

Preaching Against the Choir: Religious Leaders and Reproductive Norms in Kenya*

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Abstract

Religion shapes individuals' beliefs and behavior, but whether and how religious leaders can change social norms remains unclear. I study this in the context of family planning in Meru County, Kenya, using primary data from reproductive-age women. A central challenge to identification is that community behavior, scripture, and the stance of religious leaders are entangled in observed choices. Using a randomized vignette experiment that independently varies these forces, I disentangle them and identify the weight women place on each in a discrete-choice model with social interactions. I show that religious leaders influence women's decisions through two distinct channels. First, they directly shift women's utility. Their support for family planning increases women's willingness to adopt it, and this effect is larger than the corresponding effect of opposition. Second, religious leaders alter how women respond to the behavior of other women in their community. When a leader takes an explicit position, women place less weight on others' behavior. As a result, religious messages have their largest effects when they run counter to prevailing community behavior. I corroborate the experimental findings at scale using difference-in-differences estimates from a faith-based family-planning program, showing that program effects are largest in places where religious leaders are more trusted.

Keywords: religion; social norms; religious leaders; family planning; Kenya

JEL Classification: O12, Z12, Z13, D91, J13, C93

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1 Introduction

Across much of the developing world, religion shapes individuals' beliefs and behavior, and religious institutions, along with their leaders, command an authority that few others rival. Whether this authority can change deep-rooted social norms and serve as an instrument of development policy remains an open question. The question is particularly relevant to reproductive norms in sub-Saharan Africa (SSA). Religious institutions speak directly to childbearing, and they do so where the norm around family planning (FP)¹ is both strong and contested. What a religious leader does with that authority is theoretically and empirically ambiguous. A leader may uphold a prevailing norm or be the one figure capable of changing it.

For five decades, FP has been a cornerstone of development policy, with well-documented returns for women's health, education, and economic participation (Bailey, 2013; Goldin & Katz, 2002). Despite this investment and renewed commitments through the Sustainable Development Goals (United Nations, 2019), the effectiveness of standard FP interventions in SSA has become questionable.² In 2022, roughly 30% of the 164 million women of reproductive age with unmet need lived on the African continent. Furthermore, across much of SSA, fewer than half of those who wish to avoid pregnancy use a modern method (United Nations, 2022). The conventional explanation is a supply-side one, namely that affordable contraception is both hard to access and of low quality (Blackstone et al., 2017; Bongaarts & Bruce, 1995; Tessema et al., 2016). Two recent studies find otherwise. Dupas et al. (2025) trace low uptake to high desired family size, and Bau et al. (2024) to misconceptions about contraception and infertility.³ These findings shift the focus to traditional belief systems, culture, and social norms, a terrain religious leaders already occupy.

Religious leaders are among the most trusted figures in SSA, and they have the standing and reach to influence social norms. In this paper, I ask whether religious leaders reflect prevailing social norms in their communities or change them. I also ask how and how far they can shift social norms. Answering these questions requires separating four forces that observed behavior entangles: (1) personal preference, (2) scripture, (3) social norms, and (4) religious leader influence. Empirically isolating these forces is challenging. Moreover,

¹Christian Connections for International Health (CCIH) defines FP as “enabling couples to determine the number and timing of pregnancies, including the voluntary use of methods for preventing pregnancy—not including abortion—harmonious with their values and religious beliefs.”

²See Appendix Figure A1 for global rates of unmet need, contraceptive use, and fertility.

³Bongaarts and Casterline (2013), Caldwell and Caldwell (1987), and Timæus and Moultrie (2020) also explore the phenomenon of high desired family size.

direct questions are distorted by social desirability bias, as individuals are reluctant to admit that neighbors or leaders influence their choices, especially in highly religious societies. These mechanisms are seldom told apart, so separating them does more than merely explain FP use. It provides a measure of how trusted authorities shape the social norms that hold communities in place.

To overcome the empirical challenge and disentangle the four forces, I use a vignette experiment from a primary survey of 635 Christian women of reproductive age in Meru County, Kenya. The vignette presents short stories about a fictional woman and independently randomizes the social norm she faces, her leader's stated position, and the scriptural frame she holds. Across 5,080 vignette responses, this experimental randomization identifies the weight a woman places on each of these forces. I pair this experiment with an extension of a discrete-choice model with social interactions in which a woman's decision responds to her personal preference, the scripture she holds, the social norm she perceives, and her religious leader's position (Brock & Durlauf, 2001). The estimates answer both how important religious leaders are and how strongly conformity amplifies a leader's influence. Through counterfactual policy simulations, I assess how much leaders' advocacy can change social norms and where it will have the greatest impact.

