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Home literacy activities: Accounting for differences in early grade literacy outcomes in low-income families in Zambia

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Inequalities on child cognitive outcomes exist as children enter the first grade. These differences are even wider for children in low-income families. This article aims to examine the extent to which home factors account for variation in early literacy outcomes in the first year of schooling. A total of 72 first graders and their parents from low-income families in Lusaka, Zambia, participated in the study. A self-reported home literacy questionnaire was used to collect home literacy data – parental education, home possessions, reading materials, language awareness, print experience, writing activities, reading activities and teaching letters. Children's early literacy skills were assessed using four measures: orthography awareness, spelling, vocabulary and math tests. These tests were measured at two points: at the beginning and at the end of the first grade. Results showed that teaching letters was most predictive of literacy outcomes both at the beginning and end of the first year. The study concludes that formal teaching of letters at home is the parents' greatest strength for supporting literacy in low-income families. Thus, energies for parental involvement should be directed in ways that are culturally practised and manageable by parents for better literacy outcomes.

Introduction

Quality education is one of the 17 Sustainable Development Goals (SDGs) set for achievement by 2030. Attaining inclusive and quality education is the foundation to improving people's lives and sustainable development. Major progress has been made towards increasing access to education at all levels with rates of 52% in 1990 to 78% in 2012 (UNESCO 2014). Although basic literacy skills have improved, the need for concerted efforts is still great considering that large disparities still remain among children from the poorest households. Data shows that over 103 million youths worldwide lack basic literacy. Of the 103 million, large proportions come from developing countries. The challenges of low literacy rates are widely recognised to be greatest in sub-Saharan Africa where both access and quality remain critical problems (Ngwaru 2014). The region has the highest proportion of out-of-school children, the greatest gender disparities, the highest ratio of pupils to teachers and the lowest primary completion rates in the world (UNESCO 2008). As the most powerful and proven vehicle for sustainable development, quality education begins early in children's lives. It is acknowledged world over that parents are the first teachers for children, making their interactions and learning provisions imperative to the achievement of the SDGs. Envisioning a literate sub-Saharan Africa means realisation of the middle-class status by 2025. This vision starts with focus on the acquisition of literacy skills.

Basic literacy is the foundation of lifelong learning. Ensuring success for a literate people means understanding that literacy is deep rooted in historical culture and cannot be divorced from social contexts like family, schools and communities (Bruner 1991; Serpell et al. 2002). The family offers children the earliest literacy interactions that support early literacy and other child developmental socialisations. In the family setting, children have the ability to imitate and pick up language patterns, rhythms and meanings of languages showing culturally appropriated behaviours that support literacy. The variations in family structure, context, resources and practices have been documented to produce differences in academic performance (Akos, Rose & Orthner 2015; Aram & Levin 2001; Considine & Zappala 2002; Hammer & Maccio 2006; Hart & Risley 1995; Heath et al. 2014; Morrissey, Hutchison & Winsler 2014; Sektnan et al. 2010). Family socioeconomic status (SES) marked by parental education (Rindermann & Baumeister 2015) facilitates literacy practices experienced by family members. The level of education attained by parents enhances both content and knowledge about how reading is developed (Arnold & Doctoroff 2003; Crosnoe et al. 2010; Howard et al. 2014; Merz et al. 2015; Olson et al. 2014). Despite the generalised view that children

from low-income families are low achievers (Magnuson & Shager 2010), evidence showing variability in academic performance exists (Burchinal et al. 2011; Cairney 1997; Welsh et al. 2010). Within the family, mediated processes like parental involvement and engagement in literacy activities, expectations and attitudes have been reported to influence literacy development (Davis-Kean 2005; DeBaryshe 1995; DeLoatche et al. 2014; Gottfried et al. 2015; Sénéchal & LeFevre 2014; Skwarchuk, Sowinski & LeFevre 2014). However, these mediated activities come to the children in different shapes and sizes – quality and quantity.

