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ARTICLE



Poverty moderates the association between gender and school dropout in South African adolescents

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ABSTRACT

This study examined prospective associations between poverty, gender, and school dropout in a large community sample of South African adolescents (baseline: $n = 3515$, follow-up: $n = 3401$, 57% female, age range at baseline: 10–17 years, mean age at baseline = 13.45). School dropout was defined as being enrolled in school at baseline assessment but no longer enrolled in school at follow-up assessment. Poverty was measured at baseline assessment using an index of access to the eight highest socially perceived necessities for South African children and adolescents. Demographic characteristics including child gender and age, province, and urban versus rural location were recorded at baseline assessment and controlled for in the analysis. As predicted, higher poverty scores ($AOR = 2.01$, $p < .001$) were associated with increased odds of school dropout 1 year later. Gender was not a significant predictor of school dropout ($AOR = 1.56$, $p = .07$) but did interact with poverty ($AOR = 0.66$, $p = .04$) in predicting school dropout. However, our initial hypothesis that the impact of poverty on school dropout would be stronger for girls than boys was not supported. Instead, results indicated that while girls were at elevated risk of school dropout at low and mean levels of poverty, at high levels of poverty this gender difference was no longer evident. Findings suggest that vulnerable boys should not be neglected in policies to improve retention in education in contexts of extreme poverty.

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Education is a human right. It is globally recognised as an indicator of human development and child well-being that opens up new life opportunities and promotes personal and economic growth (Anand & Sen, 2000). Indeed, ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all is clearly articulated as one of the United Nations Sustainable Development Goals (United Nations, 2015). However, although viewed as an important human right, in low- and middle-income countries (LMIC) leaving school early remains a problem (Lewin, 2007). Poverty and female gender have been identified as important predictors of

poor educational outcomes in many sub-Saharan African countries (Lewin, 2007; Nelson Mandela Foundation, 2005). The current research examines prospective associations between poverty, gender, and school dropout in a large community sample of South African adolescents from two provinces (Western Cape and Mpumalanga).

Education in South Africa

Since the democratic elections of 1994 education has been a priority area for expansion and reform in South Africa (Spaull, 2012). Underlying this focus on education is a recognition of the need to address past inequalities and establish a more flexible, responsive, and diverse system of education provision (Sayed et al., 2007). In general, school enrolment rates in South Africa are high by the standards of sub-Saharan Africa (Sayed et al., 2007). At the time the current study was conducted, nearly 99% of 7–15-year olds (the compulsory school going age) were enrolled in school and approximately 96% of 7–18-year olds were in school (Meny-Gibert & Russell, 2010). However, despite these high overall enrolment rates only 44% of students completed their final year of high school (Department of Education, 2009). Dropout rates are highest during secondary school, leaving students with decreased chances of future employment and earning prospects (Branson & Leibbrandt, 2013; Meny-Gibert & Russell, 2010). Additionally, substantial inequalities between historically advantaged and disadvantaged schools remain (Spaull, 2012); with socio-economically disadvantaged schools (in formerly black areas under apartheid) performing poorly on tests of numeracy and literacy (Dolata et al., 2010; Howie et al., 2008) and characterised by high rates of grade repetition, school dropout, and teacher absenteeism (Fleisch, 2008; Spaull, 2012; Taylor, Muller, & Vinjevold, 2003).

Poverty and education

There is consistent evidence that poverty is associated with poor educational outcomes (Battin-Pearson et al., 2000; Van der Berg, 2005). Specifically, in South Africa poverty has been associated with elevated risk of school dropout and grade failure (Fleisch, Shindler, & Perry, 2012; Flisher, Townsend, Chikobvu, Lombard, & King, 2010; Orkin, Boyes, Cluver, & Zhang, 2014; Watkins, Sello, Cluver, Kaplan, & Boyes, 2014). It has been argued that the inability to afford school necessities (e.g. school fees, uniforms, shoes) may lead to school non-attendance and dropout (Fleisch & Woolman, 2004). Additionally, it has been suggested that girls are more likely than boys to be withdrawn from school in circumstances of family poverty, in order to earn money to supplement family income and/or provide care for dependent family members (Flisher et al., 2010; Gow & Desmond, 2007). It has also been argued that families living in poverty are on average larger (Maharaj, Kaufman, & Richter, 2000), and that larger families may have more difficulties allocating resources for each child; thereby elevating risk for poor educational outcomes such as school dropout. Importantly, poor educational outcomes while living in poverty can represent a vicious cycle, as education can be a potential path out of poverty (USAID, 2015). However, if children and adolescents who drop out of school lack literacy and numeracy abilities, this can maintain economic inactivity (Lam, Ardington, & Leibbrandt, 2011; Modisaotsile, 2012).