I find a wedge in expected behavior when the act of using FP can be hidden rather than publicly observed. For the same stories, women predict the likelihood of a fictional woman using FP at around 40% when the choice is observed, but 70% say that FP use will occur if it can be kept secret. Women are also more likely to endorse FP use than expect it, particularly where the norm is against it. These findings suggest that latent demand is high and that the constraint holding use down is social. This social constraint is also a force women are reluctant to name. In a first-person pebble-allocation game over the same drivers of her own choice, women give their village norm only about 14% of 12 pebbles. This is less than what they allocate to their personal preference (52%) or to scripture (21%). The vignettes reveal that the same norm is the force that moves them most. Therefore, standard self-reports reverse the ranking of scripture and the social norm, a social-desirability gap produced by the very forces I set out to measure.

The central result concerns how religious authority works. Religious leaders carry less weight than the social norm in women's decisions, but more than scripture. They influence behavior and the social norm in two ways. When a leader endorses FP use, there is a direct increase. A blessing moves behavior about four times as much as a prohibition does. This endorsement premium is consistent with a supportive message that licenses

women to act on the latent demand that the social norm suppresses. Another way the religious leader changes the norm is through a substitution effect. Once the leader speaks on FP, the weight women place on the social norm falls, so authority displaces the norm rather than reinforcing it. These results indicate that religious leaders have the greatest impact when they preach against the choir, that is, when their message runs counter to the prevailing norm. Lastly, I find that the estimated leader and scripture weights do not vary systematically with a woman's demographics, though the strength of conformity falls steadily with household income. I also find that women who trust their religious leader more are more moved by a supportive message.

In the counterfactual simulations, which give upper bounds, support for FP from 20% of religious leaders would increase equilibrium FP use by about 21 percentage points (pp). In contrast, a prohibition from the same share of leaders would only decrease use by 9 pp. If all leaders supported FP in communities with a baseline contraceptive prevalence rate similar to that of Meru County (50.8%), equilibrium use would increase by 39 pp. Of this increase, 23 pp are the direct leader effect, and the rest are a multiplier effect as women adjust to the new behavior of their neighbors. The structural estimates place the setting I study in a unique equilibrium regime, so the leader slides the equilibrium instead of tipping it, and FP use returns to baseline once advocacy stops. However, when I reweight my sample to match low-use villages in the Kenya Demographic and Health Survey (KDHS), conformity rises to about one, so I cannot rule out the possibility that religious leaders in such villages could eliminate a low-use norm altogether.

To corroborate these experimental findings with real-world behavior, I analyze two faith-based FP initiatives in Kenya. The CHAK-Packard and Christian Advocacy for Family Planning in Africa (CAFFPA) programs trained religious leaders as 'champions' to reduce FP stigma between 2013 and 2021. I use a difference-in-differences design built on health facility locations and the KDHS. Focusing on the CHAK-Packard program, whose counties have relatively stable pre-trends, I find an increase in birth spacing of roughly 5.5 months and a decrease in the five-year birth rate of roughly 8 pp. I also explore potential mechanisms through which the program worked and find that the effects are largest in areas with high trust in religious leaders and a dense faith-based health network. The density of government health facilities shows no significant impact. Although aggregate data cannot disentangle the forces of individual behavior, the role of trust in religious leaders aligns with the patterns observed in the experimental findings.

The policy implications follow from the estimated weights. Religious leader engagement

is most effective where conformity is strong, FP use is low, trust in religious leaders is high, and a faith-based network can deliver on a changed norm. The structural estimates locate the first three conditions, and the reduced-form evidence suggests the fourth. The results turn a call to involve religious leaders in policy into a targeted, testable, and scalable design. The framework is not specific to FP. In the first-person pebble game, women give weight to the same four forces on other issues governed by social norms, such as female genital cutting and gender-based violence. Women give the religious leader a larger share on these issues than for FP, suggesting that leaders may be capable of influencing those norms as well. In general, the design provides a way to measure how far a trusted authority can shift the social norms underlying community behavior.

I contribute to four strands of literature. First, following the literature on the measurement of social interactions (Bicchieri, 2016; Glaeser et al., 1996), I identify the strength of conformity despite it being confounded with correlated preferences and shared environments, a version of Manski's (1993) reflection problem. Building on the discrete-choice framework of Brock and Durlauf (2001) and Calvi et al. (2026), I use experimentally randomized vignettes to separate norm conformity, religious authority, and scripture. I also contrast these estimates with first-person elicitation data to illustrate potential social desirability bias. Second, I contribute to the study of leaders as agents of social and cultural change. A theoretical literature casts prominent actors as coordinators who move communities between social equilibria (Acemoglu & Jackson, 2015), and leaders are known to shape economic outcomes and cultural traits more broadly (Jones & Olken, 2005; Prummer & Siedlarek, 2017). Closest to my setting, Bassi and Rasul (2017) show that religious authority shifts fertility-related behavior. I add experimental evidence on the mechanism, quantifying how leaders can change social norms and how far their influence extends.

