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Measuring women's empowerment in selected Southern African countries

Evidence from DHS data

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Abstract: This study applies multiple correspondence analysis to construct and compare women's empowerment indices across selected Southern African countries: Lesotho, Malawi, and Zimbabwe. It also investigates the relative importance of four domains of women's empowerment in these countries. These include household decision-making, economic empowerment, attitudes towards domestic violence, and fertility. The study utilizes 2014/15 Demographic Health and Survey data for each country. The results show that the selected countries have different levels of women's empowerment. Malawi fares better than Zimbabwe and Lesotho, although significant improvement is still required in all countries. Attitudes towards domestic violence and fertility are considerable contributors to women's empowerment in these countries, while household decision-making is the least important. These results suggest that strategies to improve women's empowerment in these countries should accord relatively more focus to domestic violence and fertility. The study also indicates the relevance of a regional rather than a country-specific stance towards empowering women in Southern Africa.

Key words: household, multiple correspondence analysis, Southern Africa, women's empowerment, women's empowerment index

JEL classification: C01, C54, D63, J16

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1 Introduction

Women across the globe have historically been accorded secondary status to men in society due to legislation, patriarchy, and sociocultural norms. This has disempowered them and hampered their social, political, and economic progress. The ensuing gender inequality has been associated with poverty, violence, and low human development in many countries (Jagger 2015; Margolis 2003; Sultana 2010). This has brought the discussion of women's empowerment to the fore of economic development strategies. For instance, the fifth target of the United Nations' Sustainable Development Goals calls for gender parity and empowerment of all women and girls (Nino 2015). Thus, women's empowerment is an important indicator of socioeconomic development that is highly sought after in developing countries. It is defined as a process by which women acquire control over their lives and gain the power to make choices (O'Neil et al. 2014). Kishor and Gupta (2004) extend the definition to emphasize that it is gaining power to achieve one's goals, but not power over others. Rahman (2013) defines women's empowerment as gaining the ability to participate in decisions that affect them within the household and regarding international development policies. Further, Bhoganadam et al. (2014) attribute women's empowerment to having power in daily activities pertaining to social, political, and economic spheres.

Access to paid work and secondary stages of education play an important role in enhancing women's capacity to have control over their lives. Hence, education is a source of empowerment (Kishor 1997). Higher returns to education tend to increase women's labour force participation compared to men (Yakubu 2010), and women who earn high incomes tend to have a say in the household they live in (Archarya and Madhur 1983; World Bank 1991). Women's empowerment through education has a multiplier effect on household income (McCrary and Royer 2006), and also gives women more knowledge about contraceptives. Women with knowledge of contraceptives tend to have fewer children as taking care of children is time-intensive (Osili and Long 2007); this also increases women's productivity in the labour market.

Women's empowerment gives them greater control over their fertility and reduces the chances of them enduring domestic violence at the hands of their intimate partners (Miedema et al. 2016; Yount 2005). Women who are endowed with secondary and higher education are less likely to suffer from intimate partner violence as they have some household bargaining power, and are presumably aware of their legal rights (Schuler et al. 1996; Sen 1999). However, women's empowerment through an increased role in decision-making may sometimes increase domestic violence. For example, it may cause men to withdraw their support on important decisions, such as those regarding the healthcare of their wife and children (Basu and Koolwal 2005).

In addition to the personal benefits, women's empowerment tends to benefit society as a whole. For instance, it has an intergenerational effect—children who hail from households where women are empowered tend to have a much lower risk of malnutrition and are also able to spend time in good-quality education. A study on women's empowerment and child nutrition by Deutsch and Silber (2019) finds that greater involvement of females in household decisions has a positive impact on the nutritional status of their children.

Women's empowerment is, therefore, highly relevant for developing countries, especially those in sub-Saharan Africa. The region is home to the largest proportion of the multidimensional poor population in the world (UNDP 2019). Table 1 shows that it has the highest multidimensional poverty index (MPI) in the world, and also the highest density of population below the US\$1.90 per day poverty line. Human Development Index (HDI) values for 2018 also showed that sub-Saharan

Africa fared worse than other world regions in this indicator. The region also experiences worse gender inequality than other regions (UNDP 2019).

Table 1: Regional disparities in some development indicators

Region	MPI value	Population (millions) below the US\$1.90 poverty line	HDI 2018	Gender inequality index (2018)
Arab states	0.076	4.6	0.703	0.531
East Asia and the Pacific	0.024	2.1	0.741	0.310
Europe and Central Asia	0.004	0.6	0.779	0.276
Latin America and the Caribbean	0.033	4.1	0.759	0.385
South Asia	0.142	17.5	0.642	0.510
Sub-Saharan Africa	0.315	44.7	0.541	0.573

Source: authors' constructions based on UNDP (2019).

In light of the above, this study aims to add to the literature on women's empowerment in sub-Saharan Africa, with specific reference to selected countries in Southern Africa: Lesotho, Malawi, and Zimbabwe. Current multidimensional studies of women's empowerment in Africa have been carried out at a regional level, which masks cross-country heterogeneity. For instance, Miedema et al. (2018) focused on East African countries, Ewerling et al. (2017) on Africa, and Asaolu et al. (2018) on different sub-Saharan African regions. While these studies are informative at the regional level, the extent to which their findings can be generalized to individual countries remains in question. In addition to these regional studies, country-level studies are also required to verify whether there are empirical regularities in levels and crucial domains of women's empowerment in sub-Saharan Africa, with specific reference to Southern Africa.

The specific research questions for this study are: (1) Which of the four domains—household decision-making, economic empowerment, attitudes towards domestic violence, and fertility—is more important for women's empowerment in Lesotho, Malawi, and Zimbabwe? And (2) Are there heterogeneities in women's empowerment in these countries, with implications for policy? The running hypotheses are: First, the women's empowerment index is an increasing function of economic empowerment, increased use of contraceptives, and increased female autonomy in household decisions, as well as victims' negative attitudes towards domestic violence. Second, economic empowerment, household decision-making, fertility, and victims' attitudes towards domestic violence do not carry equal importance in the women's empowerment index. Third, the select countries have different levels of women's empowerment; some are better/worse than others. Answering these questions generates important findings for recommending whether countries in Southern Africa should adopt a regional or a country-specific stance towards women's empowerment. Also, given the scarcity of resources, they will inform targeted strategies for women's empowerment by identifying the most progressive domain.

The study proceeds as follows. Section 2 discusses some background characteristics for the selected countries. Section 3 presents the empirical and conceptual literature behind this study. Section 4 discusses the methodology and data for the study. Section 5 presents the results, and Section 6 discusses the results and concludes the study.

2 Background: selected countries in Southern Africa

Lesotho, Malawi, and Zimbabwe are Southern African countries that are afflicted by high levels of the poverty that is widespread on the continent. Using national poverty lines, about 57.1 per cent of Basotho, 51.5 per cent of Malawians, and 72.3 per cent of Zimbabweans are poverty-stricken (UNDP 2019). These countries also have low per-capita gross domestic product (GDP) by international standards. In 2018, this indicator ranked at 154th out of 182 countries for Lesotho, 177th for Malawi, and 156th for Zimbabwe (World Bank 2018). The countries' low economic status is accompanied by low human development at the world level. Table 2 shows that the respective HDI for Lesotho, Malawi, and Zimbabwe was ranked 164th, 172nd, and 150th out of 188 countries in 2018. When compared to the statistics in Table 1, this shows that the selected indicators are typical of sub-Saharan African countries.

