

SCHOOL LUNCH AND LITERACY ACHIEVEMENT IN A SAMPLE OF SOUTH AFRICAN PRIMARY SCHOOL CHILDREN

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Abstract

This study investigated school lunch and achievements in literacy in a sample of South African primary school children. Data was collected through a quantitative survey administered with pupils (N= 160) from four grade 5 to 7 classes in a school in Soweto. The survey consisted of five literacy tests that were standardized by Do-It-Profiler, a UK based institute, and Shape the Learner, a South African based consultancy. Additionally, the survey included questions pertaining to the children taking lunch to school. The results show that learners who sometimes do not have lunch obtained statistically significantly lower marks on the combined learner profiler tests than learners who had some form of lunch provided. More specifically, learners who sometimes do not have lunch performed noticeably lower in the sound text, correct word, and most likely real word test. Based on social justice theory the author discusses the implications of the findings for literacy achievement in children who do not take lunch to school.

Keywords: literacy achievement, primary school children, school lunch, social justice theory, survey

Introduction

Even though the death rate of children under the age of five has dropped globally by more than fifty percent since 1990, almost 19,000 children still die daily from causes that are preventable (Save the Children, 2013). Research indicates that poverty is the most important factor contributing to this significant death rate, even in some of the wealthiest of countries (Huston, 2011; O' Connor, 2001; Quigley, 2003; Kahn & Kamerman, 2002; Huston & Bently, 2010). The deleterious effects of poverty on children has been well documented in various areas of study, such as education (Ahmar & Anwar, 2013; Bergeson, 2006; Drummond & Stipek, 2004; Khan & Jemberu, 2002; Lacour & Tissington, 2011; Rothman, 2003; Rowan, Cohen, & Raudenbush, 2004; Sirin, 2005), physical health (Egeland, Pacey, Cao and Sobol, 2010; Jomaa, McDonnell, and Probart, 2011; Levine, 2008), mental health (Weinreb, Wehlers, Perloff, Scott, Hosmer, Sagor and Gundersen, 2002), cognitive development (Grantham-McGregor, 2007; Prado and Dewey, 2012; Sanchez, 2009; UNICEF, 2012), and social skills (Jyoti, Frongillo and Jones, 2005).

One may argue that such findings have serious implications for developing countries, for example UNICEF (2012) estimates that approximately 146 million children in such countries are underweight and suffer from chronic hunger. The effects of poverty on children in South Africa is no exception since almost 40 percent live in the poorest of families (SAHRC and UNICEF, 2014). However, due to the proliferation of literature and studies on child poverty in South Africa, it is necessary to focus on a topic that has not received much attention over the past decade, namely the association between school lunch and achievements in childhood literacy. While several South African studies have confirmed that children from low socioeconomic (SES) families have poorer academic success than children from higher SES backgrounds (Lam, Ardington, & Leibbrandt, 2011; Reddy, Prinsloo, Visser, Arends, Winnaar, & Rogers, 2012; Spaull, 2013; Van der Berg, 2007), there is a dearth of literature on the effects of nutrition on the literacy achievements of children.

The need for such a study in South Africa is motivated by the findings of several global studies, which show that achievements in literacy during childhood is affected by SES (Baker, 2003; Baker & Scher, 2002; Chow & McBride-Chang, 2003; Jordan, Snow, & Porche, 2000; Saint-Laurent & Giasson, 2005; Saracho, 2002; Stainthorpe & Hughes, 2000; Turner, 1995). This finding has been corroborated by few studies conducted in South Africa (Howie, Van Staden, Tshele, Dowse, & Zimmerman, 2012) but none of them have specifically focused on school lunch and achievements in literacy. In the context of this study 'school lunch' refers to the child participants having lunch to eat when they were at school, irrespective of its nutritional value. 'Literacy' is viewed beyond the ability to read and write to include the ability to think critically about both oral and written language, competency, knowledge and skills (Dubin & Kuhlman, 1992; Foley, 1994; Hiebert, 1991; Langer, 1991).

