Development of the Gender Roles and Male Provision Expectations Scale

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ABSTRACT

Existing composite measures assess the extent to which women and men support masculinity ideals concerning the expectation that men should provide for their partners and families. In many contexts across sub-Saharan Africa, the male provider role is taken as given. This core masculinity tenet may be associated with related gender role expectations that result in increasing young women's risk of HIV, especially within the context of transactional sex relationships. Extant literature points to five domains potentially associated with male provider role expectations: male authority, men's sexual decision-making control, women's sexual agency, women's economic dependence, and love. The goal of this study was to develop the Gender Roles and Male Provision Expectations (GRMPE) scale toward understanding whether beliefs attached to male provider role expectations increase HIV risk. We developed the GRMPE across three research phases with young women (ages 15-24) in Central Uganda that (1) used qualitative data to refine domains and develop scale items; (2) cognitively tested the refined items; and (3) pilot tested a 26-item scale across five domains with 108 young women. Using confirmatory factor analyses, we retained 15 items across four factors, corresponding to the domains of male authority, sexual decision-making, women's sexual agency, and love; which we then modeled as indicators in a single second-order factor model. The GRMPE demonstrated initial reliability and validity, and tests of criterion validity found significant associations with known HIV risk behaviors. The GRMPE scale shows promise for better examining the determinants of HIV risk and assessing gender norm change interventions.

Key words: male provider role, sub-Saharan Africa, HIV, gender inequality, Uganda

INTRODUCTION

Across sub-Saharan Africa, the majority of HIV transmission takes place through heterosexual sex, and women, particularly young women, continue to be disproportionality affected (UNAIDS, 2021). Alongside biological determinants, entrenched systems of gender inequality contribute to the social and structural factors that place young women at increased risk (UNAIDS & STRIVE, 2018). Research addressing how gender inequality structures women's HIV risk has focused on the interpersonal and individual level to the detriment of examining whether and how broader gender norms and expectations influence relationship dynamics and risk.

An enduring fundamental gender expectation across much of sub-Saharan Africa, propagated by colonial and missionary authorities, is that men should lead and provide for the family; while women should nurture and care for the family (Ferguson, 1999; Mojola, 2014). While association of men with provision, and the corresponding "male provider role," is fundamental to the production of masculinity across the globe (Gilmore, 1990; Pleck & Pleck, 1997; Zuo, 2003), it has been described as particularly central to the production and reproduction of dominant masculinity across contexts in sub-Saharan Africa (Hunter, 2002, 2005, 2010; Wyrod, 2008, 2016). Masculine identity is in part legitimized through men's ability to provide material and financial support to their loved ones, including a girlfriend or spouse (Bhana, 2015; Morrell et al., 2012). Given gender inequalities in access to economic capital, and high levels of unemployment, particularly among youth, in many burgeoning urban centers across sub-Saharan Africa, women also have a strong motivation to uphold male provider role expectations toward improving their own chances for economic security. However, exhorting expectations of male provision may result in negative consequences. First, this may serve to reify gender unequal

access to wealth and capital (Hunter, 2010). Second, by continuing to endorse the expectation that men should provide for them, women may yield (even more) power to men in domains that could put their health at risk. For example, women may "bargain with patriarchy" by giving up sexual decision-making power (Kandiyoti, 1988), and therefore increase their sexual health risk.

These concerns may be particularly relevant to women within the context of transactional sex relationships, specifically. Practicing transactional sex, or engaging in "noncommercial, nonmarital relationships motivated by the implicit assumption that sex will be exchanged for material support or other benefits" (Stoebenau et al., 2016), has been shown to nearly double women's risk of HIV in contexts with high HIV prevalence (Wamoyi et al., 2016), and is recognized by young women themselves as risky (Kyegombe et al., 2020). These are sexual relationships that are *primarily motivated*, for women, by access to economic resources, and for men, by access to sex, and extend from broader gender expectations and corresponding roles for men and women in relationships: men should provide material support, and in exchange, women should offer men sexual and domestic services (Mains, 2013; Mojola, 2014).

In this study, we describe the development of a measure that can be used to begin to address the potential health consequences of endorsing beliefs and adhering to gender roles that correspond to male provider role expectations. We developed a scale—The Gender Role and Male Provision Expectation (GRMPE) scale—intended for use within heterosexual relationships in sub-Saharan Africa that specifically captures gendered beliefs associated with, or extending from, expectations of male provision. While acknowledging sample size limitations, we also assessed whether stronger endorsement of these beliefs among young women was associated reporting practices that would increase sexual health risk, including transactional sex.

Unique Contributions of the Gender Role and Male Provision Expectations Scale

By assessing gender role expectations *conditioned on* or *associated with* the male provider role, the GRMPE scale differs in important ways from prior measures of gender roles or norms. Scales developed and tested in the U.S. and Western Europe set out to identify the extent to which women and men endorsed the male provider role in and of itself, and found sustained levels of endorsement over time (Hood, 1986; Thompson et al., 1992; Wilkie, 1993). Measures have also been developed to assess whether men experience stress resulting from efforts to enact these entrenched masculine gender role expectations (O'Neil, 2008). One example of the latter is the Gender Role Conflict/Stress Scale which captures the extent to which the strain of meeting masculine gender role expectations can carry negative effects on men's health and wellbeing (O'Neil, 2008; O'Neil et al., 1986).

Few efforts have been made to test the salience of these scales in sub-Saharan African contexts. One exception was the work of Gottert et al. to test whether measures of gender role conflict/stress were adaptable to the South African setting (Gottert et al., 2018; Gottert et al., 2016). They found that while many of the scale items were relevant, they had to drop items that captured adherence to male provision expectations because they were so universally endorsed (Gottert et al., 2016). This finding underlines the centrality of male provider expectations in at least some sub-Saharan African settings, and thus the rationale for this study to consider gender role beliefs and expectations conditioned on or associated with male provider role expectations. The GRMPE scale begins with the assumption that male provider role beliefs are generally upheld and endorsed. For example, the GRMPE scale assesses whether when men provide, respondents expect men should then hold greater sexual decision-making control.

Other important measures of gender expectations have been successfully adapted in African contexts. The Gender Equitable Men's scale (GEM) captures levels of adherence to gender-traditional roles for men and women in the domestic and public sphere more broadly (Pulerwitz & Barker, 2008). The Sexual Relationship Power Scale assesses gender power dynamics within a current sexual relationship (Pulerwitz et al., 2000). These scales have contributed to demonstrating that gender inequitable beliefs and unequal relationship power dynamics, respectively, are associated with intimate partner violence and women's sexual health risks (Barker et al., 2010; Jewkes et al., 2010; Shannon et al., 2012). Neither of these scales focus on gender expectations or beliefs associated with the male provider role explicitly, which may be particularly important for understanding women's sexual health risk, particularly in the context of relationships motivated by men's financial support in these settings.

Domains Associated with Male Provision Expectations in sub-Saharan Africa

Existing literature from sub-Saharan Africa addressing gender dynamics, particularly in transactional sex relationships, suggests there are gender roles and beliefs associated with the male provider role across five domains: men's sexual decision-making control, men's authority in intimate relationships, women's use of sexual power or agency, the links between men's provision and love, and women's economic dependence on men. We describe these in turn.