Table 2: Selected indicators for Lesotho, Malawi, and Zimbabwe

Country	Lesotho	Malawi	Zimbabwe
HDI 2018	0.518	0.485	0.563
HDI rank /188	164	172	150
Gender Inequality Index (2018)	0.546	0.615	0.504
Gender Inequality Index rank /162	135	149	128
Maternal mortality rate (2015)	487	634	443
Female share of parliament seats	22.7	16.7	34.3
Female population with at least some secondary education	32.8	17.6	55.9
Male population with at least some secondary education	25.1	25.6	66.3
Female labour force participation rate	59.8	72.9	78.6
Male labour force participation rate	74.9	82	89

Source: authors' construction based on UNDP (2019).

This presents a need for measures to improve the countries' underlying dimensions for the HDI index: life expectancy, knowledge, and a decent standard of living. We maintain that women's empowerment can go a long way in addressing these challenges. The countries also suffer from gender inequality as measured by the Gender Inequality Index (GII), which measures inequality in men's and women's status in terms of reproductive health, empowerment, and the labour market (World Bank 2016). Table 2 shows that this gender inequality is relatively better in Zimbabwe (ranked 128th/162 countries), followed by Lesotho (135th) and Malawi (149th). This cross-country differential also emerges when considering a specific measure of female well-being: the maternal mortality rate (number of deaths due to pregnancy-related causes per 100,000 live births).

The inferior position of women in Southern Africa compared to men can also be inferred from their relatively low political representation. In Malawi, only 17 per cent of parliamentarians are female, while this is about 23 per cent in Lesotho and 34 per cent in Zimbabwe (UNDP 2019). This is worrisome as women comprise more than 50 per cent of these countries' populations. According to the World Bank (2019), women make up 50.7 per cent of the total populations in Malawi and Lesotho, and 52.3 per cent in Zimbabwe. The current imbalance in parliamentary representation could be partly linked to women's relatively low educational attainment compared to men, except for Lesotho (16.7 per cent vs 25.6 per cent in Malawi and 55.9 per cent vs 66.3 per cent in Zimbabwe when considering the percentage of the male and female population aged above 24 years with at least some secondary education over the period 2010–18 (UNDP 2019)).

Teenage pregnancies and early marriages are also prevalent in Southern Africa, and sub-Saharan Africa has the highest number of teenage pregnancies in the world (Yakubu and Salisu 2018). In Malawi, early marriages are one of the key drivers of teen pregnancies, which increases social

inequality (Chirwa et al. 2019). While pregnancies do not always result in girls leaving school, they make it more difficult for young mothers to continue education (Grant and Hallman 2008). Moreover, although Zimbabwe is characterized by high levels of education and high rates of contraceptive use, it still has significant levels of child marriage (Hindin 2000). Table 2 also shows that women in the selected countries have high labour participation rates (LFPs), which are above 50 per cent. However, these are below those of their male counterparts. Most of these women are involved in informal employment that is low-paying compared to men's jobs in the formal sector (Chen 2008; Van Klaveren et al. 2010). Worse still, some of them participate in the agricultural sector as unpaid family workers. It is also notable that Basotho women account for more than 80 per cent of the workforce in the textiles industry (Chen 2008).

While women in Southern Africa have higher labour participation rates compared to those in other regions, the region has high levels of gender-based violence, intimate partner violence, femicide, and trafficking of women. For Zimbabwe, 35.2 per cent of women report intimate partner violence (Peterman et al. 2015), while for Lesotho this is 28 per cent (Chipatiso et al. 2014a) and for Malawi 42 per cent (NSO-Malawi and ICF International 2017). Although women's role and autonomy in Lesotho are increasing due to male labour migration, this has also increased the prevalence of sexual violence against women (Harrison et al. 2014). Bisika (2009) also finds that gender-based violence negatively affects females' access to education in Malawi. This problem is difficult to combat due to 'a culture of silence and stigmatisation associated with the scourge perpetrating some kind of violence against women' (Chipatiso et al. 2014b). The Southern African region is characterized by similar cultures that are deeply rooted in patriarchy, which influences power and gender-relation dynamics.

Taken together, this discussion reveals some cross-country differences in women's disadvantages, although the countries' relative positions are not systematic across indicators. For these reasons, it is crucial to invest in measures that increase women's empowerment in these countries. The study aims to distinguish women's empowerment indicators that are relatively more important in these Southern African countries, with implications for the region broadly. It also aims to compare women's empowerment indices across the countries to assess whether there are any regularities in achievements or not. Importantly, the results of this study will help in the development of empowerment strategies for women in these countries, for the sake of social, economic, and political development.

3 Literature review

3.1 Empirical literature

Women's empowerment is referred to using interchangeable terms such as *gender equality*, *women's autonomy*, and *women's status*, which makes understanding the concept more difficult. According to Kabeer (2003), women's empowerment is measured across three dimensions: agency, resources, and achievement. Proxies of agency, which are measured only through local surveys (Desai 2010), include women's power in household decision-making, including decisions on children's education, household purchases, health, use of contraceptives, and employment (Kabeer 2003). Measurements of resources involve decisions on assets and knowledge, while measurements of achievement include labour market participation, educational attainment, and health (Kabeer 2003).

Dhuli (2013) categorizes women's empowerment into levels: individual, family, community, and organizational. However, it is difficult to concurrently measure women's empowerment at individual, community, and national levels due to lack of data that cuts across all these levels (Desai 2010). Measuring women's empowerment through agency and process remain challenging as empowerment

is a multidimensional and multilevel concept that is context specific. Several scholars resort to capturing women's empowerment measures through proxy indicators. Most common indicators include health, education, decision-making, and control over resources in the economic and political spheres (Desai 2010). Malhotra et al. (2002) suggest that women's empowerment should be expanded to include six dimensions: economic, sociocultural, family/interpersonal, legal, political, and psychological.

Several indices are constructed to assess the progress of women's empowerment at the global level. These include the GII, the Gender Development Index (GDI), and the Gender Empowerment Measure (GEM) (Kabeer 1999; Phan 2016). The GGI measures women's empowerment in five dimensions: health and well-being, educational attainment, economic opportunity, economic participation, and political empowerment. The GDI measures gender gaps by concentrating on three basic dimensions of human development: standard of living, health, and knowledge. However, this is too narrow to capture the empowerment dimensions, particularly for developing countries. The GEM measures women's empowerment at an aggregate level using few indicators and focusing on income, which biases results for developing nations (Phan 2016). These measures also omit important dimensions of women's empowerment, such as their social, economic, and human resources (Kabeer 1999). The approach that we intend to follow and dimensions used for the measurement of women's empowerment are further discussed in Section 3.2.