Third, I contribute to the literature on fertility and the persistence and change of social norms (La Ferrara et al., 2012; Munshi & Myaux, 2006). Suboptimal norms can persist as self-enforcing equilibria even when they are privately unpopular (Ashraf et al., 2020; Bursztyn et al., 2020), and recent work shows they can be shifted by correcting misperceptions or by well-placed interventions (Field et al., 2021; Gulesci et al., 2025). I identify a distinct lever, the trusted religious leader, and the conditions under which engaging one changes a community's norm. Finally, I contribute to the economics of religion by treating religion as a contemporary policy instrument rather than a historical determinant (Becker et al., 2021). Where much of this literature studies religion's long-run economic legacies, I show, in the spirit of Bryan et al. (2020), that engaging religious authority can shift present-day behavior, reframing faith and its leaders as a lever for development policy.

2 The Kenyan Context

This section highlights the religious and institutional landscape of Kenya. Kenya reflects a broader pattern across sub-Saharan Africa (SSA), where deep-rooted social norms coexist with trusted religious authorities. First, I document religion as a dominant social force, in which trust in religious leaders exceeds that in traditional, presidential, and local authorities. Second, I show the involvement of faith-based organizations (FBOs) in the national healthcare infrastructure. Third, I turn to individual behavior and outline current reproductive patterns, identifying a gender gap in fertility preferences and a substantial latent demand among women for birth spacing. Finally, I note that the primary barriers to family planning (FP) uptake stem from social norms and informational misconceptions instead of doctrinal opposition, and that religious devotion is tied to the value placed on children rather than to gender roles. Together, these stylized facts suggest that religious leaders possess the social standing to change social norms around FP.

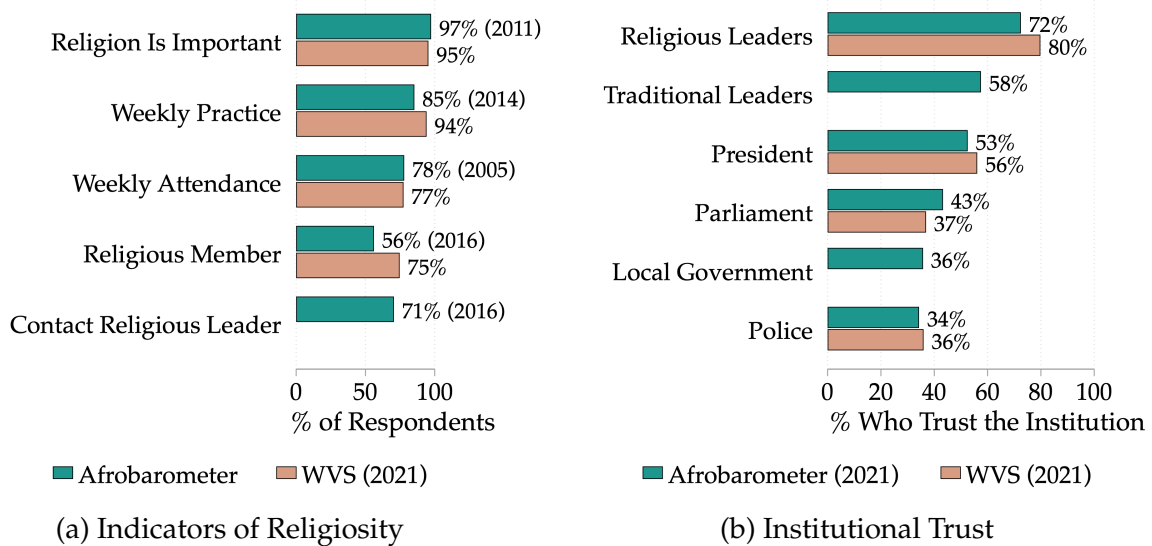
Religious Landscape Of all Kenyans, 85% identify as Christian, 11% as Muslim, and only 1.5% report no religious affiliation (KNBS, 2019).⁴ Beyond mere identification, Figure 1a shows the intensity of religiosity in Kenya. Consistently, over 95% of Kenyans report that religion is important in their lives. Religious leaders are also involved in individuals' daily lives, with 71% of respondents reporting that they have contacted a religious leader. Although self-reported measures of devotion may occasionally be subject to social-desirability bias, these figures collectively underscore religion's significance within Kenya's socio-cultural fabric. Figure 1b illustrates that religious leaders garner the highest levels of institutional trust in Kenya. In 2021, 72% of Afrobarometer respondents and 80% of World Values Survey (WVS) respondents reported trusting religious leaders at least "somewhat," the highest share of any institution.⁵ Therefore, religious leaders are positioned to act as influential moral authorities in community decision-making.

Faith-Based Social Services Across SSA, FBOs provide between 20% and 50% of all healthcare services (Bormet et al., 2021). In Kenya, data from the Kenya Master Health Facility Registry (KMHFR) show that of the 16,249 total health facilities, 1,026 are faith-based. FBOs account for 11% of Level 4 facilities (sub-county referral hospitals) and 7% of Level 3 facilities (health centers and maternity homes). Appendix Table A1 summarizes the KMHFR data on FP provision. Government facilities are the most likely to offer FP services

⁴Disaggregated, the population is 20% Catholic, 34% Protestant, 20% Evangelical, 7% African Instituted Churches, and 1% Traditionalist.