First, a number of studies suggest that within relationships characterized by male provision (this includes, e.g., monetary support toward school fees, rent, airtime-or phone credit; and/or material support such as food, cosmetics, medicines, household items etc) women and men expect men to hold greater sexual decision-making power (Jewkes et al., 2012; Stoebenau et al., 2019; Wyrod, 2016). This expectation may be rooted in the union formalization practice of bridewealth exchange—or payment made by the future groom's kin to the future bride's kin—

which effectively transfers the rights and claims over the bride's domestic and reproductive labor from the bride's kin to that of the groom's (Horne et al., 2013). Bridewealth payment remains associated with expectations of male reproductive control (Dodoo et al., 2014; Dodoo et al., 2020). As marriage practices have become less formal in many contexts, the expectation that men's provision of financial support will be exchanged for sexual services has extended to non-marital relationships (Ankomah, 1998; Hunter, 2010), and so too may expectations of men's control over sexual decision-making in such relationships.

Second, male authority may also be associated with provision. Men who can live up to provider expectations are afforded respect and authority by other men (Hunter, 2005; Swidler & Watkins, 2007), as well as by women. By providing, men demonstrate their capacity to serve in the conventional role of household head; which may mean that male provision earns men further relationship authority (e.g., decision-making power in the relationship more broadly). However, it is also possible that men's authority in relationships is expected independent of provider masculinity, as in much of sub-Saharan Africa, it is taken as given that men are the "leaders" of the household (or relationship) (Wyrod, 2016).

Next, one of the few sources of power that women wield over men in many sub-Saharan African societies is that of "erotic power"(Groes-Green, 2013). Corresponding with the social construction of men's desire for sex as insatiable, women who can use their sexuality to attract the attention of providing men have an opportunity to secure necessary financial resources (Leclerc-Madlala, 2003; Stoebenau et al., 2013; Wamoyi et al., 2011). Women's wielding of such sexual agency could be understood as a form of resistance to patriarchy (Kandiyoti, 1988). Women describe purposely seducing providing men with derogatory terms such as "skinning the goat" (Maganja et al., 2007) or "milking the cow" (Hawkins et al., 2009). In Uganda, there is a

term used to describe the act of extracting resources from providing men without offering expected sex in return: "de-toothing" (Bohmer, 2000; Kyegombe et al., 2020). Some have argued, however, that while young women may display agency in attracting providing men, this does not change the expectation of men's control over sexual decision-making (Jewkes & Morrell, 2012), serving to potentially further women's risk within relationships motivated by provision expectations.

Alternatively, men's provision of material support has also been described by both men and women as indicative of men's love and commitment to their partner. Studies throughout the region emphasize the degree to which love and money are tightly intertwined in relationships (Ankomah, 1992; Mojola, 2014; Poulin, 2007). Across many sub-Sahara African contexts, and in contrast to the West, money does not pollute notions of "pure love," but rather, enhances it (Mojola, 2014). Further, men and women understand that women's offering of sex is, likewise, an expression of love (Mojola, 2014). Love, sex, and men's provision of material support may be complexly interwoven.

Finally, strong expectations that men should be the primary providers in a household or relationship imply that women should not play this role, nor aspire to do so. Therefore, one might expect that those who uphold male provider expectations would also uphold expectations that women should be economically dependent on men. Research demonstrates men's expectation of this relationship dynamic (Manji et al., 2020; Stern et al., 2018; Wyrod, 2016). Research with women is more conflicted; while in some contexts women express they need to rely on men (Stoebenau et al., 2011), or ought not to work outside the home (Stern et al., 2018), in other studies many women do not hold such beliefs (Kandiyoti, 1988; Stern et al., 2018; Wyrod, 2016).

Introduction to Study Setting and Three-phase Study Design

We present the findings from the development and initial assessment of the GRMPE scale across three phases. The first phase aimed to develop an initial set of scale items across salient domains using qualitative data, including interviews and focus group discussions. The second phase included two rounds of 16 cognitive interviews to refine the wording of scale items. The third phase aimed to assess the GRMPE scale's structure, fit, and potential criterion validity. To do so, we administered a pilot questionnaire (n = 108) and then conducted psychometric analysis and bivariate and multivariable regression.

All three phases were conducted between 2017 and 2018 in the capital city of Kampala, and in rural communities in the Masaka District of Uganda (located 140 kilometers southwest of Kampala). We chose these settings because we were able to leverage extensive formative research the co-authors had conducted on transactional sex in these sites toward initial scale item development. We were also encouraged that prior studies on transactional sex in Uganda had identified underlying gendered motivations for the practice (e.g., Bell, 2012; Bohmer, 2000; Hoeffnagel, 2012; Nyanzi, 2004; Nyanzi et al., 2001; Sadgrove, 2007) that were largely similar to those found in other settings across sub-Saharan Africa (as reviewed in Stoebenau et al, 2016).

Study Population

Primary data collection focused on unmarried 15 to 24 year old adolescent girls and young women (AGYW) who had ever had sex given this demographics' disproportionate risk to HIV through engagement in transactional sex (Wamoyi et al., 2016). For all phases, the sample was stratified by district (Kampala, Masaka) and age group (15-19; 20-24) to capture any regional or age group differences in gender role expectations and beliefs. Within Kampala, we also captured differences in socio-economic status, sampling from both lower and middle-

income communities. For qualitative methods, this entailed capturing groups of 15-19 year olds both in school and out of school; and for 20-24 year olds this included University students, and women who had been recruited from high-risk settings, specifically, nightclubs, bars, and video parlors. Further details concerning recruitment and sampling for the pilot questionnaire, specifically, are detailed within the methods section of phase three below. See Table 1 for description of the sample and methodology across phase.

Phase 1: Formative Research to Identify Scale Items

Method

We developed the initial scale items across five domains through literature review and secondary analysis of qualitative data; and began to refine these items and their domains through primary qualitative data collection.

Procedure

We conducted a secondary analysis of qualitative data that included focus group discussions (n = 19) and in-depth interviews (n = 44) with women and men in Kampala and the Masaka district with different demographic profiles (aged 14 years and older in school, aged 14-17 out-of-school, aged between 18-24, and aged 35 and older) collected in 2014 as part of a study on transactional sex and sexual exploitation (Kyegombe et al, 2020). These data directly addressed the role of material support in sexual relationships and therefore offered an opportunity to compare evidence drawn from the literature with this study context.

Following the secondary analyses of these data, we developed an initial set of 50 scale items, drawing from participants' perspectives and experiences. The scale comprised items across each of the five domains described above. We developed 10 items per domain for initial scale development, anticipating we would eliminate many as we refined the scale (DeVellis,

2003). In each domain, items ranged in the extent to which provision did or did not influence a gender role expectation. The items also varied in valence, with a few negative statements in each domain.

We assessed the initial scale items, and explored the salience of the five domains, through primary data collection including ten focus group discussions (FGDs) with young women. The FGDs were conducted in private settings with six to ten 15-24 year old participant women in early 2017. The FGDs were moderated by two female qualitative research assistants from the same region of Uganda who had also worked on prior studies on the meaning and measurement of transactional sex with co-authors.