This article is aimed at examining how the variability in literacy environments in low-income families account for differences in early literacy outcomes at the beginning and at the end of the first grade. The examination of these literacy environments in low-income contexts is key to advancing inclusive and equal education opportunities especially for the poor. It is well documented that by the time children enter the first grade, they have some exposure ot a literate world in one way or the other (Burgess, Hetch & Lonigan 2002; Magnuson & Shager 2010; Storch & Whitehurst 2001). This literate world is facilitated by experiences in the home literacy environment. Sénéchal and LeFevre (2002) distinguish between the two forms of literate activities found in the literacy environment – informal and formal. Informal activities include reading activities, reading materials and print experiences whereas formal activities relate to those that expose the child to print-like teaching such as letter names and sounds. Despite occurring simultaneously, these activities have been found to independently influence literacy outcomes (Hood, Conlon & Andrews 2008; Manolitsis et al. 2009; Ouellette & Sénéchal 2017; Sénéchal et al. 1998). Formal activities like parental teaching of letters have a positive impact on learners' literacy skills (Evans, Shaw & Bell 2000; Torppa et al. 2006). For example, Torppa et al. (2006) found that less teaching of letter names at age 4.5 predicted delayed letter knowledge at six among Finnish learners.

Although children experience variant forms of literacy activities that usher them into literate world, experiences of those from vulnerable backgrounds are similarly poor and undifferentiated. If this assumption holds, no difference in performance should be found when children enter the first grade. The goal of this study was twofold: to find out (1) the extent to which children from low-income Zambian families experience a conventional home literate environment and (2) the extent to which this variation impacts literacy outcomes at the beginning and end of the first grade.

Method

Participants and procedure

These data were collected by the support of the reading support for Zambian children (RESUZ) project in which 42 public schools were randomly selected to participate (see Chansa-Kabali, Serpell & Lyytinen 2014 for a full description). The project assessed children's early literacy achievements at the beginning and end of the first grade by focusing on both the family and school context. The main thrust for the project was to assess the impact of a literacy game called GraphoGame™ embedded in mobile phones (see www.grapholearn.info). This article focuses on the family context specifically, the home literacy environment and how it accounts for differential achievements in early literacy. Using a quantitative design, family factors linked to early literacy were explored. For this home study, 9 out 42 public schools were purposively selected for inclusion. The learners from each of the nine schools were randomly selected for participation using the class register. A total of 72 learners were selected. After the selection of the learners, parents were contacted for participation and parental written or otherwise oral (for illiterate parents) consent was obtained for the learner and the parent to participate in the study.

Boy participants were 32 representing 44.4% (M = 7.31; SD = 0.59) whereas girls were 40 representing 55.6% (M = 7.03; SD = 0.62). Parents' age ranged from 25 to 61 (M = 35.67; SD = 6.65). Family SES characteristics assessed using profiles of parental education and occupation reflected low-income households. For education attainment, 85% mothers and 43% fathers reported to have attained up to 9 years of formal education. At senior secondary, 11% mothers and 43.1% fathers reported this attainment; 4.2% mothers and 13.9 fathers' attained a college qualification. Occupational characteristics showed a total of 40.3% mothers and 29.2% fathers as unemployed at the time of assessment. A total of 54.2% mothers and 50% fathers were engaged in non-skilled labour like janitors, house helps, waiters, bus conductors, shopkeepers and fuel attendants. Another 2.8% mothers and 9.7% fathers were engaged in semi-skilled jobs like electricians, welders, carpenters, office clerks and construction workers. A very small proportion had skilled and professional jobs, 2.8% mothers and 11.1% fathers, like teachers. A total of 69.5% families consisted of married spouses with biological children while 30.5% consisted of children from single, divorced or widowed parents. The number of family members in the households ranged from 3 to 15 with most families living in two-roomed rented houses. At the end of the first grade, analyses included only 39 children who were not intervened with the GraphoGame™.