Gender and education

Regarding gender, there is evidence that in LMIC girls are more vulnerable to school dropout than boys (Herz & Sperling, 2004; UNESCO, 2012; World Bank, 2016). Accordingly, international policymakers have placed a strong emphasis on reducing gender inequality in education, as educating girls is viewed as a means of improving overall well-being and health of families (Herz & Sperling, 2004; Klasen, 2002; Stacki & Baily, 2015; USAID, 2015). Specifically, it is argued that it is essential to provide girls with access to school in order to empower them and increase their opportunities to earn money and break cycles of poverty, which in turn would influence the next generations (Glewwe & Kremer, 2006; Herz & Sperling, 2004; Klasen, 2002). For these reasons, eliminating gender disparity at all levels of education is a key focus of the Sustainable Development Goals (United Nations, 2015). However, contrasting findings have also been reported. For example, Lewin (2007) reported that in some parts of Africa (e.g. Ghana, Gambia, and Malawi) more girls than boys are enrolled in secondary school. Additionally, in analyses of South African data by Orkin and colleagues (2014), gender was not associated with school dropout in models adjusting for poverty.

The current study

Given equivocal findings regarding gender, there is a clear need to further understand relationships between gender and school drop out in LMIC. In particular, variability in findings regarding gender differences raises the possibility that associations between gender and school dropout may be moderated by other factors. Given that according to the World Bank (2016) poverty is one of the most important factors determining whether a girl will access an education, and the argument that girls are more likely than boys to be withdrawn from school in circumstances of family poverty (Flisher et al., 2010; Gow & Desmond, 2007), research examining if poverty and gender interact in predicting school dropout is clearly warranted. The current study aimed to examine prospective associations between poverty, gender, and school dropout (measured 1 year later) in a large community sample of adolescents from poor South African communities. It was hypothesised that: (1) poverty and female gender would both be prospectively associated with school dropout, and (2) that poverty would moderate the association between gender and school dropout, such that the predicted association between female gender and school dropout would be exacerbated at high levels of poverty.

Method

Participants

Adolescents ($n = 3515$) recruited from rural and urban sites in two South African provinces (Western Cape and Mpumalanga) took part in a community-based survey. As part of a larger study of the impacts of familial HIV/AIDS (Cluver et al., 2013), participants were recruited using stratified random sampling of census enumeration areas in four health districts with over 30% antenatal HIV prevalence. In both provinces

the areas from which participants were sampled are extremely poor. On average, households were lacking nearly three of the eight basic necessities identified in the South African Social Attitudes Survey as being a basic need for all children and adolescents in South Africa (see measures section for a description of these necessities). All households in randomly selected enumeration areas were sampled consecutively (door to door) and one child per household participated in the study (if there were multiple children in the household one child was randomly selected to participate). Participants were followed up after 1 year ($n = 3401$, 97% retention rate). Fifty-seven per cent of the sample were female and ages ranged between 10 and 17 years at baseline assessment ($M = 13.45$, $SD = 2.15$). Sample characteristics for both baseline and follow-up assessments are summarised in Table 1.

Measures

School dropout

School dropout was defined as being enrolled in school at baseline assessment but no longer enrolled in school at follow-up assessment. Children indicated their school enrolment status using a binary response option (0: not enrolled; 1: enrolled) at both the baseline and follow-up assessments. In order to prevent participants who had graduated high school being coded into the dropout category, individuals who were in Year 12 (the final year of high school, $n = 27$) at baseline assessment were excluded from the analyses.

Poverty

Household poverty was assessed at baseline using an index of access to the eight highest socially perceived necessities for South African children and adolescents. These items were identified through focus groups (Barnes & Wright, 2012) and then corroborated by over 80% of those sampled in the nationally representative South African Social Attitudes Survey (Pillay, Roberts, & Rule, 2006). The eight items included: a visit to the doctor when needed, medicines when needed, more than one pair of shoes, three meals per day, soap to wash every day, enough clothes to remain warm and dry, school uniform, and money for school fees. Items were reverse scored (0: has access to the necessity; 1: does not have access to the necessity) and summed to give a total poverty score (total number of necessities lacking).