The FGDs served as a basis for furthering scale development in at least two ways. First, the FGDs used a qualitative vignette to understand more closely how power dynamics and women's agency change in the context of male provision. Specifically, participants were asked to describe how a romantic relationship would unfold, first in general, and then under the condition that the man had been providing significant financial support to the young woman. Second, the FGDs served as a basis for beginning to assess initial scale item comprehension, and response category preferences and usability. Participants were asked to provide independent responses to scale items, and their numeric responses were then recorded. In cases where there was significant variation in response, no variation, or where there were indications that participants did not understand the statement, a brief discussion of that statement would follow.

Qualitative Analysis

For the secondary analysis of qualitative data, we brought the data into Atlas.ti (version 7) for deductive coding to capture data on the domains of male authority, sexual decision-making, women's agency, love, and economic dependence. In addition, we used inductive

coding to identify additional beliefs attached to male provision for potential inclusion in the development of the scale.

Likewise, primary FGD data were verbatim transcribed and translated and brought into Atlas.ti for coding. Coding included both deductive codes developed from the field guide as well as inductive codes that captured key beliefs and perspectives related to provision. The lead author conducted the coding work and consulted with the local research team on the findings. Discussion of scale items were coded for comprehension and relatability.

Statistical Analysis

The FGD participants' numeric responses to the scale items were brought into Excel and consolidated across FGD by item. We calculated the mean, overall variance, between and within group variance, and intra-cluster correlation scores to assess the percent of the total variance explained by differences between groups. We also compared responses across sites, as studies of transactional sex note different sets of motivations and gender ideologies across urban (and relatively better-off) as compared to rural (and relatively impoverished) settings (Stoebenau et al., 2016). Quantitative findings were compared to textual data analysis. These findings were then reviewed with a psychometrician toward refining items within each domain for phase two.

Results

Qualitative Findings

Our qualitative findings from both secondary and primary data sources further supported the conceptual basis for the GRMPE scale–participants strongly asserted that men are expected to provide material support to their partners within relationships. For both men and women, it was understood as "natural" that men provide for their partners. As one young man in a focus

group explained, "It was created for a man to provide for a woman." There was, however, debate with respect to the gender roles and beliefs attached to the expectation of male provision.

First, there was a high level of variation across participants' beliefs about the extent to which men should hold sexual decision-making power in the context of provision. Within the relationship vignette, once the moderator emphasized the man's role as a provider, most, but not all, participants, altered their initial insistence on women's decision-making power around sex to suggest instead that the man should hold such power. As one participant from a focus group of 15-19 year olds from Kampala explained, "She has to do everything that [he] has asked her to do in order to get what she wants…" That said, few participants agreed that men should have decision-making power over condom use, even when they are providing.

Young women also debated women's sexual agency in relationships. Women described using their sex appeal to attract and retain providing men, and discussed efforts to "de-tooth" men. Some women expressed doubt about whether de-toothing was fair to men, and also debated whether it was dangerous, as it might incite violence. Finally, women described challenges with balancing relationships with those they love as compared to those they attract and maintain primarily for financial support, and debated the morality of maintaining multiple, concurrent relationships.

There was extensive discussion concerning the linkages between *male provision and love*. The discussions resonated with two ideals described in the literature—that provision is associated with love (Mojola, 2014), and that provision begets love (Maganja et al., 2007). These ideas were brought together in the relationship vignette once it focused on the man's role as a provider, as the following participant from a focus group with 15-19 year olds from rural Masaka demonstrates: "Jane's feelings increase because she says that if he has given me all this money, it

means that he really loves me. Jane loves Peter more." Nonetheless, some women also insisted that love could exist absent of provision—at least in the short-term. Most women agreed that if the man they "truly loved" never provided for them, then this almost certainly meant he did not love them.

The relationship between male relationship authority and provision remained less clear throughout the focus group discussions and other related formative work. There was some suggestion that men's relationship authority might increase with his level of provision, but there was also an indication that men were understood as the authority figure, regardless. As one participant from a focus group with 15-19 year olds in rural Masaka described, "He has to make the decisions because he is the one who is giving you the money *and* he is the one who has the power" (emphasis added to original).

Likewise, the relationship between male provision and expectations of women's economic dependence were less clear. In contrast to other settings in sub-Saharan Africa, where some women reflect a gender socialization of economic dependence on men (Stoebenau et al., 2011), female participants indicated that they both expected men to provide for them, but they also expected economic autonomy when they earn money, captured by the expression "*essente z'omukazi ziba z'amukazi*" (a woman's money is her money). Participants debated whether it was appropriate to expect men to provide for their partners regardless of women's economic status. Some felt strongly that even if women were outearning their male partners, their partners should still meet provider role expectations, suggesting that male provider expectations exist independent of women's earning power, rather than in place of women's economic autonomy. Finally, these discussions very often demonstrated the extent to which these domains were interrelated, which holds implication for scale structure. Provision begets love, and for men, a

woman's love is demonstrated through sex; therefore, women can perform love (using their sexual agency) for support. One young man explained, "We as boys have a saying 'love without sex is not love.'" Therefore, provision, women's sexual agency, and sexual decision-making were attached to love in competing, and conditional ways. Together, these findings shaped changes and adjustments that we made to the scale items as initially tested through the focus group discussions.

Quantitative Findings

To examine face and content validity of the initial 50 scale items, we assessed both quantitative and qualitative attributes. We eliminated or refined items that had low overall variance, low or inconsistent levels of comprehension, or that participants questioned with respect to realism or relatability. Please see Appendix Table A for a detailed account of the number of items dropped, retained, or refined by domain.

The best performing domains were sexual decision-making, women's sexual agency, and love. Most of the items for these domains were understood and had substantial within-and-between-group variation in response. For sexual agency, while six of the ten items had high levels of variation in response, the item "It is important for women to know how to trick men into giving them things" to which nearly every participant strongly agreed, held the least variation in the entire scale, and was eliminated. However, this initial finding speaks to how young women understand gendered responses to male provision expectations. The items in the remaining domains (authority and economic dependence) were somewhat less successful, both having many items with low levels of variation in response, or inconsistent comprehension, and many were therefore dropped. Following this analysis, we then refined or replaced items to

capture points raised in the focus group discussions. At the close of phase 1, we had a total of 31 remaining items that we tested using cognitive interviews in phase 2.

Phase 2: Cognitive Interviews to Refine Scale Items

Method

Cognitive interviews were conducted between May and July, 2017 to further refine scale items, addressing content validity through comprehension and relatability of each item. Cognitive interviewing is a qualitative research technique used in survey development to assess whether closed-ended survey questions are understood by the respondent as intended (Collins, 2003).

