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Evidence from Papua New Guinea

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How Do Perceptions of Relative Poverty Affect Women's Empowerment? Evidence from Papua New Guinea

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Abstract

How do perceptions of one's relative economic status affect gender attitudes, including support for women's economic participation and involvement in decision-making? We conducted a 2018 survey experiment with female and male adults in approximately 1,000 households in Papua New Guinea. Employing an established survey treatment to subtly alter respondents' perception of their relative economic well-being, we find that increased feelings of relative poverty make both men and women significantly more likely to support girls' schooling and women's paid employment, suggesting that relative economic insecurity can prompt support for women's economic participation. However, increased feelings of relative poverty may trigger greater intra-household tension. While increased perceptions of relative poverty cause women to want more household decision-making authority, men's attitudes toward women's roles in decision-making are unchanged. Results underscore the complicated nature of gender attitudes, and how support for women's economic participation may rise without simultaneous increases in women's agency in decision-making.

Keywords: women's empowerment, gender attitudes, inequality, growth, labor force participation, education

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1 Introduction

How do perceptions of one's relative economic status affect gender attitudes, including support for women's economic participation and their involvement in decision-making in their household and community? Several recent trends highlight the importance of this question. Worldwide, income inequality within developing countries is on the rise (Ravallion, 2014). The salience of inequality is also growing. For example, the proliferation of information technology, including social media, is permitting quicker comparisons of one's socio-economic standing not only with others in one's community, but also with those in distant communities or richer countries (Aker and Mbiti, 2010; World Bank, 2016; Kosec and Wantchekon, 2020). This technology may even lead individuals to feel that others are better off then they truly are given users' ability to selectively reveal relatively flattering aspects of their lives. Migration has also risen over the past several decades (Clemens et al., 2014; Bernard, 2017), in part in response to increasingly frequent adverse climate events (Reuveny, 2007; Feng et al., 2010; Mueller et al., 2014; Chen and Mueller, 2018), affecting perceptions of economic well-being. Individuals migrating are often exposed to marked contrasts in socio-economic status; possibly as a result, migration has been shown to increase the gap between wealth accumulation and wealth aspirations, fueling a deterioration in subjective well-being (Chen et al., 2019). Together, these factors may contribute to individual perceptions of being relatively poor and disadvantaged.

How might these factors impact gender attitudes? Extant scholarship on gender attitudes has established that people's beliefs regarding gender roles and gender stereotypes define women's economic and social opportunities; for example, they have been directly linked with women's labor market outcomes (Fortin, 2005; Corrigall and Konrad, 2007; Farre and Vella, 2013; Fortin, 2015; Bertrand et al., 2015), access to assets (Deere and Doss, 2006; Lambrecht, 2016), access to credit (Beck et al., 2018), and subjective well-being (Tesch-Römer et al., 2008). Gender biases and norms contribute to how women are evaluated professionally and advance in their careers (Bayer and Rouse, 2016; Mengel et al., 2018; Carlana, 2019). While regressive gender norms exhibit a high degree of cultural persistence (Alesina et al., 2013; Giuliano, 2017), recent research shows that norms can be reshaped—for example, through exposure to women leaders (Beaman et al., 2009, 2012), mothers' labor force participation (Fernández, 2013), serving with women in the military (Dahl et al., 2018), having daughters (Washington, 2008), having sisters (Healy and Malhotra, 2013), raising aspirations for men (Kosec et al., 2018), exposure

to television programs that depict deviations from traditional gender norms (Jensen and Oster, 2009; La Ferrara et al., 2012), and even school-based discussions with adolescents about gender equality (Dhar et al., 2019).

A rich literature considers the relationship between economic conditions and gender attitudes. However, while economic growth can empower women (Thomas, 1997; Dollar and Gatti, 1999; Klasen, 2006; Duvvury et al., 2013; Jayachandran, 2015; García-Moreno et al., 2015), women's empowerment may simultaneously trigger growth, raising questions about the direction of causality (Forsythe et al., 2000; Duflo, 2012; Kabeer and Natali, 2013; Diebolt and Perrin, 2013; Bandiera and Natraj, 2013; Hakura et al., 2016). Both income and gender attitudes may also be influenced by unobservable factors ranging from access to information technology to the level of investment in girls' schooling.

In thinking about the effects of economic growth on gender attitudes, a growing literature has highlighted the importance of shifts in perceptions of relative economic status. The benefits of recent economic growth have often accrued disproportionately to wealthier individuals. In addition to absolute wealth, individuals' evaluations of their economic conditions are often affected by reference points (Kahneman and Tversky, 1979; Levy, 2003; Bendor, 2010), which are influenced by their beliefs regarding how much others around them have. For example, equity theory (Adams, 1965), relative deprivation theory (Crosby, 1976; Walker and Smith, 2001), and social comparison theory (Festinger, 1954; Suls and Wheeler, 2000) all argue that individuals' evaluations of their income and achievements are significantly affected by comparisons with others. And shifts in individuals' perceptions of relative economic standing have been found to influence individuals' risk tolerance, political engagement, and assessment of government performance (Mo, 2018b; Fair et al., 2016; Healy et al., 2017).

Nonetheless, little is known about how feeling that one is relatively economically disadvantaged influences gender attitudes. On the one hand, feelings of relative economic vulnerability may lead to a backlash among men that leads them to oppose women seeking economic and social advancement, as their empowerment could be perceived as a threat to men in a context of limited economic opportunity (Inglehart, 1987; Andersen and Fetner, 2008; Morgan and Buice, 2013; Healy et al., 2017). This may explain findings that income inequality in society is associated with one spouse managing household finances (Yodanis and Lauer, 2007) and with perpetration of intimate partner violence (IPV) (Sanz-Barbero et al., 2015). On the other hand, to the extent that empowering women can improve household welfare, as suggested by

a range of studies, feeling relatively poor could motivate more egalitarian gender attitudes. Women's labor force participation brings income into the household, and women's involvement in decision-making can facilitate more efficient land management (Dillon and Voena, 2018; Goldstein and Udry, 2008; Seymour, 2017) and bring about better health (Beegle et al., 2001; Dinçer et al., 2014; Sraboni et al., 2014), nutrition (Ekbrand and Halleröd, 2018; Imai et al., 2014; Lépine and Strobl, 2013; Smith and Haddad, 2001; Smith et al., 2003), and education (Qian, 2008) outcomes for household members.

This paper aims to uncover the causal effects of perceptions of one's relative economic status on gender attitudes by carrying out a novel survey experiment with both women and men in about 1,000 rural households in Papua New Guinea (PNG)—a country with highly non-egalitarian gender attitudes. We randomized receipt of a "relative poverty prime" that subtly made "treated" persons feel relatively less well off compared to other households, and then asked both women and men in each household about their attitudes toward women's economic participation[1] and their involvement in community and household decision-making.

The design of the prime builds on survey experiments conducted in Nepal (Mo, 2012, 2018a), Pakistan (Fair et al., 2016; Healy et al., 2017), and the United States (Haisley et al., 2008a). Specifically, we asked individuals about their annual household income, and offered five answer choices that reflected different income ranges. For half of respondents, we used a set of answer choices such that the vast majority of households would be in the lowest income bracket. For the other half of individuals, we used a different set of answer choices such that the vast majority of households would place their income in the middle or a higher bracket. The logic of the prime is that respondents derive information from researchers and their survey questions, and tend to interpret the middle choice as the expected response. Multiple studies have demonstrated that respondents assume that the ranges offered by a surveyor are not arbitrarily selected by the researchers, and interpret the middle of the set of ranges offered as the typical or normal response (e.g., Gaskell et al., 1994; Menon et al., 1997; Richardson, 2004; Rockwood et al., 1997; Shwarz et al., 1985). As such, the first set of individuals is primed to feel relatively poor and like the income distribution is wider than it actually is, while the second set of individuals is primed to feel more neutral or relatively positive about their relative economic standing, and to perceive the income distribution to be narrower.

[1] We took into account both their participation in work outside the home, as well as their accumulation of human capital in this analysis.

We find that both women and men who are primed to feel relatively poor are significantly more likely to support girls building their human capital and women engaging in paid employment, which suggests that feelings of relative deprivation and the salience of inequality can prompt support for women's economic participation. However, this support is not necessarily accompanied by increases in support for women's involvement in decision-making in their communities or households. While being primed to feel relatively poor makes women more likely to express support for women's participation in intra-household decision-making, the prime does not similarly alter men's stated preferences regarding their participation in decision-making. Further, neither male nor female respondents express increased support for women's involvement in community decision-making. We find no evidence that the relative poverty prime changed perceptions regarding the costs to men (who compete against job-seeking women for paid jobs) or to children (who depend heavily on women for care in Papua New Guinea) of women entering the formal labor force. Furthermore, we find no evidence that the poverty prime affected individuals' levels of social conservatism. In other words, increased support among men for women's economic participation stemming from feelings of relative poverty appears to come primarily from a desire to raise household income, and appears unlikely to empower women in other domains.

Broadly, our research highlights the disjuncture between increased economic participation for women and increased empowerment. Trends of increasing inequality in developing countries, and the increased salience of relative poverty that often accompanies these changes in the income distribution, may result in an uptick in women's labor participation without necessarily influencing their prescribed roles in decision-making within their household and community. Consistent with our findings, Blattman et al. (2013) find that giving cash grants of approximately $150 and basic business skills training to poor women led to large increases in income and wealth, but few effects on women's independence, status in the community, or freedom from IPV. Similarly, Beath et al. (2013) show that mandated female participation in community development projects can increase female income generation, but produces no change in views of women's roles in decision-making or in attitudes toward the general role of women in society. Malhotra and Mather (1997) argue that women's employment and education are largely immaterial for household decisions related to social and organizational matters. This is also in keeping with work by Elson (1999), which identifies that labor participation does not automatically empower women, as power imbalances remain profitable for men.

The paper is organized as follows. Section 2 reviews the previous research this study contributes to, as well as background information on the country context in which we implement our study: Papua New Guinea (PNG). Section 3 describes our experiment, detailing how it allows us to estimate the causal impacts of feelings of relative poverty on gender attitudes. Section 4 presents our findings, wherein feelings of relative deprivation contributed to an increased likelihood of supporting women's economic participation, but no impact on men's support for women's empowerment in intra-household decision-making, and no impact on either gender's support for women's empowerment in decision-making in the community. We conclude in Section 5 by discussing the implications of these findings for our understanding of the relationship between economic development and women's political and economic roles in society.

2 Background

2.1 Economic Conditions and Gender Attitudes

We contribute to a growing literature on the linkages between income and gender relations. Cross-country comparative work by Seguino (2007) shows that increases in women's paid employment promote egalitarian gender norms. However, Bertrand et al. (2015) describe how aversion to wives earning more than their husbands alters labor market outcomes for women—and results in a sharp drop in the household's share of income earned by the wife just to the right of 1/2. In keeping with men perceiving women's economic participation as a threat, Vyas and Watts (2009) carry out a systematic review of evidence on the impact of women's involvement in income generation on experiences with IPV, finding as many cases of increased risk of violence as of reduced risk. Cools and Kotsadam (2017) similarly find no evidence that resources protect women against IPV. Evidence on the impacts of cash transfers on IPV is similarly mixed; while Breisinger et al. (2018) find increases in IPV, other studies find reductions—especially when intra-household conflicts are especially intense (e.g., in polygamous households) (Heath et al., 2019) and when programs increase the social costs to men of perpetrating violence (e.g., through simultaneously encouraging women to attend trainings that build their self-efficacy and self-esteem) (Roy et al., 2018). Negative economic shocks have also been shown to lead to more women's deaths (Miguel, 2005; Sekhri and Storeygard, 2014) or fewer investments in girls' schooling (Björkman-Nyqvist, 2013). Our study design allows us to disentangle the effects of perceptions of the household's relative economic well-being from other factors that

cash transfer programs or employment may introduce, such as women's interactions with others in their community and their perceived self-efficacy and self-esteem.