Currently there are few studies that have measured women's empowerment from a multidimensional perspective for developing countries, regardless of the international recognition given to measurement of women's empowerment. Phan (2016) analyses women's empowerment for South East Asia using the principal axis factoring method and Demographic Health Survey (DHS) data. The study constructs a women's empowerment index based on labour force participation, education, household decision-making, and contraception use dimensions. The results suggest that three of the factors (excluding contraceptive use) affect women's empowerment, with labour force participation being the leading factor. However, the results are not generalizable to Southern African countries due to some regional peculiarities. Miedema et al. (2018) examine women's empowerment for East African countries using DHS data. The study applies multi-country confirmatory factor analysis (CFA) to women's participation in household decisions, attitudes towards spousal abuse, and women's human/social assets. The results confirm that these three dimensions model women's empowerment in East Africa. The CFA method used attempts to discover complex patterns in the dataset (Yong and Pearce 2013). However, it assumes that there is a linear relationship between factors and variables in question (Gorsuch 1983). Also, the extent to which the findings are generalizable to other regions is questionable as the study solely focused on East Africa.

Ewerling et al. (2017) investigate women's empowerment for the African region based on three dimensions: attitude towards violence, decision-making, and social independence. The study utilizes principal component analysis (PCA) on a pooled dataset for selected African countries to construct the women's empowerment index, and then compares it to the GDI. The results suggest that women's empowerment in Africa is affected by these three dimensions, with attitude towards violence being the persistent indicator across all African regions. Even though the study is informative, it presents some limitations. The first is related to the use of PCA to compute the women's empowerment index, as PCA is designed for linear variables, whereas the indicator variables for women's empowerment dimensions are categorical variables (Gorsuch 1983). Second, assessing the index's validity based on the GDI is problematic as the GDI itself is considered too narrow to capture fitting empowerment dimensions for developing countries. Also, the Survey-based Women's emPOWERment index (SWPER) is not comparable with the GDI as the GDI measures gender gaps—the comparison between men and women—while SWPER focuses solely on women.

Asaolu et al. (2018) measure empowerment for women in different sub-Saharan African regions and determine the important dimensions by applying CFA to DHS data. The results suggest that labour participation, education, and attitudes towards gender violence are the dimensions that define women's empowerment for East Africa, while in Western, Central, and Southern Africa access to healthcare is also a key component. Although informative, the study has some limitations. For instance, the analysis is based on a pooled sample of countries in a specific sub-region of sub-Saharan Africa. To some extent, this masks the relative importance of the underlying women's empowerment domains at a country level. Thus, the study fails to educate us on whether the findings from the pooled analysis are truly reflective of the constituent countries' situations. Moreover, CFA requires knowledge of theory and the prior of a model regarding the tested variables, which is not readily available.

Apart from Asaolu et al. (2018) and Ewerling et al. (2017), other studies of women's empowerment in Southern Africa are country-specific and focus on individual dimensions of women's empowerment, such as education, employment, the ability to make decisions in the household, fertility, and perceptions of gender-based violence, rather than adopting a multidimensional stance that accommodates the broadness of the women's empowerment measure. For instance, Wekwete et al. (2014) conduct a study in Zimbabwe to determine the prevalence of gender-based violence as well as the association between women's empowerment (proxied by attitudes towards domestic violence, control of cash earnings, participation in household decision-making, and women's ownership of assets) and partner gender-based violence. The study found that there were no associations between women's empowerment proxies and partner gender-based violence. The study also found that younger women were more likely to experience partner violence than older women, and women who did not participate in household decision-making were more likely to experience gender-based violence than women who participated.

Hindin (2003) studies factors associated with attitudes towards wife-beating in Zimbabwe. The study finds that women who made joint household decisions with their partners were less likely to justify wife-beating, and that younger women were more likely to justify wife-beating compared to older women. For Malawi, Palamuleni and Adebawale (2014) study the relationship between women's empowerment and the use of permanent contraceptives.

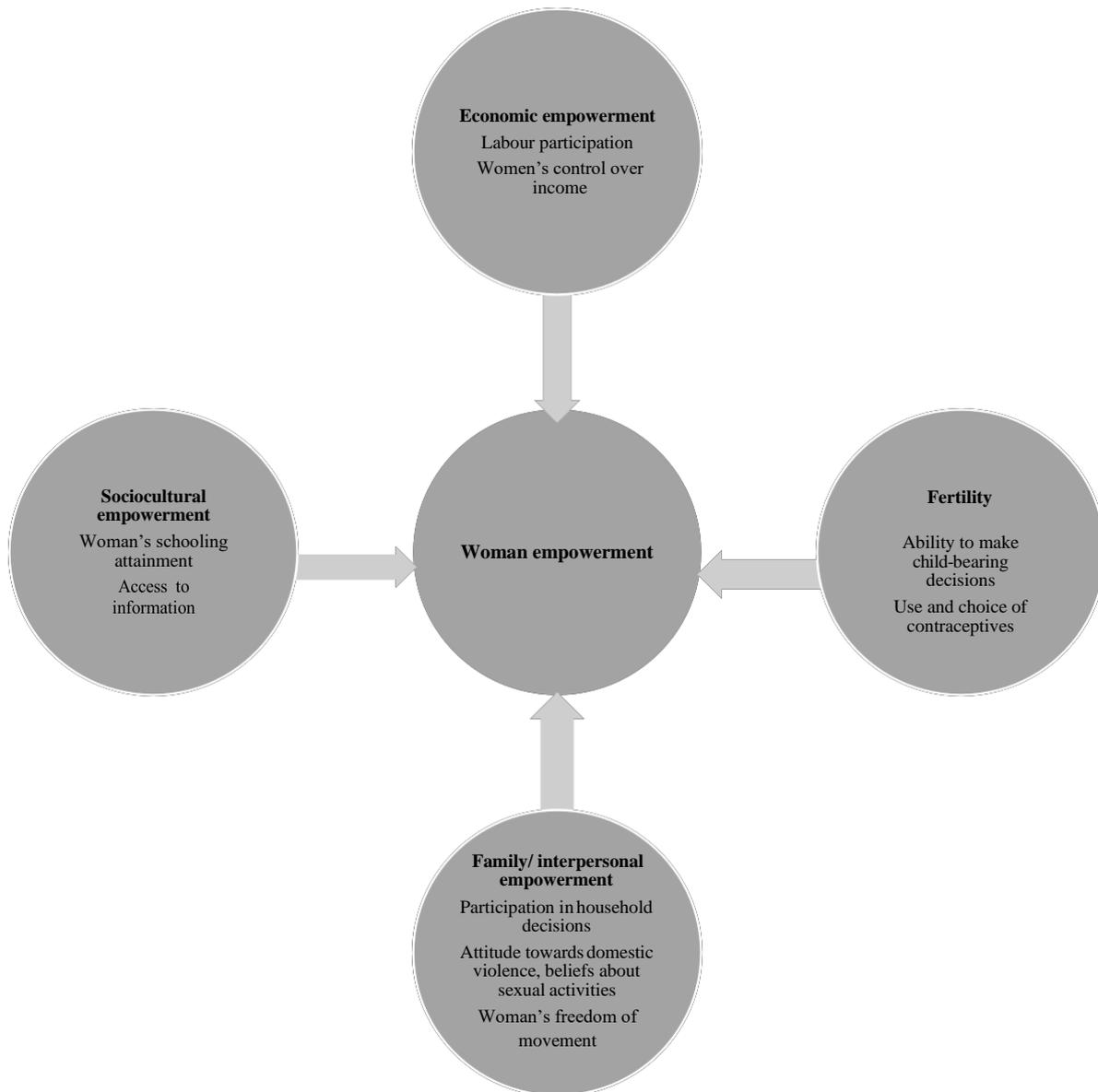
The results from the study suggest that the use of permanent contraceptives was higher among women who have access to family planning programmes, and highly empowered women were most likely to use permanent contraceptives. Bisika (2009) examines gender-based violence and females' access to education in Malawi, and finds that gender-based violence has a negative effect on females' access to primary education. Brown et al. (2006) study sexual violence among Basotho women. The results from the study suggest that women with less education were more likely to suffer from sexual violence than educated women.