Procedure

The same research assistants who conducted the FGDs also conducted two rounds of cognitive interviews with 16 participants in each round, for a total of 32 interviews. Cognitive interviews are conducted using a semi-structured interview guide. The respondent is asked to answer a survey question and then to explain how they understood the question and the cognitive processes that brought them to answer as they did. In the first round, we oversampled participants with higher levels of education (university students, participants with higher secondary-level education) who were more likely to easily articulate their thought processes and assist in identifying concerns with wording and reasons for any mismatch between perceived and intended meaning of an item. We used the analyses from round one to inform round two. For the second round, we oversampled women with lower levels of education to ensure our refined questions were also appropriately understood by a less literate population.

Qualitative and Statistical Analysis

We transcribed and translated the participants' responses to each open-ended question assessing their comprehension and rationale for level of agreement to each scale item. Participants' responses were then compiled in matrices for item-based comparison. We also assessed numeric response scores and calculated the overall mean and variance in response for each item. We used both qualitative (comprehension, relatability) and quantitative findings (low variance, significant differences across region) to determine whether to retain and refine or to eliminate items.

Results

We dropped a total of five items between interview rounds and modified 11. Items were dropped when the variance in response was very low and qualitative data further indicated universal rationale for the responses. Items were modified to adjust concerns with comprehension or relatability as determined by the qualitative findings (e.g., replace "control" with "authority"). We also removed double negatives, re-ordered phrases to ensure the main point was stated first, or either toned down or strengthened the implication of the item for further emphasis of the role of provision within each domain.

Participants' explanations for their responses also highlighted the relationships between the different domains. For example, many of the responses to a later eliminated item concerning men's sexual decision-making power were justified based on the love the woman might have for the man. The item stated: "If a man gives a woman a lot of financial support, she can still say 'no' when he asks for sex." As one 20 year old woman from Masaka explained, "I can still say no to sex because I do not love him, and yet I can agree to have sex with one who has not given me anything because I love him." Interestingly, this response contradicts the findings from the

FGDs that suggest that women find it difficult to thwart the advances of men who have been providing for them.

We tested 26 items in the second round of cognitive interviewing. The results showed overall improvements in comprehension following changes from the first round. We retained all of the items from this round, but made further refinements to two to improve variation and comprehension. For example, one item in round two concerning provision and love stated, "A woman can still feel loved even if her partner *does not* provide her any financial support." After round two results demonstrated low variance in the response (most participants strongly agreed), we changed this to "A woman can still feel loved even if her partner *never* provides her any financial support."

Following the second round of cognitive interviewing, review by a psychometrician offered additional recommendations toward ensuring the items captured beliefs and judgements about gender role expectations using explicit or implicit "should" statements. This resulted in small changes to six items. For example, we changed the item, "If a man is providing a lot of financial support *then he is* the one to decide on whether or not to use a condom during sex" to "If a man is providing a lot of financial support *then he should be* the one to decide …". See Table 2 for the evolution of select items from each domain over the course of the development of the scale.

Phase 3: Pilot Questionnaire to Assess Properties, Fit, and Validity of the Scale

Method

The final phase of the study included the administration of a pilot questionnaire and the use of confirmatory factor analysis (CFA) to begin to assess the properties, fit, and validity of the GRMPE scale.

Participants

For the pilot questionnaire we recruited 108 adolescent girls and young women in Masaka and Kampala districts including a community-based (n = 78) and venue-based (n = 30) sample. In each district, the community-based sample (n = 78) was comprised of four randomly selected lowest administrative units within two purposively selected sub-counties or divisions. Divisions in Kampala were selected to encourage a range in socio-economic status across respondents. Within each administrative unit, we randomly selected households, assessed whether a resident met our eligibility criteria, and conducted interviews in or near their homes. In each district, we also purposively sampled participants from venues (n = 30 total) associated with transactional sex (nightclubs, bars, video parlors, and universities) to facilitate the assessment of whether gender beliefs differed for those who reported practicing transactional sex.

Procedure

Six qualified female enumerators administered the pilot in January-February, 2018 in the local Luganda language in one-on-one face-to-face interviews. Questions and scale items were read aloud to the respondent, and the interviewer recorded responses on tablets using the ODK platform.

Measures

The GRMPE scale included 26 items with four response categories: strongly disagree, disagree, agree, strongly agree. We also collected data on socio-demographic variables, respondent's sexual behavior and partners in the last 12 months, vignettes to test social norms associated with transactional sex (see Stoebenau et al., 2019), and items from gender equity and relationship power scales that have been used in similar settings (Pulerwitz & Barker, 2008; Pulerwitz, Gortmaker, & DeJong, 2000). For sexual risk behavior, we included a binary measure

to assess engagement in transactional sex in the last 12 months with a question that had been developed for use in Uganda (Wamoyi et al., 2019). We also asked respondents their age at first sex, in years, and the number of sexual partners they had in the last 12 months. For the latter, we created a binary measure to differentiate two or more partners from one or no partners.

Statistical Analysis

All 108 participants answered all 26 GRMPE items and all other items used in our analyses, so there was no need for special procedures to deal with missing data. We conducted a series of analyses aimed at refining, determining the internal consistency of, and generating evidence of the validity of the GRMPE, following recent recommendations for the development and validation of scales (Boateng et al., 2018). In the first set of these analyses, we used confirmatory factor analysis (CFA) to identify and remove poorly fitting items, thereby reducing the number of items in the scale; and to examine the validity of our five-factor conceptual model (from our five domains). As recommended for CFA with ordinal indicators (Flora & Curran, 2004) (Yang-Wallentin et al., 2010), we used the robust weighted least squares estimator for ordinal indicators as implemented by the WLSM option in MPlus 8.4 (Muthén, 2019) to fit a five-factor model to the full set of 26 indicators. We examined the overall fit of the model using the cut-offs recommended by Hu and Bentler (1999) for the root mean squared error of approximation (RMSEA < 0.06), the comparative fit index (CFI > 0.95), the Tucker-Lewis Index (TLI > 0.05) and the standardized mean squared residual (SMSR < 0.08), as well as the factor loadings. Over several iterations, we then removed items with low (below 0.5) factor loadings, generally removing just one item at a time and then re-examining the fit of the model and the loadings on the remaining items. We then added pairwise correlations between the uniquenesses of select indicators based on modification indices and conceptual considerations. Because of the

high correlations among the remaining four latent factors, we fit a second-order factor model. In this model, the questionnaire items serve as indicators for each first-order factor, as they do in regular confirmatory factor analysis. These four first order factors then, in turn, serve as indicators for a single second-order factor. To assess the internal consistency of the final four subscales and the full scale, we computed ordinal alphas following the procedure described by Gadermann et al. (2012), using Stata 14 to obtain and manipulate matrices of polychoric correlation coefficients.

To provide preliminary evidence of the criterion validity of the GRMPE, we fit bivariate and multivariable regression models in which the GRMPE subscales were used to predict three behavioral outcomes: transactional sex, having multiple partners, and age at first sex. As with our CFAs, we fit these models using the robust weighted least squared estimator in MPlus 8.4 (Muthén, 2019), and report standardized regression coefficients of the latent factors on each of the three behavioral outcomes. In our analyses, we did not adjust for complex sample design given both the small sample size, and the explicit effort in our sampling frame to generate a heterogeneous sample rather than a representative one.