We also contribute to a broader literature on the drivers of women's empowerment. Kabeer (1999) defines women's empowerment as the process by which those who have been denied the ability to make strategic life choices acquire this ability. Literature in this vein shows that many levers to empower women may be successful. For example, recent research suggests that women can be empowered through exposure to female role models and relationships with respected women (Beaman et al., 2009, 2012; Fernández, 2013; Dahl et al., 2018; Washington, 2008; Healy and Malhotra, 2013; Jensen and Oster, 2009; La Ferrara et al., 2012) or through training in adolescence (Dhar et al., 2019). However, they may also beget backlash; for example, Morgan and Buice (2013) show that men's gender attitudes are susceptible to backlash effects, as women's economic advancement can be perceived as a threat. Relatedly, Razavi (1992) notes that economic prosperity may reduce gender inequalities in basic well-being, but intensify other social restrictions that inhibit women's ability to make choices. Null results have also been found; for example, Van der Windt (2018) finds that explicitly including women in project selection and implementation for a community development project only weakly influenced the role of women in the community and policy outcomes, and had no impact on either the role of women within the household or gender attitudes. We contribute by shedding light on how perceptions of one's relative economic position may influence gender attitudes and thus potentially women's empowerment.

Our paper is also related to a growing literature on the impact of an individual's psychological state, as influenced by their perception of their economic status compared to others within their community. These include whether individuals vote and engage politically (Solt, 2008), whether they support their government (Fair et al., 2016; Healy et al., 2017), and whether or not they undertake economic and political activities with high levels of risk (Mo, 2012, 2018a). Building on this literature, we focus on attitudes toward women's roles in society. We specifically examine the extent to which perceptions of relative economic status impact whether women and men espouse egalitarian attitudes about women's economic participation and their roles in community and household decision-making.

2.2 The Economy of PNG

We consider the case of Papua New Guinea (PNG) to explore the relationship between perceptions of relative poverty and gender attitudes. The economy of PNG relies heavily on extractive resources. Ongoing commodity price fluctuations and a 7.5 magnitude earthquake in early 2018 (that disrupted liquified natural gas extraction and other mining activities) highlight the vulnerability of PNG's economy to economic and climate shocks.[2] In response, the government adopted its third Medium-Term Development Plan (MTDP III: 2018-2022) in October 2018, calling for more inclusive growth with a renewed focus on agriculture, improved physical infrastructure to spur private-sector led growth, and greater emphasis on the quality of education and skills development to increase competitiveness (PNG Department of National Planning and Monitoring, 2018). While income generated by its oil and mining sectors grant PNG a lower-middle income country status, these sectors are dominated by foreign firms and are capital intensive, offering limited job creation for the local population. The large revenues derived from natural resource extraction activities have largely remained in the hands of a few, with little re-investment in human capital and physical infrastructure to diversify and spur further economic growth.

Rural inhabitants make up approximately 87 percent of the total population in PNG, of which 80 percent is semi-dependent on rain-fed subsistence farming (Bourke and Harwood, 2009). Poverty is also concentrated in rural areas. The most recent Household Income Expenditure Survey (HIES), from 2009–10, reported that approximately 40 percent of the population in PNG lives below the poverty line, of which 90 percent live in rural areas (Gibson, 2012).[3] The survey data that we use for this paper, collected in rural areas of four lowland provinces during May–July 2018, report that a majority of households live below the poverty line (52 percent), which is consistent with the aforementioned work noting a concentration of poverty in rural areas, suggesting that a concerted effort to bolster the agricultural sector (farm and non-farm) is necessary to reduce poverty (Schmidt et al., 2019).

The social and cultural definitions of labor within PNG translate to a greater share of female labor dedicated to subsistence agriculture and household maintenance. However, an important share of women (almost 2/3 of all informal workers) are also working in the informal sector to supplement household incomes (Stanley, 2018). Identifying the constraints and opportunities

[2] GDP was projected to grow by 2.5 percent in 2018; however, GDP growth slowed from 2.8 percent in 2017 to 0.3 percent in 2018, largely due to halted mining activities after the February earthquake (World Bank, 2019).

[3] PNG has one of the highest poverty rates in the Pacific Island States region.

of women to more actively engage in income-earning activities and household decision-making is important to formulating policies that promote inclusive and sustainable growth.

2.3 Gender Relations in PNG

Accompanying PNG's comparatively high poverty rate for the region is an alarming rate of domestic violence and aggression towards women and girls (Bradley and Kesno, 2001; Wardlow, 2006; Eves et al., 2010; Jolly et al., 2012). Recent studies have cited that approximately 65 percent of women in PNG have experienced some form of physical violence (Ganster-Breidler et al., 2010; UNIFEM, 2010). This violence has been attributed to historical and traditional customs that fail to sanction it. The custom of a bride price—money given by the groom's family to the bride's—is often reinterpreted by men as a justification of intimate partner violence (IPV) (Hague et al., 2011; Lowes and Nunn, 2017; Rees et al., 2017; Eves, 2019). In addition, physical violence is often defended as necessary to shape male (via male–male rivalries) and female (via violence towards women) identities in PNG society (Anderson, 2015; Kelly-Hanku et al., 2016).

Labor and land are among the most important assets of the rural poor and often determine the bargaining power of household members (Barrett and McPeak, 2006; Deere and Doss, 2006). As in many developing countries, a majority of communities in PNG follow patrilineal inheritance structures, whereby men are the primary owners and managers of agricultural land (Overfield, 1998; Quisumbing and Maluccio, 2003; Quisumbing and Hallman, 2005; Moretti, 2006). However, even in matrilineal communities covered by our survey, men traditionally oversee the land women inherit. Men also control the majority of household income, even if a majority of the labor was performed by women (Jones and McGavin, 2015). As men are the primary landholders, they also control decision-making related to cash crops (such as coffee and oil palm), and resource extraction activities (such as gold mining), effectively limiting women's engagement in these activities (CARE International, 2015; Jones and McGavin, 2015). Women are often required to provide unpaid or underpaid labor on these activities in return for access to land and/or men's protection (Overfield, 1998; Moretti, 2006; Koczberski, 2007).

While geographic variations exist within PNG, on average, existing studies suggest that women are not inhibited from working and earning money independently outside of the household. We conducted three focus groups in June 2019 to follow up on our quantitative data collection and better understand how women and men perceive work opportunities and income generation outside of own-farm agriculture. Given the high costs of transportation within PNG,

the research team requested (via radio dispatch and in-person requests to village leaders) that individuals from surrounding communities in the East Sepik survey area convene in one community for a series of focus groups. In total, approximately 100 individuals gathered from 13 different communities. Focus groups were divided by gender, whereby two groups of women and one group of men were formed. Each focus group was asked the same set of questions surrounding women's involvement within the community and the market economy, and women and men's intra-household decision-making practices.

The women's focus group identified domestic activities and childcare responsibilities as a major constraint to engaging in income earning activities outside the home, such as a non-farm enterprises. The men's focus group expressed no concern with women working outside of the home as long as domestic and traditionally defined "women's work" (cleaning, childcare, cooking, etc.) was fulfilled. When discussing who managed the extra income, it was not uncommon for men and women within the household to manage income earnings separately. Moreover, men cited the need for women to control their own (women's) business earnings in order to buy needed household goods because men tend to spend it on gambling and alcohol. However, other studies have found that women face significant challenges in being able to control income they earn; men either take it or pressure them to contribute to social obligations and male family members (Koczberski, 2002; Eves et al., 2018).

The high prevalence of violence against women in PNG shapes women's decision-making regarding off-farm work. Even when women enter into off-farm income earning activities, they are still responsible for defined female roles including activities such as food preparation, child rearing, and planting and harvesting subsistence crops, meaning that engagement in off-farm work substantially increases overall working hours per day for women in particular (Overfield, 1998). While some women have reported not entering into off-farm work due to concerns of increased family harassment for greater contributions (which also indirectly insure personal security), others have been dissuaded from diversifying labor income due to threats of physical violence if domestic and childcare responsibilities are not fulfilled (Eves et al., 2018). Consistent with these findings, Koczberski (2007) report that poor remuneration of female labor compared to male labor, and limited decision-making autonomy regarding how external money is spent within the household, dissuade women from seeking off-farm labor opportunities.

Beyond our qualitative work, a variety of studies of PNG have investigated the conditions that may escalate violence towards women and their linkages with income earning opportunities

for women. Zimmer-Tamakoshi (2012) finds that increases in women's educational attainment lead to greater IPV, citing that men reported perceiving women's education as a threat to traditional female roles. Similarly, Kelly-Hanku et al. (2016) report that women who are viewed as acting outside of socially accepted norms, such as by visiting nightclubs or bars, or by being in public places after dark (such as markets, where they sell goods) are considered "fair game" for sexually violent acts. Women have also reported violence and conflict within households due to unfulfilled expectations surrounding the amount of money men in their households feel should be brought home from selling goods in the market (Eves et al., 2018).

The intersection between the need to preserve traditional roles and the ever-increasing role of women participating in the cash economy may redefine gender roles in PNG over time. Koczberski (2002) argues that the local economy's greater integration into a monetary economy (via greater female access to oil palm production work in plantation schemes) has improved women's ability to perform their customary, gendered roles due to an increased ability to pay with earned cash for goods and services for the household. Nonetheless, a distinction between women's economic advancement and women's empowerment is drawn in many of the case studies of PNG that look at women's labor participation within and outside of the household (Eves et al., 2018). Most studies suggest that women are not inhibited from working and earning money independently outside of the household. This is reflected in estimates of labor market participation. As of 2018, 48.9 percent of the labor force in PNG was comprised of women (World Bank, 2018). However, it is less clear to what degree, if any, this translates into increased women's access to and control over resources and decisions within the home.

3 Empirical Strategy

3.1 Data

Our results come from an original survey we conducted in Papua New Guinea during May - July 2018, implemented through the International Food Policy Research Institute (IFPRI). We crafted a multi-topic survey titled the Papua New Guinea Household Survey on Food Systems, comprised of modules on household characteristics; agricultural production; household assets; non-agricultural income; consumption and expenditures; gender; economic shocks, food insecurity, and household well-being; women's healthcare, pregnancy care, and breastfeeding practices; healthcare and vaccination practices; and anthropometry (IFPRI, 2018). A total of

1,026 households across 70 communities in 4 survey areas were interviewed by a team of 23 enumerators and 5 supervisors.[4] The gender module, central to this study, first asked individuals about their household's total income and then included questions related to attitudes toward women's involvement in economic activities, community decision-making, and intra-household decision-making.

PNG represents a challenging environment for data collection given its rugged topography (ranging from 0 to 4,500 meters above sea level) covered with thick tropical rainforest. Limited transportation infrastructure and heavy rainfall (averaging 8,000 mm per year) often create impassable conditions (in areas that have roads), leaving rural populations largely unreachable by motorized means of transportation. Finally, localized violence and tribal conflict is common and unpredictable in PNG, creating yet another obstacle to detailed data collection. The survey data used in this analysis is the first of its kind in nearly a decade since the last PNG Household Income Expenditure Survey was implemented in 2009/2010 (Gibson, 2012).