Testing procedure

Home visits were scheduled with parents in collaboration with teachers. Parental consent to participate in the study was obtained, in writing or otherwise orally for parents who were illiterate. Administration of the parents' questionnaire lasted approximately 45 minutes to an hour. The language of administration for parents who could not speak English was primarily the local languages (IciBemba and Cinyanja) and code switching between English and the local languages for parents who were conversant with English.

Child measures were conducted individually at respective schools. Each child spent about 1 hour during the assessment. All four tests had sample items that were introduced first before the actual test. The orthographic awareness was set for

3 minutes. Without a time limit, the spelling test was administered by dictation. For the spelling, vocabulary and math tests, the child was presented with four possible responses from which they were expected to choose the correct response. All these tests progressed with increasing difficulty.

Measures

Parents' questionnaire

To measure home literacy-related activities, questions were adapted for the Zambian context from previously used questionnaires by Sénéchal et al. (1998), Foy and Mann (2003) and Haney and Hill (2004).

Reading Activities – Parents were asked to rate the frequency of reading-related activities on a five-point scale – 5 (daily), 4 (2 to 3 times a week), 3 (once a week), 2 (at least once a month) and 1 (never). Questions included the following: 'How often the parent reads for pleasure', 'How often the parent shared what they read', 'How often they read to the child', 'How often they offered help in reading', 'How often they talked about what they read to the child' A total of nine items were asked which produced an internal consistency of α = 0.87.

Parental education was assessed using a five-point scale – 1 = no formal schooling; 2 = primary; 3 = junior secondary; 4 = senior secondary; 5 = college or higher. This was combined for mothers and fathers to obtain a parental education variable. These items gave a reliability of α = 0.70.

Possessions were assessed by the presence (yes) or absence (no) of the following items – television, running water, flushable toilet, electricity, stove and a car which gave an internal reliability of α = 0.78.

Assessment relating to writing activities (six items), teaching letters (six items), language awareness (six items) and print experience (six items) asked questions on the frequency of the activities in the home which were measured on a five-point scale – 5 (daily), 4 (2 to 3 times a week), 3 (once a week), 2 (at least once a month) and 1 (never). The internal consistency values for each of the variables were α = 0.78, 0.72, 0.81 and 0.71, respectively. Reading materials were assessed by availability, type and quantity.

Children's measures

Four locally adapted tests that measure early literacy were used. All the measures were in ciNyanja.[1] (1) Learner's orthographic awareness was assessed using letter knowledge, syllables and simple words. The test yielded a moderate test–retest reliability, $r = 0.67$ ($N = 22$). This test had an objective scoring system ranging from -54 to 54. A child received a score of 1 for every correct response and -1 for every incorrect response. (2) Spelling items included letter sounds, syllables and simple four letter words. The assessment showed a high test–retest reliability, $r = 0.86$ ($N = 22$). For both these tests, the learner was required to underline the correct responses from four possible answers. The test scoring system ranged from 0 to 20 with a score of 1 for every correct response and a 0 for every incorrect response.

1.CiNyanja is the officially approved language of literacy instruction in Lusaka province where the study was conducted.

Vocabulary

The Picture Vocabulary Test (PVT) was used to assess receptive language. Originally developed by Dunn and Dunn (1997), an adapted version with 30 items was used. This adapted version was translated into four most widely spoken indigenous languages (ciNyanja, iciBemba, siLozi and ciTonga) in Zambia and yielded a value of α = 0.83 for internal consistency (Zuilkowski et al. 2012). The test presents four visually displayed pictures on each trial from which the child has to choose one picture that corresponds to the spoken word. Each correct response receives a score of 1. The range of possible scores for this test is 0–30.

Math skills

The Zambia Achievement Test – Mathematics (ZAT-M) – was used to measure math competence in primary school grades, developed by researchers from the University of Zambia and Yale University (Stemler et al. 2009). This test has been standardised on a large population of primary school learners in Zambia. It reported a satisfactory internal consistency among items of α = 0.77 (Jere-Folotiya et al. 2014). Items on the test are arranged in order of increasing difficulty and each item has four possible responses that the learner chooses from. The test's scoring ranged from 0 to 30, a correct response giving a score of 1 and an incorrect one 0. The test also applies a discontinuation rule if the learner gets incorrect responses four consecutive times.