Results

Tables 3 - 5 report findings from the pilot questionnaire which served as the basis for assessing GRMPE scale properties' as well as criterion validity (see also (Stoebenau et al., 2019) for additional details concerning respondent characteristics). The first two columns of Table 3 present item means and standard deviations. The next two columns present factor loadings, model fit statistics, and correlations among item uniquenesses from our original five-factor and final four-factor models. Overall, the fit of the original five-factor model with all 26 indicators was not satisfactory. Moreover, eight items had factor loadings below 0.5, and a few of these

factor loadings were extremely low. Our iterative procedure resulted in the elimination of 11 indicators and one entire factor, Economic Dependence, from the model, leaving a four-factor model with 15 indicators. It also resulted in the addition of correlations between five pairs of indicator uniquenesses. The fit of the final model was substantially better, with the CFI and TLI both well above the 0.95 threshold, SRMR below the 0.08 threshold, and RMSEA only somewhat above the 0.06 threshold, suggesting adequate fit. A full accounting of the changes made at each iteration is presented in Appendix Table B.

Subscale and total scale statistics are presented in Table 4. The ordinal alphas for three of the subscales—Authority, Sexual Decision-Making, and Women's Sexual Agency—were increased by the removal of items with low factor loadings. For one subscale, Provision and Love, the ordinal alpha decreased slightly, but remained in the recommended range of 0.70 or higher. Latent correlations among three of the four subscales—Sexual Decision-Making, Women's Sexual Agency, and Provision and Love—were very high. Each of these three subscales had a moderate latent correlation with the remaining subscale, Authority.

The first four rows of Table 5 present bivariate and multivariable associations between the four GRMPE subscales and three behavioral outcomes, all risk factors for HIV among adolescent girls and young women (UNAIDS & STRIVE, 2018). One subscale, Authority, was not strongly associated with any of the three behavioral outcomes in either bivariate or multivariable analyses. The remaining three subscales—Sexual Decision-Making, Women's Sexual Agency, and Provision and Love—had substantial and statistically significant bivariate associations with all three behavioral outcomes. In multivariable models, by contrast, none of the subscales had statistically significant associations with these outcome behaviors, and in several cases the point estimates are in the opposite direction of the corresponding bivariate association.

For each of these three outcomes, however, a substantial proportion of the variation, ranging from 64% for transactional sex to 41% for age at first sex, was accounted for jointly by the four subscales.

The high correlations among the four subscales (presented in Table 4) and pattern of regression coefficients from multivariable models predicting behavioral outcomes (presented in Table 5), led us to consider a second-order factor model. Factors loadings, correlations among uniquenesses, and fit statistics for this model are presented in the last column of Table 3. The overall fit of this model, as well as the loadings of items on the four first-order factors, were nearly identical in this model to what we obtained in the four-factor model. Moreover, the loadings of the four first-order factors on the second-order factor were high, ranging from 0.71 to 0.94. The full set of 15 items had an ordinal alpha of 0.87, as shown in the last row of Table 4. And the second-order factor had substantial and statistically significant standardized regression coefficients on the three behavioral outcomes, as shown in the last row of Table 5.

DISCUSSION

We developed a scale that assesses the extent to which respondents endorse gender role beliefs that extend from the expectation that men should provide for their families and romantic partners over three phases of data collection and analysis. In this study setting, we found strong evidence that gender role beliefs concerning male sexual decision-making power, women's sexual agency, and beliefs about love were conditioned upon or associated with expectations of male provision. We found less evidence for the associations between provision expectations and gender role beliefs concerning male authority or women's economic dependence. We found adequate model fit for both a four-factor model with all but the economic dependence domain included, and a second-order single factor model which had equivalent fit statistics and

performed better in models assessing criterion validity. The good fit of the four-factor model, along with the decent factor loadings, provides support for the validity of our conceptual model, albeit, a modified version thereof in which the economic dependence component is excluded.

While acknowledging sample size limitations, we began to assess criterion validity by examining whether variation in item responses was associated with behavioral risk factors for HIV (Table 5). Bivariate analyses indicated that women who more strongly endorsed gender role beliefs corresponding to male provision within the subscales on men's sexual decision-making power, women's sexual agency, and love, were more likely to have practiced transactional sex, to have had multiple partners in the last twelve months, and reported an earlier age at first sex. In other words, young women who were more likely to agree that men who provided support should have sexual decision-making control were also more likely to report sexual risk behaviors. Likewise, women who reported sexual risk behaviors were also more likely to agree with statements indicating that women should use their sexual prowess to attract men who can provide for them; and more likely to agree with statements suggesting that a man's material support showed his love, or increased her love for him. The multivariable models did not show consistent findings, likely as a result of the high latent correlations between three of the factors. However, the second-order model demonstrated results consistent with the bivariate findings for each of these outcomes, suggesting that, overall, endorsing gender role beliefs conditioned on male provider role expectations may be associated with sexual risk behavior for young women.

Relationships between Domains of Male Provision Expectations

We found support for a four-factor model, indicating distinct attributes within each of these subscales, however, there were high latent correlations between three of these subscales. These findings suggest that, while men's authority in relationships and control of sexual

decision-making, women's sexual agency, and provision and love may be conceptually distinct, and in some ways empirically distinct; the empirical distinction between them is very small. This finding is further corroborated by the fit of the second-order model. The correlations in the four factor model suggest that those who endorse statements indicating that men who provide should control sexual decision-making were also likely to endorse the belief that women should use their "erotic power" to attract men who can provide for them. In turn, women who adhere to each of these sets of beliefs are also more likely to endorse statements that associate provision with love.

Our qualitative data support this finding most across the domains of love and sexual decision-making. We had found that both women and men connected love, sex, and provision to each other in their discussions concerning gender relationship expectations. Other subscale correlations were less anticipated. Repeatedly in the literature on transactional sex, and described by women in phase 1 of this study, women tout their sexual agency, manifested in their ability to attract and retain providing men, and characterize such relationships as more instrumental than emotionally motivated. One might conclude from this that the subscale for women's sexual agency should be independent, if not inversely related, to other subscales. Rather, it was highly positively correlated with men's sexual decision-making power. This suggests an alternative conceptualization, intimated in our phase 1 focus groups. Before we introduced provision in the relationship, women described themselves as having more power; once we indicated the partner had been substantially providing, many suggested they would relinquish control.

The strong correlation between these two subscales has implications for sexual health risk, as it suggests that while women may endorse beliefs about their erotic power, they do so alongside upholding beliefs that men who provide should hold sexual decision-making power.

This would indicate that sexual agency is not a form of patriarchal resistance, but rather, that women's sexual "agency" is highly circumscribed (Jewkes & Morrell, 2012), as it is manifested within a broader patriarchal belief system. The findings concerning the relationship between provision and love and other subscales were suggested by prior literature. Namely, provision is associated with love, and women who feel loved show their love and commitment in return through sex (Mojola, 2014).