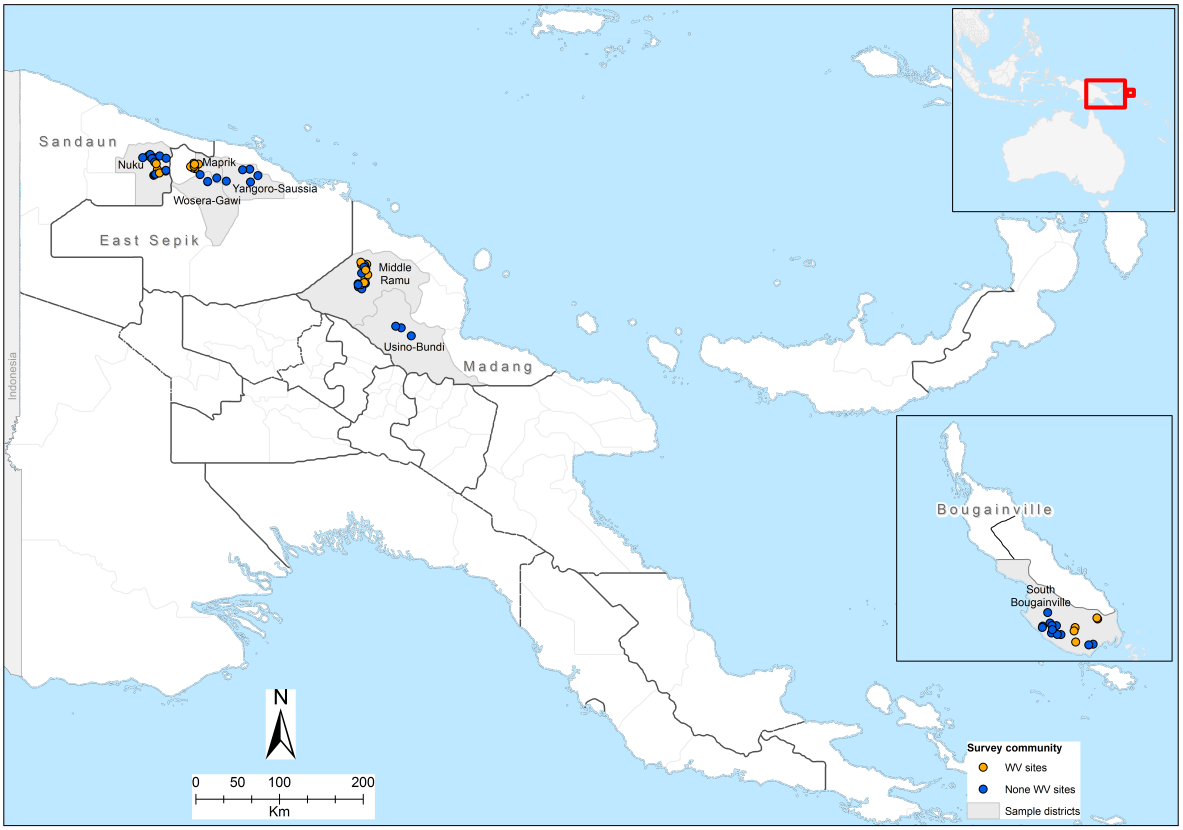
Given the above-mentioned challenges to survey data collection in PNG, the survey sample design required strong collaboration with local partners in order to gain access to some of PNG's more remote rural areas. Thus, the sampling strategy was shaped by the geographic location of communities where World Vision International (WVI) was actively engaged. In doing so, the survey sample was divided into communities that would receive WVI support and those that were not targeted for WVI support. For survey participation, WVI communities were randomly selected from a comprehensive list of planned WVI communities for each survey area (East Sepik, West Sepik, Madang, and the Autonomous Region of Bougainville), and comprised a third of the entire survey sample. Given logistical and security limitations within PNG, non-WVI communities were randomly selected from a comprehensive subset of communities that were between one and four hours travel time from a WVI community and comprised the remaining two-thirds of the survey sample.[5] Locations of survey sites are shown in Figure 1.

While it does not detract from the internal validity of our findings, given its implications for external validity, we point out two relevant features of the sample selection process. First, communities that were identified to receive the WVI program were not randomly selected; rather,

[4] Only two households approached for interview refused to participate.

[5] For example, travel to the Madang survey area requires a three-hour 4 × 4 vehicle drive, and a seven to nine hour outboard-motor boat ride to reach the nearest WVI community from Madang town. Within village areas, walking is the only mode of transportation, as there are no roads between villages; the Ramu river is used for transportation between villages along the river. Further, on-river and within-village travel can only occur during daylight hours for security reasons.

Figure 1: Survey sample locations by World Vision and non-World Vision status



Source: Authors' calculations

WVI, in collaboration with the PNG cocoa board, identified communities that were affected by a recent cocoa pod borer infestation, which devastated local cash crop economies. Second, the travel time restrictions (1–4 hours away) for selection of non-WVI survey communities excluded many communities from the sampling frame. Thus, our survey is not representative at the district, provincial or nation levels. However, we used GIS data to select the most spatially expansive set of non-WVI communities possible within this travel time range, in order to obtain the largest variance possible across the four survey sites.

Most survey modules were designed to be administered to the most knowledgeable individual on that topic; they were typically answered by household heads, 86.4 percent of whom were male in our sample for analysis. Data for most modules were collected via tablet using Computer Assisted Personal Interviewing (CAPI). However, three modules were designed to be administered to a woman who was either the spouse of the head or the head herself, and were collected using pen and paper surveys since resources and logistics only permitted one tablet to be used in each household. These three modules covered: women's healthcare, pregnancy

care, and breastfeeding practices; healthcare and vaccination practices; and anthropometry. A single module—the gender module—was designed to be administered to both the head and their spouse, in order to allow us to contrast women's and men's responses; the man was to complete this using the CAPI version, and the woman to complete it using the pen and paper version.

In the full sample of 1,026 households, 328 households had only one individual who could answer the gender module (i.e. either the head or their spouse was not available for interview), and 10 had no individual who could answer the gender module (i.e. both head and spouse were not available for interview for this module).[6] The final sample for analysis, where the poverty prime dummy, data on imbalanced covariates (see Subsection 3.6), and at least one of the outcomes are non-missing contains 1,372 individuals from 884 households.

The instructions for the gender module were to administer it in private whenever possible. We were particularly focused on women responding to the module privately, as we were concerned that they would feel a need to respond to questions in accordance with what their spouse or others in the household would expect instead of what they actually felt. Overall, 78.9 percent of women and 49.6 percent of men were effectively interviewed alone. This suggests a high ability to separate women from their spouses during interviews—likely facilitated by men being simultaneously interviewed or away working, and enumerators sharing the gender of the respondent such that household members would not oppose women being interviewed alone. That men were less likely than were women to listen in may reflect gender-specific roles in the household (e.g., women being more likely than men to be taking care of household chores nearby while their spouse was being interviewed inside the home). Occasionally, one's spouse had died, was temporarily or permanently away at the time of the interview, or refused to answer. As a result, 34.8 percent of women and 16.2 percent of men came from households in which they were the only ones in the household available to answer the gender module.

3.2 Priming experiment

Our relative poverty prime is a variation of that used by Haisley et al. (2008b) to study the decision to participate in lotteries. Mo (2012, 2018a) first employed this design to study the effects

[6] In 10.2 percent of households in the full sample, the female respondent to the paper and pen questionnaire also answered the CAPI gender module. In such cases, we use her pen and paper data for consistent treatment across women. As a result, all men's gender module data in our final sample for analysis were collected via CAPI, and all women's gender module data in this sample were collected via paper and pen. We also dropped 57 households interviewed by an enumerator who was subsequently dismissed for poor performance (inaccurate data), and 6 households from a community not in our survey plan, where data collected were stopped mid-way through when the mistake was identified.

of inequality on political and economic behavior, and both Healy et al. (2017) and Fair et al. (2016) replicated that design in Pakistan. At the start of the gender module, the respondent was either assigned to receive a poverty prime (and thus induced to feel relatively poor, and like the income distribution is wider than it actually is), which we refer to as receiving treatment, or assigned to a control condition designed to frame their household's income neutrally (and make them perceive the income distribution to be narrower). For men, the CAPI randomly chose treatment or control with equal probability. For women, equal numbers of treatment and control condition surveys were printed, supervisors shuffled the pile and distributed surveys to enumerators, and enumerators used the version at the top of their pile at the time of each interview.[7]

Specifically, we asked all respondents the following question: "Annual income is the amount of cash income you earn from all agricultural and non-agricultural activities. It includes the approximate value of items that you produce and consume as a family or give as a gift, or you have sold the good (i.e. produce from your garden). How much income did your family earn last year in KINA?" We then randomly assigned respondents to receive one of the following two sets of annual household income response options to place their household:

Control (No Poverty Prime)	Treatment (Relatively Poor Group) (Poverty Prime)
0-250 kina	0-2,000 kina
251-500 kina	2,001-4,000 kina
501-1,500 kina	4,001-8,000 kina
1,501-3,000 kina	8,001-16,000 kina
More than 3,000 kina	More than 16,000 kina

The prime was designed such that the respondents who received the treatment version of the income question would feel as if their income was in the bottom part of the income distribution, and like the income distribution is wider than it actually is. This is because they would most likely find themselves selecting the lowest income bracket offered by the researchers as their household income. The half assigned to the control condition would be made to feel that their income was more typical (roughly at the median of the distribution) or better, and that

[7]Ideally, we would have randomized treatment at the household level to avoid within-household spillovers. However, due to differences in the format of data collection across genders (CAPI for men vs. pen and paper for women) and interview timing (sometimes women were enumerated first, and other times it was men), we were forced to randomize at the individual level.

the income distribution was narrower. Again, this is because in their case, they would most likely find their household income to be in the middle or higher income brackets offered by the researchers, given how we selected these brackets.

The logic of this prime derives from previous research showing that response options to ordinal or interval questions sends cues to respondents about what are normal or typical responses (e.g. Courneya et al., 2003; Menon et al., 1997; Rockwood et al., 1997; Shwarz et al., 1985). Specifically, respondents frequently assume that the ranges present in a question were purposely selected so that the middle response is the modal or most typical response. As such, the middle response changes the respondent's reference point, and they then assess their level of economic well-being in relation to that point. Research in decision making, economics, and psychology has repeatedly found that people do not simply evaluate outcomes like poverty in absolute terms, but rather in comparison to others (Crosby, 1976; Festinger, 1954; Suls and Wheeler, 2000; Walker and Smith, 2001). Reference points can therefore significantly impact how people feel and what decisions they make (Heath et al., 1999; Kahneman and Tversky, 1979).

The middle income bracket in the control group is only 501–1,500 kina, whereas the middle income bracket in the treatment group is much higher, at 4,001–8,000 kina. In other words, if we selected our income brackets correctly, respondents in the treatment group are more likely, compared to the control group, to place themselves in lower income brackets.

3.3 Spillovers

Our use of CAPIs with men and pen and paper questionnaires with women forced us to randomize treatment at the individual rather than household level. As such, two respondents within a household would be expected to receive the opposite treatment 50 percent of the time. Consistent with expectations, conditional on two household members (one male and one female) receiving the gender module, 49.6 percent of respondents received the opposite treatment as their spouse. Taking into account that many households we surveyed had only a single respondent, overall, 32 percent of women and 41.4 percent of men lived in a household in which their spouse similarly completed the gender module but received the opposite prime.

This introduces the potential for treatment spillovers—specifically, individuals overhearing their spouse receive one treatment before being assigned to another (unfortunately, we lack time stamps on women's interviews, and thus cannot ascertain which spouse was interviewed first). However, spillovers should be minimized as enumerators were instructed to administer

the gender module in private. To the extent that it was not possible to interview respondents privately, we are able to identify when there may be spillover effects, as the enumerators were required to record information on who was present in case the individual could not be interviewed alone.[8] This information allows us to code a dummy (flag) variable for an individual having received the opposite prime as their spouse and their spouse further having had adults of their opposite gender present for their interview. For example, if a woman received the opposite treatment condition as her husband, we would examine if her husband was interviewed with an adult woman present. If he was, this flag would then take on a value of 1 for the woman, as she may have been among the adult women present for her husband's interview.

Summarizing this binary (flag) variable by gender provides an upper-bound on spillovers by gender. We find that 15.5 percent of women's interviews and 5.3 percent of men's interviews might have been affected by spillovers. This is an upper bound since only those enumerated *second* in their household could be affected by their spouse's interview. As noted, we are not certain which spouse was enumerated second; to the best of our knowledge, it would have been the female respondent half of the time and the male the other half. Thus, in expectation terms, 7.75 percent of female interviews and 2.65 percent of male interviews were contaminated by spillovers. Because we cannot be sure which of the 15.5 percent of women and 5.3 percent of men who were *potentially* subject to spillovers actually were, we check the robustness of our results to omitting all of these flagged individuals. We show that our main findings are generally preserved when using this smaller sample.[9] However, to the extent that there were spillover effects, it would likely make it more difficult for us to detect treatment effects.

3.4 Empirical specification

To examine the impact of being primed to feel relatively poor on an individuals' gender attitudes, we estimate the following empirical specification using Ordinary Least Squares (OLS), first for the sample of women and then for the sample of men:

$$G_{ijse} = \beta_0 + \beta_1 P_{ijse} + \boldsymbol{\beta_2 X_{ijse}} + \omega_e + \phi_s + \epsilon_{ijse}, \tag{1}$$

[8] Specifically, they were asked if the individual was interviewed successfully alone, with only children present, with adult women present, with adult women and children present, with adult men present, with adult men and children present, with adult men and women present, or with adult men and women and children present.