Results

Descriptive statistics

The means, standard deviations and the range of scores (minimum and maximum) on the home literacy variables are presented in Table 1.

TABLE 1: Descriptive statistics of home literacy variables, $N = 72$.

Home literacy variables	Minimum score	Maximum score	*M*	*SD*
Parental education	2	14	6.75	2.75
Possessions	2	12	8.93	2.35
Reading materials	0	15	6.62	4.02
Language awareness	2	19	10.34	5.77
Teaching letters	0	12	4.39	3.22
Writing activities	0	11	4.62	3.01
Print awareness	2	12	6.75	3.13
Reading activities	4	14	8.51	3.00

Table 2 above presents means, standard deviations and range of scores for the literacy outcome variables at Phase 1 and Phase 2.

Table 3 below shows results of learners' performance at the beginning and end of the first grade using the paired *t*-tests, which showed that significant differences were indicated for orthographic awareness t (39) -8.68, $p < 0.001$; spelling t (39)

-3.11, $p < 0.003$; vocabulary t (39) -2.13, $p < 0.038$. A non-significant difference was found for mathematics t (39) -1.03, $p > 0.05$.

Bivariate correlations

A correlation matrix was computed to determine the bivariate associations among the home literacy variables. Testing multicollinearity by using tolerance and variance inflation factors showed that numerical responses for each variable included in the analysis did not violate the assumptions for possible multicollinearity. Violation of multicollinearity occurs when the values of tolerance are closer to 0 or that of the variance inflation factors are closer to 5.0. For this study, values of tolerance were more than 0.89 and the variance inflation factors were less than 1.25. Multicollinearity assumes that when violation of the variables occurs, factors being investigated are measuring the same construct (Field 2013). The non-violation of the multicollinearity assumptions shows that variables under investigation are not measuring the same construct. However, shared variance is implied by the observed significant correlations.

The zero order correlations in Table 4 shows home variables at the beginning of the first grade. All the variables were significantly correlated except for the home possessions and math ematics variables which were not significantly correlated $p > 0.05$.

The zero order correlations in Table 5 shows home variables at the end of the first grade. All the variables were significantly correlated except for the home possessions which did not correlate significantly with spelling $p > 0.05$; math ematics did not correlate significantly with reading materials and writing activities $p > 0.05$.

Regression analyses

The regression analyses followed the stepwise method to assess predictors that emerged significant. Theoretically, the home literacy variables being assessed have been reported to have some relationship with literacy skills. This relationship can be seen from the significant correlations noted from the above tables. However, the stepwise method is applied without prior assumptions and is purely based on a strict mathematical criterion and random assignment of the variables.

In Table 6, when all the explanatory variables were entered into the regression model, results showed that for orthographic awareness, teaching letters and reading materials emerged significant F (1, 69) = 44.93, $\Delta R2 = 0.39$, $\beta = 0.48$, $p < 0.001$; F (1, 68) = 10.88, $\Delta R^2 = 0.32$, $\beta = 0.32$, $p < 0.01$, respectively. For spelling, teaching letters and parental education emerged significant F (1, 69) = 56.00, $\Delta R2 = 0.44$, $\beta = 0.53$, $p < 0.001$ and F (1, 68) = 5.24, $\Delta R^2 = 0.47$, $\beta = 0.24$, $p < 0.05$, respectively. Language awareness singularly predicted

TABLE 2: Descriptive statistics of early literacy outcome variables.

Literacy outcomes	Phase 1 (N = 72)				Phase 2 (N = 40)			
	Min	*Max*	*M*	*SD*	*Min*	*Max*	*M*	*SD*
Orthographic awareness	-2	28	16.82	7.43	0	31	23.39	7.48
Spelling	1	17	8.36	3.54	3	20	14.47	5.48
Vocabulary	16	28	23.81	2.82	13	30	24.47	3.59
Math ematics	6	25	16.67	4.01	1	27	17.71	5.61

TABLE 3: Differences in early literacy outcome variables at the beginning (pre) and end (post) of the first grade.

