness	Kurtosis
PPVT	60	67.32	14.22	-.36	-.41
ROL	60	21.47	9.46	-.19	-.08
WAI	60	27.45	7.30	-.43	-.43
PostHRSW	59	21.31	11.67	-.44	-.936
PostWtgV	59	13.76	10.11	.51	-.64
FUHSW	57	31.11	8.88	-1.92	2.71
FUWtgV	57	37.89	25.58	.77	.08
ChangeHRSW	57	9.14	6.96	.50	.17
ChangeWtgV	57	23.74	17.40	.85	.37

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