[9] These results are described in Subsection 4.3 and appear in Appendix Table A1. As those who could not be interviewed alone are likely to be a non-random subset of individuals, we do not make this our main sample for analysis.

where i indexes individuals, j indexes households, s indexes communities, and e indexes enumerators. The outcome, G_{ijse}, is the extent of disagreement or agreement with a gender-related statement. The original answers to gender-related statements are on a scale from 1 to 5; we recode as necessary so that larger values indicate more egalitarian, or progressive, gender attitudes. We then standardized the 5-point scale measures using the mean and standard deviation of the control group to facilitate interpretation of the effects. P_{ijse} is a dummy for receiving a poverty prime. X_{ijse} is a vector of individual-, household-, and community-level controls with imbalance (p-value < 0.10) across treatment and control groups for at least one gender, described in Subsection 3.5. Given variation in the quality of locally recruited enumerators, we include enumerator fixed effects ω_e.[10] Community fixed effects, ϕ_s, are also included to account for variation in gender attitudes across communities to improve the precision of our estimates.

3.5 Outcome Measures

The main outcomes of this study are a respondent's attitudes towards eight statements related to women's roles in society. Seven are common to both genders, and one was asked only of men due to survey length considerations for the women's survey. Individuals chose an answer along a scale from 1 to 5, from "strongly agree" (1) to "strongly disagree" (5). All eight gender-regressive statements (e.g., "A good woman always supports her husband's opinions") were coded such that a larger number (more disagreement) reflects more egalitarian gender attitudes. We normalized responses to each so that they have mean 0 and standard deviation 1 in the control group (men and women pooled).[11] Table 1, Panel A provides the exact wording for each of the eight statements. Our primary outcomes include four variables. They assess the extent to which respondents support prioritizing girls for education, prioritizing women for paid employment opportunities, involving women in decision-making about community issues, and involving women in intra-household decision-making (particularly with reference to household assets). Our secondary outcomes include an additional four variables. Two of these capture whether or not respondents feel that other individuals assume costs when women engage in paid work. The first assesses the extent to which respondents believe men are harmed by

[10] In the original design, a team of 5-8 enumerators were expected to collect data in a few pre-specified communities. But in implementation, individual enumerators also went to other communities (i.e. impassable transportation conditions or localized violence), according to survey needs. There are a total of 23 enumerators and 69 communities in the final sample for analysis.

[11] We standardize using the control group of men and women pooled together rather than separately standardizing for women (using the mean and standard deviation of control group women), and then repeating for men, so that coefficients on the poverty prime are comparable across respondents of different genders.

women participating in the labor market (as competitors for jobs), while the second examines the extent to which individuals believe children are harmed by women participating in the labor market (as this may detract from childcare). Our secondary measures also include two variables capturing social conservatism: the extent to which respondents believe wives should support their husband's opinions—available for both male and female respondents—and the extent to which respondents believe that women should adhere to traditions and behave like their mother's generation—available only for male respondents.

Beyond measures of gender attitudes, we also consider three other outcomes, used to assess the extent to which the poverty prime had its intended effect: the "income bracket" an individual selected, as described in Subsection 3.2 (ranging from 1 to 5, reflecting the lowest through the highest brackets); an individual's post-treatment perception of their relative economic standing (a variable ranging from 1 to 5, reverse-coded such that higher numbers reflect higher relative economic standing, which we then normalize to have mean 0 and standard deviation 1 in the control group);[12] and the extent of "over-reporting" of an individual's annual income relative to actual annual expenditures captured via a detailed set of questions in an expenditure module (we take reported income minus actual expenditures and then normalize this variable to have mean 0 and standard deviation 1 in the control group).

Some studies use larger suites of questions to assess gender attitudes. For example, Alkire et al. (2013) propose a tool for measuring the empowerment, agency, and inclusion of rural women in five domains using a detailed survey-based module. Our set of questions was necessarily short given limited space in the survey that could be used to study gender attitudes. However, one benefit of our brief survey instrument in the context of a priming experiment is that the effects of the prime—which may be short-lived—are likely to be relatively strong across most questions rather than only a subset of the earlier questions included in the instrument.

[12]Specifically, this question asks, "Compared to your neighbors, do you and your family earn [much more, a little more, about the same, a little less, or much less?]"

Table 1: Summary statistics by prime, for women and for men

	Unprimed women		Primed women		p-value,	Unprimed men		Primed men		p-value,
	Mean	N	Mean	N	difference	Mean	N	Mean	N	difference
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Dependent variables (standardized except for income bracket)										
Extent of disagreement - In your opinion, when money is scarce, to what extent should boys have more education than girls? ("Prioritize boys for education")	0.019	388	0.072	364	0.472	-0.013	286	0.201	275	0.017
Extent of disagreement - In your opinion, if jobs are scarce, to what extent should they be reserved for men rather than women? ("Reserve jobs for men")	0.017	390	0.111	357	0.226	-0.013	286	0.161	273	0.042
Extent of disagreement - In your opinion, to what extent should men have the final word about decisions affecting the community? ("Men should make community decisions")	-0.051	400	-0.076	377	0.711	0.063	295	0.251	283	0.036
Extent of disagreement - In your opinion, to what extent should a husband make all the decisions in the household about how to manage assets like farm equipment? ("Husband should manage household assets")	-0.046	388	0.036	374	0.250	0.080	295	0.158	281	0.381
Extent of disagreement - If a women earns money outside the home, a man somewhere will be less able to provide for his own family. ("Women crowd out men for jobs")	-0.019	377	-0.086	357	0.395	0.041	296	-0.061	286	0.198
Extent of disagreement - When a wife earns money through work outside the home, her children are negatively affected. ("Women's work harms children")	-0.032	346	0.051	335	0.302	0.034	294	0.090	289	0.475
Extent of disagreement - A good woman always supports her husband's opinions. ("Women should support husband's opinions")	-0.093	400	-0.119	377	0.679	0.130	301	0.114	292	0.861
Extent of disagreement - In your opinion, to what extent is it important for young women to abide by traditions, and behave like their mothers' generation? ("Young women should abide by tradition")						0.010	298	0.079	288	0.438
How much income did your family earn last year in KINA ("Income bracket")	2.890	400	1.578	379	0.000	3.100	301	1.747	292	0.000
Compared to your neighbors, do you and your family earn [much more, a little more, about the same, a little less, or much less] ("Post-treatment perception of relative poverty")	-0.029	392	0.089	371	0.109	0.056	295	-0.022	280	0.325
Difference between annual reported income and annual expenditure ("Over-reporting")	0.010	400	0.103	379	0.216	-0.039	301	0.048	292	0.343
Panel B: Individual variables										
Dummy - being married	0.941	423	0.923	403	0.309	0.971	311	0.977	303	0.651
Dummy - age 16-24	0.103	409	0.106	386	0.871	0.036	306	0.030	297	0.699
Dummy - age 25-35	0.433	409	0.383	386	0.158	0.284	306	0.333	297	0.193
Dummy - age 36-50	0.364	409	0.373	386	0.798	0.431	306	0.431	297	0.992
Dummy - age 51-64	0.086	409	0.109	386	0.269	0.196	306	0.162	297	0.271
Dummy - age 65+	0.015	409	0.028	386	0.178	0.052	306	0.044	297	0.626
Dummy - highest level of education: no schooling	0.215	424	0.171	403	0.114	0.078	309	0.063	303	0.470
Dummy - highest level of education: some school	0.172	424	0.181	403	0.736	0.159	309	0.168	303	0.745
Dummy - highest level of education: completed primary	0.587	424	0.610	403	0.498	0.683	309	0.680	303	0.937
Dummy - highest level of education: completed secondary	0.014	424	0.015	403	0.929	0.032	309	0.033	303	0.965
Dummy - highest level of education: completed university	0.012	424	0.022	403	0.241	0.049	309	0.056	303	0.675
Dummy - relationship to household head: Head	0.104	424	0.134	403	0.179	1.000	311	1.000	303	
Dummy - relationship to household head: Spouse	0.896	424	0.866	403	0.179	0.790	309	0.775	302	0.658
Dummy - occupation: agriculture	0.658	424	0.636	401	0.507	0.065	309	0.056	302	0.663
Dummy - occupation: manual work	0.002	424	0.002	401	0.969	0.058	309	0.079	302	0.301
Dummy - occupation: trained worker	0.014	424	0.027	401	0.180	0.032	309	0.043	302	0.489
Dummy - occupation: services	0.021	424	0.017	401	0.695	0.039	309	0.017	302	0.094
Dummy - occupation: other	0.288	424	0.312	401	0.453	0.013	309	0.023	302	0.342
Dummy - occupation: unemployed	0.017	424	0.005	401	0.112	0.003	309	0.007	302	0.550

Source: Authors' calculations based on PNG survey 2018.
Notes: The universe of Panel A is all observations non-missing for the poverty prime dummy, all covariates with imbalance identified in subsection 3.6, and at least one of the outcome variables, referred to as "final sample for analysis." The universe of Panels B, C, and D is all observations non-missing for the poverty prime dummy and at least one of the outcome variables, less restrictive than the sample of Panel A. All outcome variables in Panel A are coded and constructed as described in sub-section 3.5. The *p*-value is calculated from a joint orthogonality test, using Stata command –orth_out– (Long, 2016).

Summary statistics by prime, for women and for men (con't)

	Unprimed women		Primed women		p-value,	Unprimed men		Primed men		p-value,
	Mean	N	Mean	N	difference	Mean	N	Mean	N	difference
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel B: Individual variables (con't)										
Dummy - interviewed alone or just with children	0.795	424	0.789	403	0.839	0.508	311	0.488	303	0.628
Dummy - interviewed with adult women or with adult women and children	0.092	424	0.094	403	0.909	0.212	311	0.211	303	0.976
Dummy - interviewed with adult men or with adult men and children	0.045	424	0.055	403	0.518	0.064	311	0.083	303	0.388
Dummy - interviewed with adult men and women or with adult men and women and children	0.068	424	0.062	403	0.712	0.215	311	0.218	303	0.943
Dummy - individual answered both gender modules	0.132	424	0.102	403	0.176	0.000	311	0.000	303	
Dummy - individual answered both gender modules with opposite primes	0.054	423	0.045	400	0.537	0.000	311	0.000	303	
Dummy - individual overheard her spouse's opposite prime	0.150	413	0.147	394	0.908	0.042	306	0.060	300	0.329
Panel C: Household characteristics										
Dummy - head female	0.104	424	0.134	403	0.179	0.000	311	0.000	303	
Dummy - head being married	0.939	423	0.918	403	0.255	0.971	311	0.977	303	0.651
Dummy - head age 16-24	0.032	410	0.036	384	0.712	0.036	306	0.030	297	0.699
Dummy - head age 25-35	0.327	410	0.326	384	0.969	0.284	306	0.333	297	0.193
Dummy - head age 36-50	0.471	410	0.411	384	0.093	0.431	306	0.431	297	0.992
Dummy - head age 51-64	0.137	410	0.177	384	0.116	0.196	306	0.162	297	0.271
Dummy - head age 65+	0.034	410	0.049	384	0.280	0.052	306	0.044	297	0.626
Dummy - head highest level of education: no schooling	0.088	421	0.075	402	0.487	0.078	309	0.063	303	0.470
Dummy - head highest level of education: some school	0.181	421	0.154	402	0.313	0.159	309	0.168	303	0.745
Dummy - head highest level of education: completed primary	0.646	421	0.674	402	0.397	0.683	309	0.680	303	0.937
Dummy - head highest level of education: completed secondary	0.045	421	0.025	402	0.115	0.032	309	0.033	303	0.965
Dummy - head highest level of education: completed university	0.040	421	0.072	402	0.047	0.049	309	0.056	303	0.675
Dummy - head speaking Tok Pisin	0.988	424	0.983	403	0.503	0.994	311	0.993	303	0.979
Dummy - head speaking English	0.460	424	0.459	403	0.981	0.463	311	0.518	303	0.172
Dummy - head speaking Local village dialect	0.946	424	0.940	403	0.742	0.923	311	0.964	303	0.029
Dummy - head or spouse holding an official position	0.321	424	0.400	403	0.018	0.395	311	0.393	303	0.944
Number of male adults in the household	1.330	424	1.494	403	0.009	1.621	311	1.488	303	0.085
Number of female adults in the household	1.361	424	1.474	403	0.031	1.495	311	1.370	303	0.053
Household size	5.733	424	5.948	403	0.162	6.103	311	5.970	303	0.457
First principal component of ALL assets based on total value of each item	-0.021	422	-0.018	402	0.984	-0.074	309	0.121	302	0.197
First principal component of housing quality and conditions	-0.012	424	-0.058	403	0.620	-0.171	311	-0.099	303	0.448
Spatially deflated expenditure per adult equivalent per day	7.947	422	8.228	402	0.439	7.916	310	8.843	302	0.039
Dummy - pre-treatment perception of hh poverty: below average	0.243	419	0.227	401	0.578	0.215	311	0.210	300	0.870
Dummy - pre-treatment perception of hh poverty: about average	0.637	419	0.638	401	0.972	0.669	311	0.620	300	0.208
Dummy - pre-treatment perception of hh poverty: above average	0.119	419	0.135	401	0.510	0.116	311	0.170	300	0.055
Dummy - reporting that a household member goes to sleep hungry	0.146	424	0.099	403	0.040	0.154	311	0.158	303	0.890
Dummy - both female and male respondent in household answered gender module	0.634	424	0.640	403	0.863	0.830	311	0.848	303	0.532
Dummy - male and female respondents in household received opposite primes	0.310	413	0.312	394	0.945	0.402	306	0.427	300	0.538
Panel D: Community characteristics										
Lives in commmunity with reliable mobile phone network service	0.640	422	0.587	402	0.120	0.639	310	0.649	302	0.791
Distance to nearest daily or weekly market or town (km)	8.218	422	7.922	402	0.834	6.074	310	7.213	302	0.398
Dummy - community tracing descents through father	0.566	422	0.485	402	0.019	0.477	310	0.536	302	0.145
Dummy - community tracing descents through mother	0.107	422	0.124	402	0.426	0.100	310	0.079	302	0.375
Dummy - community tracing descents through both mother and father	0.327	422	0.391	402	0.057	0.423	310	0.384	302	0.333
Dummy - World Vision treatment	0.342	424	0.414	403	0.032	0.325	311	0.350	303	0.512