Table 1. Sample characteristics at baseline and follow-up assessments, disaggregated by gender.

	Baseline ($n = 3515$)			Follow-up ($n = 3401$)		
	Boys	Girls	p	Boys	Girls	p
Gender (n , %)	1523 (43%)	1992 (57%)	<.001	1475 (43%)	1926 (57%)	<.001
Poverty (M , SD)	2.66 (2.31)	2.76 (2.33)	.204	2.61 (2.33)	2.85 (2.35)	.004
Not-enrolled in school	18 (1%)	40 (2%)	.057	52 (3%)	95 (5%)	.047
Live in urban area (n , %)	789 (52%)	989 (50%)	–	763 (52%)	957 (50%)	–
Live in rural area (n , %)	734 (48%)	1003 (50%)	.205	712 (48%)	969 (50%)	.238
Mpumalanga (n , %)	751 (49%)	913 (46%)	–	746 (51%)	902 (47%)	–
Western Cape (n , %)	772 (51%)	1079 (54%)	.041	729 (49%)	1024 (53%)	.030
Age (M , SD)	13.43 (2.12)	13.46 (2.17)	.676	14.63 (2.18)	14.70 (2.25)	.360

p -values are associated with one-way ANOVAs or χ^2 tests. Significant p -values bolded.

Demographic characteristics

Demographic characteristics including child gender and age, province, and urban versus rural location were also recorded at baseline assessment.

Procedure

Ethical approvals were obtained from the University of Oxford, University of Cape Town, and University of KwaZulu-Natal, as well as government Health and Education Departments of the Western Cape, Mpumalanga, and KwaZulu-Natal. Prior to participation, both children and primary caregivers provided voluntary informed consent (<2.5% refusal). Participants in the Western Cape spoke isiXhosa and participants in Mpumalanga spoke Sesotho, Xitsonga, or SiSwati. All measures were translated into local languages and translations were checked by back-translation. Children and adolescents participated in the language of their choice. At both assessment points, measures were administered verbally by trained research assistants who had previous experience working with vulnerable children. The overall questionnaire package was designed in the style of a teen magazine and included pictures of popular music and television stars. In total, participation took approximately 60 min at both baseline and follow-up assessments. No incentive for participation was provided, although participants received certificates of thanks. Confidentiality was maintained unless participants requested assistance or were at significant risk of harm.

Analyses

Analyses were conducted in three stages in SPSS 23. First, we checked for any differences in age, gender, poverty, and school enrolment (at baseline assessment) between participants lost and retained at follow-up using the full sample. After conducting these initial analyses, the sample was limited to participants enrolled in school at baseline assessment (additionally excluding participants who were in their final year of secondary school at baseline assessment). Second, using this limited data set we examined descriptive statistics and conducted univariate analyses assessing prospective associations between gender, poverty, and school dropout. Finally, a logistic regression was conducted to test multivariate associations between gender, poverty, and school dropout (controlling for child age, province, and urban versus rural location). The gender*poverty interaction term was included in this model to test whether the association between gender and school dropout was moderated by poverty.

Results

Children lost and retained at follow-up assessment

Children and adolescents lost to follow-up did not differ with regard to gender [$\chi^2(1) = .07, p = .79$] or school enrolment [$\chi^2(1) = 2.34, p = .13$] at baseline assessment (Table 2). However, participants lost to follow-up were older [$F(1, 3512) = 6.44, p = .01$,

Table 2. Comparison of children lost and retained at follow-up assessment.

	Not followed-up (<i>n</i> = 114)	Followed-up (<i>n</i> = 3401)	<i>p</i>
Girls (<i>n</i> , %)	66 (3.3%)	1926 (96.7%)	–
Boys (<i>n</i> , %)	48 (3.2%)	1475 (96.8%)	.79
Age (M, SD)	13.95 (2.24)	13.43 (2.15)	.01
School non-enrolment (<i>n</i> , %)	4 (3.5%)	55 (1.6%)	.13
Poverty (M, SD)	3.63 (2.35)	2.68 (2.31)	<.001

p-values associated with one-way ANOVAs or χ^2 tests. Significant *p*-values bolded.