In light of the above, this study intends to extend the literature on women's empowerment in Southern Africa, with particular reference to Lesotho, Malawi, and Zimbabwe. A separate multiple correspondence analysis (MCA) is carried out for each country to avoid understating or overstating select countries' achievements in women's empowerment. On the basis of this analysis, conclusions for the region are drawn.

3.2 Conceptual framework

The study rationalizes the multidimensional approach to women's empowerment by adapting a framework from Malhotra (2005) and Miedema et al. (2018). This encompasses four dimensions of a woman's empowerment at the household level. These include economic empowerment, sociocultural empowerment, family/interpersonal empowerment, and fertility, as shown in Figure 1.

Figure 1: Four dimensions of a woman's empowerment



Source: authors' construction.

Figure 1 shows that women's empowerment is a multidimensional concept (Kabeer 1999), as the four dimensions are intricately linked and also converge to establish the concept. Women's labour force participation, access to wage earnings, and control over their own income are important in enhancing women's economic empowerment. Having gainful paid employment brings more economic independence to women, enhances their decision-making power, and improves their access to healthcare and greater contraceptive use (Miedema et al. 2018).

Empowerment of women at the household level increases women's socioeconomic status as it enhances their influence in decisions about the desired number of children, to the benefit of individual and child welfare. Access to information and schooling attainment also play a huge role in the sociocultural women's empowerment domain. Both have an intergenerational effect since women with a high level of schooling are able to take care of themselves, ensure children do not suffer from malnutrition, and are able to make decisions pertaining to fertility (Asaolu et al. 2018). Equipping women with information and education may also lead to an increase in their household decision-making role and freedom of mobility (Mahmud et al. 2012). Such empowered women are

also able to read labels and make better-informed decisions regarding child nutrition and health, thereby providing higher-quality care to their children (Malapit and Quisumbing 2015).

High educational attainment is also positively associated with greater access to communication technologies. *Ceteris paribus*, an educated female can easily access and use technologies and modern means of communication like mobile phones, the internet, television, and other household or societal-level electronic equipment. To some extent, these can work to enhance women's social education, employability, and quality of care given to their families.

Women with greater autonomy in household decisions tend to be less tolerant of domestic violence and have greater mobility (Asaolu et al. 2018). The mobility of women is a crucial indicator of empowerment. Women who can easily move to various locations for education, shopping, and job opportunities without tasking for permission have a high level of independence, which translates to empowerment. Since education is an important potential source of empowerment, the expectation is that women's decision-making, particularly solo decision-making, will increase with education (Kishor and Subaiya 2008).

Empowerment of women is considered as a process in which women challenge existing norms and the culture they live in (Swain and Wallentin 2009). Cultural beliefs play an important role in household decision-making and overall decisions on fertility. Patriarchy is prevalent across almost all cultures, but especially in the Southern Africa region (Stockard and Johnson 1992). Yodanis and Lauer (2004) found a link between adhering to patriarchal values and sexual violence against women. Empowered women are more likely to leave abusive relationships, thereby reducing gender-based violence. Freedom of movement and mobility together with increased household decision-making partially gives women an opportunity to invest in their own health and education (Kabeer 2005). Given the complementary role of these dimensions in explaining women's empowerment, this study utilizes proxies for the indicator variables to measure women's empowerment in the selected countries.

4 Methodology and data

4.1 Multiple correspondence analysis

Women's empowerment indices are normally constructed as weighted averages of the indicator variables used as proxies for the underlying dimensions. The literature review section has shown that the extant literature has constructed women's empowerment indices based on variable weights derived from PCA and CFA. However, we argue that these methods are not suitable for a study of women's empowerment based on our dataset and Section 3.2. PCA and CFA are designed as dimension-reduction methods for linear continuous variables, yet information for some women's empowerment dimensions is captured as non-linear categorical variables (Nenadic and Greenacre 2007; Yalcin and Amemiya 2001). This applies, for instance, to questions on household decision-making, where a woman can make a solo decision, a joint decision with her spouse, or only the spouse can make the decision. On the one hand, PCA unrealistically assumes, in this context, that the categories are ordered and also that the distances between them are the same (Nenadic and Greenacre 2007). On the other hand, MCA is designed for an analysis of non-linear categorical variables, which is its main advantage for this study over PCA (Bazillier and Gouret 2004). MCA also makes fewer assumptions about the underlying distributions of the data, thereby imposing fewer constraints on the analysis (Greenacre and Blasius 2006) and avoids symmetry and heterogeneity problems posed by PCA.

In MCA, weights for proxy variables for each indicator of a women's empowerment dimension are endogenously defined in the scalar index (Bazillier and Gouret 2004). Thus, MCA lets the data speak for itself, instead of assuming any prior economic model or any presumption of efficiency (Ferrant 2014). To some extent, this captures the behavioural patterns of a given population. Because of these advantages, this study proceeds to utilize the weighting structure derived from MCA to reduce the dimensionality of the four domains of women's empowerment into a single women's empowerment index. Importantly, this method is similar to a non-linear PCA.

The analysis commences by operationalizing all indicators for household decision-making, labour force participation, education, fertility, and attitudes towards domestic violence, so that they are made eligible for MCA. This involves first transforming all our indicator variables into categorical variables with the lowest rank attached to the category that shows a low level of empowerment, while a higher rank shows better empowerment. For instance, in the case of education attainment, ranks of 1, 2, 3, and 4 can be attached to no schooling, primary, secondary, and tertiary education holders, respectively. This follows as MCA applies correspondence analysis (CA)¹ to a Burt matrix that is derived by transforming the data set into dummy variables.

The algorithm of joint correspondence analysis (JCA) is then applied to the Burt matrix to solve for poor diagonal fit of MCA. JCA is an analytical algorithm that modifies diagonal blocks of the Burt matrix while maintaining the off-diagonal blocks (Greenacre 2007). Applying JCA rescales the coordinates obtained from the MCA solution to best fit the pairwise cross-tabulations off the main diagonal of the Burt matrix. A sum of the off-diagonal elements of the modified Burt matrix gives eigenvalues. An iterative least squares method is applied to the modified Burt matrix until the diagonal block elements reach a convergence tolerance, which generates JCA inertias (measures of variation in the data) (Greenacre 2007).