Source: Authors' calculations based on PNG survey 2018.
Notes: The universe of Panels B, C, and D is all observations non-missing for the poverty prime dummy and at least one of the outcome variables, less restrictive than the sample of Panel A. The *p*-value is calculated from a joint orthogonality test, using Stata command –orth_out– (Long, 2016).

Table 2: Summary statistics by gender

	Women		Men		p-value,
	Mean (1)	N (2)	Mean (3)	N (4)	difference (5)
Panel A: Dependent variables (standardized except for income bracket)					
Extent of disagreement - In your opinion, when money is scarce, to what extent should boys have more education than girls? ("Prioritize boys for education")	0.045	752	0.092	561	0.409
Extent of disagreement - In your opinion, if jobs are scarce, to what extent should they be reserved for men rather than women? ("Reserve jobs for men")	0.062	747	0.072	559	0.858
Extent of disagreement - In your opinion, to what extent should men have the final word about decisions affecting the community? ("Men should make community decisions")	-0.063	777	0.155	578	0.000
Extent of disagreement - In your opinion, to what extent should a husband make all the decisions in the household about how to manage assets like farm equipment? ("Husband should manage household assets")	-0.005	762	0.118	576	0.030
Extent of disagreement - If a women earns money outside the home, a man somewhere will be less able to provide for his own family. ("Women crowd out men for jobs")	-0.052	734	-0.009	582	0.451
Extent of disagreement - When a wife earns money through work outside the home, her children are negatively affected. ("Women's work harms children")	0.009	681	0.062	583	0.347
Extent of disagreement - A good woman always supports her husband's opinions. ("Women should support husband's opinions")	-0.106	777	0.122	593	0.000
How much income did your family earn last year in KINA ("Income bracket")	2.252	779	2.433	593	0.016
Compared to your neighbors, do you and your family earn [much more, a little more, about the same, a little less, or much less] ("Post-treatment perception of relative poverty")	0.028	763	0.018	575	0.852
Difference between reported annual income and annual expenditure ("Over-reporting")	0.055	779	0.004	593	0.384
Panel B: Individual variables					
Dummy - poverty prime	0.487	779	0.492	593	0.829
Dummy - married	0.932	778	0.973	593	0.001
Dummy - age 16-24	0.102	767	0.032	593	0.000
Dummy - age 25-35	0.417	767	0.312	593	0.000
Dummy - age 36-50	0.366	767	0.433	593	0.012
Dummy - age 51-64	0.095	767	0.180	593	0.000
Dummy - age 65+	0.020	767	0.042	593	0.014
Dummy - highest level of education: no schooling	0.182	779	0.069	593	0.000
Dummy - highest level of education: some school	0.175	779	0.162	593	0.535
Dummy - highest level of education: completed primary	0.610	779	0.683	593	0.005
Dummy - highest level of education: completed secondary	0.015	779	0.034	593	0.026
Dummy - highest level of education: completed university	0.018	779	0.052	593	0.000
Dummy - relationship to household head: Head	0.119	779	1.000	593	0.000
Dummy - relationship to household head: Spouse	0.881	779	0.000	593	0.000
Dummy - occupation: agriculture	0.634	779	0.779	593	0.000
Dummy - occupation: manual work	0.003	779	0.062	593	0.000
Dummy - occupation: trained worker	0.022	779	0.071	593	0.000
Dummy - occupation: services	0.021	779	0.039	593	0.044
Dummy - occupation: other	0.312	779	0.029	593	0.000
Dummy - occupation: unemployed	0.009	779	0.015	593	0.290
Dummy - occupation: not in labor force	0.000	779	0.005	593	0.047
Dummy - interviewed alone or just with children	0.789	779	0.496	593	0.000
Dummy - interviewed with adult women or with adult women and children	0.095	779	0.212	593	0.000
Dummy - interviewed with adult men or with adult men and children	0.049	779	0.073	593	0.065
Dummy - interviewed with adult men and women or with adult men and women and children	0.067	779	0.219	593	0.000
Dummy - individual answered both gender modules	0.105	779	0.000	593	0.000
Dummy - individual answered both gender modules with opposite primes	0.044	776	0.000	593	0.000
Dummy - individual overheard her spouse's opposite prime	0.155	760	0.053	585	0.000

Source: Authors' calculations based on PNG survey 2018.
Notes: The universe is all observations non-missing for the poverty prime dummy, all covariates with imbalance identified in subsection 3.6, and at least one of the outcome variables, referred to as "final sample for analysis." All outcome variables in Panel A are coded and constructed as described in sub-section 3.5. The *p*-value is calculated from a joint orthogonality test, using Stata command –orth_out– (Long, 2016).

Table 1, Panel A summarizes the outcome variables by treatment status.[13] For the "income bracket" outcome, both women and men who received the poverty prime chose a significantly lower income bracket (ranging from 1–5), as we would anticipate. We explore the effect of priming on choice of income bracket more thoroughly in regressions discussed in Section 4.1 and presented in Table 3. For women, the group primed to feel poor is statistically indistinguishable from the control group in their eight gender attitude outcomes. For men, however, there is a statistically significant difference between primed and unprimed men for three statements.

[13]Panel A of Table 1 and all of Table 2 include observations in our final sample for analysis, which are those that appear in at least one of our regressions (i.e., the poverty prime dummy, all control variables described in Subsection 3.6, and at least one outcome measure are non-missing).

Specifically, poverty primed men are *less* likely to prioritize boys for education, express a desire to reserve jobs for men, or assert that men should ultimately make community decisions.

Table 3: Effect of the poverty prime on income bracket selected

	(1)	(2)	(3)
Controls added iteratively			
Covariates with imbalance	x	x	x
Enumerator FE		x	x
Community FE			x
Panel A: Women			
Dummy - poverty prime	-1.421***	-1.423***	-1.422***
	(0.079)	(0.075)	(0.076)
R^2	0.415	0.498	0.579
N	779	779	779
Panel B: Men			
Dummy - poverty prime	-1.378***	-1.333***	-1.335***
	(0.085)	(0.079)	(0.085)
R^2	0.494	0.593	0.642
N	593	593	593

Source: Authors' calculations based on PNG survey 2018.
Notes: The universe is all women and men in our final sample for analysis. The outcome variable is the answer to the "income bracket" question ("How much income did your family earn last year in KINA:"), on a five-rung ladder (increasing with income), as described in subsection 3.2. Our treatment variable, the dummy for poverty prime, indicates whether the individual received a poverty prime of response options with wider interval of income. Our basic controls include all covariates with imbalance in Table 1: 1) individual controls: categories of individual's primary occupation; 2) household-level controls: age categories of the household head, education categories of the household head, dummies for three major languages the household head speaks, a dummy for head or spouse holding an official position in an organization in this area, number of adult male household members, number of adult female members, a quadratic of spatially deflated household expenditure per adult equivalent per day, three dummies for household perception of poverty ("POP") prior to the experiment, a dummy for having a household member sleeping at night hungry because of inadequate food; 3) community-level controls: a dummy for receiving the World Vision treatment, and three dummies for tracing descents through father, mother, or both. Community-level controls are dropped out in the fully controlled, preferred specification. Standard errors are in parentheses. *** indicates p<0.01; ** indicates p<0.05; and * indicates p<0.10.

Table 2 contrasts the sample of women with that of men, testing for statistically significant differences across genders on each of our outcomes. For four of the seven gender attitude outcomes for which we have data on both women and men, attitudes are not statistically different across genders. However, interestingly, for the remaining three statements—i.e. "men should make community decisions," "husband should manage household assets," and "women should support husband's opinions"—men on average have a higher mean (more disagreement),

which means they indicate more progressive gender attitudes than do women. These findings are consistent with predictions from system justification theory (Jost and Banaji, 1994); women in PNG may try to legitimize existing social arrangements, and thus accept the status quo of gender inequality, even if it is not necessarily in their own interest.[14]

3.6 Covariate Measures

For all of our estimates of Equation 1, we include controls for all variables with imbalance across treatment and control groups for either gender. Panels B, C, and D of Table 1 summarize the characteristics of individuals, households, and communities, by prime, for each gender separately.[15] We considered 60 individual-, household-, and community-level characteristics. Overall, we observe statistical imbalance between the treatment and control groups (p-value below 0.10) for nine characteristics in the sample of women and six characteristics in the sample of men. This is little more than what we would expect to see by statistical chance given our number of tests. Moreover, we detect no imbalances on individual-level variables related to overhearing interviews.[16]

Nevertheless, given the observed imbalances across the poverty primed and control arms for the male and/or female participants, we ultimately include the following household-level controls: age categories of the household head, education categories of the household head, dummies for speaking each of three major languages (Tok Pisin, English, and local village dialects),[17] a dummy for the head or spouse holding an official position in an organization in this area (a signal of the household's social status), the numbers of adult female and adult male household members, a quadratic in the amount of household expenditure per adult equivalent

[14] Additionally, women may feel a need to provide socially desirable responses, especially if members of their family are present when answering, which translates to responses that are less gender equitable.

[15] The sample in these three panels are all observations that are non-missing for the poverty prime dummy and at least one of the outcomes, which is less restrictive than the sample in Panel A. We use this larger sample to select the covariates with imbalance, and then summarize outcomes and covariates using the final sample for analysis (also non-missing for all selected covariates) in Panel A of Table 1 and all of Table 2, for easier interpretation of effect sizes obtained from the final sample for analysis.

[16] In the sample of women, we observe statistical imbalances for: head's age category, head's education category, head or spouse holding an official position in an organization in the area, number of adult male household members, number of adult female members, a dummy for a household member going to sleep hungry, method of tracing descents, and assignment to World Vision treatment. In the sample of men, we have imbalances on the individual's primary occupation, languages the head speaks, number of adult male household members, number of adult female members, spatially deflated household expenditure per adult equivalent per day, and dummies for the respondent's perception of the household's poverty level ("POP") prior to the experiment being administered (below average, about average, or above average).