Pairs	Paired differences					t	p
	M	*SD*	*SE*	95% CI of the differences			
				Lower bound	Upper bound		
Pre OA–post OA	-6.57	5.86	0.75	-8.08	-5.05	-8.68	0.001
Pre spelling–post spelling	-1.77	4.39	0.57	-2.90	-0.63	-3.11	0.003
Pre vocabulary–post vocabulary	-0.90	3.28	0.42	-1.75	-0.05	-2.13	0.038
Pre math ematics–post math ematics	-0.75	5.61	0.72	-2.20	0.69	-1.03	0.305

TABLE 4: Summary of zero order intercorrelations of variables at the beginning of the first grade, N = 72.

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. Parental education	1											
2. Home possessions	0.40***	1										
3. Reading materials	0.26*	0.37**	1									
4. Language awareness	0.49***	0.45***	0.36**	1								
5. Print experience	0.45***	0.34**	0.31**	0.56***	1							
6. Teaching letters	0.56***	0.49***	0.45***	0.38**	0.44***	1						
7. Writing activities	0.36**	0.26*	0.37**	0.40***	0.57***	0.53***	1					
8. Reading activities	0.27*	0.35**	0.30**	0.38**	0.35**	0.43***	0.49***	1				
9. Orthographic awareness	0.56***	0.38**	0.62*** *	0.42***	0.46***	0.68***	0.41***	0.34**	1			
10. Spelling	0.48***	0.30**	0.26*	0.36**	0.46***	0.62***	0.43***	0.41***	0.22*	1		
11. Vocabulary	0.28*	0.36**	0.23*	0.30**	0.39**	0.32**	0.24*	0.29*	0.27*	0.44***	1	
12. Math ematics	0.56***	0.16	0.53***	0.30**	0.49***	0.55***	0.37**	0.25*	0.69***	0.43***	0.42***	1

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

vocabulary F (1, 69) = 6.85, ΔR^2 = 0.07, β = 0.30, p = 0.011 whereas teaching letters predicted mathematics F (1, 69) = 26.31, ΔR^2 = 0.26, β = 0.52, p < 0.001.

Table7 above shows that when the same variables were entered for analyses into the regression model at the end of the first grade. Teaching letters significantly predicted orthographic awareness F (1, 37) = 8.86, $\Delta R2$ = 0.27, β = 0.55, p < 0.01, spelling F (1, 37) = 31.50, ΔR^2 = 0.59, β = 0.78, p < 0.001 and mathematics F (1, 37) = 7.71, ΔR^2 = 0.24, β = 0.52, p = 0.01. Language awareness still predicted vocabulary F (1, 37) = 12.46, ΔR^2 = 0.16, β = 0.42, p < 0.001.

Discussion

This study examined the extent to which home literacy environment variables in low-income families account for differences in literacy outcomes at the beginning and end of the first grade. Differences in family structure, context and resources play a significant role in learners' literacy outcomes (Akos, Rose & Orthner 2015; Cairney 2000; Rindermann & Baumeister 2015; Schaefer 1991). The context (low income) under examination poses as a potential risk for literacy development. However, realities of resilience have also been recorded in spite of the contextual constraints (McBridge-Chang, Chow & Tong 2010). As Cope and Kalantzis (2000) put it, children negotiate a world in which there are multiliteracies and within a complex world there are different life chances.

Variables examined included parental education, home possessions, reading materials, language awareness, print exposure, writing, reading and teaching activities. The first aim of the study addressed the extent to which learners experience the conventional literate home. A 'conventional literate home' is operationalised as one that provides opportunities that are widely agreed upon. For example, oral language, presence of books, unconventional print, reading, writing and teaching activities were part of the ecological and cultural features that shaped and sustained the literate experiences. Results from descriptive statistics have shown that children experienced the conventional literacy home. The study has shown that children were exposed to oral language. Oral language abilities in early childhood have been reported to predict beginning literacy skills such as phonological awareness, letter knowledge and concepts about print as well as later reading achievement (Bishop & Adams 1990; Chaney 1994; Scarborough 1990). Others purport that literacy begins with the development of oral language. Children will learn to read by associating the written form with speech–vocabulary (Kintsch & Kintsch 2005). As a significant part of literacy

TABLE 5: Summary of zero order intercorrelations of variables at the end of the first grade, N = 40.