The principal inertia is decomposed into percentages explained by dimensions (factors or axes to be extracted). Each dimension is associated with each variable's factor score and a decomposition of its inertia. The proportions of principal inertia accounted for by the dimensions are in decreasing magnitude: the first dimension accounts for the largest percentage, hence factor scores in the first dimension are used as weights to construct the women's empowerment index, which is simply a weighted sum (Greenacre 2007). The results for dimension 1 also show the relative importance of each variable for women's empowerment (i.e. each variable's contribution to the decomposition of variance). Importantly, these results are used to achieve our objective of identifying the important dimension for women's empowerment in select countries. Furthermore, we normalize all indices using the min-max method,² which restricts the indices to between 0 and 1, to mitigate the problem of negative indices at the bottom of the distribution that is associated with negative indicator weights. All this is operationalized using the Stata 2015 statistical analysis package, and individual weights are applied in the analysis so that the results can reflect the full population. Notably, the analysis is carried out separately for each country and the results are compared across countries.

4.2 Data source and choice of women's empowerment indicators

This study uses data from the DHS for Lesotho (2014), Malawi (2015), and Zimbabwe (2015). These were collected using standardized questionnaires by USAID (the United States Agency for International Development). The DHSs contain information on individuals' demographic characteristics, socioeconomic status, and a wide range of health measures. For this study, we limited

¹ This is similar to PCA, but applied to categorical data.

² $(CI - CI_{min}) / (CI_{max} - CI_{min})$. CI = capability index; CI_{min} = minimum value; CI_{max} = maximum value (www.un.org/development/desa/dpad/wp-content/uploads/sites/45/max-min.pdf).

our analysis to data from the couples module, in particular married women and/or women who are cohabitating with their partners, as empowerment measures focus on power dynamics within marriage. These are consequential for women and their children's well-being. The data are based on questionnaires for women and men who are representative of these countries' populations. The empirical analysis is based on women aged 15–49 years. The original sample sizes for the selected countries are shown in Table 3. For the sake of our analysis, we had to drop all individuals who did not have the full set of required information for our analysis, leading to the selected samples in Table 3.

Table 3(a): Unweighted (original) sample for married and cohabitating women by country (ages 15–49)

Women's empowerment indicator	Lesotho (n = 736)				Malawi (n = 3,806)				Zimbabwe (n = 3,499)			
	Mean	Std dev.	Min.	Max.	Mean	Std dev.	Min.	Max.	Mean	Std dev.	Min.	Max.
Household decision-making												
Health decisions	1.963	0.980	1.000	6.000	2.505	1.103	1.000	6.000	1.994	0.980	1.000	6.000
Large purchases	2.188	0.882	1.000	3.000	2.759	1.064	1.000	3.000	2.013	0.886	1.000	3.000
Economic empowerment												
Woman's education	1.565	0.681	–	3.000	1.116	0.632	–	3.000	1.771	0.590	–	3.000
Employment status	0.409	0.492	–	1.000	0.668	0.471	–	1.000	0.440	0.496	–	1.000
Attitude towards domestic violence												
Beating justified if wife neglects kids	0.245	0.643	–	8.000	0.099	0.501	–	8.000	0.242	0.687	–	8.000
Beating justified if wife argues	0.276	0.655	–	8.000	0.084	0.473	–	8.000	0.190	0.602	–	8.000
Beating justified if wife burns food	0.666	0.372	–	8.000	0.069	0.476	–	8.000	0.085	0.436	–	8.000
Fertility												
Read about contraceptives in magazines	0.075	0.263	–	1.000	0.086	0.280	–	1.000	0.204	0.403	–	1.000
Heard about contraceptives on radio	0.240	0.428	–	1.000	0.455	0.498	–	1.000	0.327	0.469	–	1.000
Heard about contraceptives on TV	0.137	0.344	–	1.000	0.104	0.305	–	1.000	0.197	0.398	–	1.000
Age at first birth	20.155	3.275	12.000	35.000	18.541	2.862	9.000	35.000	19.631	3.227	12.000	37.000
Ideal number of children	2.995	1.335	–	7.000	3.845	1.308	–	7.000	3.973	1.340	–	7.000

Note: – represents 0.000.

Source: authors' construction based on DHS data.

Table 3(b): Selected (weighted) sample sizes for married and cohabitating women by country (ages 15–49)

Women's empowerment indicator	Lesotho (n = 736)				Malawi (n = 3,806)				Zimbabwe (n = 3,499)			
	Mean	Std dev.	Min.	Max.	Mean	Std dev.	Min.	Max.	Mean	Std dev.	Min.	Max.
Household decision-making												
Health decisions	1.963	0.980	1.000	6.000	2.505	1.103	1.000	6.000	1.994	0.980	1.000	6.000
Large purchases	2.188	0.882	1.000	3.000	2.759	1.064	1.000	3.000	2.013	0.886	1.000	3.000
Economic empowerment												
Woman's education	1.565	0.681	–	3.000	1.116	0.632	–	3.000	1.771	0.590	–	3.000
Employment status	0.409	0.492	–	1.000	0.668	0.471	–	1.000	0.440	0.496	–	1.000
Attitude towards domestic violence												
Beating justified if wife neglects kids	0.245	0.643	–	8.000	0.099	0.501	–	8.000	0.242	0.687	–	8.000
Beating justified if wife argues	0.276	0.655	–	8.000	0.084	0.473	–	8.000	0.190	0.602	–	8.000
Beating justified if wife burns food	0.666	0.372	–	8.000	0.069	0.476	–	8.000	0.085	0.436	–	8.000
Fertility												
Read about contraceptives in magazines	0.075	0.263	–	1.000	0.086	0.280	–	1.000	0.204	0.403	–	1.000
Heard about contraceptives on radio	0.240	0.428	–	1.000	0.455	0.498	–	1.000	0.327	0.469	–	1.000
Heard about contraceptives on TV	0.137	0.344	–	1.000	0.104	0.305	–	1.000	0.197	0.398	–	1.000
Age at first birth	20.155	3.275	12.000	35.000	18.541	2.862	9.000	35.000	19.631	3.227	12.000	37.000
Ideal number of children	2.995	1.335	–	7.000	3.845	1.308	–	7.000	3.973	1.340	–	7.000

Note: – represents 0.000.

Source: authors' construction based on DHS data.

Women's empowerment indicators

Table 4 shows the women's empowerment dimensions and the corresponding indicators employed in this study. This choice has been informed by Section 3.2, DHS datasets, and the existing literature (cf. Asaolu et al. 2018; Kishor and Gupta 2004; Miedema et al. 2018; Phan 2016; Pratley 2016; Yaya et al. 2018).

Table 4: Women's empowerment dimensions and indicators

Dimension	Indicator
Household decision-making	Decisions on healthcare
	Decisions on large purchases
Economic empowerment	Women's education levels
	Women's employment status
Attitude towards domestic violence	Attitude on whether a wife should be beaten if she neglects children
	Attitude on whether a wife should be beaten if she argues with her spouse
	Attitude on whether a wife should be beaten if she burns food
Fertility	Whether a woman is aware of contraceptive methods
	Woman's age at first birth
	Woman's ideal number of children

Source: authors' construction based on DHS data.

A detailed description of the indicators is presented below. Individual responses for each variable have been coded such that a higher value indicates greater empowerment. 'Don't know' responses have been coded as missing values. We excluded all missing values from the analysis, consequently reducing our country sample sizes as discussed above.

