

Youth food insecurity in Ghana and South Africa: Prevalence, socioeconomic correlates, and moderation effect of gender



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ABSTRACT

In sub-Saharan Africa (SSA), food insecurity disproportionately affects adolescents and young adults. However, youth food insecurity in SSA remains understudied. We examined the prevalence, socioeconomic correlates, and moderation effect of gender on youth food insecurity. Our study used a cross-sectional design with data collected from 1,383 and 4,165 youth (aged 15 to 24 years) in South Africa and Ghana, respectively. We performed multiple imputation and analyzed data using multivariable linear regression with clustered-robust standard errors. We conducted moderation tests by adding a 2-way interaction between gender and socioeconomic factors. Results indicated a high prevalence of food insecurity, most notably severe food insecurity. Significant socioeconomic correlates included: age, income, assets, and number of household dependents in Ghana; and race, financial capability skills, number of household shocks, and dwelling type in South Africa. In both countries, we found a moderation effect of gender, which suggests that boys are more food secure when their families have fewer economic resources and that girls are more food secure when their families have greater economic resources. We also observed a moderation effect of gender among younger youth but not among older youth in Ghana. Building household economic resources remains an important pathway to access to adequate food, particularly for girls. In addition, appropriate programs may be those that tailor their components to youths' developmental stages, living situations, and financial responsibilities.

1. Introduction

The United Nation's 2030 agenda for sustainable development includes goals to end hunger and to achieve food security (United Nations [UN], 2015), defined as lack of access by individuals to adequate resources that are necessary to obtain appropriate foods for a nutritious diet (Food and Agriculture Organization [FAO], 2006). The 2030 agenda has contributed to increased interest in food insecurity, including youth food insecurity. Much of the focus on youth food insecurity has been on its association with adverse outcomes, such as undernutrition (Belachew et al., 2013), psychological distress (Rani et al., 2018), emotional and behavioral disorders (Shankar, Chung, & Frank, 2017; Whitsett, Sherman, & Kotchick, 2018), suicidal ideation (Almansour & Siziya, 2017; Pryor et al., 2016), and experience of violence (Andarge & Shiferaw, 2018; Khuwaja et al., 2018; Meinck, Cluver, Boyes, & Ndhlovu, 2015). While there is an established body of knowledge linking food insecurity to adverse youth outcomes, research on predictors of youth food insecurity and gender's moderation effect

has received less attention. In sub-Saharan Africa (SSA), studies on the prevalence and correlates of food insecurity among young people remain limited. Previous research on youth food insecurity in SSA has been conducted primarily in Ethiopia (Belachew et al., 2012; Hadley, Belachew, Lindstrom, & Tessema, 2009; Hadley, Lindstrom, Tessema, & Belachew, 2008; Tamiru et al., 2016). Limited research about predictors of youth food insecurity and the moderation effect of gender highlights critical evidence gaps in a region where youth are more likely than adults to lack access to adequate food (Amarnani, Nandi, & Melgar-Quinonez, 2017) and where adolescent girls and young women remain vulnerable to economic and social discrimination (Martinez & Odhiambo, 2018; Wodon, Male, Montenegro, Nguyen, & Onagoruwa, 2018).

Living without food is a serious issue facing young people globally. From a practice and policy standpoint, the lack of relevant evidence may impede timely and appropriate targeting of at-risk youth and identification of modifiable factors that can be targeted through suitable and sufficient programs to mitigate or eliminate youth food

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insecurity. This study aims to provide initial evidence that practitioners and policymakers may use to guide efforts to address youth food insecurity. In particular, the current study focused on two research objectives: to explore the prevalence and malleable socioeconomic correlates of youth food insecurity in Ghana and South Africa and to examine whether gender moderates the association between socioeconomic factors and food insecurity.

1.1. Youth food insecurity research in SSA

Limited research on youth food insecurity in SSA could be attributed to several factors, including the lack of suitable data with validated measures of food access. It is also plausible that the link between food insecurity and limited economic or financial resources is axiomatic, which may not require further examination. Although research in both high- and low-resource settings has found economic and financial variables, most notably income to be constantly associated with food access (Baer, Scherer, Fleegler, & Hassan, 2015; Pereira, Handa, & Holmqvist, 2017; Smith, Rabbitt, & Coleman-Jensen, 2017), excessive emphasis on one aspect may not take us far enough in understanding what factors lie at the core of youth food insecurity. For example, previous research has found an association between food insecurity and noneconomic factors such as health conditions, social networks and capital, and gender (e.g., Dean & Sharkey, 2011; Hadley et al., 2008; Smith et al., 2017; Tsai et al., 2012). Moreover, the youth population is heterogeneous with varying economic, physical, and social characteristics (Chulani & Gordon, 2014; Dawes, Vest, & Simpkins, 2014; Kilford, Garrett, & Blakemore, 2016). In turn, these characteristics may influence youth's ability to access food through qualitatively different ways than older adults and among subgroups of youth (Belachew et al., 2012; Smith et al., 2017). For example, youth ages 15 to 18 years may remain dependent on their parents or caregivers for their food access, particularly youth who attend school and live with their parents or caregivers. In contrast, youth ages 19 to 24 years may start exerting their independence and attempt to live outside their families. In other words, differences in living situations and reliance on parents or caregivers, among other reasons, suggest the importance of examining relevant correlates to inform effective targeting and appropriate programming.

Another research gap is the examination of gender's moderation effect on youth food insecurity. Income and other economic resources to obtain food are influenced by structural factors that are beyond the control of individuals. For example, gender remains a predictor of income as gender may determine the types of available jobs for women (Koch, D'Mello, & Sackett, 2015). Social norms assign women with subordinate roles to men, which may exacerbate gender-based socioeconomic disparities (Hardee, Gay, Croce-Galis, & Peltz, 2014; Kamndaya, Kazembe, Vearey, Kabiru, & Thomas, 2015). For example, food allocation may be biased against girls and young women, which could mean that they receive smaller portions or a less diverse diet (Aurino, 2017). Gender bias in food allocation occurs in households with varying degrees of resources, including households with sufficient resources to provide food for all its members (Hadley et al., 2008; Harris-Fry et al., 2018). This interplay of gender-biased norms and resulting socioeconomic disparity suggests that young women may be at a higher risk of food insecurity compared to young men (McCoy, Ralph, Wilson, & Padian, 2013; Tibesigwa & Visser, 2016), and that gender may moderate the association of socioeconomic factors with food access (Hadley et al., 2008). However, evidence that supports a moderation effect of gender on the relationship between socioeconomic variables and food insecurity among youth in SSA remains limited.

Last, while income is often used to measure household economic welfare, income data in low-resource settings and among youth may not be reliable and verifiable (Moser & Felton, 2007). For example, in many communities in Ghana and South Africa, income remains highly variable for those employed in informal labor markets and can be seasonal, such as when earned from farming. In addition, the high youth

unemployment rate in Ghana and South Africa may exclude job-related income as a reliable financial source to access food. Thus, in those situations, when there are no viable income sources, food might be obtained through exchange of nonmonetary means. For example, food can be shared at one point in time in exchange for food or other in-kind resources at some later time via existing social networks (Mertens et al., 2015). Given those social norms, the inclusion of appropriate indicators of socioeconomic status is essential.