⁵Religious leaders have consistently ranked first in trust over the past decade. See Appendix Figure A2.

Figure 1: Religiosity and Trust



NOTE: Panel (a) reports the percentage of respondents on five dimensions of religiosity, namely having contacted a religious leader, active membership in a religious group, weekly attendance, weekly practice, and rating religion as important. Panel (b) reports the percentage who trust each institution “somewhat” or “a lot.” Data are from the Afrobarometer and World Values Survey (WVS). Appendix Figure A2 reports every wave.

at every level of care below referral hospitals, with 72% of facilities listing FP as an active service, reflecting their mandate to ensure widespread service availability. Overall, FBOs have lower rates of FP provision. However, facilities associated with the Christian Health Association of Kenya (CHAK) and registered with the Kenyan health ministry are roughly 20 percentage points more likely to provide FP services than the national FBO average. Within CHAK, Seventh-day Adventist, Africa Inland Church and AIPCA facilities, and Methodist churches are the leading denominations in FP supply, with 83.3%, 66.0%, and 56.3% of their associated facilities offering these services.⁶

Reproductive Outcomes Appendix Figure A3a shows the evolution of reproductive health needs in Kenya over the past quarter-century. Following a period of marginal decline between 2000 and 2008, the unmet need for modern contraceptive methods fell sharply through 2015. While this downward trend has persisted, unmet need remains at around 10% in the general population. Teenage childbearing remains prevalent, with nearly 15% of women aged 15–19 having already begun childbearing. Appendix Figure A3b illustrates the shifting landscape of contraceptive method mix among Kenyan women between 2003 and 2022. While injectable contraceptives have historically been the most prevalent modern method, the data reveal a marked shift by 2022, in which the uptake of implants has grown

⁶These figures reflect KMHFR facility records as of September 2025. Only facilities that explicitly list FP as an active service are counted toward the FP provision rate.

to reach parity with injections. For women, particularly those in rural contexts, the rise of long-acting reversible contraceptives, like implants, offers practical advantages in terms of privacy, long-term effectiveness, and reduced frequency of facility visits.

Fertility Preferences Appendix Figure A4a displays the ideal number of children and total children ever born for both men and women. Across the survey periods, men's ideal family size consistently exceeds women's by between 0.3 and 0.5 children. Similar to the findings of Dupas et al. (2025), the desired family size remains high. However, a substantial portion of women express a desire to space or limit future births. Appendix Figure A4b shows that 76% of women wish to delay their next birth by at least two years. A further 40% of women state that their last child was unintended, while 32% of currently pregnant women report that the pregnancy was not desired at this point in time. These figures indicate that a significant share of women have a latent demand for birth spacing. However, these preferences often clash within the household, as 27% of women report that their husbands desire more children than they do. Importantly, when it comes to using contraception, husbands are rarely the main decision makers. Among married women using contraception, only 6% report in 2022 that their husband mainly decides on its use, and among non-users, only 9% report that he mainly decided against it.

Norms, Stigmas, and Misconceptions Persistent social stigmas and misconceptions regarding contraceptive use represent a significant barrier to its uptake. Figure 2a details male attitudes toward FP, which frequently associate contraceptive use with infidelity and social transgression. Over 40% of Kenyan men state that women who use contraceptives become “promiscuous.” Furthermore, a gendered perception of responsibility persists, with approximately one-fifth of men viewing contraception as an exclusively female problem. These stigmas make FP socially costly to use when observed. While knowledge of contraceptives is nearly universal, Figure 2b illustrates that informational frictions remain.⁷ Fear of side effects is a primary driver of non-use, with nearly half of women reporting they never received counseling on potential side effects. Male opposition remains a hurdle, with one-fifth of women reporting husband disapproval in 2014.