Theoretical Perspective

The author believes that a social justice theoretical framework is imperative in understanding the relationship between school hunger and the literacy achievement of children. Social justice theory highlights the social injustices that exist in society that often lead to the oppression and unequal opportunities, which children may be exposed to often compromising their dignity and potential to succeed in life (Leatham, 2005; Pillay & Nesengani, 2006; Lethale, 2008; Pillay, 2014b; Shriberg, Wynne, Briggs, Bartucci & Lombardo, 2011). The author supports the view of Weaver-Hightower (2011) who contend that food and hunger are major social justice issues in schools because of their cultural and political connotations. Studies have shown that the lack of nutritional food and hunger are very common amongst particular children and communities (Anyon, 2005; Patel, 2007). Children from these communities also bear the brunt of social stigma, especially when they have to stand in line to receive food hampers at their schools (Ludvigsen and Scott, 2009). Social justice theorists postulate that all children should be provided with fair and equal opportunities to make certain that they succeed in life (Pillay, 2014a). In the context of this study, this would mean that all children should be provided with a nutritious school lunch to ensure that they have equal opportunities to achieve some level of success in literacy (Benedetto & Olisky, 2001; Smith, 2002; Stainton Rogers, 2004; Bartolo, 2010).

Method

Data collection

Data was collected through a survey which quantified the number of children who took lunch to school. There were three items in the survey about school lunch that the learners could respond to, namely: I bring my own food to school, I buy food at school, or I sometimes go hungry at school. These items served as independent variables in the study. Only those independent groups, where significant differences were found, will be discussed. The dependent variables are the five literacy tests written by the learners.

The results of these five tests were initially captured in Excel. The tests were:

1. Non-word spelling (30 B items)
2. Reading fluency (8 C items)
3. Spelling – type sounded word correctly (25 D items)
4. Word spelt correctly (30 E items)
5. Most likely real word (24 F items)

Each of these tests were analyzed separately by coding 1 as correct and 0 as incorrect. This data was then transferred into SPSS 22.0 for statistical testing. Actual details of the tests can be accessed from Do-IT-Profiler (2015), <http://www.doitprofiler.net>. The reliability and validity of the tests have been well established over a 20 year period of extensive research (Do-It-Profiler, 2015).

Participants and setting

The sample used in this study was obtained from a previously disadvantaged black school located in Orlando East, Soweto. Soweto is an urban settlement in South Africa that was established in the 1930's by the Apartheid government as a means to separate Blacks from Whites (South African History Online, <http://www.sahistory.org.za/places/soweto>). During the apartheid years, the lives of people in Soweto were characterized by abject poverty, segregation and inequity. Often public schools were in an appalling condition providing an extremely poor quality of education. The school involved in this study was no exception. Even though the situation in this particular school has improved since the advent of democracy, change has been very slow. The participants were 160 primary school children from a school in the Soweto Township of Johannesburg, South Africa (Males= 93; females =67, age range 12 to 14) (see Table 1). Of these, 94 (58.75%) self-reported taking their own lunch to school, 54 (33.75%) reported buying their lunch at school, while 12 (7.5%) indicated that they were sometimes hungry at school.

Table 1. Participant demographics

| Category | N | Percentage |
|---|-----|------------|
| Gender | 160 | 100 |
| Males | 93 | 58.1 |
| Females | 67 | 41.9 |
| Where does your lunch at school come from? | | |
| Bring own lunch | 94 | 58.75 |
| Buy it at school | 54 | 33.75 |
| Sometimes go hungry | 12 | 7.5 |

Statistics

Descriptive statistics were used to quantify the number of participants who took their own food to school, the number who bought food at school, and the number who were sometimes hungry. The five literacy tests mentioned above served as dependent variables in this study. These five tests formed an integrated multivariate factor, which was named “combined learner profiler literacy score.” Testing for significant differences between independent variables were facilitated by first testing the multivariate factor using a suitable test and when any significant difference was found at this level the individual tests were tested at the univariate level to see which of the five tests was responsible for the difference between the independent groups. As four of the five tests were negatively skewed the researcher made use of non-parametric procedures at the univariate level.