1.2. Current study

In addition to addressing gaps in the literature, we conceptualized the present study to expand what we know about food insecurity among youth in SSA. First, we focused on social and economic factors because our definition of food insecurity emphasized its access dimension, which is closely associated with individual or household social and economic resources (Barrett, 2010). We also considered limitations of income data as we examined the association of other socioeconomic variables with food access. Second, we assessed whether gender moderated the association between socioeconomic variables and food insecurity. We also examined whether gender's moderation effect differed between the two groups of Ghanaian youth. In the current study, we split the Ghanaian sample into two: younger youth (or those aged 15 to 18 years) who were attending senior high school and older youth (or those aged 19 to 24 years) who completed or out of senior high school. We did not divide the South African sample because all study participants were at least 18 years old, and none remained in senior high school at the time of data collection. Third, we investigated whether significant socioeconomic correlates of food insecurity varied based on youth's age and stage of development using data from youth in two countries – Ghana and South Africa. The Ghana study comprised junior public high school students, whereas the South Africa study was restricted to youth not in employment, education, or training (NEET). Although there were differences between the Ghanaian and South African samples, youth in both studies shared similar socioeconomic profiles. In both countries, data came from economic inclusion projects for underserved youth from low socioeconomic households. Also, study participants came from predominantly urban and peri-urban areas in both countries. Last, we were able to identify the prevalence of food insecurity and examine its socioeconomic predictors because both studies used the same measure of food insecurity as reported by youth. We also assessed whether significant correlates across the two countries are comparable through the selection of matching variables that represent socioeconomic status in each country while adding similar indicators unique to each study and its setting. In other words, our predictor variables were distinct only in their operational definitions, whereas the overall socioeconomic construct remained the same between countries.

2. Material and methods

2.1. Study design

This study used a cross-sectional design. We analyzed quantitative data from two youth-focused economic strengthening projects in Ghana and South Africa. The Institutional Review Boards at the Universities of Ghana, Johannesburg, and North Carolina at Chapel Hill approved the original study protocols. In both projects, research staff met with prospective participants (and their caregivers, if a participant was a minor) to explain the study. For non-English speaking persons, the information sheet and consent form were translated into local languages. Recruitment was conducted at schools (Ghana) and employment training sites (South Africa). Informed consent (and assent for those under 18 years old at the time of data collection) was obtained from all individual participants included in the study. For minor participants in the Ghana project, we first obtained consent from an adult caregiver.

After receiving an adult informed consent, we collected the assent of the participant. Participants in the South Africa project were 18 years old and older at the time of data collection.

The MasterCard Foundation supported the Ghana project. It was implemented in collaboration with the Institute of Statistical, Social and Economic Research at the University of Ghana, HFC Bank Ghana, and a consortium of U.S.-based partners, including the University of North Carolina at Chapel Hill, Washington University in St. Louis, Save the Children, New America, and the Consultative Group to Assist the Poor (CGAP). The South Africa project was supported by the Ford Foundation, Jobs Fund South Africa, the National Youth Development Authority (NYDA) of South Africa, and the University of Johannesburg (UJ). Research partners included the University of North Carolina at Chapel Hill and UJ's Centre for Social Development in Africa. Implementation partners in South Africa comprised the following eight youth-focused organizations: EOH, NYDA's YouthBuild, loveLife groundBREAKERS, Afrika Tikkun Training Services, Fit for Life Fit for Work, Raymond Ackerman Academy, Thabiso Skills Institute, and Harambee Youth Employment Accelerator.

2.2. Study sample

Our study sample comprised 1,383 and 4,165 young South Africans and Ghanaians, respectively. They were a subset of youth recruited to participate in one of two distinct youth-focused research projects: a financial inclusion randomized trial in Ghana and youth employability and financial capability experiment in South Africa. We limited our study sample to youth between the ages of 15 to 24, consistent with the UN's universal definition (United Nations, 1996).

2.2.1. Ghana

Data were from the endline survey of a cluster-randomized youth financial inclusion project. Endline data were collected in 2014. The details of the original project are described in detail elsewhere (Chowa et al., 2015). A multi-stage sampling method was used to identify the clusters and individuals within clusters that comprised the study. After identifying the eight administrative regions in Ghana where the financial institution (FI) partner operated in 2011, 100 public junior high schools (JHS) were randomly selected from an eligible pool of 581 JHS within the FI's service area. Thus, the sample reflected the FI's service area, which at the time of the study, was concentrated in the country's urban and *peri*-urban areas. At each selected JHS, the school enrollment list was used to assess study eligibility and to select qualified youth participants based on their age (12 to 14 years old at the time of baseline data collection in 2011) and enrollment status. Between 60 and 63 students were randomly selected, for a total baseline sample of 6,252 youth. In 2014, 4,289 youth were re-interviewed for the endline survey. Youth with and without endline surveys differed significantly on age and region of residence. Younger youth were more likely to be re-interviewed than older youth, whereas youth from predominantly urban and *peri*-urban areas were more likely to be re-interviewed than youth from rural areas. Thus, the Ghanaian endline sample was younger and more urban compared to the baseline sample. At endline, 4,165 youth were between the ages of 15 to 24.

2.2.2. South Africa

Data were from the baseline survey of a cluster-randomized youth employability and financial capability trial in South Africa. Baseline data were collected in 2015. The details of the original project are described in detail elsewhere (Graham et al., 2016). The clusters included 46 training sites, which represented all locations where the project's eight youth-focused implementing organizations were implementing an employability program. At each location or training site, youth were selected to participate in the study. The enrollment list at each training site was used to assess study eligibility and to select youth participants. Inclusion criteria included age (18 to 25 years old), not

currently employed, not currently in school, not currently enrolled in a skills training program, and a citizen of South Africa. Thus, the South African sample was more likely to be youth not in employment, education, or training (NEET), compared to the broader youth population in the country. Overrepresentation of NEET youth was expected due to the original project aims, which was to evaluate the impact of employability and financial capability programs on employment and economic outcomes. While the number of youth selected per site differed due to variation in class sizes, the average number of NEET youth recruited and enrolled per site was 43. While the baseline sample in the South Africa project included 1,993 participants, 1,383 youth were between the ages of 15 to 24.

2.3. Study setting

2.3.1. Ghana

The original study was conducted in eight of 10 administrative regions in Ghana. These eight regions account for more than 90% of the country's population (Ghana Statistical Services, 2014). Additionally, 100 public JHS were randomly selected from an eligible pool of 581 junior high schools. While the schools were spread across 8 of 10 administrative regions in 2011, 63 of 100 junior high schools were in three regions, namely, Eastern (24 schools), Greater Accra (21 schools) and Ashanti (18 schools).

2.3.2. South Africa

The study was conducted in all nine provinces of South Africa. Forty-six training sites located across the country were included in the study. These 46 sites represented eight different organizations and, at the time of baseline data collection, their existing training sites. While the training sites were spread across all nine South African provinces, there was an urban bias as 36 of 46 training sites were in metropolitan areas.

2.4. Data collection and sources

Data were collected using interviewer-administered questionnaires in 2014 (Ghana) and 2015 (South Africa). The survey questionnaires in both countries included information on demographic, socioeconomic, educational, and financial characteristics of youth, their parents, and their households. Data on household food insecurity were reported by youth. Except for parental employment, household size, and household income in Ghana, which were reported by parents, all other data were reported by youth. Parents were interviewed in Ghana only.