Cohen's $d = 0.24$] and missing more basic necessities [$F(1, 3514) = 21.55, p < .001$, Cohen's $d = 0.36$]. Although an overall 1-year follow-up rate of 97% is very good, it should be noted that some of the most vulnerable participants could not be traced. The results should be interpreted with this in mind. The sample was limited to youth assessed at both time points for all further analyses ($n = 3401$).

Univariate associations between gender, poverty, and school dropout

Descriptive statistics disaggregated by gender are presented in Table 3. As we were specifically interested in school dropout, the sample was additionally limited to those who were enrolled in school at baseline assessment and not in their final year of secondary school ($n = 3319$). Boys and girls did not differ significantly on poverty scores at baseline assessment; however, a small but significant gender difference was evident at follow-up assessment, with girls reporting significantly higher poverty scores than boys [$F(1, 3317) = 7.20, p = .007$, Cohen's $d = 0.09$]. Higher poverty scores were prospectively associated with risk of school dropout. In comparison with children who were still enrolled at school ($M = 2.65, SD = 2.31$), children who had dropped out of school by follow-up assessment ($M = 4.53, SD = 2.17$) had significantly higher poverty scores at baseline assessment [$F(1, 3344) = 27.30, p < .001$, Cohen's $d = 0.83$]. There was no gender difference in school dropout over the 1 year follow-up period [$\chi^2(1) = 1.91, p = .168$].

Table 3. Descriptive poverty and educational data for children followed up and enrolled in grades 1–11 at baseline assessment.

	Baseline (<i>n</i> = 3319)		Follow-up (<i>n</i> = 3319)	
	Boys (<i>n</i> = 1451)	Girls (<i>n</i> = 1868)	Boys (<i>n</i> = 1451)	Girls (<i>n</i> = 1868)
Poverty (M, SD)	2.59 (2.29)	2.71 (2.32)	2.59 (2.32)	2.81 (2.34)
School dropout (<i>n</i> , %)	–	–	39 (2.7%)	66 (3.5%)
Grade 1 (<i>n</i> , %)	2 (<1%)	5 (<1%)	2 (<1%)	1 (<1%)
Grade 2 (<i>n</i> , %)	17 (1%)	15 (1%)	3 (<1%)	8 (<1%)
Grade 3 (<i>n</i> , %)	73 (5%)	51 (3%)	25 (2%)	15 (<1%)
Grade 4 (<i>n</i> , %)	147 (10%)	160 (9%)	87 (6%)	61 (3%)
Grade 5 (<i>n</i> , %)	204 (14%)	264 (14%)	134 (9%)	166 (9%)
Grade 6 (<i>n</i> , %)	237 (16%)	269 (14%)	220 (15%)	244 (13%)
Grade 7 (<i>n</i> , %)	255 (18%)	300 (16%)	223 (15%)	259 (14%)
Grade 8 (<i>n</i> , %)	227 (16%)	285 (15%)	244 (17%)	281 (15%)
Grade 9 (<i>n</i> , %)	154 (11%)	288 (15%)	230 (16%)	308 (17%)
Grade 10 (<i>n</i> , %)	84 (6%)	154 (8%)	140 (10%)	253 (14%)
Grade 11 (<i>n</i> , %)	31 (2.1%)	68 (4%)	71 (4.9%)	140 (8%)
Grade 12 (<i>n</i> , %)	–	–	31 (2%)	66 (4%)

Table 4. Multivariate associations between poverty, gender, and school dropout adjusting for age, province, and urban versus rural location.

	<i>B</i> (<i>SE</i>)	Odds ratio (95% CI)	<i>p</i>
Constant	−4.13 (.22)	.02	<.001
Age	.83 (.11)	2.29 (1.83 – 2.88)	<.001
Province	−.17 (.12)	.84 (.67–1.06)	.14
Urban/rural location	.08 (.10)	1.08 (.88–1.32)	.46
Poverty	.70 (.17)	2.01 (1.45–2.79)	<.001
Gender	.44 (.24)	1.56 (.97–2.51)	.07
Poverty*gender	−.41 (.20)	.66 (.45–.99)	.04

Significant *p*-values bolded.

Multivariate associations between gender, poverty, and school dropout

Multivariate associations between gender, poverty (predictors), and school dropout (outcome) were tested in a binary logistic regression model. Given that province ($r = -.41$, $p < .001$) and urban versus rural location ($r = .17$, $p < .001$) were significantly associated with poverty, and that child age was significantly associated with school dropout ($r = .15$, $p < .001$), these were controlled for in the analysis. As one of the primary aims of the study was to examine the potential moderating effect of poverty on the association between gender and school dropout, all predictor variables and covariates entered in the logistic regression model were standardised.