From the earliest phases of this work we found items that sought to capture the links between male provision and authority in relationships did not behave as well as items in other subscales. There were internal inconsistencies in responses to items (e.g., strong endorsement of statements that implied both that provision meant greater male authority, and those that implied provision had little bearing on authority) and qualitative data indicated concerns with comprehension as intended for many of the initial items. Therefore, many of the initial items were dropped prior to the pilot test. These findings may be because the belief that men should assume the role of authority figure within relationships is not necessarily conditioned on provision. Robert Wyrod's analysis (2016) of masculinity in central Uganda purports three interrelated tenets: masculinity and work (which entails expectations of provision), masculine authority, and masculinity and sexuality. He draws clear linkages between provision and sexuality, as we see here as well, but suggests provision and authority are parallel constitutive elements of masculinity, and that authority is not necessarily conditioned on work or provision (Wyrod, 2016). Our findings here, and in a related analysis of social norms attached to male provision expectations, support this conceptualization (Stoebenau et al., 2019). Still provision may accentuate expectations about men's authority, or further justify it, which may explain the

moderate correlation between subscales, and the overall fit for a second-order model including this factor.

Finally, beliefs that women should be economically dependent on men did not hold together as a subscale, or as an independent scale, and only two individual items within this scale showed promising correlations with the other factors in either a five-factor model assumption or in a single-factor model assumption. The reasons for this are unclear. It may be because women who endorsed other gender expectations concerning male provision did not endorse beliefs about women's need to rely on such provision. This may point to resistance to patriarchal belief systems with respect to women's economic autonomy. The poorer fit for women's economic dependence may also reflect context-specific belief systems; therefore, these items should be tested when adapting this scale to other settings, as they may be relevant elsewhere. Finally, the poor fit for this subscale may also be more indicative of the distinctions in subscale item language, reflective of differences in the assumptions underlying this as compared to other domains. While the remaining domains focused on what women or men should do or believe *as a result of* or under the assumption of male provision in a relationship, the items included in this subscale were conditioned on women's economic independence, or assessed the extent to which women should rely on male provision at all, as these were the items that performed best in earlier phases of the study.

Limitations and Next Steps

One limitation of this study is that it was conducted in just two parts of one country, and findings may not generalize to other countries in sub-Saharan Africa or even other parts of Uganda. However, the domains identified through the extensive literature review, which included studies from across sub-Saharan Africa (see Stoebenau et al., 2016), were upheld in this

setting as well (with the exception of economic dependence), suggesting adaptability of this scale to other settings.

The pilot questionnaire was limited by a small sample size (n = 108) within a relatively homogenous population (unmarried sexually active young women in central Uganda). We restricted the pilot to this group in order to facilitate tests of criterion validity, particularly associations with known HIV risk behaviors (transactional sex, multiple partners). However, this means the findings cannot be generalized to a broader population. It remains less clear whether in a general population stronger adherence to gender beliefs attached to male provision expectations would remain most likely for women who report engaging in higher risk practices. Testing the scale's construct validity across different and broader populations are important next steps for scale development and refinement.

Our conceptual understanding of the domains through which male provision may influence gender roles and beliefs that put women at risk guided the construction of the four factor model. However, our analyses demonstrated high latent correlations among these domains, with the analytical implication that it may be impossible empirically to disentangle the effects on behavior of one factor or subscale from those of the other three factors or subscales. For most applications, therefore, we recommend using a single GRMPE scale based on all 15 items rather than the four subscales. This recommendation is supported by the goodness of fit for the second-order model. Nonetheless, when applying this scale to different settings, we would recommend pretesting and adapting scale items across all five subscales. The scale should also be refined and tested among men to identify if men's endorsement of these beliefs likewise corresponds to their sexual health risks and sexual control behaviors.

Implications for Intervention

We developed this scale to further understanding of the gender dynamics that place adolescent girls and young women at disproportionate risk to HIV and related sexual health concerns. Our initial findings suggest that it may be important to critically address male provision expectations more specifically as a focus of interventions that aim to reduce adolescent girls and young women's sexual health risk. These interventions should be aimed at both women and men, as patriarchal belief systems carry negative implications for everyone. Wyrod's framework of three interrelated, yet distinct, aspects of masculinity is also helpful here (work, authority, sexuality) (Wyrod, 2016). Issues of male authority and power in relationships have been addressed in interventions aimed at reducing intimate partner violence and young women's HIV risk through innovative community-based approaches (Jewkes & Cornwall, 1998; Kyegombe et al., 2014). However, we have yet to address how masculinity and work—enacted through provider role expectations—impact the health and wellbeing of women and men. Addressing explicitly, and critically, the gender roles and beliefs attached to male provision expectations may help adolescent girls and young women to understand how endorsing such expectations, particularly within the context of relationships motivated by male provision, can increase their HIV risk.

Our initial findings also emphasized the relationship between provider masculinity and men's sexual decision-making control, which further place women at risk in multiple, intersecting ways. First, women's beliefs about their agency are tied to their beliefs about his power in decision-making; second, women's beliefs about demonstrations of love through provision are also tied to his sexual decision-making control. Addressing the relationship between provision, love, and control will be important for programs to tackle, and could

potentially be addressed through social norm interventions that build norms around love, respect,

women's sexual autonomy and rights, and the value of multiple incomes for households'

financial security and ability to invest.

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Table 1

Sampling frame, Study Populations, Research Methods and Characteristics of Participants across all Phases of Research for the Development of the

GRMPE Scale in Masaka and Kampala Districts, Uganda

	Phase 1		Phase 2	Phase 3
	Secondary analysis	Primary data	Cognitive Interviews	Pilot Study
Sample Frame	Purposive sample	Purposive sample	Purposive sample	Randomly selected household-based sample (n = 78) Purposive venue-based sample (n = 30)
Study Methods	IDIs (n = 44) FGDs (n = 19)	FGDs (n = 10)	Semi-structured cognitive interviews (n = 32)	Face-to-face structured interviews (n = 108)
Study Population Characteristics	*Women and men* Ages: 14-17, 18-24, 35+ - 14-17: In school vs. out of school; - 18-24: out of school	*Women* Ages 15-19, 20-24 - 15-19: In school vs. out of school - 20-24: University students; venue-based; low-income residents	*Women* Ages 15-19, 20-24 - 15-19: In school vs. out of school - 20-24: University students; venue-based; low-income residents	*Women* Mean age: 19.9 Mean age 1st sex: 16.6 Percent TS in last 12 mths: 48.2 Percent 2+ partners in last 12 mths: 27.8