2.5. Variables and measures

2.5.1. Food insecurity

Food insecurity was measured using an adaptation of the Household Food Insecurity Access Scale (HFIAS; Coates, Swindale, & Bilinsky, 2007). HFIAS had been validated with various populations in SSA (Frongillo & Nanama, 2006; Knueppel, Demment, & Kaiser, 2010). HFIAS consists of nine items that ask respondents the frequency of experiencing different conditions and degrees of food insecurity within the past 30 days. Response options for the nine items range from 0 (*never*) to 3 (*often*). A continuous HFIAS score was calculated by summing the score for all nine questions. HFIAS scores ranged from a minimum of 0 to 27. A higher HFIAS score indicates greater food insecurity. For descriptive purposes, we also created a categorical measure that defines the prevalence of food insecurity (Coates et al., 2007). This definition classified youths' access to food as secure and mild, moderately, and severely insecure.

2.5.2. Socioeconomic correlates of food insecurity

We included socioeconomic variables that have been shown to influence food access among households in low-resource settings (Hadley,

Stevenson, Tadesse, & Belachew, 2012; Jomaa, Naja, Kharroubi, & Hwalla, 2018; McDonald et al., 2015; Smith et al., 2017; Vuong, Gallegos, & Ramsey, 2015; Walsh & Rooyen, 2015) and in young adults in high-resource settings (Baer et al., 2015; Dean & Sharkey, 2011; McLaughlin et al., 2012; Niemeier & Fitzpatrick, 2018). In the Ghana model, correlates included age of youth (in years), gender (male or female), household income quartiles (lowest, low, high, or highest) measured in Ghanaian cedi, number of household dependents, household asset ownership, parents' employment status (formally employed with regular salary/wage or informally employed without regular salary/wage), youths' frequency of saving money (every day, two to three times a week, two to three times a month, once a month, or once every few months or less), and number of hours that youth attended financial education classes (none, less than five hours, six to nine hours, or ten or more hours). Household income referred to typical monthly income received by the household from different sources, including employment, remittances, and revenue generated from assets. Asset ownership included three different types of assets owned by youths' families: livestock, mode of transport, and household possessions. Asset ownership was measured using an asset index (Filmer & Scott, 2012) for each type of asset.

In the South Africa model, correlates included: age of youth (in years), gender (male or female), race (Black or others), child support grant beneficiary (no, yes, or unsure), dwelling type (formal or informal), currently doing unpaid work (yes or no), caregiver for any children (yes or no), asset ownership, and the number of household economic shocks. We also included indicators of financial capability, such as whether youth are responsible for planning how money is spent (yes or no), frequency of running short of cash (never, sometimes, or regularly), and whether youth have money left over after paying for food (yes or no). Formal dwelling included house, flat or brick structure, traditional dwelling or hut, flat in a block of flats, and town or semi-detached house. Informal dwelling included shack in a backyard or elsewhere and rooms or garage, not in the backyard. Consistent with the Ghana measures, asset ownership included three different types of assets: livestock, mode of transport, and household possessions; ownership was measured using an index for each type of asset. In contrast with the Ghana data, asset ownership in the South Africa data referred to assets owned by youth, not their families. Household shocks referred to any significant events that happened in the household in the past year. We measured household shocks by counting the number of "yes" responses to a list of events, including job loss, theft of household items, divorce or separation, severe illness or injury, death or loss of a household member, imprisonment, and migration.

2.6. Analysis

We used multivariable linear regression with the ordinary least squares (OLS) method to analyze our data because of the study's continuous outcome variable. The unit of analysis was the individual youth. We conducted moderation tests by adding a 2-way interaction between gender and socioeconomic factors. In our final analysis, we only included significant interaction that supports a moderation effect. We estimated four multivariable models using the continuous-level HFIAS score. Model 1 assessed the association of socioeconomic variables with the HFIAS score using the entire Ghanaian sample. Model 2 estimated the same relationship using the whole South African sample. Models 3 and 4 estimated socioeconomic correlates of youth food insecurity using subsamples of Ghanaian youth. Model 3 comprised younger youth (or those aged 15 to 18 years), whereas model 4 included older youth (or those aged 19 and older). Statistical inference after OLS regression was based on cluster-robust standard errors due to the clustered nature of our data (schools/communities in Ghana and municipalities in South Africa). We also conducted diagnostic tests. Results showed no evidence of multicollinearity and influential data.

Additionally, we performed multiple imputation (MI) to address

potential issues associated with missing data such as reduction in sample size and biased parameter estimates. Missing data on study variables reduced the sample size to 786 South African and 3,293 Ghanaian youth. Results of cluster adjusted bivariates tests indicated no significant differences in food insecurity and all but one socioeconomic variable between the final study sample and the excluded observations due to missing data. The youths' ages significantly differed ($p = .01$) between the final analytical and excluded Ghanaian sample. Our missing data analysis included several steps, each undertaken separately. First, although there is no established cutoff regarding an acceptable proportion of missing data for valid statistical inferences (Dong & Peng, 2013), we examined missing-data patterns. All except two variables (gender and age) included in the final South Africa model had missing values. The proportion of missing values ranged from a high of 21% (household possessions index) to a low of 1% (dwelling type). In the Ghana dataset, nine of 13 variables had missing values. The proportion of missing values ranged from a high of 20% (parents' education level) to a low of less than 0.50% (asset indices). Second, we conducted diagnostic tests to explore missing-data mechanisms (Eddings & Marchenko, 2012). Results suggested that the missing at random assumption may be reasonable. Third, we built an imputation model based on best practices outlined in the literature (e.g., Bouhlila & Sellaouti, 2013; Enders, 2010; White, Royston, & Wood, 2011). For example, we imputed separately by gender to take into account our interaction tests (Bartlett, 2014). Fourth, MI datasets were created by imputation using the chained equations approach (White et al., 2011). Fifth, we created an MI model with 100 imputed datasets (for both Ghana and South Africa data) to yield accurate statistical results (Graham, Olchowski, & Gilreath, 2007). Last, we compared the results based on complete case-analysis and MI. Although coefficient sizes were comparable, results based on complete-case analysis had larger standard errors and wider confidence intervals than MI results. Complete-case results are available as supplementary data.

3. Results

3.1. Sample characteristics

Table 1 lists the sample characteristics. Food security is highly prevalent among Ghanaian and South African youth in our study. Seventy percent of Ghanaian and 83% of South African youth reported experiencing inadequate food access. A higher proportion of South African youth (47%) experienced severe food insecurity compared to Ghanaian youth (36%). Furthermore, we examined whether sample characteristics differed by gender. Results of cluster adjusted tests indicated a few significantly different characteristics, as illustrated by the p values in Table 1. Young men were more likely to live in a household with more transport assets (Ghana and South Africa, $p = .02$) and household items (South Africa, $p = .03$) compared to young women. Young South African women were more likely to be a caregiver for a child compared to young South African men ($p = .03$). While more young men (37% in Ghana and 49% in South Africa) were severely food insecure compared to young women (35% in Ghana and 46% in South Africa), this relationship was not significantly different.