Ethical considerations

Ethical clearance for conducting this study was granted by the Ethics Committee of the Faculty of Education at a university in Johannesburg, South Africa. Consent for the study was provided by the school principal, school management team, and parents of the learners. Additionally, each learner assented to participate in the study. To ensure confidentiality names of the participants and the school have been omitted.

Data Analysis

Data was analyzed descriptively and also comparatively to determine any relative differences in literacy achievement between learners who did not take lunch to school and peers from same grades and classes who usually had lunch at school. Scores on four of the five literacy tests were positively skewed and non-parametric analysis (Mann-Whitney U-test; Wilcoxon test) were preferred for the group comparisons.

Results and Discussion**Table 2: Where does your lunch at school come from?**

Significance of differences between the three sources of school lunch groups with respect to the combined literacy tests

| Test | Group | Mean | ANOVA (p-value) | Dunnnett T3 | | | |
|------------------------|---------------------|-------|--------------------|-------------|----|----|----|
| | | | | 1 | 2 | 3 | |
| Combined literacy test | Bring own lunch | 57.38 | 0.000** | 1 | / | - | ** |
| | Buy it at school | 56.45 | | 2 | - | / | ** |
| | Sometimes go hungry | 42.60 | | 3 | ** | ** | / |

** = Statistically significant at the 1% level ($p < 0.01$)

The data in Table 2 shows that learners who sometimes do not have lunch obtained statistically significantly lower marks on the combined learner profiler tests than did learners who had some form of lunch provided. This is probably due to socio-economic circumstances where the poorer learners sometimes go hungry at school as the physiological need to eat and obtain energy goes unsatisfied in the poorer learners. The mean scores obtained are shown in figure 1.

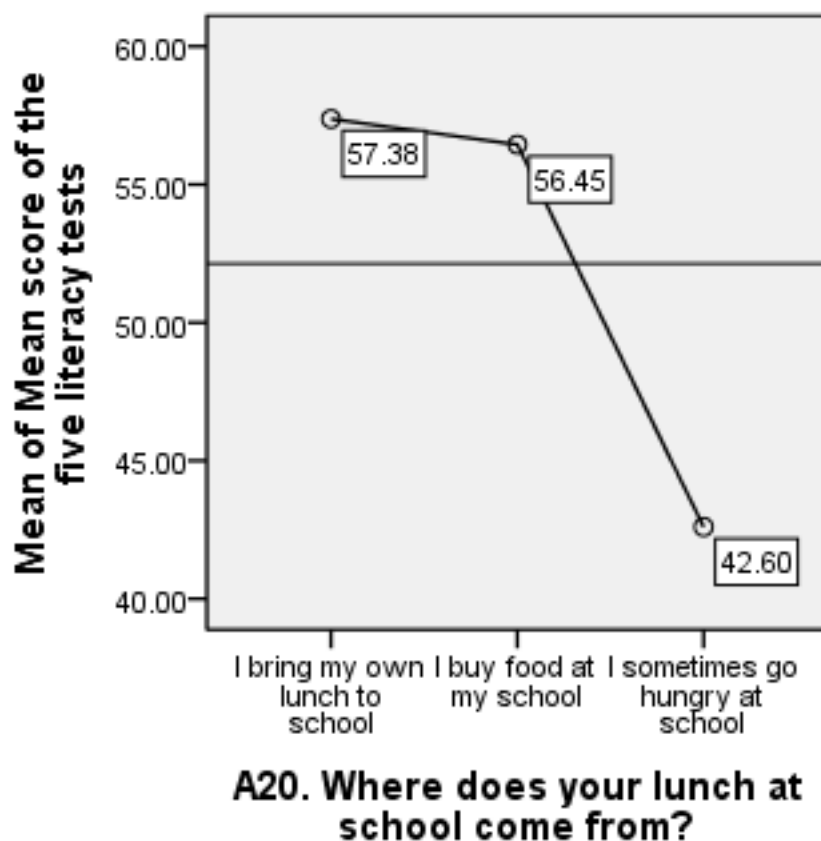


Figure 1: Line graph showing the combined literacy means for the three source of school lunch groups