[17] All household heads speak at least one of these languages, and some speak more than one.

per day (spatially deflated),[18] a dummy for having a household member go to sleep hungry,[19] and three dummies for perception of the household's relative poverty ("POP") prior to the experiment (below average, about average, and above average).[20,21] Individual-level control variables include a series of dummies for the individual's primary occupation: agriculture, manual work, trained worker (e.g. clerical support workers, professionals, managers), services, other, unemployed, and not in the labor force. Finally, community-level controls include a dummy for assignment to the World Vision treatment and dummies for having patrilineal, matrilineal, or both systems for tracing ancestors and inheriting wealth; these dummies are dropped when we include community fixed effects in our preferred, fully controlled, specification.

Table 2, Panel B summarizes various individual-level variables by gender. We see that, as designed, approximately half of the women and men in our study (48.7 percent and 49.2 percent, respectively) received the poverty prime. Female respondents tend to be younger than male respondents, on average, with 51.9 percent of females age 35 or under compared with only 34.4 percent of men. Women are also generally less educated than men. Though agriculture is the most common occupation for both genders, men are significantly more likely to work in agriculture (77.9 percent of men compared to 63.4 percent of women), as well as serve as trained workers (7.1 percent of men versus 2.2 percent of women) and do manual work (e.g. mining, construction, manufacturing, and transport and storage sectors) (6.2 percent of men versus 0.3 percent of women). Women are more likely to work in "other" sectors, such as doing domestic work (31.2 percent of women versus 2.9 percent of men).

[18] Expenditure is constructed from the consumption module of the PNG survey. Price information is available only for purchased goods. We assign the median price of a purchased item at most local geographic unit to the same item produced at home or received as a gift provided that there are at least 10 price observations at that geographic unit. In addition, a spatial price index is calculated from estimated regional poverty lines using the Poverty Line Estimation Analytical Software (PLEASe) (Arndt et al., 2016), which takes into account spatial differences in costs of living. We divide the nominal expenditure by the spatial price index to obtain spatially adjusted expenditure variable.

[19] As expenditure is averaged across time, a dummy for reporting that a household member goes to sleep hungry may be a better measure of food security in the current season.

[20] These POP dummies provide a good baseline measure of perceived relative poverty. They were constructed from this question, with a 7-point Likert scale: "Compared to other households in this community, would you describe your household as: "the richest in the village" (1), ... "about average" (4), ... "the poorest in the village" (7). The first three responses are coded as above average, and the last three are coded as below average.

[21] There were two other subsections between the POP question and the gender module. Further, both treatment and control groups were asked the POP question.

4 Results

4.1 Effects of priming on questions about income

All individuals were asked to choose the range, or bracket, into which their income fell when given a set of five answer choices (1, 2, 3, 4, or 5). However, the income ranges of each bracket were designed to be narrower and more concentrated at the bottom of the income distribution for the control group than the treatment group. If individuals listened to the answer choices and dutifully tried to locate their own household's income in the correct bracket, then we should see that the group "treated" with income ranges to prime them to feel relatively poor chose a lower income bracket compared to the control group. This is indeed what we find; in column 3 of Table 3, which is our preferred specification with the full set of controls, we see that receiving the poverty prime leads to a bracket choice that is 1.42 units lower for women (significant at the 0.01 level), and 1.34 units lower for men (significant at the 0.01 level). The estimates of coefficients and standard errors are highly stable across specifications. We conclude that individuals did listen to the answer choices enumerators provided, and "treated" individuals accordingly placed themselves in a lower bracket than "control" individuals.

We were also interested in how receipt of the poverty prime impacted individuals' perceptions of their economic standing. We anticipated that receiving the poverty prime, and thus, on average, reporting one's income to be in a lower bracket than those who did not receive the prime, would lead to stronger feelings of relative deprivation. These feelings could manifest in at least two possible ways: reporting to the interviewer that one is indeed relatively worse off compared to neighbors (which requires a willingness to be open and honest about any feelings of relative deprivation invoked by the prime), and/or misrepresenting one's income when answering the question about the bracket in which one's income lies, immediately after being primed (something that should largely happen among those who are not open about any feelings of relative deprivation invoked). Motivations for misrepresenting one's income to the enumerator asking the question might be due to shame, guilt, or worry. On the one hand, being primed to feel relatively poor could generate feelings of shame, increasing the desire to inflate one's income in answering the income bracket question. This may stem from social desirability bias (Fisher, 1993), which refers to individuals committing systematic errors in self-reported measures owing to their desire to avoid embarrassment and project a favorable image to others (in this case, enumerators). Conversely, being primed to feel neutrally (or relatively well-off)

about one's income could lead to feelings of guilt or even to worry that one's relatively well-off status, if known to community members, could fuel demands for redistribution.[22] This could be driven by an aversion to "standing out" (Jones and Linardi, 2014) or even greed. It might motivate an individual to deflate his income when selecting an income bracket.

We first considered whether the poverty prime increased the likelihood of *reporting* that one is relatively worse off compared to neighbors—which, by definition, requires a willingness to openly and honestly *report* these feelings. Specifically, we considered the individual's response to the question, "If you compare your own household to another household, do you think you have done okay? Do you think you and your family have done [much better, a little better, about the same, a little worse, or much worse]?"[23] Priming would, by definition, not affect an individual's assessment of their relative well-being if individuals uniformly wish to say they are "about the same" as their neighbors. Indeed, we do find that a disproportionate share of women (42.7 percent) and men (35.7 percent) report their income as being about the same as others. And a full 78.9 percent of women and 86.3 percent of men report their income as being in one of the middle three answer choices. However, this question does not explicitly direct respondents to think about their relative economic standing; respondents could think that the interviewer was asking about their general well-being relative to other dimensions like health or what they have done for their community. This makes it inherently more challenging to interpret answers to this question as responses about one's perceived economic standing.

With that said, as the question still captures some aspect of relative standing, we assess the relationship between receipt of the poverty prime and answers to this question. Appendix Table A2 shows, among men, a negative relationship between being primed to feel poor and feeling relatively well-off compared to others. In our preferred, fully controlled specification, being primed to feel poor leads to a 0.1 standard deviation reduction in men's reported estimation of their own standing relative to that of others, though it is not statistically significant at conventional levels. For women, we similarly do not find a statistically significant relationship between being primed to feel relatively poor and feeling relative well-off. Either respondents did not experience feelings of relative deprivation in response to being primed, they were relatively

[22] While individuals were assured that their responses were to be kept private as part of our Institutional Review Board agreements, individuals may nonetheless worried about their privacy.

[23] The question was originally written to specifically ask about relative economic standing: "Compared to your neighbors, do you and your family earn [much more, a little more, about the same, a little less, or much less]?" Unfortunately, we learned later that the question was ultimately translated into Tok Pisin, the local language, in a way that made that distinction unclear. The question noted reflects what respondents actually heard.

more hesitant to admit to those feelings compared to men, or the question as worded did not actually prompt respondents to report their perceived relative economic standing. This motivates us to consider a measure of feeling relatively deprived that is less dependent on whether one honestly reports their feelings to an unknown enumerator.

Table 4: Effect of the poverty prime on income over-reporting behavior

	(1)	(2)	(3)
Controls added iteratively			
Covariates with imbalance	x	x	x
Enumerator FE		x	x
Community FE			x
Panel A: Women			
Dummy - poverty prime	0.148***	0.146***	0.145***
	(0.040)	(0.038)	(0.039)
Control mean	0.010	0.010	0.010
R^2	0.743	0.782	0.807
N	779	779	779
Panel B: Men			
Dummy - poverty prime	0.184***	0.223***	0.210***
	(0.050)	(0.047)	(0.051)
Control mean	-0.039	-0.039	-0.039
R^2	0.733	0.778	0.799
N	593	593	593

Source: Authors' calculations based on PNG survey 2018.
Notes: The universe is all women and men in our final sample for analysis. The outcome variable is the difference between reported income, proxied by the midpoint of each income bracket, and constructed expenditure. The outcome variable is also standardized such that it has a mean of 0 and standard deviation of 1 in the control group. The treatment and control variables are described in the footnote of Table 3. Standard errors are in parentheses. *** indicates p<0.01; ** indicates p<0.05; and * indicates p<0.10.

In Table 4, we considered as our outcome the difference between the individual's reported income (we take the midpoint of the income bracket they selected)[24] and their actual total annual expenditure. The actual expenditures come from a detailed consumption and expenditure module that collected weekly consumption data (bought, produced, and gifted items) as well as monthly and yearly non-food purchases; it was asked pre-treatment, typically of the head.[25]

[24]In the 9.8 percent of cases for women and 12.1 percent of cases for men where individuals chose the top bracket, we take the actual top-coded value of the bracket as their reported income (i.e. 3,000 Kina in the control condition and 16,000 kina in the treatment condition, as the top brackets for these conditions were "More than 3,000/16,000 kina").

[25]Expenditure is a more appropriate proxy for income given the inherent challenges of gathering income data in a low income, rural context (see for example Ravallion and Lokshin (2006), Ravallion (2015), and Lanjouw and Ravallion (1995) for further discussion on income and poverty measurement).

Here we find that our poverty prime predicts a significantly higher likelihood of misreporting one's own income. Specifically, for those primed to feel relatively poor, the income figure they report tends to be significantly higher relative to their actual expenditure. Specifically, for women, being primed to feel poor leads to a 0.15 standard deviation increase in the distance between the income level they report and their actual expenditures, whereas for men, it leads to an even larger 0.21 standard deviation increase. These results are significant at the 0.01 level for both genders. This provides additional evidence that the prime affected one's feeling about their relative economic standing—making those primed to feel relatively poor more likely to overstate their income (as captured by expenditures) and those who received no such prime relatively more likely to understate their income, possibly a means of avoiding looking either too poor (possibly due to feelings of shame) or too rich (possibly due to guilt or worry that others in one's community may try to lay claim to their income), respectively.

Given the cultural context of PNG, it is perhaps not surprising that the effects of the prime are borne out in more subtle misreporting about income, rather than individuals overtly indicating to enumerators what they feel is their standing relative to their neighbors. PNG is a context in which such comparisons are not considered socially appropriate, and where the wealthy are socially obligated to redistribute assets and money to help their kinship group and community. For example Goddard et al. (2017) underscores the risk of a modest cash income being tied to unrealistic kinship group expectations of reciprocity. Similarly, Monsell-Davis (1993) describes the "disincentive to initiative" for otherwise entrepreneurial individuals in PNG, given the heavy demands placed on individuals to share any gains with their kinship group.

4.2 Women's economic participation

We theorized that a poverty prime can have negative or positive effects on the extent to which individuals espouse egalitarian gender attitudes toward women's economic participation. In assessing the effects of perceived relative poverty on women's economic participation, we consider two questions: "In your opinion, when money is scarce, to what extent should boys have more education than girls?" (columns 1–3), and "In your opinion, if jobs are scarce, to what extent should they be reserved for men rather than women?" (columns 4–6). For each, as discussed in Section 3.5, we coded responses and normalized the variable such that a higher value indicates more egalitarian gender attitudes (either greater disagreement with prioritizing boys over

girls for education, or greater disagreement with prioritizing men over women for jobs). Each of these questions presents a trade-off between girls (women) and boys (men) in order to encourage respondents to prioritize using scarce resources, which is individuals' everyday reality, rather than asking about general support for education and jobs for all.

Table 5: Effect of the poverty prime on attitudes toward women's economic participation

	Extent of disagreement...					
	"Prioritize boys for education"			"Reserve jobs for men"		
	(1)	(2)	(3)	(4)	(5)	(6)
Controls added iteratively						
Covariates with imbalance	x	x	x	x	x	x
Enumerator FE		x	x		x	x
Community FE			x			x
Panel A: Women						
Dummy - poverty prime	0.061	0.091	0.078	0.120	0.137*	0.144*
	(0.072)	(0.069)	(0.071)	(0.078)	(0.075)	(0.077)
Control group mean	0.019	0.019	0.019	0.017	0.017	0.017
R^2	0.120	0.239	0.336	0.075	0.199	0.314
N	752	752	752	747	747	747
Panel B: Men						
Dummy - poverty prime	0.199**	0.163*	0.209**	0.156*	0.134	0.181**
	(0.091)	(0.085)	(0.089)	(0.087)	(0.082)	(0.086)
Control group mean	-0.013	-0.013	-0.013	-0.013	-0.013	-0.013
R^2	0.066	0.251	0.378	0.073	0.231	0.359
N	561	561	561	559	559	559

Source: Authors' calculations based on PNG survey 2018.
Notes: The universe is all women and men in our final sample for analysis. The outcome variables are the extent of disagreement to statements "in your opinion, when money is scarce, to what extent should boys have more education than girls" ("prioritize boys for education") and "in your opinion, if jobs are scarce, to what extent should they be reserved for men rather than women" ("reserve jobs for men"). Each outcome variable has been standardized using the mean and standard deviation of the control group, as described in sub-section 3.5. The treatment and control variables are described in the footnote of Table 3. Standard errors are in parentheses. *** indicates p<0.01; ** indicates p<0.05; and * indicates p<0.10.