Economic empowerment

In this study, economic empowerment has been proxied by employment status and education. Existing studies (Asaolu et al. 2018; Miedema et al. 2018; Phan 2016) consider women's employment, type of employment, type of earnings received, and a comparison of women's earnings with their partner's. However, for our analysis we only look at whether a woman is employed or not. This follows as a significant number of women reported themselves as unemployed; hence they did not have information related to their position on the job market. Including those variables could have introduced a lot of missing information that could have biased the indices. Also, some of the data sets have missing information on the type of employment and occupation type. However, we coded 1 if a woman was unemployed and 2 if she was employed. This ranking suggests that employed women are more empowered than the unemployed. For education, other studies capture women's literacy levels, levels of education completed, and a comparison of husband and wife's education. However, this study, only focused on women's completed levels of education. This follows as literacy levels were correlated with level of education completed; hence, they were dropped from the analysis. Again, we do not include comparison of women's education with their partners as it portrays women's empowerment poorly. For example, we cannot rule that a woman with a PhD is highly empowered if she is married to a man with a Bachelor's degree. Women's education has been coded as follows: (1) they do not have any education; (2) they completed primary school; (3) they completed secondary school; and (4) they completed tertiary education.

Household decision-making

Indicators for household decision-making are employed as proxies for women's autonomy and freedom. Existing studies on women's empowerment draw from three select decisions: who decides on women's healthcare, who decides on whether women can visit their family/relatives, and who

decides on the household's daily purchases and large purchases? For this study, we focused on household decision-making on healthcare and large purchases. We excluded visitation decisions from the analysis because the responses were highly correlated with those of healthcare decision-making. Responses on daily purchases were poor, hence we excluded the category. Women who make sole household decisions were given the highest empowerment score of 3, while women who make joint decisions with their partner were given an empowerment score of 2, and women who had no say were regarded as disempowered, and thereby given a score of 1.

Fertility

Indicators for fertility considered in the study include awareness on contraceptives, age at first birth, and ideal number of children that a woman wants to have. Awareness on contraceptives is via three methods: radio, TV, and reading in newspapers/magazines. We coded as follows: (1) a woman responded *no* to any of the three methods of awareness; and (2) a woman responded *yes*. Women are therefore said to be empowered if they are aware of contraceptives based on any of the three methods. It is worth noting that answering no to these questions does not indicate a lack of empowerment as the data are not exhaustive of all forms of communication. Many women in African countries, especially those living in rural areas, get information from the clinic and via word of mouth. Age at first birth is an important measure of fertility. Drawing from Asaolu et al. (2018), we depict empowerment as follows: (1) age was less than 15 years; (2) age was 15–17 years; (3) age was between 18–20 years; and (4) age was 21 years and above. For ideal number of children, empowerment was coded as follows: (1) the woman desired more than six children; (2) the woman desired 4–6 children; and (3) the woman desired 0–3 children. We code higher empowerment scores for women who desire fewer children because empowered women are much more likely to desire fewer children than those who are not empowered, especially in an African situation where poverty is rife (Atake and Ali 2019). However, this indicator may be limited as intention may differ from the women's actual number of children.

Attitudes towards domestic violence

Women's empowerment influences attitudes towards domestic violence in the household. Following studies conducted for the Southern African region (Asaolu et al. 2018), we proxied attitudes towards domestic violence by whether a woman justified physical violence based on the following behaviours: if she argues with her partner, if she neglects the children, and if she burned food. This has been coded as: (1) the woman responded *yes*; and (2) the woman responded *no*. We maintain that this variable captures empowerment since liberated women would not tolerate any form of violence; they would point at non-violent ways of resolving issues.

5 Results

The results for our analysis based on MCA and DHS datasets for Lesotho, Malawi, and Zimbabwe are presented in Tables 5 and 6. Table 5 presents the percentage shares (variable means/proportions), weights, variable contributions, and percentage inertia explained by dimension one for Lesotho, Malawi, and Zimbabwe. Table 6 shows the aggregated contribution values for the women's empowerment indicators for each country and the women's empowerment index.

Table 5 :Results from MCA by country

Women's empowerment indicator	Lesotho			Malawi			Zimbabwe		
	Percentage share	Weights	Variable contribution	Percentage share	Weights	Variable contribution	Percentage share	Weights	Variable contribution
Household decision-making									
<i>Who decides on healthcare?</i>									
1. Spouse/partner alone	10.3	-1.637	0.023	32.9	-0.587	0.009	15.0	-0.805	0.008
2. Woman and partner	54.5	-0.093	0.000	51.9	0.357	0.005	54.0	0.033	0.000
3. Woman alone	35.2	0.620	0.011	15.3	0.053	0.000	31.0	0.332	0.003
<i>Who decides on large household purchases?</i>									
1. Spouse/partner alone	8.2	-1.948	0.026	42.8	-0.504	0.009	12.8	-1.097	0.013
2. Woman and partner	82.3	0.181	0.002	51.1	0.437	0.008	63.3	0.321	0.005
3. Woman alone	9.5	0.106	0.000	6.1	-0.120	0.000	23.9	-0.262	0.001
Economic empowerment									
<i>Women's education</i>									
1. No education	2.2	-1.197	0.003	14.0	-1.041	0.013	1.4	-2.227	0.006
2. Primary education	46.7	-1.188	0.055	64.9	-0.438	0.010	30.3	-1.629	0.067
3. Secondary education	41.4	0.633	0.014	18.9	1.686	0.045	61.5	0.405	0.008
4. Higher education	9.7	3.297	0.088	2.2	5.132	0.048	6.8	4.024	0.092
<i>Employment status</i>									
<i>Are you employed?</i>									
1. No	53.6	-0.610	0.017	32.2	-0.247	0.002	54.2	-0.485	0.011
2. Yes	46.4	0.704	0.019	67.8	0.118	0.001	45.8	0.573	0.013
Attitude towards domestic violence									
<i>Beating justified if wife neglects children</i>									
1. Yes	20.7	-2.831	0.138	8.1	-5.637	0.214	19.9	-2.457	0.100
2. No	79.3	0.741	0.036	91.9	0.496	0.019	80.1	0.612	0.025
<i>Beating justified if wife argues with spouse</i>									
1. Yes	22.3	-3.292	0.202	6.4	-6.369	0.217	16.3	-3.240	0.142
2. No	77.7	0.946	0.058	93.6	0.437	0.015	83.7	0.630	0.028
<i>Beating justified if wife burns food</i>									
1. Yes	4.6	-3.954	0.060	4.6	-6.907	0.183	7.1	-3.666	0.080
2. No	95.4	0.191	0.003	95.4	0.333	0.009	92.9	0.281	0.006

Fertility									
<i>Read about contraceptives in magazines/news in the last few months</i>									
1. No	7.5	-0.212	0.003	8.3	-0.231	0.004	18.3	-0.624	0.027
2. Yes	92.5	2.624	0.043	91.7	2.551	0.045	81.7	2.778	0.118
<i>Heard about contraceptives on the radio in the last few months</i>									
1. No	25.9	-0.464	0.013	43.8	-0.490	0.011	33.3	-0.423	0.010
2. Yes	74.1	1.324	0.038	56.2	0.627	0.014	66.7	0.843	0.020
<i>Heard about contraceptives on TV in the last few months</i>									
1. No	16.0	-0.447	0.014	9.3	-0.306	0.007	7.1	-0.535	0.020
2. Yes	84.0	2.347	0.073	90.7	3.006	0.070	82.9	2.594	0.096
<i>Age at first birth</i>									
1. Less than 15 years	0.8	-0.635	0.000	4.9	-0.970	0.004	2.1	-1.557	0.004
2. 15–17 years	16.5	-1.336	0.025	30.4	-0.577	0.008	24.2	-1.027	0.021
3. 18–20 years	40.7	-0.181	0.001	44.9	0.043	0.000	42.2	-0.372	0.005
4. 21 years and above	42.0	0.713	0.018	19.8	1.031	0.018	31.5	1.391	0.051
<i>Ideal number of children</i>									
1. More than 6 children	0.5	-2.503	0.002	1.4	-0.400	0.000	0.2	0.252	0.000
2. 4–6 children	34.3	-0.547	0.009	64.9	-0.262	0.004	72.0	-0.307	0.006
3. 0–3 children	65.2	0.306	0.005	33.7	0.520	0.008	27.8	0.797	0.015
Principal inertia explained by one dimension		69.65			47.91			66.29	

Source: authors' construction based on DHS data.