The Mann-Whitney U test and the Wilcoxon test was used to determine which of the 5 learner profiler tests were responsible for this difference in the combined learner profiler scores. Only those tests where differences were found are displayed in Table 3.

Table 3: The hypotheses test summary for the five learner profiler tests

| | Null Hypothesis | Test | Sig. | Decision |
|---|---|---|--------|-----------------------------|
| 3 | Percentages of sound texts correct (D) is the same across categories of A20. Where does your lunch at school come from? | Independent-Samples Kruskal-Wallis Test | .002** | Reject the null hypothesis. |
| 4 | Percentages of the correct word (E) is the same across categories of A20. Where does your lunch at school come from? | Independent-Samples Kruskal-Wallis Test | .002** | Reject the null hypothesis. |
| 5 | Percentages of most likely real word-Word choice 2 (F) is the same across categories of A20. Where does your lunch at school come from? | Independent-Samples Kruskal-Wallis Test | .007** | Reject the null hypothesis. |

Asymptotic significances are displayed. The significance level is .050.

** = Statistically significant at the 1% level (p<0.01)

There were only significant differences in tests D, E and F and hence the Mann-Whitney U-test and Wilcoxon test as produced by SPSS 22.0 are given in Table 4.

Table 4: Non-parametric test values for test D, E and F regarding group1 (bring my own lunch) and group 3 (sometimes go hungry)

| | Percentages of sound texts correct (D) | Percentages of the correct word (E) | Percentages of most likely real word-Word choice 2 (F) |
|-----------------|--|-------------------------------------|--|
| Mann-Whitney U | 221.500 | 222.500 | 271.000 |
| Wilcoxon W | 299.500 | 300.500 | 349.000 |
| Z | -3.423 | -3.430 | -2.958 |
| Sig. (2-tailed) | .001 | .001 | .003 |
| Effect size | 0.33 | 0.33 | 0.29 |

a. Grouping Variable: A20. Where does your lunch at school come from?

** = Statistically significant at the 1% level ($p < 0.01$)

Effect size – $r = 0.10 - 0.29$ small; $r = 0.30 - 0.49$; moderate; $r = 0.5+$ large

The data in Table 4 show that those learners who bring their own lunch to school (Group 1) differ statistically significantly from those who sometimes go hungry regarding the sound text correct test (D), the correct word (E) and the most likely real word (F). Tests D and E have the highest effect size namely 0.33 and hence these two would be the most important in explaining the variance present in the test scores. There were also statistically significant differences present between groups 2 (those who buy lunch at school) and group 3 (those who sometimes go hungry) and these results are shown in Table 5

Table 5: Non-parametric test values for test D, E and F regarding group 2 (buy lunch at school) and group 3 (sometimes go hungry)

| | Percentages of sound texts correct (D) | Percentages of the correct word (E) | Percentages of most likely real word-Word choice 2 (F) |
|-----------------|--|-------------------------------------|--|
| Mann-Whitney U | 133.500 | 127.000 | 192.000 |
| Wilcoxon W | 211.500 | 205.000 | 270.000 |
| Z | -3.175 | -3.291 | -2.210 |
| Sig. (2-tailed) | .001** | .001** | .027* |
| Effect size | 0.39 | 0.41 | 0.27 |

a. Grouping Variable: A20. Where does your lunch at school come from?