The overall model was significant [$\chi^2(6) = 96.58$, $p < .001$] and accounted for between 3–12% of the variance in school dropout (Cox and Snell $R^2 = .03$; Nagelkerke $R^2 = .12$). After controlling for child age, province, and urban versus rural location, higher poverty scores were associated with significantly higher odds of school dropout a year later (Table 4). The association between gender and school dropout was approaching significance ($p = .07$), with a trend for girls to be at greater risk of school dropout. Additionally, the interaction between poverty and gender was significant. As indicated in Figure 1, at low (1 SD below the mean) and mean levels of poverty girls were at elevated risk of school dropout; however, at higher levels of poverty (1 SD above the mean) this gender difference was no longer evident and boys were at equally elevated risk of school dropout.

Discussion

Education is an essential tool of welfare, particularly in LMIC where children's well-being as adults is strongly dependent on their educational outcomes (Glewwe & Kremer, 2006). The current study investigated prospective associations between poverty, gender, and school dropout in a large community sample of South African adolescents. We also examined whether associations between gender and school dropout were moderated by poverty.

Overall school dropout rates were approximately 3.5%. This is consistent with South African data indicating that around 96% of children and adolescents were enrolled in school (Meny-Gibert & Russell, 2010). As predicted, after controlling for important socio-demographic confounders (age, province, and urban versus rural location) higher poverty was associated with school dropout. Additionally, there was a trend towards

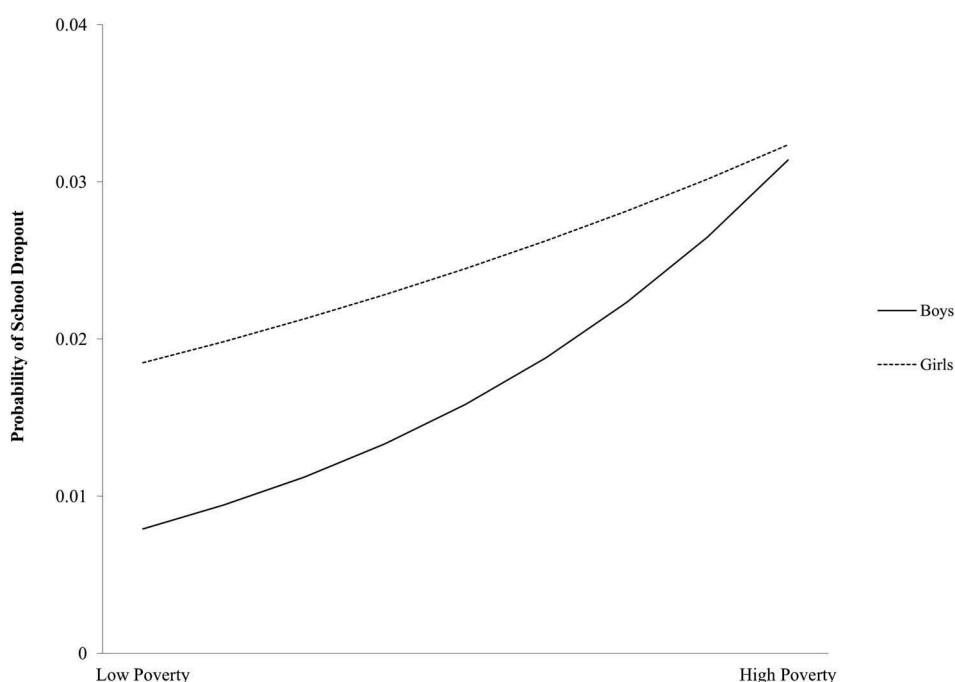


Figure 1. Interaction between gender and poverty in predicting school dropout (adjusting for age, province, and urban versus rural location).

girls being at elevated risk of school dropout overall ($p = .07$). These findings are consistent with previous research and data from LMIC (Fleisch et al., 2012; Flisher et al., 2010; Herz & Sperling, 2004; Orkin et al., 2014; UNESCO, 2012; World Bank, 2016). However, poverty additionally moderated the association between gender and school dropout. We had initially hypothesised that the impact of poverty on school dropout would be stronger for girls than boys. Unexpectedly, our analysis indicated that although girls were at elevated risk of school dropout overall, at high levels of poverty this gender difference was no longer evident and boys were at equally elevated risk of school dropout.