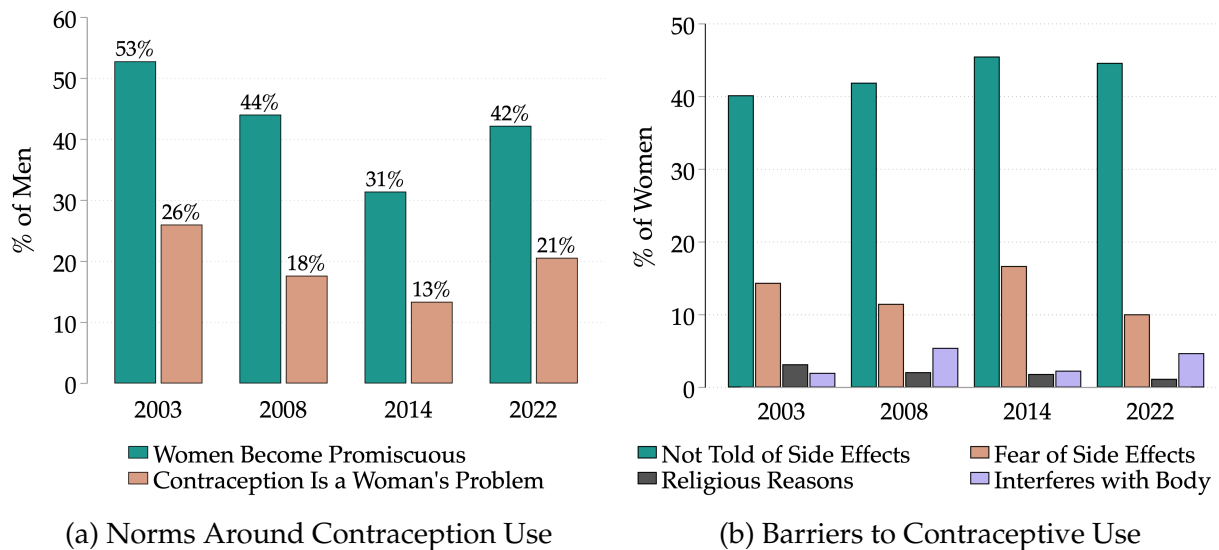
Across religious affiliation, the differences in usage, knowledge, and unmet need between Catholics and other Christians are negligible.⁸ Catholic doctrine formally opposes modern contraception, so this similarity suggests that doctrine alone does not drive FP use. Only 1%–3% of women cite direct religious prohibition as their reason for non-use. Where

⁷See Appendix Figure A5a for contraceptive knowledge and Appendix Figure A6b for barriers to contraceptive use.

⁸See Appendix Figure A5b.

religious intensity does matter is in the value placed on children. Compared to other Kenyans, the 41% who give the most devout answer to every religiosity question are more likely to see children as a duty to society (76% against 66%) and to say contraception is never justifiable (17% against 12%). However, they do not hold more conservative views on gender roles.⁹ These results suggest that religion shapes views on FP through the value placed on children and through social stigma rather than through doctrinal prohibition. The severity of gender norms extends well beyond contraception, with female genital cutting still affecting 15% of women ages 15–49, and 41% of women reporting violence from a partner (KNBS & ICF, 2023), both of which reflect the community pressures that characterize this setting.

Figure 2: Norms and Misconceptions Around FP



NOTE: Panel (a) reports the percentage of Kenyan men who believe contraception makes women promiscuous and that family planning is a woman's problem alone. Panel (b) reports women's reasons for not using contraception and the share not told about side effects by a provider. Data are from the Kenya Demographic and Health Surveys. Appendix Figures A6a and A6b report more items.

3 Survey Design and Descriptive Evidence

Social norms, religious authority, and scripture are all entangled in observed behavior. Furthermore, asking about these forces directly invites social-desirability bias. This section describes the survey I designed to overcome both empirical challenges. The main instrument is an original stated-choice vignette experiment that independently randomizes the three forces across third-person scenarios within each respondent, allowing the influence

⁹See Appendix Table A2, which also reports the change in each view per standard deviation of a continuous religiosity index, with demographic controls. Data are from the WVS.

of each to be identified from exogenous variation. First, I outline the survey setting and sample. Second, I describe the vignette experiment and a complementary pebble-allocation game. Finally, I provide descriptive evidence from the elicitation data on how each force shapes beliefs around family planning (FP) use.

3.1 Setting and Sample

The primary data were collected through an original survey of 635 Christian women of reproductive age in the Maua area of Meru County, Kenya. Meru County suits the study well. It is a primarily agrarian society where traditional customs remain strong, yet it has a long history of religious institutions dating back to the 19th-century Methodist missions. Thus, it provides a “dual-authority” environment in which traditional and religious structures coexist but may pull the community in different directions. Women were recruited through Sodzo Kenya’s table-banking savings groups, known locally as *Kuja Pamoja kwa Jamii* (Come Together for Community). Sodzo’s presence differs across villages. Some groups are long-established and others are only a meeting or two old, so the sample is neither uniformly selected nor uniformly empowered.

Trained enumerators surveyed group members who were Christian, of reproductive age, and willing to participate. The sample was restricted to Christian women to preserve doctrinal coherence in the scripture frames used in the vignette instrument. The interview was conducted in Kimeru and tablet-assisted for data capture. The vignette stimuli were printed on physical cards, and the allocation task used physical pebbles and boxes, which kept the tasks concrete for respondents with limited numeracy. Before the main survey, I held focus groups and a pilot study to test the instrument and refine the vignette design. These confirmed that respondents understood the tasks and that the vignettes were realistic and culturally appropriate. In the main survey, comprehension checks and response patterns show the same.¹⁰

The respondents are on average 35 years old, and 81% are married or in a union. Formal schooling is limited, with 76% having completed at most primary education and 25% reaching secondary school or beyond. The sample spans Kenya’s major Christian traditions. Pentecostal churches and mainline Protestants, which in Meru are largely Methodist, Anglican, and Presbyterian, each account for about a fifth of the sample. African Instituted Churches, together with the Africa Inland Church, make up a further 15%, and Catholics and Adventists are smaller minorities. The remaining third belongs to a dense landscape

¹⁰See Appendix Table B4.

of small independent congregations, split between charismatic and gospel churches and African-initiated Zionist and apostolic churches.