3.2. Socioeconomic correlates

Table 2 presents the results of the multivariable analysis that examined socioeconomic correlates of youth food insecurity and the moderation effect of gender. Columns 2–4 and Columns 5–7 show results from our sample of Ghanaian and South African youth, respectively. Our multivariable results indicated significant associations between household socioeconomic factors and youths' food access. Overall, youth with more economic resources were less likely to be food insecure compared to youth with less or limited economic resources.

Table 1
Sample characteristics and prevalence of youth food insecurity.

| Variables ^a | Ghana | | | | South Africa | | | |
|--|------------------------|------------------|-----------------------|------|----------------------|----------------|---------------------|------|
| | Overall (N = 3,293) | Male (n = 1,622) | Female (n = 1,671) | p | Overall (N = 786) | Male (n = 306) | Female (n = 480) | p |
| | % or M (SD) | | | | % or M (SD) | | | |
| <i>Independent variable</i> | | | | | | | | |
| Food insecurity, continuous | 5.57 (5.80) | 5.66 (5.86) | 5.48 (5.74) | 0.47 | 6.78 (6.44) | 6.58 (6.19) | 6.91 (6.61) | 0.61 |
| Food insecurity, categorical | | | | 0.90 | | | | 0.84 |
| Food secure | 30% | 29% | 30% | | 17% | 17% | 17% | |
| Mildly food insecure | 9% | 9% | 10% | | 16% | 17% | 15% | |
| Moderately food insecure | 25% | 25% | 25% | | 20% | 17% | 22% | |
| Severely food insecure | 36% | 37% | 35% | | 47% | 49% | 46% | |
| <i>Youth characteristics</i> | | | | | | | | |
| Age (in years) | 16.39 (1.91) | 16.49 (1.98) | 16.28 (1.85) | 0.12 | 21.91 (1.76) | 22.03 (1.68) | 21.84 (1.80) | 0.56 |
| Gender | | 49% | 51% | – | | 39% | 61% | – |
| Race | | | | | | | | 0.81 |
| Black | | | | | 95% | 94% | 96% | |
| Others | | | | | 5% | 6% | 4% | |
| Caregiver for any children | | | | | | | | 0.03 |
| Yes | | | | | 30% | 21% | 36% | |
| No | | | | | 70% | 79% | 64% | |
| Child support grant beneficiary | | | | | | | | 0.38 |
| Yes | | | | | 29% | 25% | 31% | |
| No | | | | | 57% | 59% | 55% | |
| Do not know | | | | | 14% | 16% | 14% | |
| <i>Youth financial and employment characteristics</i> | | | | | | | | |
| Frequency of saving money | | | | 0.13 | | | | |
| Never | 14% | 13% | 15% | | | | | |
| Every day | 19% | 17% | 22% | | | | | |
| 2 to 3 times a week | 42% | 44% | 40% | | | | | |
| 2 to 3 times a month | 15% | 16% | 14% | | | | | |
| Once a month | 6% | 6% | 5% | | | | | |
| Once every few months or less | 4% | 4% | 4% | | | | | |
| Frequency of running short of money | | | | | | | | 0.07 |
| Never | | | | | 43% | 49% | 40% | |
| Sometimes | | | | | 47% | 42% | 50% | |
| Regularly | | | | | 10% | 9% | 10% | |
| Number of hours of financial education | | | | 0.91 | | | | |
| None | 20% | 19% | 21% | | | | | |
| Less than five hours | 66% | 66% | 66% | | | | | |
| Six to nine hours | 11% | 12% | 10% | | | | | |
| Ten or more hours | 3% | 3% | 4% | | | | | |
| Responsible for planning how money in the household is spent | | | | | | | | 0.99 |
| Yes | | | | | 41% | 41% | 41% | |
| No | | | | | 59% | 59% | 59% | |
| Ever had money left over for other necessary items | | | | | | | | 0.95 |
| Yes | | | | | 62% | 62% | 62% | |
| No | | | | | 38% | 38% | 38% | |
| Currently doing unpaid work | | | | | | | | 0.95 |
| Yes | | | | | 13% | 12% | 13% | |
| No | | | | | 87% | 88% | 87% | |
| <i>Household characteristics</i> | | | | | | | | |
| Monthly income quartile | | | | 0.69 | | | | |
| Lowest | 22% | 28% | 32% | | | | | |
| Low | 22% | 23% | 21% | | | | | |
| High | 31% | 23% | 23% | | | | | |
| Highest | 25% | 26% | 24% | | | | | |
| Number of household dependents | 4.89 (3.13) | 5.02 (3.29) | 4.77 (2.97) | 0.40 | | | | |
| Type of dwelling | | | | | | | | 0.71 |
| Formal | | | | | 86% | 85% | 87% | |
| Informal | | | | | 14% | 15% | 13% | |
| Livestock ownership index | 4.70 (6.78) | 5.09 (6.82) | 4.33 (6.72) | 0.17 | 0.19 (1.24) | 0.34 (1.69) | 0.09 (0.82) | 0.43 |
| Transport asset index | 0.49 (0.92) | 0.60 (1.05) | 0.38 (0.77) | 0.02 | 0.03 (0.14) | 0.06 (0.18) | 0.01 (0.10) | 0.02 |
| Household items index | 2.35 (1.73) | 2.36 (1.71) | 2.33 (1.75) | 0.85 | 0.98 (1.17) | 1.20 (0.99) | 0.83 (1.24) | 0.03 |
| Number of household shocks in the past year | | | | | 2.71 (1.72) | 2.64 (1.75) | 2.75 (1.71) | 0.60 |
| Parental employment status | | | | 0.99 | | | | |
| Receive a regular salary or wage | 11% | 11% | 11% | | | | | |
| Does not receive a regular salary or wage | 89% | 89% | 89% | | | | | |

Note: M = mean, SD = standard deviation

^a M(SD) for continuous variables, and percentage distribution (%) for categorical variables

Table 2
Socioeconomic correlates of youth food insecurity and moderation effect of gender using data from Ghana (2014) and South Africa (2015).