Table 5 reveals that the poverty prime, on average, increased support for building girls' human capital and having women participate in paid employment. As shown in columns 1–3, both women and men who received the poverty prime show more disagreement with statements around prioritizing boys over girls for education—that is, they have more egalitarian attitudes toward women's education—though this difference is not statistically significant for female respondents. For men, being primed to feel relatively poor increases disagreement by 0.21 standard deviations, significant at the 0.05 level. It appears that, at least for men, any feelings of relative deprivation that a poverty prime brings about translate into a desire for girls to build their human capital. This could reflect that men who feel economically vulnerable have a greater desire to increase the earnings potential of daughters or other female household

members—thus increasing the household's overall earnings. For example, literate daughters are more likely to be able to help run a non-farm enterprise, assist in more complex household chores, or tutor younger siblings including brothers. It could also reflect a desire to increase daughters' eventual marriage prospects through more education (Still, 2011), to the extent that educated women fetch a higher bride price in PNG—a country where the practice of paying the bride's family at the time of marriage is common (Gerawa, 2015). Education, however, typically delays marriage (Ikamari, 2005)—and thus the receipt of a bride price. Thus, the effect of educating daughters on the net present value of a bride price received is ambiguous and will depend on individuals' discount rates, the education elasticity of bride prices, and the education elasticity of age at first marriage. Regardless of the mechanism, the evidence suggests that being primed to feel relatively poor leads to a diminished effect of gender on educational investment decisions, and thus more openness to women taking up opportunities for education.

In Columns 4–6, we see that for both women and men, receipt of the relative poverty prime leads to greater disagreement with statements around prioritizing men over women for jobs. That is, both genders express more egalitarian attitudes toward women's participation in paid employment. Women's disagreement increases by 0.14 standard deviations (significant at the 0.10 level) while for men, the poverty prime increases disagreement by a larger, 0.18 standard deviations (significant at the 0.05 level).[26] Compared to the outcome on attitudes to girls' education, we thus have more consistent evidence across respondents of both genders that being primed to feel poor leads to more egalitarian gender attitudes. Moreover, marriage market considerations are significantly less likely to explain the results of this second measure. Any feelings of relative deprivation that a relative poverty prime brings about appear to translate into a desire for women household members—and not only men—to have access to income-generating opportunities that might help alleviate any shortfalls in household income relative to other households' income levels.

A natural question is whether increased support for women's labor market participation is driven by simultaneous changes in perceptions of the costs to other individuals of their greater participation. At least two groups could potentially be perceived as losing out: men, who are direct competitors for jobs, and children, who in PNG, as in many other contexts, rely predominantly on mothers for care. Table 6 considers how the poverty prime affects two outcomes: the

[26]Results are very similar when excluding individuals who have someone in their household that received the opposite prime from their own; these individuals could potentially have overheard being primed (see columns (1) and (2) in Appendix Table A1).

extent to which individuals feel that women taking up jobs crowds out men (columns 1–3), and the extent to which individuals feel that women working harms children (columns 4–6). We find that the poverty prime does not affect respondents' perceptions of how women's participation in paid employment affects men or children, regardless of respondent gender. That the poverty prime increases both genders' support for women's economic participation while not affecting their assessment of its costs suggests it is the benefits of women's paid employment (in terms of more income) that is driving their support. This may reflect perceptions that labor markets are sufficiently segregated that women are not real competitors, that women can "do it all," or that other women (e.g., grandmothers, aunts, sisters, etc.) in the household could ensure that children are properly cared for if some women in the household work.

Table 6: Effect of the poverty prime on opinions about how women's work affects others

	Extent of disagreement...					
	"Women crowd out men for jobs"			"Women's work harms children"		
	(1)	(2)	(3)	(4)	(5)	(6)
Controls added iteratively						
Covariates with imbalance	x	x	x	x	x	x
Enumerator FE		x	x		x	x
Community FE			x			x
Panel A: Women						
Dummy - poverty prime	0.002	-0.005	0.025	0.070	0.068	0.091
	(0.076)	(0.076)	(0.078)	(0.079)	(0.076)	(0.075)
Control group mean	-0.019	-0.019	-0.019	-0.032	-0.032	-0.032
R^2	0.165	0.231	0.342	0.121	0.252	0.413
N	734	734	734	681	681	681
Panel B: Men						
Dummy - poverty prime	-0.131	-0.093	-0.039	0.057	0.094	0.106
	(0.080)	(0.076)	(0.081)	(0.075)	(0.064)	(0.070)
Control group mean	0.041	0.041	0.041	0.034	0.034	0.034
R^2	0.078	0.225	0.328	0.179	0.430	0.486
N	582	582	582	583	583	583

Source: Authors' calculations based on PNG survey 2018.
Notes: The universe is all women and men in our final sample for analysis. The outcome variables are the extent of disagreement to statements "if a women earns money outside the home, a man somewhere will be less able to provide for his own family" ("women crowd out men for jobs") and "when a wife earns money through work outside the home, her children are negatively affected" ("women's work harms children"). Each outcome variable has been standardized using the mean and standard deviation of the control group, as described in sub-section 3.5. The treatment and control variables are described in the footnote of Table 3. Standard errors are in parentheses. *** indicates p<0.01; ** indicates p<0.05; and * indicates p<0.10.

Overall, the results suggest that feelings of relative deprivation have the potential to substantially increase both women's human capital and their participation in the formal labor market. We find relatively large effect sizes despite the subtlety of our relative deprivation

prime, suggesting economically important psychological dimensions related to relative wealth undergirding decisions about women's economic participation.

4.3 Women's empowerment in decision-making

As being primed to feel relatively poor increases support for girls' education and women's participation in paid employment, a natural question is whether this extends to other domains of women's empowerment. To that end, we assess the effects of the relative poverty prime on questions related to women's decision-making authority within the community and household. In Table 7, we analyze the impact of the poverty prime on the following two statements related to women's decision-making authority both outside and inside the home: "In your opinion, to what extent should men have the final word about decisions affecting the community?" (columns 1–3) and, "In your opinion, to what extent should a husband make all the decisions in the household about how to manage assets like farm equipment?" (columns 4–6).

Table 7: Effect of the poverty prime on attitudes about women's role in decision-making in the community and household

	Extent of disagreement...					
	"Men should make community decisions"			"Husband should manage household assets"		
	(1)	(2)	(3)	(4)	(5)	(6)
Controls added iteratively						
Covariates with imbalance	x	x	x	x	x	x
Enumerator FE		x	x		x	x
Community FE			x			x
Panel A: Women						
Dummy - poverty prime	0.019	0.032	0.008	0.116*	0.131*	0.139**
	(0.070)	(0.068)	(0.068)	(0.070)	(0.067)	(0.069)
Control mean	-0.051	-0.051	-0.051	-0.046	-0.046	-0.046
R^2	0.033	0.155	0.297	0.120	0.251	0.340
N	777	777	777	762	762	762
Panel B: Men						
Dummy - poverty prime	0.177**	0.093	0.101	0.036	-0.017	0.039
	(0.085)	(0.075)	(0.080)	(0.086)	(0.075)	(0.081)
Control mean	0.063	0.063	0.063	0.080	0.080	0.080
R^2	0.182	0.415	0.485	0.158	0.402	0.466
N	578	578	578	576	576	576

Source: Authors' calculations based on PNG survey 2018.
Notes: The universe is all women and men in our final sample for analysis. The outcome variables are the extent of disagreement to statements "in your opinion, to what extent should men have the final word about decisions affecting the community" ("men should make community decisions"), and "in your opinion, to what extent should a husband make all the decisions in the household about how to manage assets like farm equipment" ("Husband should manage household assets"). Each outcome variable has been standardized using the mean and standard deviation of the control group, as described in sub-section 3.5. The treatment and control variables are described in the footnote of Table 3. Standard errors are in parentheses. *** indicates p<0.01; ** indicates p<0.05; and * indicates p<0.10.

The results for men are largely null. The coefficient on the relative poverty prime is generally

positive, which would if anything suggest greater support for women's involvement in decision-making. However, it is never statistically significant in our specification with the full set of controls. For women, the poverty prime does not affect their support for women's involvement in community decision-making; the coefficient on the poverty prime is small and far from being statistically significant. However, it does lead to significantly greater support for women's involvement in intra-household decision making among women, across all three specifications (columns 4–6). In our preferred specification with the full set of controls, women who are primed to feel relatively poor are 0.14 standard deviations more likely to disagree that husbands should exclusively manage household assets (significant at the 0.05 level).

For men, these results suggest that making relative poverty more salient by administering a relative poverty prime increases support for women's economic participation but is not accompanied by more egalitarian attitudes with regard to women's roles in community and household decision-making. This is consistent with a pure economic motivation story related to the advancement of the economic bottom-line of the household rather than a broader desire to empower women explaining men's increased support for women's participation in paid employment. For women, the results are more mixed, and the effects of the prime are centered on intra-household decision-making but not on community decision-making. It may be the case that women who have been primed to feel relatively poor become increasingly averse to perceived mismanagement of household resources by men, for which costs may be perceived to be higher if there is less income to meet daily consumption needs. For example, as we discussed in Section 2, focus group discussions mentioned that some men waste limited resources on alcohol and gambling. While Evans and Popova (2017) show that on average cash transfer programs reduce spending on temptation goods like these, cash transfers—which often carry conditions, and may be explicitly given to women—may be distinct from the resources—specifically, household assets—about which spouses in our survey are making decisions.

One of the motivations for empowering women to be involved in community and intra-household decision-making could be an erosion of social conservatism. That is, feelings of relative deprivation brought about by a relative poverty prime could lead to changes in the extent to which individuals feel it is important to uphold certain societal norms related to gender. However, we find no evidence that this is the case. Table 8 takes as outcomes respondents' attitudes towards two statements: "A good woman always supports her husband's opinions" (columns 1–3, again with controls being added sequentially) and, "In your opinion, to what

extent is it important for young women to abide by traditions, and behave like their mothers' generation?" (columns 4–6). The latter question was asked only of men due to survey length considerations for women. We find that for neither gender does receipt of the relative poverty prime predict decreased social conservatism. In our specifications with the full set of controls (columns 3 and 6), while the coefficient is always positive (suggesting that the poverty prime leads to less socially conservative attitudes), it is not statistically significant. For women, the point estimate of the coefficient on the poverty prime in column 3—the only social conservatism outcome available for women—is also incredibly small, at 0.005 (compared to 0.096 for men). Overall, we take this as evidence that any shifts in attitudes toward women's roles in intra-household decision-making are unlikely to be driven by concomitant reductions in social conservatism. After being primed to feel poor, even though women support more involvement of women in intra-household decision-making—in line with increased aversion to male control in a resource-constrained setting—they remain equally socially conservative.

Table 8: Effect of the poverty prime on degree of social conservatism

	Extent of disagreement...					
	"Women should support husband's opinions"			"Young women should abide by tradition"		
	(1)	(2)	(3)	(4)	(5)	(6)
Controls added iteratively						
Covariates with imbalance	x	x	x	x	x	x
Enumerator FE		x	x		x	x
Community FE			x			x
Panel A: Women						
Dummy - poverty prime	-0.008	-0.001	0.005			
	(0.064)	(0.063)	(0.066)			
Control group mean	-0.093	-0.093	-0.093			
R^2	0.095	0.183	0.278			
N	777	777	777			
Panel B: Men						
Dummy - poverty prime	-0.033	0.056	0.096	0.038	0.062	0.108
	(0.090)	(0.070)	(0.073)	(0.090)	(0.085)	(0.089)
Control group mean	0.130	0.130	0.130	0.010	0.010	0.010
R^2	0.112	0.496	0.587	0.081	0.231	0.364
N	593	593	593	586	586	586

Source: Authors' calculations based on PNG survey 2018.
Notes: The universe is all women and men in our final sample for analysis. The outcome variables are the extent of disagreement to statements "a good woman always supports her husband's opinions" ("women should support husband's opinions") and "in your opinion, to what extent is it important for young women to abide by traditions, and behave like their mothers' generation" ("young women should abide by tradition"). Each outcome variable has been standardized using the mean and standard deviation of the control group, as described in sub-section 3.5. The treatment and control variables are described in the footnote of Table 3. Standard errors are in parentheses. *** indicates p<0.01; ** indicates p<0.05; and * indicates p<0.10.