Religiosity is near-universal, as 95% attend services weekly and 90% report trusting religious leaders somewhat or a lot.¹¹ Women also turn to their religious leaders when it concerns FP. Of the 510 women asked, around a third said they would turn to their religious leader if there were disagreement on FP use with their partner, ahead of a health worker (23%) and parents or in-laws (20%). Although husbands rarely make the decision outright, gender roles are also conservative, with 96% agreeing that a woman should obey her husband even when she disagrees with him and 36% saying they could not use FP if their husband were strongly against it.

Even though the ideal family size remains high at roughly four children, FP is familiar in this sample. Almost every woman knows a modern method, 95% have ever used one, and 84% currently use a modern method of contraception. The use is concentrated in the methods a provider delivers, with 63% of current users relying on injectables, 23% relying on implants, while only 4% rely on the daily pill and fewer than 1% on condoms. Therefore, continued use occurs through a clinic and much of it is for spacing, as 40% of current users want another child. Access does not appear to be the binding constraint, as none of the 29 women who have never used a method cite cost or distance as the reason. However, the average travel time to the nearest clinic is just over an hour, mostly on foot. FP use in the sample is well above Meru County as a whole, where 51% of women use a modern method (KNBS & ICF, 2023), let alone Kenya and sub-Saharan Africa (SSA), making it a high-use setting. Given this, the setting might be a difficult place to detect a normative constraint, since widespread use suggests that little is holding women back from using FP.

The high-use setting turns out to be an advantage for two reasons. First, it does not affect what I estimate, since the influence of each force comes from comparing how the same woman's answers change from one story to the next, and her own FP use remains the same across all stories. Second, it makes the evidence of the norm more convincing. Even women who use FP themselves judge a hypothetical woman's use to fall when few women in her village use it and to rise if she can use FP in secret. Hence, the social pressure of the norm is still there, but it is hidden behind high FP use, and looking at behavior alone would miss it. The design also reaches beyond this setting, since the norm card describes villages where 2 or 5 out of 10 women use FP, well below the 84% in the sample. Therefore, every respondent also predicts behavior in communities more conservative than her own.

¹¹See Appendix Table B1 for summary statistics of the sample.

3.2 The Vignette Experiment

Direct questions about contraceptive use, religion, and social norms are subject to social-desirability bias. Although the interviews were conducted privately and kept confidential, a respondent who faces strong social pressure against FP might still underreport her true preference when asked directly about these issues. To circumvent this, I employ a third-person design that presents short stories about a fictional woman named “Kendi” and asks respondents to report what they believe Kendi would do. This framing creates psychological distance between the respondent and the sensitive behavior.

Design The third-person experiment implements a structured factorial vignette design with three treatment factors, each varied across eight stories presented to each respondent. The three factors are: (1) the social norm around FP, (2) the stance of a religious leader, and (3) the scriptural frame a woman has internalized. By the social norm, I mean what other women in Kendi’s village do and approve of. This is conveyed by the card, which shows the number of women who use FP. Each story is placed in front of the respondent as four physical cards, one depicting Kendi’s profile and one for each treatment factor, with the story read aloud from the tablet. The profile card is assigned at random and fixed for the respondent across all eight stories. The design sets which treatment cards are non-neutral in each story. The tablet randomizes the level of each non-neutral card (for or against FP) and the order of the stories and balances the assignment across respondents.