| Variables ^a | Household Food Insecurity Access Scale Scores | | | | | |
|--|---|------|--------------|--------------------------|------|--------------|
| | Ghana (N = 4,165) | | | South Africa (N = 1,383) | | |
| | β | p | 95% CI | β | p | 95% CI |
| <i>Youth characteristics</i> | | | | | | |
| Age (in years) | 0.27 | 0.00 | 0.17, 0.38 | 0.23 | 0.07 | -0.02, 0.49 |
| Race (reference = others) | | | | 1.22 | 0.02 | 0.22, 2.23 |
| Caregiver for any children [†] | | | | 0.36 | 0.32 | -0.39, 1.11 |
| <i>Youth financial and employment characteristics</i> | | | | | | |
| Frequency of saving money (reference = never) | | | | | | |
| Every day | -0.77 | 0.09 | -1.66, 0.12 | | | |
| 2 to 3 times a week | -0.51 | 0.23 | -1.36, 0.34 | | | |
| 2 to 3 times a month | -0.55 | 0.23 | -1.45, 0.35 | | | |
| Once a month | 0.85 | 0.19 | -0.43, 2.13 | | | |
| Once every few months or less | 0.01 | 0.99 | -1.33, 1.35 | | | |
| Number of hours of financial education (reference = none) | | | | | | |
| Less than five hours | 0.51 | 0.10 | -0.10, 1.12 | | | |
| Six to nine hours | -0.02 | 0.97 | -0.76, 0.72 | | | |
| Ten or more hours | -0.14 | 0.79 | -1.22, 0.94 | | | |
| Frequency of running short of money (reference = never) | | | | | | |
| Sometimes | | | | 2.92 | 0.00 | 2.27, 3.57 |
| Regularly | | | | 6.77 | 0.00 | 5.73, 7.81 |
| Responsible for planning how money in the household is spent [†] | | | | 0.92 | 0.03 | 0.10, 1.75 |
| Ever had money left over for other necessary items [†] | | | | -1.33 | 0.00 | -2.00, -0.67 |
| Currently doing unpaid work [†] | | | | 0.74 | 0.29 | -0.69, 2.17 |
| <i>Household characteristics</i> | | | | | | |
| Monthly income quartile (reference = lowest) | | | | | | |
| Low | -1.28 | 0.00 | -1.95, -0.60 | | | |
| High | -1.29 | 0.00 | -1.93, -0.65 | | | |
| Highest | -2.67 | 0.00 | -3.35, -1.97 | | | |
| Number of household dependents | 0.16 | 0.00 | 0.10, 0.22 | | | |
| Type of dwelling (reference = informal) | | | | -1.76 | 0.00 | -2.58, -0.95 |
| Livestock ownership index | -0.01 | 0.62 | -0.03, 0.02 | -0.15 | 0.30 | -0.45, 0.16 |
| Transport asset index | | | | -0.66 | 0.60 | -3.31, 1.98 |
| Household items index | -0.44 | 0.00 | -0.60, -0.29 | -0.31 | 0.06 | -0.63, 0.01 |
| Number of household shocks in the past year | | | | 0.71 | 0.00 | 0.51, 0.90 |
| Parental employment status (reference = does not receive a regular salary or wage) | -0.35 | 0.18 | -0.87, 0.17 | | | |
| Gender (0 = male, 1 = female) | 0.03 | 0.87 | -0.38, 0.46 | 0.25 | 0.46 | -0.46, 0.96 |
| Transport asset index | -0.23 | 0.04 | -0.45, -0.01 | | | |
| Child support grant beneficiary (reference = no) | | | | | | |
| Yes | | | | 1.06 | 0.13 | -0.35, 2.49 |
| Unsure | | | | 0.31 | 0.70 | -1.37, 2.00 |
| <i>2-way interaction</i> | | | | | | |
| Female × transport asset index | -0.34 | 0.04 | -0.67, -0.01 | | | |
| Female × yes | | | | -1.68 | 0.02 | -3.09, -0.27 |
| Female × unsure | | | | -1.36 | 0.11 | -3.06, 0.33 |

Note: CI = confidence intervals. Results were based on 100 multiply imputed datasets with two-tailed tests and cluster-robust standard errors due to the clustered nature of our data.

[†] Reference = no.

3.2.1. Ghana

A youth's age, household income, assets, and household size were significantly associated with food access. Older youth were more likely to be food insecure compared to younger youth. Every one-year increase in age was associated with 0.27 points increase in HFIAS scores. Income was negatively associated with food insecurity. Youth from households with income in the low, high, and highest quartiles were less likely to be food insecure compared to their peers in the lowest income quartile. For example, youth in the highest income quartile scored 2.67 points lower on the HFIAS than youth in the lowest quartile. Household size was positively associated with food insecurity. Households with more dependents were more likely to be food insecure than households with fewer dependents. Last, asset ownership was negatively associated with food insecurity. For every unit increase in the household items index, HFIAS scores decreased by 0.45 points. For every unit increase in the transport asset index, HFIAS scores decreased by 0.35 points. These results indicated that greater ownership of transport assets and household items was associated with food security.

3.2.2. South Africa

A youth's race, as well as household financial and economic characteristics, were significantly associated with food access. Black youth were more likely to be food insecure compared to nonBlack youth. The frequency of running short of money was associated with food insecurity. Youth who reported running short of money sometimes or regularly were more likely to have inadequate access to food compared to youth who reported never running short of money. For example, compared to youth who never ran short of money, youth who regularly ran short of money scored 6.77 points lower on the HFIAS. In contrast, youth who ever had money left over for other necessary items were less likely to be food insecure compared to their peers who reported not ever having extra money for other necessary items. Another significant correlate of youth food insecurity in our South African sample was whether youth were responsible for planning how money in the household is spent. Youth with spending responsibility were more likely to be food insecure compared to youth without spending responsibility. In addition to youth financial traits, household economic factors were correlated with food insecurity. For example, youth who reported living

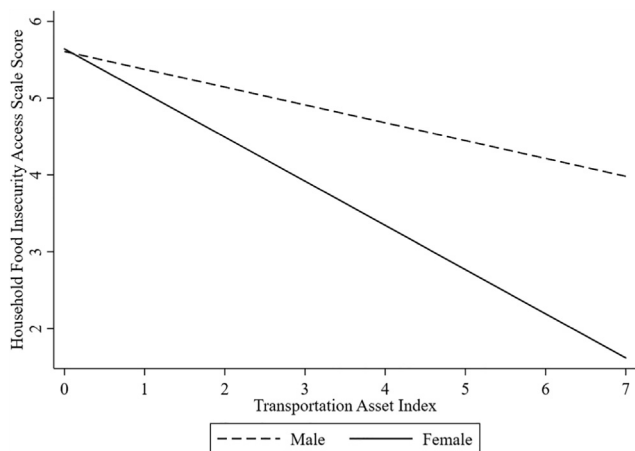


Fig. 1. Moderating effect of gender on the association between transportation asset index and youth food insecurity in Ghana.

in a formal dwelling such as a house, flat, or brick structure scored 1.76 points lower on HFIAS compared to youth who reported living in informal housing such as shacks in the backyard. Also, the number of household shocks in the past year was associated with food insecurity. For every household shock that a youth's household experienced in the past year, HFIAS scores increased by 0.71 points. Last, although asset ownership was not significantly associated with food security, greater ownership of assets was associated with lower HFIAS scores.

3.3. Moderation effect of gender

The results of the moderation tests are presented at the bottom of Table 2. Two-way interaction results indicated that gender moderated the relationship of food insecurity with transport asset index (Ghana) and receipt of child support grant (South Africa). Fig. 1 shows the predicted HFIAS score for adolescent boys and girls at different levels of transport asset index. As depicted in Fig. 1, the interaction effect indicated that the relationship between ownership of transport assets and food insecurity differed based on a youth's gender. Adolescent boys were slightly less food insecure compared to adolescent girls when ownership of transport-related assets was low (asset index value near zero). However, in households owning more transport-related assets (asset index value ≥ 1), adolescent girls were less food insecure compared to adolescent boys. Fig. 1 also indicates that, as ownership of transport-related assets increased, adolescent girls experienced a steeper decline in their HFIAS scores compared to adolescent boys.

We found a similar moderation effect of gender in the South African sample. Fig. 2 shows the predicted HFIAS score for young adult men and women based on whether they received the child support grant. As depicted in Fig. 2, the interaction effect indicated that the relationship between a child support grant and food insecurity differed based on a youth's gender. When youth did not receive a child support grant during their childhood, young women were more food insecure compared to young men. However, when youth received a child support grant during their childhood, young women were less food insecure (as illustrated by their lower HFIAS score) compared to young men (as represented by their higher HFIAS score). Last, when youth were unsure whether they received a child support grant, results indicated no moderating effect of gender.