4.4 Analysis of prime effectiveness and manipulation checks

Our analysis of how priming individuals to feel that they have a relatively lower economic status impacts their gender attitudes assumes that our experiment had its intended effect. Evidence from Nepal (Mo, 2012, 2018a) and Pakistan (Fair et al., 2016; Healy et al., 2017)—as well as the aforementioned analyses of Tables 3 and 4—support this assertion. However, we are able to gain further verification that our treatment had its intended effect by examining how the effects of the poverty prime vary with the respondent's perception of their economic status prior to treatment. We posit that people who already felt relatively poor before the prime should be somewhat immune to its effects.

For this exercise, we leverage data from a question administered pre-treatment to both the poverty primed and controls groups, asking respondents about their perception of their household's relative poverty (POP), described in detail in Subsection 3.6. We consider treatment effects separately for two groups: (1) respondents whose pre-treatment POP is below average (i.e., those who described themselves as being poorer than other households in the community), and thus who we hypothesize should be relatively immune to a prime aimed at making them feel below average compared to those with average or above-average POP; and (2) respondents whose pre-treatment POP is average or above average (i.e., those who described themselves as being about average or richer than other households in the community), and whom we hypothesize as being susceptible to our relative poverty prime.

In Table 9, we repeat the analyses of our main results from Tables 5 and 7 for the two pre-treatment POP groups. Outcomes related to women's economic participation appear in columns 1–2, while outcomes related to women's involvement in decision-making appear in columns 3–4. We report both the effect size (coefficient on the poverty prime) for each of the two pre-treatment POP groups as well as its corresponding p-value. We also report the mean of each outcome for the control group for each of the pre-treatment POP groups.

Responses for the control and treatment groups should be equal among those who felt relatively poor before being "treated," as the treatment would have no effect. Indeed, we see that the effects of the relative poverty prime are consistently *only* seen among those who initially (prior to treatment) assessed their household's relative economic standing as being average or above average (i.e. those who did not *already* feel relatively poor pre-treatment). This finding is consistent with the effects of the relative poverty prime on gender attitudes being attributable to its effects on individuals' perceptions of their relative economic standing.

Table 9: Effect of the poverty prime by pre-treatment perceptions of relative poverty status (POP)

	Extent of disagreement...			
	Economic participation		Community and household decision-making	
	"Prioritize boys for education"	"Reserve jobs for men"	"Men should make community decisions"	"Husband should manage household assets"
	(1)	(2)	(3)	(4)
Panel A: Women				
Treatment effect, average or above POP	0.123	0.207**	0.01	0.225***
P-value (average or above)	0.129	0.018	0.893	0.004
Control group mean: average or above POP	-0.020	-0.078	0.046	0.239
Treatment effect, below average POP	-0.070	-0.067	0.003	-0.150
P-value (below average)	0.630	0.669	0.985	0.288
Control group mean: below average POP	0.032	0.050	-0.083	-0.138
R^2	0.336	0.317	0.297	0.346
N	752	747	777	762
Panel B: Men				
Treatment effect, average or above POP	0.251**	0.240**	0.081	0.014
P-value (average or above)	0.013	0.013	0.368	0.875
Control group mean: average or above POP	0.026	-0.002	0.240	0.344
Treatment effect, below average POP	0.082	-0.012	0.188	0.172
P-value (below average)	0.662	0.949	0.278	0.328
Control group mean: below average POP	-0.025	-0.016	0.012	0.005
R^2	0.378	0.361	0.486	0.465
N	561	559	578	576

Source: Authors' calculations based on PNG survey 2018.
Notes: The universe is all women and men in our final sample for analysis. Pre-experiment perceptions of relative poverty ("POP") are answers to a question about the perception of relative economic standing in the community ("compared to other households in this community, would you describe your household as:"). POP can be a good baseline measure of people's perceptions of relative poverty. We coded two dummies for perceiving one's household to be average or above average in the community, and below average in the community, and interacted each of these dummy variables with the treatment dummy variable in all regressions in this table. The outcome variables are the extent of disagreement to four gender-related statements. Economic participation statements include: "in your opinion, when money is scarce, to what extent should boys have more education than girls" ("prioritize boys for education") and "in your opinion, if jobs are scarce, to what extent should they be reserved for men rather than women" ("reserve jobs for men"). Decision-making statements include: "in your opinion, to what extent should men have the final word about decisions affecting the community" ("men should make community decisions"), and "in your opinion, to what extent should a husband make all the decisions in the household about how to manage assets like farm equipment" ("men should manage household assets"). Each outcome variable has been reverse-coded such that a larger value indicates more egalitarian attitudes, and then standardized using the mean and standard deviation of the control group, as described in sub-section 3.5. All regressions include basic controls of covariates with imbalance, enumerator fixed effects, and community fixed effects, described in the footnote of Table 3. The POP dummy included in regressions in this table is the dummy for perceiving one's household as being average or above average in the community. Standard errors are in parentheses. *** indicates p<0.01; ** indicates p<0.05; and * indicates p<0.10.

4.5 Correcting for multiple hypothesis testing

To correct for multiple hypotheses, we follow Anderson (2008) and Benjamini et al. (2006) to construct the sharpened "q-values" that control for the False Discovery Rate (FDR), or the proportion of rejections that are actually type I errors. We compute q-values for results of all fully controlled specifications in each of Tables 5, 6, 7, and 8, and present the FDR-adjusted q-values in Appendix Table A3. We see that even after adjusting for multiple hypotheses testing, being primed to feel relatively poor still leads to greater support for women's economic participation among women and men. However, we no longer see that the prime increase's women's demand for involvement in intra-household decision-making. We take this evidence supporting feeling of relative deprivation mainly influencing attitudes toward women's economic participation but not their proper role in decision-making.

5 Conclusion

Using an original experimental dataset collected in Papua New Guinea in 2018, we present evidence that perceptions of relative economic standing within a community can affect gender attitudes. We find that being primed to perceive one's economic status as being low compared to other community members can engender more openness to women's economic participation and to education for girls. This shift in participants' preferences towards reserving jobs for women and prioritizing girls for education is remarkable given that we used a very subtle and light-touch prime. However, we cannot interpret this as evidence that inequality is good for women's empowerment given the centrality to empowerment of women having agency in intra-household decisions (Kabeer, 1999). Among male respondents, the salience of relative poverty leads to no change in preferences related to women's role in decision-making. Looking at mean responses to questions around gender roles, we see that there is a strong sense that wives should always agree with their husbands, and women need to abide by traditional gender norms and defer to men with regard to decisions that affect the household and the community. As such, the shifts that we see around economic participation are likely stemming from a desire for women to earn income that can contribute to the household income. Contributing income to one's household with the expectation that women not renege on their responsibilities to the family and defer to men's decision-making authority is a far cry from women's empowerment.

Our findings are consistent with qualitative studies that speak to the growing expectation

that women do it all—contribute financially to the household, while managing household work (e.g., cleaning and child-rearing)—with relatively limited authority to make decisions. Moreover, while there is no change in men's beliefs regarding women's proper role in intra-household decision-making, when relative poverty is more salient, women want more decision-making authority in the household. The differential effects of perceived relative poverty on attitudes toward women's decision-making roles across genders suggest that shifts in feelings of relative deprivation can create conditions that are ripe for increased intra-household tension.

Overall, our findings help us understand the complicated nature of gender attitudes that are likely to influence women's economic participation and their human capital accumulation. They also underscore how asking questions only about economic participation of women would lead to false conclusions pertaining to women's empowerment, and the effects that economic development and inequality may have on gender attitudes and intra-household bargaining. Future research should explore whether there are any circumstances or contexts in which changes in the income distribution do change gender attitudes with regard to decision-making authority.

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Online Appendix

Table A1: Effect of the poverty prime when excluding individuals who could have overheard a spouse being given the opposite priming condition

	Extent of disagreement...			
	Economic participation		Community and household decision-making	
	"Prioritize boys for education"	"Reserve jobs for men"	"Men should make community decisions"	"Husband should manage household assets"
	(1)	(2)	(3)	(4)
Panel A: Women				
Dummy - poverty prime	0.129	0.147*	0.006	0.165**
	(0.079)	(0.086)	(0.076)	(0.077)
Control group mean	0.046	0.059	-0.068	-0.056
R^2	0.373	0.343	0.325	0.383
N	635	633	659	646
659				
Panel B: Men				
Dummy - poverty prime	0.201**	0.181**	0.078	0.019
	(0.091)	(0.088)	(0.082)	(0.084)
Control group mean	0.005	-0.008	0.064	0.055
R^2	0.374	0.360	0.494	0.456
N	531	530	549	547

Source: Authors' calculations based on PNG survey 2018.
Notes: The universe is all women and men in our final sample for analysis that did not potentially overhear their spouse's opposite prime. The outcome variables are identical to Table 9. All regressions include basic controls of covariates with imbalance, described in the footnote of Table 3, enumerator fixed effects, and community fixed effects. Standard errors are in parentheses. *** indicates p<0.01; ** indicates p<0.05; and * indicates p<0.10.

Table A2: Effect of the poverty prime on perceptions of relative standing

	(1)	(2)	(3)
Controls added iteratively			
Covariates with imbalance	x	x	x
Enumerator FE		x	x
Community FE			x
Panel A: Women			
Dummy - poverty prime	0.052	0.078	0.088
	(0.070)	(0.071)	(0.073)
Control mean	-0.029	-0.029	-0.029
R^2	0.167	0.199	0.307
N	763	763	763
Panel B: Men			
Dummy - poverty prime	-0.109	-0.081	-0.098
	(0.071)	(0.071)	(0.077)
Control mean	0.056	0.056	0.056
R^2	0.272	0.317	0.395
N	575	575	575

Source: Authors' calculations based on PNG survey 2018.
Notes: The universe is all women and men in our final sample for analysis. The outcome variable is the answer to the "manipulation check" question ("Compared to your neighbors, do you and your family earn [much more, a little more, about the same, a little less, or much less]?"), standardized using mean and standard deviation from the control group (reverse-coded before the standardization such that it increases with perceptions of relative income), as described in subsections 3.2 and 3.5. The treatment and control variables are described in the footnote of Table 3. Standard errors are in parentheses. *** indicates p<0.01; ** indicates p<0.05; and * indicates p<0.10.

Table A3: Correcting for multiple hypotheses by controlling for False Discovery Rate (FDR)

	Women		Men	
	(1) Naive p value	(2) Sharpened q value	(3) Naive p value	(4) Sharpened q value
Panel A: Table 5 Economic participation				
"Prioritize boys for education"	0.278	0.091	0.020	0.078
"Reserve jobs for men"	0.062	0.078	0.036	0.078
Panel B: Table 6 How women's work affects others				
"Women crowd out men for jobs"	0.748	0.845	0.628	0.845
"Women's work harms children"	0.229	0.845	0.129	0.845
Panel C: Table 7 Decision-making				
"Men should make community decisions"	0.905	0.827	0.209	0.457
"Husband should manage household assets"	0.045	0.222	0.636	0.737
Panel D: Table 8 Social conservatism				
"Women should support husband's opinion"	0.938	0.507	0.190	0.507
"Young women should abide by tradition"	0.224	0.507		

Source: Authors' calculations based on PNG survey 2018.
Notes: The sharpened q-values are constructed following Anderson (2008) and Benjamini et al. (2006) to correct for multiple hypotheses. The sharpened "q-values" that control for the False Discovery Rate (FDR), or the proportion of rejections that are actually type I errors. We compute q-values for results of all fully controlled specifications in each of Tables 5, 6, 7, and 8. The treatment and control variables are identical to Table 3. Standard errors are in parentheses. *** indicates p<0.01; ** indicates p<0.05; and * indicates p<0.10.

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