One potential explanation for this finding may be the distinction between absolute and relative poverty (Foster, 1998). Absolute poverty refers to households living below a minimum standard necessary to sustain subsistence. From this perspective, individuals falling under some fixed absolute threshold are defined as poor. Absolute poverty is a particularly useful indicator for enabling comparisons across geographies and time (Dieltiens & Meny-Gibert, 2012). However, measures of absolute poverty do not capture variability in the depth and distribution of poverty within communities (Foster, 1998). In contrast, relative poverty is defined with reference to the society in which an individual lives, and explicitly captures variability in the depth and distribution of poverty within communities. Individuals or families are judged to be poor if they are poor in comparison to those around them (Dieltiens & Meny-Gibert, 2012; Foster, 1998; Noble, Wright, & Cluver, 2007). Traditionally, relative poverty reflects a psychosocial experience of poverty, in which poverty is not only about material

deprivation but also considers how individuals see themselves in relation to others in society and whether individuals believe they can participate fully in society (Dieltiens & Meny-Gibert, 2012). Although the poverty measure used in the current study did not assess beliefs about societal participation and exclusion, the notion of relative poverty raises the possibility that variability in levels of poverty is important, even within communities experiencing high rates of absolute poverty (and we suggest that capturing variability in the depth of poverty may be conceptually similar to relative poverty within these communities).

The communities we sampled are extremely poor, even given the high absolute rates of poverty in South Africa (Dieltiens & Meny-Gibert, 2012; Oosthuizen, 2008). On average households were lacking nearly three of the eight basic necessities identified in the South African Social Attitudes Survey as being a basic need for all children and adolescents in South Africa (Pillay et al., 2006). Therefore, a high level of family poverty within these communities represents extreme economic vulnerability. Our data indicate that poverty is associated with elevated risk of school dropout for both boys and girls. Additionally, within these generally high-poverty communities girls are at increased risk of dropout overall. However, in families experiencing extreme economic vulnerability, girls and boys are at equally elevated risk of dropout. Assessing variability in poverty within communities may enable a more fine-grained understanding of associations between poverty, gender, and school dropout that might be masked when an absolute definition of poverty is used. Further research examining gender differences in school dropout at varying levels of poverty could shed additional light on this important issue.

If replicated, the finding that poverty moderates the association between gender and school dropout has important policy implications. International policymakers have placed a strong emphasis on promoting gender equality in education, with the specific objective of breaking cycles of poverty (USAID, 2015). Our finding that overall girls were at greater risk of school dropout strongly supports the importance of global efforts to reduce gender inequality in education. However, the finding that boys were at equally elevated risk of school dropout at high levels of poverty indicates that vulnerable boys should not be neglected in policy and programming decisions. Specifically, in the context of extreme poverty and vulnerability, the focus should be on keeping all adolescents in school. It will be important to identify whether policies to support school retention work similarly or differently across genders. This finding is consistent with a recent call for a broader equity approach to child development in the context of vulnerability, particularly in highly HIV-affected communities (Hensels et al., 2016).

The study has a number of limitations that should be noted. First, although the overall sample was quite large, given the relatively low dropout rates we did not have sufficient participants to examine whether impacts of poverty and gender on school dropout differ across primary and secondary school. This is an important question and should be addressed in future research. Second, participants were sampled from low-income areas where the population is predominantly black African. Findings are therefore not necessarily generalisable to other population groups in South Africa. Additionally, as the study was limited to one country, findings may not be representative of other LMIC. Further research is needed to determine the extent to which the South African experience is representative of LMIC more broadly. Third, although the

longitudinal design is a strength of the study, the data were limited to two time points. Additional research examining longer term associations between gender, poverty, and educational outcomes would be beneficial. Finally, although the retention rate was high, some of the most vulnerable children and adolescents were among those unable to be traced and all results should be interpreted with this in mind.

Bearing these limitations in mind, the current study establishes the importance of a nuanced understanding of how poverty and gender impact school dropout. It is essential that we continue to support girls living in poverty to attend school and to close the gender gap in education (United Nations, 2015). However, extreme poverty raises dropout risk for both girls and boys, and vulnerable boys should not be neglected in policies to improve retention in education.

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Disclosure statement

No potential conflict of interest was reported by the authors.

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