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. Parental education	1											
2. Home possessions	0.40***	1										
3. Reading materials	0.26*	0.37**	1									
4. Language awareness	0.49***	0.45***	0.36**	1								
5. Print experience	0.45***	0.34**	0.31**	0.56***	1							
6. Teaching letters	0.56***	0.49***	0.45***	0.38**	0.44***	1						
7. Writing activities	0.36**	0.26*	0.37**	0.40***	0.57***	0.53***	1					
8. Reading activities	0.27*	0.35**	0.30**	0.38**	0.35**	0.43***	0.49***	1				
9. Orthographic awareness	0.30**	0.32**	0.50***	0.40***	0.37**	0.57***	0.21*	0.32**	1			
10. Spelling	0.55***	0.14	0.38**	0.37**	0.39**	0.65***	0.38**	0.48***	0.26*	1		
11. Vocabulary	0.31**	0.24*	0.47***	0.23*	0.35**	0.42***	0.29*	0.23*	0.25*	0.41***	1	
12. Math ematics	0.22*	0.36**	0.13	0.20*	0.23*	0.48***	0.09	0.25*	0.52***	0.47***	0.21*	1

*p < 0.05; **p < 0.01; ***p < 0.001.

TABLE 6: Regression analyses of predictive home literacy variables on early literacy outcomes at the beginning of the first grade.

Outcome variable	Predictor variables	Statistical models						
		b	SEb	ΔR^2	*β*	*Df*	*F*	*p*
Orthographic awareness	Teaching letters	0.63	0.12	0.39	0.48	1.69	44.93	0.001***
	Reading materials	0.70	0.21	0.32	0.32	1.68	10.88	0.002**
Spelling	Teaching letters	0.33	0.06	0.44	0.53	1.69	56.00	0.001***
	Parental education	0.31	0.13	0.47	0.24	1.68	5.24	0.025*
Vocabulary	Language awareness	0.21	0.08	0.07	0.30	1.69	6.85	0.011**
Mathematics	Teaching letters	0.367	0.07	0.26	0.52	1.69	26.31	0.001***

*p < 0.05, **p < 0.01, ***p < 0.001.

TABLE 7: Regression analyses of predictive home literacy variables on early literacy outcomes at the end of the first grade.

Outcome variables	Predictor variables	Statistical models						
		b	SEb	ΔR^2	*β*	*Df*	*F*	*p*
Orthographic awareness	Teaching letters	0.867	0.29	0.27	0.55	1.37	8.86	0.007**
Spelling	Teaching letters	0.756	0.135	0.59	0.78	1.37	31.50	0.001***
Vocabulary	Language awareness	0.24	0.068	0.16	0.42	1.37	12.46	0.001***
Mathematics	Teaching letters	0.808	0.291	0.24	0.52	1.37	7.71	0.012**

**p < 0.01, ***p < 0.001.

development, oral language was examined and construed as language awareness for this study. From the findings, it is clearly shown that children experienced oral language through language interactions like games and songs. These experiences varied from home to home.

Studies have indicated the significance of reading materials for a literate home (Heath 1983; Stanovich 1986). Reading materials have symbols of the written language, that is, essential elements for emergent literacy. Despite the scarcity, children were exposed to this important resource. The nature of reading materials included newspapers, magazines, adult books (often acquired for free) and very few children's books. The Bible was most common reading material present in all the homes. Acquisition of books especially children's books was attributed to financial challenges. Many parents reported experiencing financial hardships and food provision for the family was more primary and critical than books. As such, the acquisition of books for reading purposes was secondary especially when parents experienced other pressures that were deemed primary. This is in line with Ngwaru (2014) where he reports that low-income parents often do not see educational provisions of their children beyond their economic circumstances.