3.4. Socioeconomic correlates and moderation effect of gender by youth's age group

Table 3 lists the socioeconomic correlates and gender's moderation effect on food insecurity by the youth's age group in the Ghana study. Overall, the results were similar. Age, income, household size, and

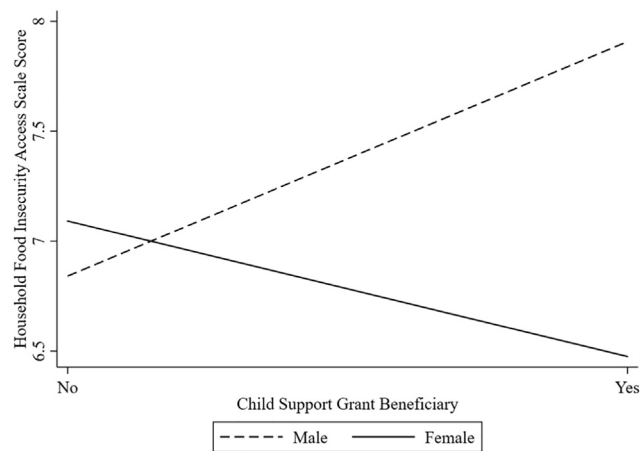


Fig. 2. Moderating effect of gender on the association between receipt of child support grant and youth food insecurity in South Africa.

ownership of household items remained significantly associated with food insecurity among youth from both age groups. The main difference between age groups was the interaction effect of gender. Two-way interaction results indicated that gender moderated the relationship of transport asset index with food insecurity in the model that included younger youth sample (or those aged 15 to 18 years). In the model that comprised older youth (or those aged 19 to 24 years), gender did not moderate the relationship of youth food insecurity with transport asset index. Fig. 3 displays the interaction effect of gender on the relationship between youth food insecurity and transportation asset index. Consistent with findings based on the overall sample (Fig. 1), adolescent boys aged 15 to 18 years were slightly less food insecure compared to adolescent girls aged 15 to 18 years when ownership of transport-related assets was low (asset index value near zero). However, in households owning more transport-related assets (asset index value ≥ 1), adolescent girls were less food insecure compared to adolescent boys. Fig. 3 also indicates that as ownership of transport-related assets increased, as illustrated by higher index values, adolescent girls aged 15 to 18 years experienced a steeper decline in their HFIAS scores compared to adolescent boys aged 15 to 18 years.

4. Discussion

Study findings indicate a high prevalence of food insecurity in our sample of Ghanaian and South African youth. Nearly four in 10 Ghanaian and five in 10 South African youth experienced severe food insecurity. The high prevalence in our study is consistent with national estimates of food-insecure households in Ghana and South Africa. In 2014–2015, 51% and 41% of households in Ghana and South Africa, respectively, reported moderate or severe food insecurity (Pereira et al., 2017). Further, the higher prevalence of food insecurity among South African youth compared to Ghanaian youth in our study may be explained by differences in age and living arrangements. While youth in both countries were primarily from urban and peri-urban areas, the South African sample was, on average, five years older than the Ghanaian sample. This age gap might suggest different living arrangements, responsibilities, and vocational goals. For example, the older South African youth might have been living independently from their families and responsible for their food, whereas the younger Ghanaian youth might be dependent on their parents or caregivers for food access. It is also possible that a larger number of older youth have their own families or been living with their partners, which means the youth provide food to more than one person. In the South Africa sample, 6% of youth reported either being married or living with a partner at the time of baseline data collection. It is also possible that the lower prevalence of food insecurity in the Ghanaian sample, especially among students,

Table 3
Socioeconomic correlates of youth food insecurity and moderation effect of gender by youth's age group in Ghana (2014).

| Variables ^a | Household Food Insecurity Access Scale Scores | | | | | |
|--|---|------|--------------|-------------------------|------|---------------|
| | Younger Youth (n = 1,390) | | | Older Youth (n = 2,775) | | |
| | β | p | 95% CI | β | p | 95% CI |
| <i>Youth characteristics</i> | | | | | | |
| Age (in years) | 0.40 | 0.04 | 0.02, 0.77 | 0.48 | 0.00 | 0.31, 0.66 |
| <i>Youth financial and employment characteristics</i> | | | | | | |
| Frequency of saving money (reference = never) | | | | | | |
| Every day | -0.61 | 0.33 | -1.86, 0.63 | -0.81 | 0.14 | -1.88, 0.26 |
| 2 to 3 times a week | -0.29 | 0.63 | -1.51, 0.93 | -0.59 | 0.23 | -1.56, 0.38 |
| 2 to 3 times a month | -0.57 | 0.36 | -1.79, 0.65 | -0.49 | 0.38 | -1.59, 0.61 |
| Once a month | 0.49 | 0.64 | -1.57, 2.56 | 1.04 | 0.19 | -0.50, 2.58 |
| Once every few months or less | 0.36 | 0.69 | -1.42, 2.14 | -0.17 | 0.84 | -1.82, 1.49 |
| Number of hours of financial education (reference = none) | | | | | | |
| Less than five hours | 0.30 | 0.50 | -0.58, 1.17 | 0.68 | 0.05 | -0.01, 1.37 |
| Six to nine hours | -0.45 | 0.41 | -1.51, 0.62 | 0.27 | 0.59 | -0.70, 1.23 |
| Ten or more hours | -0.54 | 0.58 | -2.46, 1.38 | 0.11 | 0.87 | -1.16, 1.38 |
| <i>Household characteristics</i> | | | | | | |
| Monthly income quartile (reference = lowest) | | | | | | |
| Low | -0.98 | 0.09 | -2.12, 0.16 | -1.42 | 0.00 | -2.23, -0.61 |
| High | -1.41 | 0.01 | -2.45, -0.36 | -1.23 | 0.00 | -2.02, -0.44 |
| Highest | -2.50 | 0.00 | -3.53, -1.48 | -2.67 | 0.00 | -3.53, -1.82 |
| Number of household dependents | 0.13 | 0.02 | 0.02, 0.24 | 0.17 | 0.00 | 0.09, 0.25 |
| Livestock ownership index | 0.02 | 0.21 | -0.01, 0.07 | -0.02 | 0.20 | -0.06, 0.012 |
| Household items index | -0.37 | 0.01 | -0.58, -0.15 | -0.50 | 0.00 | -0.71, -0.29 |
| Parental employment status (reference = does not receive a regular salary or wage) | -0.41 | 0.35 | -1.28, 0.46 | -0.37 | 0.27 | -1.03, 0.30 |
| Gender (0 = male, 1 = female) | 0.18 | 0.57 | -0.44, 0.80 | -0.05 | 0.85 | -0.60, 0.50 |
| Transport asset index | -0.18 | 0.27 | -0.49, 0.14 | -0.29 | 0.05 | -0.59, -0.003 |
| <i>2-way interaction</i> | | | | | | |
| Female × transport asset index | -0.60 | 0.02 | -1.12, -0.09 | -0.18 | 0.38 | -0.59, 0.23 |

Note: CI = confidence intervals. Results were based on 100 multiply imputed datasets with two-tailed tests and cluster-robust standard errors due to the clustered nature of our data.

[†] Reference = no.