Table 6: Aggregated women’s empowerment dimensions and women’s empowerment index by country

	Lesotho	Malawi	Zimbabwe
Household decision-making	0.062	0.031	0.03
Economic empowerment	0.196	0.119	0.197
Attitude towards domestic violence	0.497	0.657	0.381
Fertility	0.244	0.193	0.393
WE index	0.453	0.515	0.485
WE index (pooled)	0.507	0.506	0.486

Source: authors’ construction based on DHS data.

5.1 Percentage share

For each question’s response category, this is the percentage of women whose response to the question falls within that category. Statistics for household decision-making on healthcare and large purchases show that a large percentage of women make joint decisions with their husbands across the three countries. Using the case of health, this applies to 54.5 per cent in Lesotho, 51.9 per cent in Malawi, and 54 per cent in Zimbabwe. Turning to sole decision-making by women, 35.2 per cent of Basotho women, 31.3 per cent of Zimbabwean women, and 15.3 per cent of Malawian women fall into this category for healthcare decisions. For large purchases, Zimbabwe has a relatively large percentage of women who make sole decisions (23.9 per cent), followed by Lesotho (9.5 per cent) and Malawi (6.1 per cent). This could be because husbands are absent (working away from home), so it is by default that the women make decisions. Generally, after joint decision-making, Malawian women appear to be the least empowered in this indicator as most of their decisions for both large purchases and healthcare are taken by men.

In terms of statistics for economic empowerment indicators, a woman’s highest level of education and employment status show that Malawi has the largest percentage of employed women (67.8 per cent), followed by Zimbabwe (45.8 per cent) and Lesotho (46.5 per cent). However, the picture changes when we consider education. Women in Malawi are least educated compared to Lesotho and Zimbabwe. For instance, 78.9 per cent of Malawian women’s highest level of education is primary and below, while this is 48.8 per cent in Lesotho and 31.8 per cent in Zimbabwe. This ranking also applies to secondary education, as 61.5 per cent of Zimbabwean women attained this education level, which was 20.1 and 42.6 percentage points higher than those for women in Lesotho and Malawi. Higher education was least achieved by women across the three countries (9.7 per cent, 6.9 per cent and 2.2 per cent in Lesotho, Zimbabwe, and Malawi respectively).

Looking at the attitudes towards gender-based violence, Lesotho has a relatively large percentage of women who tolerate this violence, followed by Zimbabwe and Malawi, respectively. Thus, Malawian women are relatively more empowered in this dimension. This is consistent with Ewerling et al.’s (2017) findings in which, out of 34 African countries, Malawi ranked first in empowerment of women related to attitude towards domestic violence, Zimbabwe ranked ninth and Lesotho ranked tenth. For instance, 20.7 per cent of Basotho women tolerate being beaten if they neglect children, compared to 19.1 per cent and 8.1 per cent for Zimbabwean and Malawian women, respectively. This order of responses also applies to tolerance of beating when a woman argues with her spouse (see Table 5). However, a relatively larger percentage of Zimbabwean women are tolerant of beating if a wife burns food (7.1 per cent compared to 4.6 per cent for Lesotho and Malawi). In general, women in all three countries have a low tolerance for beating when they burn food, compared to neglecting children and arguing with a spouse.

For the fertility dimension, contraceptive use awareness is quite high across the countries, with over 80 per cent of women informed about contraceptives via reading newspapers/magazines and

watching television. Awareness via radio is also high across the countries, ranging from 56.2 per cent in Malawi to 74.1 per cent in Lesotho. In the case of a woman's age at first birth, a large percentage of women in Malawi and Zimbabwe gave birth when they were aged 18–20 years (44.9 per cent and 42.2 per cent, respectively), while for Lesotho this applies to women aged 21 years and above (42 per cent). For births at ages 15–17 years, Malawi has the highest share of women in this cohort (30.4 per cent), followed by Zimbabwe (24.2 per cent) and Lesotho (16.5 per cent). To some extent, this suggests that teen pregnancies are relatively higher in Malawi compared to other countries. First birth age less than 15 years is low across countries, at 0.8 per cent for Lesotho, 2.1 per cent for Zimbabwe, and 5 per cent for Malawi. Turning to the ideal number of children, 4–6 children is the highest desired number for Zimbabwe and Malawi, while for Lesotho it is 0–3 children. In general, all three countries have a low desire for more than six children, with less than 2 per cent of women in this category, as shown in Table 5. These statistics show that the percentage distribution of women across indicators in different women's empowerment dimensions varies across countries, which calls for an analysis of the relative weights of these variables and their contributions to the women's empowerment index.

5.2 Weights

In Table 5, column 2 for each country displays the weight for each variable (i.e. constructed from the MCA). As discussed earlier, these weights are factor scores based on the first dimension of the MCA output as it captures the largest percentage of total inertia (i.e. principal inertia). Principal inertia is expressed as a percentage of total inertia (represents the percentage of total variation in the data) that is explained by the corresponding principal dimension (Greenacre 1998). The results for this study show that the first dimension explained 69.65 per cent of total inertia for Lesotho, 66.29 per cent for Zimbabwe, and 47.91 per cent for Malawi.

The weights for each variable across the empowerment dimensions in Table 5 show that in most cases the magnitude increases as the indicator variables reflect higher empowerment (this positively contributes to the women's empowerment index), while components that reflect lower empowerment have negative weights (negatively contribute to the women's empowerment index). For example, in Lesotho, completing higher education, reading about contraceptives in magazines/newspapers increases the women's empowerment index score, while being unemployed and giving birth at younger than 15 years decreases it. The weights conform to expectations. For instance, looking at the highest education level completed, women with no education are the least empowered, thereby corresponding to a lower weight, and women who completed higher education are most empowered, shown by having a higher weight. This is consistent for all other variable questions, such as attitude towards domestic violence and contraceptive use, except for household decision-making, where joint decision-making is highly weighted.