In order to encourage the exposure of books to children, the creation of libraries with full engagement of parents would help facilitate the experience with books. When these libraries are erected, library visits should be made mandatory for children could be a strategic direction. In order to ensure maximum parental involvement, some form of penalty on both the parent and child may be applied. In the bid to avoid the penalty, the children may be the front runners in reminding the parents. In addition, tying the library attendance to some form of assessment and awards would send a message of importance to the parents. Parents can sign some kind of a registry whenever the child attends the library. This could be a way of keeping track of the library attendance. The concept of an award may increase library attendance especially since this is not a cultural experience of many Zambians. Therefore, emphasising library attendance when learners are young may register its important at an early age and may be a practice developed for later learning. Schools could come up with guidance on suitable attendance per week or month and the kind of awards. In addition to conventional print, children in this study experienced 3 unconventional forms of print in the environment – labels on foodstuffs, laundry packages, street signs, etc. This experience added to their print exposure. Other researchers have also reported on the importance of unconventional reading materials and their impact on the emergent literacy in the absence of conventional books (Heath 1983; Ngwaru 2014; Purcell-Gates 1995). Using unconventional reading materials is a way by which children are exposed to print in less-resourced homes. The use of unconventional materials in the absence of conventional materials could serve as a stepping stone for introducing learners to print.

The study examined the influence of specific home variables on the literacy outcomes at the beginning and end of the first grade. At the beginning of the first grade, teaching letters and reading materials predicted orthographic awareness. The teaching of letters as an activity is a deliberate, systematic and intentional activity which aims at introducing children to written language. Although the presence of reading materials may not necessarily require systematic teaching, the presence itself is considered by many researchers as a gateway to a literate world (Bloch 2002; Goodman 1986; Ngwaru 2014). The presence of reading materials not only introduces children to the written language but additionally can be viewed as an important cultural phenomenon which in itself is a significant part of their experience. In the systematic teaching of letters, reference is made to actual representation and structure of the letters found in the books explaining why the two variables predicted orthographic awareness.

Spelling was predicted by teaching letters and parental education. Similarly, teaching of letters was more predictive because of the nature of the activity. Despite the general low levels of education, it can be argued that parents with higher educational attainment may have engaged in various ways of teaching spelling including teaching of sounds. The sounds taught included the vowels a, e, i, o and u. Research shows that teaching letters – sounds and names – is more predictive of early spelling skills (Hecht & Close 2002; Ouellette & Sénéchal 2017; Sénéchal 2006; Silinskas et al. 2010; Treiman et al. 1998).

Teaching letters singularly predicted mathematical skills. This finding was unexpected because the teaching of letters and mathematical skills seem unrelated at first glance. However, it could be that in the episodes of teaching, parents could have taught mathematical materials like numbers, puzzles, etc. This study only captured the activity of teaching letters without exploring other skills that could have been included in the teaching sessions. It would be interesting to explore the different skills that children are exposed to in teaching sessions.

Like other studies, this study found that vocabulary was influenced by language awareness. This finding was expected because the amount of oral language that the child is exposed to determines the amount of vocabulary they possess. Oral language activities such as singing and games explain the scoring on the vocabulary test. It can also be argued that these children were exposed to many people in the community who interacted with them at different levels. Each unit of interaction between the child and a significant other and especially among themselves was characterised by oral language enhancers like games.

Results of this study have shown statistically significant differences on all literacy outcome measures at pre- and post-tests except for mathematics. The difference in the literacy outcomes was expected because the children were expected to have gained knowledge in the learning processes both at school and home. However, the non-significant finding for mathematics could be explained by the fact that at this stage, teachers, schools and homes may focus more on reading than

math ematics. At the end of the first grade, teaching of letters singularly predicted orthographic awareness, spelling and mathematical skills. This result may have followed this pattern because skills other than reading could have been included in the teaching. While these results show the positive effect of the formal teaching activities at home, some studies in the United States have shown a negative effect of home teaching on literacy skills (Chen & Stevenson 1989). This contradiction could have been caused by differences in the way families engage in teaching. Each family would have engaged different strategies which best suited them and thus did not succumb to a systematic way of teaching.