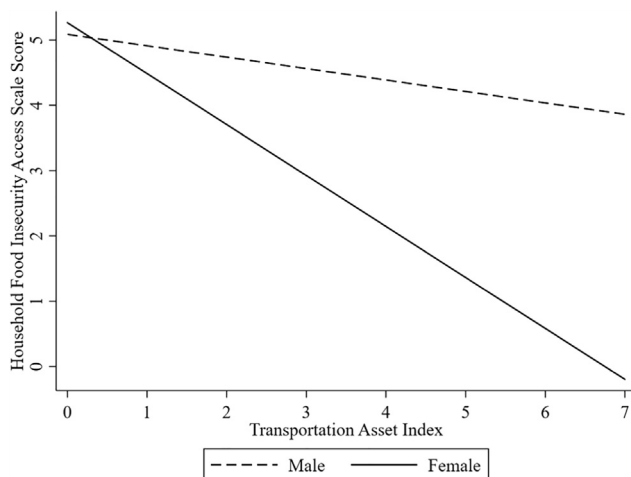


Fig. 3. Moderating effect of gender on the association between transportation asset index and food insecurity among younger youth or those aged 15 to 18 years in Ghana.

might reflect access to food in their boarding schools. While our study did not examine their association, we recognize that macroeconomic factors such as food production, supply chain, and prices likely affect access to food access and the prevalence of food insecurity in each country (Conceição, Levine, Lipton, & Warren-Rodríguez, 2016; Sheahan & Barrett, 2017).

Our study results also underscore three additional key findings. First, household economic resources remain a protective factor against food insecurity, consistent with previous research (e.g., Baer et al., 2015; Belachew et al., 2012; Vuong et al., 2015). In Ghana, youth from households with higher income and more assets (particularly transport

and household items) were less likely to experience inadequate food access. Higher income translates into more resources to purchase or produce food. Similarly, assets, especially productive assets, may generate additional income and improve a family's cash flow, which in turn, provides added financial resources to obtain food. In contrast, having more household dependents was associated with food insecurity. Consistent with theoretical and empirical evidence, this finding indicates that as the number of dependents increases, the resources accrued by other dependents, particularly young household members decline (Downey, 2001). Given that most participants in the Ghana study came from low-income households, this positive association between household size and food insecurity suggests that the consequences of not having access to adequate food might be more severe among youth in large families with fewer resources.

In South Africa, salient indicators of youth's socioeconomic standing include race and housing conditions. Race was a significant predictor of food access, with Black youth more likely to be food insecure than their nonBlack peers. Youth living in informal dwellings or settlements were more likely to be food insecure than youth living in a formal dwelling. In South Africa, poverty and material deprivation remains closely linked to race and area of residence (Burger, van der Berg, van der Walt, & Yu, 2017). Black South Africans' cumulative disadvantage continues to adversely affect their education and labor market outcomes (Fransman & Yu, 2019; Gradín, 2013), which in turn, influence their ability to obtain adequate access to food. For example, chronic unemployment rates and employment in precarious low-paying service sector jobs continue to be higher among young Black South Africans than their white counterparts (Gradín, 2019). Further, while foods are available in informal settlements through various food service enterprises and grocery retailing (Petersen & Charman, 2018), informal settlement residents might not have sufficient financial resources to buy adequate food. Income poverty and material deprivation among

informal settlement residents have been attributed to occupational segregation by race resulting in limited employment opportunities and overrepresentation in precarious low-paying jobs (Gradin, 2019).

Additionally, youths' financial acumen, particularly their ability to manage money is a consistent predictor of food access. For example, youth who ran out of money either sometimes or regularly were more likely to lack food access than their peers who reported never running short of money. The frequency of running short of money might be an indicator of a person's income level or economic resources. Running short of money could also indicate a person's money management knowledge and skills (Kidwell, Brinberg, & Turrisi, 2003). To further illustrate such a proposition, we found that youth who are responsible for planning how to spend household money were more likely to be food insecure compared to youth without the same responsibility. This finding may suggest youths' limited ability to budget reasonably and pay for basic household needs such as food. In contrast, we found that youth who reported having money left over for other necessary items were less likely to be food insecure compared to youth who reported not having money left over for other necessary items. Although numerous factors affect one's ability to have leftover money for necessary items, it is plausible that one of those factors is youths' ability to manage money and plan for recurring, necessary expenses (Bamforth, Jebarajakirthy, & Geursen, 2017; Kidwell et al., 2003). Further, youths' ability to manage money and plan for future expenses may help them buffer the adverse effect of household shocks on food access. Our results suggest that an increasing number of household shocks, such as job loss, migration, and illness was associated with food insecurity.

Second, gender moderates the relationship between socioeconomic factors and food insecurity. Our findings add to a growing list of positive effects of increased household economic and financial resources on the well-being of adolescent girls and young women from low-income families (Banda, Svanemyr, Sandøy, Goicolea, & Zulu, 2019; Handa, Devreux, & Webb, 2010). Gender's moderation effect suggests the importance of household economic security, broadly, and micro-economic investments on girls and young women, particularly as a protective factor against food insecurity and its adverse consequences. Gendered resource dilution (Kalmijn & van de Werfhorst, 2016) may be particularly detrimental in girls and young women from poor households. In some communities, adolescent girls and young women are at a higher risk of food insecurity due to gender bias and traditional norms of household food allocation (Aurino, 2017; Miller, 1997). Gender-based food allocation bias puts adolescent girls and young women at the bottom of the food distribution hierarchy, which means they might obtain food after the men, young men, and older women received their shares. This gendered bias is largest in low-income households that are also severely food insecure (Hadley et al., 2008). Our findings appear to support gender bias in adolescents or younger youth. In Ghana, gender's moderation effect seems to be salient among younger youth but not among older youth. This finding implies that adolescents girls (aged 18 and younger) from families that do not own transport-related assets may be the most susceptible to food insecurity. Consistent with previous research (Aurino, 2017; Hadley et al., 2008), adolescent girls may be least preferred than adolescent boys and other adult household members, especially in settings where adolescent girls have historically experienced discrimination. In other words, adolescent boys may be at an advantage when it comes to intrahousehold food distribution due to prevailing sociocultural norms in Ghana about gender roles and expectations (Evans-Klock, 2017).

Third, a comparison of results suggests heterogeneity of significant socioeconomic correlates associated with food security. Overall, economic resources matter. However, which economic resources are essential appear to depend on the youth's living arrangement, age, and stage of neurocognitive development. In Ghana, household income and assets are negatively associated with food insecurity. These significant associations support the notion that younger youth may remain dependent on their parents or other family members for food, as is the

case with the Ghanaian sample (mean age = 16 years). At the time of data collection in 2014, many Ghanaian youths remained in schools, which meant they were more likely to be considered as dependent. In contrast, older South African youth (mean age = 22 years) in the study might have transitioned into living on their own and less dependent on their families for food. The independent living arrangement of older youth may explain why youths' financial traits were predictive of food security. Youth living on their own are more likely to be responsible for making household decisions about spending, budgeting, planning, and money management compared to youth who remain dependent and living with their families.