Notes: IDI = in-depth interview; FGD = focus group discussion; TS = transactional sex; For every phase, the sample was stratified by region with

equal participation from the Masaka and Kampala districts

Table 2

Examples of Changes to GRMPE Scale Items within each Domain across Study Phases

Scale Item Sub-domain	Version in FGD	Version in Round One of Cognitive Interviews	Version in Round Two of Cognitive Interviews	Version in Pilot Survey
Male Authority	When a man helps his partner to pay for things important to her, it means *he should make all the decisions* in the relationship.	When a man helps his partner to pay for things important to her, it means he *should be in control of that* relationship	When a man helps his partner to pay for things important to her, it means he should *have authority in* that relationship.	When a man helps his partner to pay for things important to her, it means he should have authority in that relationship
Male Sexual Decision-Making Power	If a man is providing financial support *then he has the right to* decide whether or not to use a condom during sex.	If a man is providing a lot of financial support *then he is the one to* decide on whether or not to use a condom during sex.	If a man is providing a lot of financial support *then he is the one to* decide on whether or not to use a condom during sex.	If a man is providing a lot of financial support *then he should* decide whether or not they use a condom during sex
Women's Economic Dependence	The best way for a woman to pay for her needs is to find a man who can help her.	*The best way for a woman to pay for her needs* is to find a man who can help her.	*Of all the ways a woman can pay for her needs*, the best way is to find a man who can help her.	Of all the ways a woman can pay for her needs, the best way is to find a man who can help her.
Women's Sexual Agency	A woman *can take advantage of a man's desire* for her to get what she wants.	A woman *can use her physical beauty* to get whatever she wants from a man.	*As a woman, it's important to know how to use physical beauty* to get whatever you want from a man.	As a woman, it's important to know how to use physical beauty to get whatever you want from a man.
Provision and Love	The more money a man gives *to his girlfriend*, the more she loves him.	The more money a man gives *to his partner*, the more she loves him.	The more money a man gives to his partner, the more she loves him.	The more money a man gives to his partner, the more she loves him.

Note: Italicized text within the example items denote phrases or words that were altered across the phases of the study.

Table 3

Item Wording, Descriptive Statistics, and Results from the Original and Final Confirmatory Factor Analysis Models

		Factor Loadings		
	Mean (SD)	Original Five Factor	Final Four Factor	Second-Order
Male Authority				
1. A man who provides some financial support to his partner should be the one to decide when they see each other.	2.18 (0.93)	0.519	0.581	0.523
2. No matter how much support they provide, men should have the power to make decisions in relationships.	2.09 (0.85)	0.622	0.712	0.643
3. When a man helps his partner to pay for things important to her, it means he should have authority in that relationship.	2.57 (0.92)	0.680	0.663	0.626
4. A woman whose partner provides only a little financial support should not have to do what he asks.	2.28 (0.80)	0.276		
Male Sexual Decision-Making				
5. If a man is providing financial support for his partner, then she is expected to have sex with him.	2.10 (0.94)	0.652	0.621	0.622
6. If a man is providing a lot of financial support then he should decide whether or not they use a condom during sex.	1.64 (0.79)	0.650	0.624	0.624
7. A woman is expected to have sex with a man in order to pay him back for all the things that he has provided for her.	1.87 (0.89)	0.677	0.677	0.677
8. A man with a lot of money can have sex with whoever he wants.	2.24 (1.07)	0.472		
9. After a woman begins having sex with a man, she should be able to ask for more support.	2.90 (0.83)	0.575		
10. In order to continue to get support from a man, a woman has to continue having sex with him.	2.26 (0.94)	0.707	0.700	0.699
Economic Dependence				
11. A woman who earns enough money should not need financial support from her partner.	2.22 (0.91)	0.014		
12. It is very hard for a woman to 'attain her goals' without a partner's support.	2.14 (0.98)	0.330		
13. Women should not depend on men to financially support them.	2.03 (0.89)	0.657		
14. A woman who earns enough money should be more respected by her partner.	2.78 (0.84)	0.370		
15. Of all the ways a woman can pay for her needs, the best way is to find a man who can help her.	2.24 (0.93)	0.615		
Women's Sexual Agency				
16. Women are lucky because they can get financial support from men just by having sex with them.	2.07 (1.03)	0.712	0.685	0.687
17. Once a woman eats a man's money, she should know that she will eventually have to pay him back with sex.	2.21 (0.99)	0.449		
18. As a woman, it's important to know how to use physical beauty to get whatever you want from a man.	2.71 (0.93)	0.661	0.626	0.624
19. It is okay for a woman to cheat on her partner if he does not provide enough financial support.	2.57 (1.01)	0.489	0.456	0.455
20. A woman can use sex to get anything she wants from a man.	2.36 (0.95)	0.736	0.772	0.771
21 It is easy to eat a man's money without having sex with him.	3.05 (1.02)	0.085		
Provision and Love				
22. A woman can still feel loved even if her partner never provides any financial support.	1.98 (0.74)	0.652	0.667	0.667
23. If a man provides very little financial support to his partner, it means he doesn't really love her.	1.95 (0.68)	0.517	0.615	0.613
24. The more money a man gives to his partner, the more she loves him.	2.55 (1.03)	0.732	0.780	0.780

25. The more a man helps a woman to pay for things she needs, the more it shows that he *loves* her.	2.70 (0.91)	0.645	0.623	0.624
26. A woman falls in love with a man much faster if he is giving her money.	2.94 (0.96)	0.648		

Correlations Between Uniquenesses

Items 3 and 18			0.442	0.295
Items 3 and 23			-.472	-0.448
Items 5 and 6			.386	0.384
Items 6 and 7			.332	0.332
Items 18 and 23			-.369	-0.349

Second-Order Factor Loadings

Authority	0.707
Sexual Decision-Making	0.914
Women's Sexual Agency	0.939
Provision and Love	0.804

Model Fit Statistics

RMSEA	0.110	0.077	0.079
CFI	0.875	0.970	0.967
TLI	0.859	0.960	0.958
SRMR	0.085	0.063	0.067

Note: Italicized items were those retained in the final four-factor, and single second-order models.

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Table 4

Summary Statistics for Subscales of GRMPE Scale

	Ordinal Alpha			**Pairwise Latent Correlations***			
	Original	Final	Mean (SD)	(1)	(2)	(3)	(4)
(1) Male Authority	0.53	0.68	2.28 (0.68)	1.00			
(2) Male Sexual Decision-Making	0.76	0.80	1.97 (0.67)	0.58	1.00		
(3) Women's Sexual Agency	0.68	0.73	2.43 (0.70)	0.44	0.89	1.00	
(4) Provision and Love	0.76	0.75	2.30 (0.61)	0.54	0.70	0.78	1.00
Economic Dependence	0.52						
Total	0.87	0.87	2.24 (0.50)				

Note: All pairwise latent correlations are statistically significantly different from zero at the p < 0.001 level.

Table 5

Standardized Regression Coefficients (and p-values) Assessing Bivariate and Multivariable Associations between Subscales, Second-Order Factor,

and Behavioral Outcomes

	Transactional Sex		Multiple Partners		Age at First Sex	
	Bivariate	Multivariable	Bivariate	Multivariable	Bivariate	Multivariable
Male Authority	0.136 (0.336)	-0.571 (0.074)	0.228 (0.132)	-0.338 (0.452)	-0.213 (0.088)	-0.004 (0.988)
Male Sexual Decision-Making	0.663 (< 0.001)	1.109 (0.236)	0.624 (<0 .001)	1.321 (0.363)	-0.401 (0.001)	0.512 (0.511)
Women's Sexual Agency	0.612 (< 0.001)	-0.571 (0.704)	0.479 (< 0.001)	-0.814 (0.586)	-0.563 (< 0.001)	-0.777 (0.307)
Provision and Love	0.583 (< 0.001)	0.568 (0.097)	0.438 (< 0.001)	0.366 (0.502)	-0.564 (< 0.001)	-0.309 (0.208)
		R^2=0.640		R^2=0.507		R^2=0.408
Second-order Factor	0.664 (< 0.001)		0.571 (< 0.001)		-0.556 (< 0.001)	

Note: For each outcome, the R^2 coefficients reflect the proportion of variation accounted for jointly by the four subscales in the four-factor model.