5.3 Variable contributions

The contributions of each variable to the variation in data explained by dimension 1 has been obtained from a decomposition of the variance. The results are shown in Table 5 under the column labelled *variable contribution*, as percentages contributed by each variable to dimension 1, and therefore the empowerment index. The variable contributions sum to 1 for each country. We aggregate contributions for the indicators of household decision-making, economic empowerment, attitudes towards domestic violence, and fertility for each country to obtain the relative contributions of the dimension to the women's empowerment index, as shown in Table 6. The statistics generally show that attitudes towards gender-based violence have the largest contribution towards women's empowerment, followed by fertility, economic empowerment, and household decision-making. For the specific countries, this ordering applies to Malawi and Lesotho, while in Zimbabwe the only difference is that fertility is more important than attitudes towards gender-based violence. In Lesotho, attitudes towards gender-based violence contributed 49.7 per cent, fertility 24.4 per cent, economic

empowerment 19.6 per cent, and household decision-making 6.2 per cent. For Malawi this was 65.7 per cent for attitudes towards gender-based violence, 19.3 per cent for fertility, 11.3 per cent for economic empowerment, and 3.1 per cent for household decision-making. The case for Zimbabwe shows that gender-based violence contributed 38.1 per cent, fertility 39.3 per cent, economic empowerment 19.3 per cent, and household decision-making 3 per cent. These results suggest a need to improve the role of household decision-making and economic empowerment in women's empowerment.

5.4 Empowerment index

The women's empowerment index ranges between 0 and 1. A higher magnitude implies a relatively higher achievement towards women's empowerment. The results in Table 6 suggest that Malawi is the most empowered, with a women's empowerment index of 51.5 per cent, followed by Zimbabwe with 48.5 per cent and finally Lesotho with 45.3 per cent. We pool the country data sets so that we can compare the women's empowerment index across the countries. The pooled results suggest that Lesotho is the most empowered, with a women's empowerment index of 50.7 per cent, followed by Malawi with 50.6 per cent and finally Zimbabwe with 48.6 per cent. However, the magnitudes of these indices suggest that women in these countries are yet to be empowered, especially where the index is below 50 per cent. This implies that governments in these countries need to prioritize women's empowerment, especially for the sake of socioeconomic development.

6 Discussion and conclusion

This empirical analysis aimed to measure women's empowerment for Southern African countries and identify the important dimensions of women's empowerment at the household level. Our study builds upon existing developing countries studies (Asaolu et al. 2018; Ewerling et al. 2017; Miedema et al. 2018; Phan 2016) that employ a statistical methodology to measure women's empowerment from a multidimensional approach. This is the first study to use MCA to construct a women's empowerment index at the household level for selected Southern African countries. Unlike previous studies, this study is conducted across countries rather than presenting a pooled country analysis of women's empowerment.

The results for this study are consistent with the underlying hypotheses. They show that our household-level dimensions do not carry equal weight in the women's empowerment index. Attitudes towards domestic violence emerged as a key driver of women's empowerment across the three countries, while household decision-making carried the least importance. This harmonizes with previous studies (Asaolu et al. 2018; Ewerling et al. 2017) that found attitudes towards violence to be a prominent indicator for women's empowerment in Africa. A review of intimate violence justification by Waltermaurer (2012) reveals that a sizeable number of women in this region tend to justify gender-based violence. This has a negative impact on women's status, reduces their self-confidence, and compromises down their dignity.

There are several factors that contribute to the ongoing domestic violence against women in Southern Africa. First, the discriminatory sociocultural attitudes against women reinforced by cultural traditions. Second, the fact that domestic violence is still being treated as a private matter. Third, women's rights are still violated, regardless of guarantees of equality in the constitution. Fertility emerged as the second important women's empowerment dimension. These results are consistent with those of Atake and Ali (2019). Women's empowerment is an increasing function of the use of contraceptives. The results ranked economic empowerment as the third most important dimension for women's empowerment (i.e. just above household decision-making). These results are in contrast

with a similar study of women's empowerment in Africa: Asaolu et al. (2018) found that labour force participation was a prominent indicator. This could be due to the fact that a fairly large proportion of women in our sample, more than 50 per cent, are unemployed.

Household decision-making emerged as the smallest contributor to the women's empowerment index across all countries. This finding is consistent with those of Asaolu et al. (2018), who found little evidence to support household decision-making as an important women's empowerment dimension in Southern Africa. Despite regional differences, our results on household decision-making are consistent with those for East Africa (Miedema et al. 2018) and South East Asia (Phan 2016). There is also an overlap of a higher percentage of joint decision-making in Southern Africa and East Africa, as found by Miedema et al. (2018).

Our statistical analysis showed that a low proportion of women make sole decisions concerning household activities, whereas a large proportion of women make joint decisions with their partners. In practice it makes sense for partners to make household decisions together, especially for large purchases such as buying a car, as both partners' utility is supposed to be increased when consuming this household public good. As a result, empowerment of women in this dimension is less strongly reflected in the empowerment index.

Our select countries also exhibited different levels of women's empowerment, with Malawi faring better than Zimbabwe and Lesotho, which both have an empowerment index of less than 50 per cent. Malawi's relatively high achievement in women's empowerment could be a result of high employment (67.8 per cent are employed) and relatively low tolerance of gender-based violence. On the basis of these results we conclude that, overall, married women aged 15–49 years in Southern Africa are still under-empowered. Notably, our results differ from Ewerling et al. (2017), where Lesotho was the most empowered, followed by Zimbabwe and Malawi. This difference could be partly because older data sets were used by Ewerling et al., whereas we used the latest data sets (Lesotho 2009 vs Lesotho 2014; Malawi 2010 vs Malawi 2015; and Zimbabwe 2010 vs Zimbabwe 2015), and women's empowerment across the countries could have evolved over this period. Looking at the pooled empowerment indices, Lesotho and Malawi fare better than Zimbabwe, with both having an empowerment index just above 50 per cent while Zimbabwe still ranks below 50 per cent.

Based on our findings, strategies to empower women in the selected countries should place much greater focus on domestic violence and fertility as these are the key drivers of the low achievement uncovered by this study. Given resource constraints in the region, measures to improve women's empowerment should place more emphasis on alleviating domestic violence. Also, that economic empowerment did not play a major role in women's empowerment in these countries is worrisome, possibly because of how it was narrowly captured by employment status due to data constraints. Hence, there is a need for further studies on this outcome. The results also attest to the relevance of a regional rather than a country-specific stance towards empowering women in Southern African countries. For instance, there is a need for regional strategies to educate society about a need to change social norms and attitudes towards domestic violence.

This study also has some limitations. First, only married/cohabiting women were included in the study as empowerment measures focus on power dynamics within couples, which are consequential for women and their children's well-being. This could have biased our results as it is possible that empowered women are not married, or will marry later in life. Also, the design of the DHS questionnaires poses a limitation on capturing domestic violence and fertility preferences. For instance, the way the questions are asked on justification of wife-beating do not present alternative options for resolving disputes. For fertility preferences, the number of children desired by a woman may not be reflective of the number of children the woman ends up having, especially in an patriarchal context in which some women are coerced by their husbands into having more than the

desired number of children. Hence, there could be a gap between desire and outcome in this case. Additionally, our measurement of women's empowerment was constrained by the inability to include more Southern African countries due to data issues. Finally, we note that there is a trade-off on cross-country comparisons of the women's empowerment index versus the detailed understanding of the drivers of women's empowerment in individual country contexts as the same variables are used. Furthermore, the data do not contain information we can use to explain differences in the women's empowerment index across countries.

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