* = Statistically significant at the 5% level ($p > 0.05$ but $p < 0.01$)

** = Statistically significant at the 1% level ($p < 0.01$)

Effect size – $r = 0.10 - 0.29$ small; $r = 0.30 - 0.49$; moderate; $r = 0.5+$ large

The data in Table 5 indicated that those learners who sometimes go hungry at school (G3) differ statistically significantly in sound text correct (D), correct word (E) and most likely real word (F) from those learners who buy lunch at school (G2). The best predictor was the correct word (E) test followed by D and F.

Using analyses from both Tables 4 and 5 one could also conclude that it is the learners who sometimes go hungry who perform most poorly in tests D, E and F and the physiological need of hunger probably influences the ability to concentrate in school and in tests to a larger extent than those learners who have some source of food. Learners who bring their own food to school (group1) and those who buy it at school (group 2) do not differ in the three learner profiler tests. In addition, as one can compare effect sizes directly with one another, it can be seen that the most important predictor in the three tests (D, E and F) was test E as it had the highest effect size in both the difference between groups 1 and 3 and 2 and 3. As the largest effect size of 0.4 was between those who buy food at school (G2) and those who go hungry (G3) one could also possibly conclude that the difference is due to financial circumstances as those who can buy food can afford it while those who go hungry cannot afford to buy food. Learners who bring food to school are also probably better off financially or have the means to prepare their own school lunch.

Discussion and recommendations

The number of children (7.5%) who did not have lunch at school was relatively small in the sample that was used in this particular study but the findings still indicated that these children performed more poorly in literacy tasks as compared to the other children who ate lunch at school. This finding corroborates previous studies which found that children who do not have school lunch perform more poorly in literacy tasks as compared to those children who take lunch to school (Kursmark Weitzman, 2009; Winicki & Jemison, 2003). However, it must be emphasized that this association is certainly not meant to insinuate a causal relationship between school lunch and poor literacy achievement amongst children since this was a small correlational pilot study limited to one school. Nonetheless, based on the findings there are some important recommendations that should be considered in order to improve the situation of children affected by school hunger.

Firstly, government should work collaboratively with community and religious based organizations to provide nutritious school meals for children who cannot afford to take lunch to school. Research has indicated that children who live in poverty usually experience hunger and this impacts negatively on their academic achievement and future economic prosperity (Save the Children, 2012; World Bank, 2006). In this way the cycle of poverty is constantly perpetuated and the poor remain poor. From a social justice perspective one would emphasize the importance of eradicating this cycle of poverty through systemic interventions and support. Secondly, schools should be instrumental in educating children out of poverty (Mouton, Louw, & Strydom, 2013; Thomas, 2012) through the integration of nutrition as an essential component of early childhood education and care and development programmes (Save the Children, 2013). Thirdly, government and relevant stakeholders should strategically integrate stimulation interventions into early childhood programmes to counter the effects of hunger on children's literacy development. Lastly, it is necessary to be cognisant of the connotations that food imposes on the identity and culture of people, for example, poor people are identified by the type of food they eat (Weaver-Hightower, 2011). Undoubtedly the implementation of the above recommendations would promote social justice and in the process enhance the potential of children from poor families to succeed in life.

Limitations and Conclusion

The results need to be interpreted with caution, since a major limitation was the small sample size and the fact that it was conducted in only one school. As such, the results may not be representative of school lunch and achievements in literacy for all children in Soweto, or in South African schools generally. A longitudinal study on the impact of school lunch on literacy achievement is most likely to shed light on the early and later childhood experiences of children. Despite the limitations, the findings serve as a useful pilot study to warrant the need for further in-depth research on the impact of school lunch on the literacy achievement of children. Finally, it is hoped that findings from the study might support social justice initiatives to address educational disadvantage among children who experience poverty (Bartolo, 2010; Benedetto & Olisky, 2001; Smith, 2002; Stainton Rogers, 2004).

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