Appendix Table A

Quantitative Results of items by domain resulting from FGD Discussions, Phase 1

Domain	Items tested	Items dropped (low variance, poor comprehension)	Item refined/ added for phase 2	Items remaining for phase 2
Provision and Sexual Decision-Making	10	4	1	7
Provision and Sexual Agency	10	2	1	8
Provision and Love	10	5	1	6
Provision and Male Authority	10	6	1	4
Provision and Economic Dependence	10	4	0	6

Appendix Table B

Factor Loadings, Fit Statistics, and Correlations among Item Uniquenesses for All CFA Iterations

	M01	M02	M03	M04	M05	M06	M07	M08	M09	M10	M11	M12	M13	M14	M15	M16
Factor Loadings																
Male Authority																
Q800	0.519	0.519	0.520	0.556	0.555	0.557	0.552	0.553	0.543	0.544	0.569	0.595	0.583	0.583	0.581	0.581
Q801	0.622	0.623	0.623	0.659	0.668	0.679	0.681	0.671	0.653	0.665	0.698	0.732	0.714	0.714	0.714	0.712
Q802	0.680	0.680	0.679	0.728	0.720	0.709	0.712	0.720	0.742	0.731	0.684	0.636	0.660	0.660	0.662	0.663
Q803	0.276	0.275	0.275													
Male Sexual Decision-Making																
Q804	0.652	0.652	0.651	0.649	0.650	0.649	0.656	0.672	0.645	0.647	0.684	0.684	0.684	0.632	0.621	0.621
Q805	0.650	0.650	0.651	0.650	0.657	0.663	0.665	0.683	0.688	0.696	0.743	0.744	0.744	0.686	0.624	0.624
Q806	0.677	0.677	0.677	0.675	0.679	0.671	0.676	0.688	0.681	0.685	0.725	0.725	0.724	0.724	0.677	0.677
Q807	0.472	0.472	0.472	0.472	0.467	0.475	0.465									
Q808	0.575	0.575	0.576	0.577	0.575	0.573	0.578	0.600	0.615	0.606						
Q809	0.707	0.707	0.706	0.708	0.704	0.703	0.694	0.695	0.710	0.705	0.705	0.704	0.704	0.706	0.700	0.700
Women's Economic Dependence																
Q810	0.014															
Q811	0.330	0.329	0.329	0.338												
Q812	0.657	0.656	0.655	0.661	0.599	0.534	0.534	0.535								
Q813	0.370	0.368	0.369	0.355	0.333											
Q814	0.615	0.614	0.615	0.615	0.573	0.500	0.499	0.498								
Women's Sexual Agency																
Q815	0.712	0.712	0.710	0.710	0.713	0.707	0.686	0.676	0.669	0.661	0.684	0.690	0.690	0.691	0.691	0.685
Q816	0.449	0.449	0.451	0.452	0.459	0.458										
Q817	0.661	0.661	0.659	0.661	0.655	0.651	0.649	0.660	0.656	0.651	0.629	0.604	0.604	0.605	0.605	0.626
Q818	0.489	0.489	0.489	0.486	0.482	0.490	0.487	0.475	0.471	0.464	0.454	0.459	0.459	0.460	0.460	0.456
Q819	0.736	0.736	0.734	0.734	0.735	0.739	0.733	0.740	0.751	0.766	0.771	0.783	0.783	0.781	0.781	0.772
Q820	0.085	0.085														
Provision and Love																
Q821	0.652	0.652	0.652	0.651	0.645	0.645	0.661	0.665	0.642	0.671	0.677	0.677	0.672	0.673	0.673	0.667
Q822	0.517	0.517	0.517	0.516	0.522	0.526	0.522	0.516	0.520	0.560	0.578	0.580	0.596	0.595	0.595	0.615
Q823	0.732	0.732	0.731	0.730	0.731	0.729	0.739	0.742	0.754	0.802	0.793	0.792	0.787	0.787	0.788	0.780
Q824	0.645	0.645	0.645	0.643	0.648	0.643	0.635	0.642	0.651	0.644	0.632	0.632	0.628	0.627	0.627	0.623
Q825	0.648	0.648	0.649	0.654	0.647	0.652	0.639	0.629	0.625							

	M01	M02	M03	M04	M05	M06	M07	M08	M09	M10	M11	M12	M13	M14	M15	M16
Correlations between Uniquenesses																
Q802*Q817												0.445	0.444	0.444	0.444	0.442
Q802*Q822													-0.447	-0.447	-0.448	-0.472
Q804*Q805														0.337	0.385	0.386
Q805*Q806															0.322	0.332
Q817*Q822																-0.369
Model Fit Statistics																
RMSEA	.110	.112	.118	.118	.112	.112	.115	.115	.117	.117	.103	.094	.088	.085	.082	.077
CFI	.875	.880	.879	.887	.905	.913	.913	.917	.921	.925	.942	.952	.959	.962	.965	.970
TLI	.859	.864	.861	.870	.890	.898	.897	.901	.905	.908	.927	.940	.947	.951	.954	.960
SRMR	.085	.094	.095	.093	.088	.086	.086	.084	.084	.082	.073	.070	.067	.066	.065	.063

Note: M01 through M16 refer to the iterations of the model from M01, which included all 26 items, five factors, and no correlations among uniquenesses; to Model 16, where the number of factors and items was reduced to four and 15, respectively, and five correlations among item uniquenesses had been added.

COMPLIANCE WITH ETHICAL STANDARDS

The research protocol pertaining to the studies described below was reviewed and approved by the Mildmay Uganda Research Ethics Committee, the Uganda National Council on Science and Technology and American University Institutional Review Board. The research team ensured the participants understood the objectives of the study, their rights as participants, the voluntary nature of their participation, and proceeded with data collection only following the receipt of signed informed consent. For minors under the age of 18 and living with parents or guardians, their guardians were approached first, and only once having their signed informed consent did the research team seek informed assent from the adolescent girl.

DECLARATIONS

Conflicts of Interest: not applicable

Availability of data and material: Available upon request

Code availability: Qualitative data coded in Atlas.ti, version 7; quantitative data examined in Stata (version 14) and MPlus, version 8.

Authors Contributions: Stoebenau led the conceptualization of the project, the design of all studies, oversaw data collection, contributed to quantitative data analysis and led the writing. Bingenheimer contributed to all stages, led quantitative data analysis across all studies, wrote the results for study three, and significantly contributed to the writing of the discussion; Kyegombe contributed to the conceptualization of the study and its design, contributed to the management of data collection, and assisted in the writing; Datar contributed to the quantitative and qualitative data analysis and the writing of the introduction and results; Ddumba-Nyanzi oversaw and managed the data collection for all three studies, prepared all of the data for analysis, and contributed to writing the manuscript.