The significance of asset ownership in predicting food insecurity is consistent with the argument that youths' dependency, as illustrated by their living arrangement and age, may explain the saliency of assets as a protective factor. Asset ownership, which was measured in both countries, appears to be a significant protective factor against food insecurity among Ghanaian adolescents but not among young South Africans. In Ghana, assets represented items owned by the family. In South Africa, assets represented items owned by youth. Ghanaian youth and their families may have more assets, assuming they have a more extended period to accumulate wealth. In contrast, many South African youth in the study might have recently transitioned into living independently from their families and thus, might not have as much time to build their assets and use the assets to protect against food insecurity. In other words, for older youth, their own resources may shape their access to food. For younger youth, their food security is influenced by resources owned by their families.

In addition to living arrangements, age and its corresponding phase of neurocognitive development may explain the relevance of individual financial traits among older youth's food access. Evidence shows that older youth or those considered to be young adults (21 years old and beyond) have begun to master delayed gratification and emotional regulation (Casey, Heller, Gee, & Cohen, 2019). In turn, delayed gratification and emotional regulation might explain young South African adults' comprehension of money management and the consequences of financial decisions. In contrast, cognitive and emotion regulation among younger youth remains underdeveloped, heightening their risk of suboptimal decisions (Casey, Jones, & Hare, 2008; Geier, 2013). Evidence also suggests that variation in neurocognitive development explains adolescents' heightened emphasis on immediate gratification and rewards, as well as their vulnerability to poor decision-making relative to adults (Barkley-Levenson & Galván, 2014; Geier, Terwilliger, Teslovich, Velanova, & Luna, 2010). Suboptimal financial decisions might be worsened by limited access to and experience with money among younger youth. In contrast, older youth might have their sources of money and more experience with money. Thus, the combination of age-centered neurocognitive development (cognitive and emotion regulation) and greater access and experience with money may explain the significance of youths' financial capability characteristics on access to food among South African youth in the study, but not in the Ghanaian sample.

4.1. Implications

Our findings have implications for food access programming and policy. First, microeconomic resources are a consistent predictor of youth food security. Efforts to promote income-generating livelihoods among youth and their families remain an essential tool to tackle food insecurity. These programs provide additional resources or enhance household income to obtain adequate food. However, practitioners and policymakers should consider the heterogeneity of youth and appropriateness of interventions based on youths' development stage, age, and living arrangement. School-based food assistance programs might be valuable to younger youth, in addition to helping their families accumulate more assets that generate income. School-based food assistance programs might also be beneficial to youth from poor households

and female students, who are more likely to experience household food allocation bias than male students. In Ghana, a randomized trial of the government's school feeding program showed substantial learning and cognitive gains for girls and the poorest students (Aurino, Gelli, Adamba, Osei-Akoto, & Alderman, 2018). Expansion of Ghana's school meals program to high school students may offer one example of leveraging an existing nutrition program to reduce food insecurity among youth, particularly adolescent girls and students living in poverty. For older youth, income-generating programs that focus on skills building, employment, and financial capability might be an appropriate intervention. Financial capability, particularly access to financial education classes that include budgeting, spending, money management, and financial planning, might be pertinent to older youth as they transition into adulthood and make financial decisions on their own. Accounting for youth's different characteristics when developing and testing food security programs may result in appropriate and effective interventions. For example, any financial capability or skills-building programs must recognize the variation in neurocognitive development among youth to ensure that content, skills, and incentives are developmentally appropriate. Second, the moderation effect of gender highlights the importance of improving household economic conditions as a mechanism to enhance the well-being of adolescent girls and young women. As households become more affluent, it is plausible that there are more resources to go around, which in turn, may benefit adolescent girls and young women's food access. Also, our results highlight the protective role of social assistance programs such as South Africa's child support grant on young women's food access. It appears that social investments directed toward children, especially girls, may have longer-term benefits. Third, food security programs should target higher-risk youth and provide them with tools to obtain food in the immediate and longer-term. In Ghana, youth at higher risk of food insecurity include older youth, whereas, in South Africa, older youth, Black youth, and youth living in informal dwellings remain at higher risk of food insecurity.

4.2. Study limitations

Our study provided one of the few examples of empirical evidence on the prevalence of youth food insecurity, its correlates, and gender's moderation effect in a large sample of Ghanaian and South African youth. Although the relationship between better economic standing and food access seems evident, we identified specific microeconomic factors associated with youth food insecurity that could be altered through interventions. Additionally, heterogeneous findings on the relationship between socioeconomic status and other aspects of food security, such as food utilization (Banerjee & Duflo, 2011; Masa, Chowa, & Nyirenda, 2018), cautions us to assume a positive relationship between SES and food access without supporting empirical evidence.

However, study results should be interpreted in the context of the following limitations. First, our sample may not be representative of Ghanaian and South African youth. Thus, the generalizability of findings to the broader youth population within and between countries is limited and should be interpreted considering the original projects' different sampling methods. Nonetheless, our sample included youth with low socioeconomic status, which might be more relevant to our study objectives. Second, we used cross-sectional data, which provide weak evidence of a causal relationship. Lack of temporal order does not eliminate reverse causality and may alter the true direction of a relationship. Third, although we reviewed the literature to identify relevant indicators, our correlates were limited to variables measured in the study and were not exhaustive. Fourth, the use of cross-sectional data and the lack of qualitative data restricts our ability to expound study findings. For example, longitudinal data might illustrate possible mechanisms that explain the association between receipt of child support grants during childhood and youth food insecurity. Qualitative data might provide insights into the association between child support

grants and food security. However, our study remains one of the few research studies in SSA to examine gender's moderation effect. Fifth, the omission of essential variables in the MI model might bias study findings. To minimize bias, we created an imputation model that included auxiliary variables to capture more associations between variables (Enders, Dietz, Montague, & Dixon, 2006; Graham, 2009). Sixth, the use of identical survey items in both countries could strengthen our arguments on similarities and differences of food insecurity correlates based on youths' development stage and living situation. Thus, the different socioeconomic indicators across countries may limit our ability to generalize findings. Nonetheless, our study adds to the increasing number of research studies that have examined the prevalence and correlates of youth food insecurity in cross-national settings. Additionally, the questionnaires in both studies comprised age-appropriate and culturally congruent items. Last, our definition and measure of food security centered on access. Results do not tell us about food choice and intake, or access to food over time. Future research should address these limitations to expand our understanding of food insecurity among youth and how best to resolve the issue using a youth-focused lens.

5. Conclusion

The high prevalence of youth food insecurity and its adverse consequences draw attention to the importance of finding appropriate and sustainable solutions that improve access to food. Overall, our findings suggest that household socioeconomic status remains a constant predictor of food access among youth in Ghana and South Africa. Efforts to improve food access through building household economic resources might be useful if programs consider the heterogeneity of the youth population between and within countries. Appropriate programs may be those that tailor their components to youths' developmental stage and their financial responsibilities and living situations. Programs should also target at-risk youth, including girls and young women in poorer households. Improving household economic security might translate into higher investments in young women's access to food and their overall well-being.

Declaration of interest

None

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Role of the funding source

The funders had no role in study design, data collection, analysis and interpretation, decision to publish, or preparation of the manuscript.

CRedit authorship contribution statement

Rainier Masa: Conceptualization, Methodology, Formal analysis, Writing - original draft. **Zoheb Khan:** Project administration, Data curation, Formal analysis. **Gina Chowa:** Writing - review & editing, Funding acquisition.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.childyouth.2020.105180>.

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