Analyses at end of the year showed that only teaching letters predicted three of the literacy skills – orthographic awareness, spelling and math ematics. The performance on these skills could be explained by the systematic classroom instruction in reading and numeracy that learners receive at school. It could be that home variables may not show significant contribution to the skills acquired once children start experiencing systematic teaching from school. The debate around the effectiveness of home variables is still ongoing. For example, whereas Bus et al. (1995) contend that shared book reading accounts for 8% of early reading, Scarborough and Dobrich (1994) only found a positive weak association.

These results have shown that among low-income, less educated parents the formal activity of teaching letters makes a difference at the beginning and end of the first grade. This is in line with findings by Sénéchal (2006). Other variables that literature has reported to be associated with literacy outcomes did not emerge as significant predictors in this study. For example, reading activities, although present, is not a widely performed activity in Zambia, regardless of education level. Generally, reading and especially to children or to other people is not a culturally practised activity in many families. Many Zambians practise reading for its functionality – filling out hospital forms, employment search in newspapers and school-related purposes (Sampa 2005). This kind of reading may not nurture sharing of information especially with children because it is meant for self. The other reason for not finding reading activities as a predictor relates to the fact that many people shy away from reading. A plausible explanation for shying away relates to the language. To many Zambians, English in which reading materials are written is a third or fourth language. As such, many people may lack confidence to read in the language – making the situation even worse for less educated parents. In addition, reading is difficult for many less educated parents. In this study, 78% of the parents found reading difficult despite indicating reading proficiency at different levels.

It was expected that language awareness would continue to impact vocabulary at the end of the year. Here, the children increased their social networks to include friends and teachers. These interactions seemingly impacted their oral language. Other unexpected results that did predict literacy outcome was writing. An explanation for this finding could be that writing is secondary and comes after the very basic skills (knowledge) have been acquired. Thus, its activity may not be as emphasised early in the acquisition of literacy skills.

Overall, the study reveals lower levels of literate experiences. This could be explained by low levels of parental educational attainment that may inhibit their exploration and level of participation in such activities. Parents may lack confidence in interacting with their children on such activities and place the responsibility of teaching their children on the school. This may reduce the literacy interactions at home (Chansa-Kabali et al. 2014). The other explanation may be that this study targeted the parents; it did not capture the role of siblings in helping the younger ones. In Africa, children are usually helped by their older siblings, cousins, other relations or neighbours who are more skilled. The focus on the parents may have not tapped into this important resource of other people within the developmental sphere of the child.

These results are indicative of the activities that children in low-income families experience. Encouraging parents to conduct formal teaching activities in the homes appears to be more yielding. It is acknowledged that aspects of the home literacy environment are critical to the development of literacy skills; it is important for contexts like the one under examination to concentrate its strength. For instance, variables like parental education, home possessions and reading materials are anchored on the alleviation of poverty. Because poverty is a reality that may not go away soon, this study proposes that parents should engage in activities that are easy and manageable but still make an impact. Similarly, reading activities require changing a number of things including historical patterns that have been created. This too may take a longer time to achieve and requires massive sensitisation and awareness programmes. The advantage of encouraging teaching of letters is that most parents not only know letters of the alphabet but may also feel confident teaching them The conclusions of this study should be treated with caution owing to the fact that when children were in school, systematic teacher instruction was instituted and could have an impact on their literacy outcomes. The fact that Since teacher variables were not controlled for, it could be that at the end of the first grade, the teacher factors may have played a significant role in the achieved literacy outcomes. Similarly, the small sample size may not produce confident conclusions. As such, these results are only indicative and further studies should consider larger samples size including other socioeconomic classes and teacher variables.

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