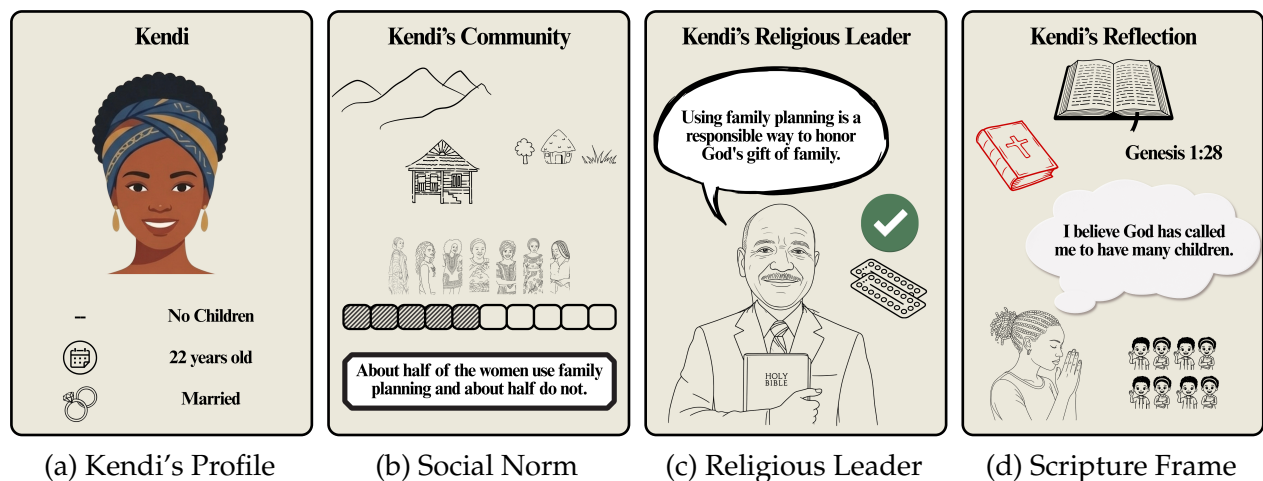
Why a Stated-Choice Design The forces I study in this paper cannot be separated using observed choices. The social norm in a community, the stance of a religious leader, and the scripture that its members internalize move together and respond to one another, so observational correlation cannot separate them (Manski, 1993). A survey experiment instead creates its own identifying variation (Stantcheva, 2023). The vignette experiment randomizes each force for the same woman, so that the comparison between two stories holds everything else, including Kendi’s profile, fixed. This buys clean identification at the cost of realism. That is, a respondent reports what she expects a fictional woman to do in a hypothetical situation, not what she herself does.

The estimates describe how women in this community expect a woman in Kendi’s position to respond to each force. To read them as the weights that govern actual decisions, I assume that respondents know how such decisions are made in their own community. The same assumption underlies the estimation of random utility models from elicited choice probabilities (Blass et al., 2010) and from hypothetical choices, which have been shown to track the choices respondents later make (Wiswall & Zafar, 2018). Furthermore, responses

to vignette and conjoint designs have been shown to approximate real-world behavior (Hainmueller et al., 2015), and in Section 7, I compare the experimental findings with the effects of two faith-based FP programs in Kenya.

Profiles and Cards Figure 3 shows an example of the four cards for a single story. There are five profile cards: (A) age 16, unmarried, no children; (B) age 22, unmarried, no children; (C) age 22, married, no children; (D) age 22, married, one child; and (E) age 28, married, one child. The profiles form a ladder in which each adjacent pair differs in a single attribute (age for $A \rightarrow B$, marriage for $B \rightarrow C$, parity for $C \rightarrow D$, and age again for $D \rightarrow E$). Two of these steps bundle their attribute with a second feature by design. The marriage step ($B \rightarrow C$) also introduces a husband and a joint-decision frame, and the first-child step ($C \rightarrow D$) also shifts the story to a birth-spacing frame. Nevertheless, the steps allow me to compare the preference for FP across a range of life stages. Every story also makes it clear that access to FP is available at a clinic at no cost and that Kendi is considering using a clinic method to delay the birth of a child, but is unsure whether doing so is acceptable. Therefore, access is held fixed by design and only the social and religious settings of her decision vary.

Figure 3: A Complete Vignette Example



NOTE: One complete story. The profile card is fixed for the respondent, and the three treatment cards vary across her eight stories. This example shows (a) a 22-year-old, married, childless Kendi, (b) a village where about half the women use family planning, (c) a supportive religious leader, and (d) the fruitfulness passage. Appendix B.2 shows every card.

The social-norm card shows how many out of 10 women in the village use FP (2, 5, or 8), with shaded blocks paired with the phrases “almost no one,” “about half,” or “almost all.” The religious-leader card conveys the public position of Kendi’s religious leader. At the opposing level, he spoke publicly to the congregation, teaching that FP shows a lack of trust in God’s plan. At the silent level, he has not spoken publicly about it. At the supportive level, he spoke publicly to the congregation, teaching that FP is a responsible

way to honor God’s gift of family. The scripture card sets the passage Kendi reads before deciding. Its fruitfulness level gives Genesis 1:28, “Be fruitful and multiply, and fill the earth,” after which she believes God has called her to have many children. Its neutral level presents no passage. Its stewardship level cites 1 Timothy 5:8, “If anyone does not provide for his own household, he has denied the faith,” after which she believes God has called her to care for her children and ensure they are healthy.

Both passages speak to the value placed on children, which varies by religious devotion. The two passages are also not equally familiar, but the choices were deliberate. Genesis 1:28 is a widely known pronatalist verse, while 1 Timothy 5:8 is one of the passages that faith-based FP programs in Kenya use to argue that parents should plan for their children, space pregnancies for their health, and have the family they can support (Bormet et al., 2021). The idea behind the verse is familiar, even if the verse itself might not be as well-known. This shows in the data, where all but 2 of the 635 respondents agree that God gave them wisdom and stewardship to plan their families. Since each scripture card states how Kendi internalizes the passage, the treatment is the verse along with this reading, much as a sermon would deliver it.

The leader and scripture cues are specific, recognizable messages, so women’s responses to the vignettes reflect actual religious content. Pilot and focus-group testing of the vignette cards suggests that the two non-neutral levels of each card are symmetric around its neutral level. That is, the low and high norm shares, the opposing and supportive leader messages, and the fruitfulness and stewardship frames are meant to carry equal weight, apart from the difference in familiarity between the two passages discussed above. Although the cards themselves cannot guarantee equal force, they were written and tested to read symmetrically. Therefore, I read asymmetry that the estimates later reveal between a supportive and an opposing cue as how women respond, including what they already believe, rather than the wording of the cards.

Story Structure Since each respondent hears eight stories, every comparison between stories is made within the same woman. Therefore, her own characteristics cannot drive the differences between her answers to the stories. Table 1 shows the eight stories each respondent hears. Story 1 is the baseline, with all three treatment cards at their neutral level. Stories 2–4 vary one factor at a time, Stories 5–7 vary two, and Story 8 varies all three. The single-factor stories isolate the influence of each force on the respondent’s prediction of Kendi’s FP use, the two-factor stories show how the forces interact, and the final story provides a specification check. Each non-neutral card is drawn for or against FP, so the

eight story types cover all 27 combinations of the three cards across respondents. Since the draws are also balanced, each card is neutral in half the stories and at each non-neutral level in about a quarter.

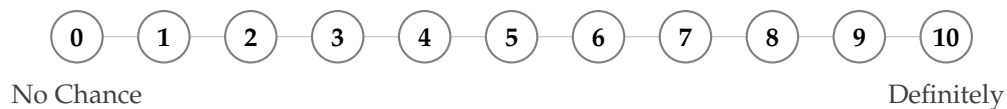
Table 1: The Eight Stories Each Respondent Hears

Story	Name	Norm	Leader	Scripture	What the Story Asks
1	Baseline	0	0	0	Anchor, all three cards neutral
2	Norm	$\pm$	0	0	What the community does on its own
3	Leader	0	$\pm$	0	What the leader does on his own
4	Scripture	0	0	$\pm$	What a passage does on its own
5	Norm $\times$ Leader	$\pm$	$\pm$	0	Does the leader change the pull of the norm?
6	Norm $\times$ Scripture	$\pm$	0	$\pm$	Does scripture change the pull of the norm?
7	Leader $\times$ Scripture	0	$\pm$	$\pm$	Do the leader and scripture interact?
8	Omnibus	$\pm$	$\pm$	$\pm$	All three at once, a specification check

NOTE: $\pm$ indicates random draws of the low or high level of that card (2 or 8 out of 10 women using FP, an opposing or supportive leader, a fruitfulness or stewardship passage), balanced across respondents. 0 is the neutral level (5 out of 10 women, a silent leader, no passage). Story order is randomized within each respondent.

Outcome Questions Two questions are asked after each vignette. The primary outcome is a likelihood belief elicitation, which asks “On a scale of 0 to 10, where 0 is no chance and 10 is definitely. What is the chance that Kendi will go to the clinic to receive a family planning method?” Responses are recorded on a 0–10 integer chance scale shown in Figure 4. Rather than reporting a number verbally, the respondent points to the position corresponding to her estimate. This instrument is cognitively natural for respondents with limited numeracy, and it was tested in both the focus groups and the pilot study. A secondary outcome is a normative agreement question measured on a five-point Likert scale asking how strongly the respondent agrees that “Kendi should use a family planning method.” The gap between this endorsement and the expected behavior is informative, since it suggests a social constraint holding back FP use.¹²

Figure 4: The Zero-to-Ten Chance Scale



NOTE: The scale respondents used to report the primary outcome. Pointing to a position from 0 (“no chance”) to 10 (“definitely”), the respondent gave her belief about the chance that Kendi would go to the clinic for FP.

It is important to clarify what the outcomes measure. The primary outcome concerns the specific act of whether Kendi goes to the clinic to receive an FP method. Although this

¹²See Appendix Figure C1 and Appendix Table C3. On a common zero-to-one scale, endorsement exceeds expectation by 0.061 on average, with a 95% confidence interval from 0.045 to 0.076.

implies that Kendi uses the method, it never measures whether she uses it consistently or which method she chooses. Injectables are the most common method in my setting, and each renewal requires a clinic visit that others can observe. However, the outcome measures do not capture the continuation or correct use of the methods that depend on daily use or sexual intercourse, such as the pill or condoms. These methods are also less frequent in my sample, with fewer than 5% of women currently using them.

A key supplementary question is the secret-injection question. After one randomly selected vignette, respondents are asked whether Kendi would secretly obtain an FP injection at a clinic far from her village. The injection lasts three months and leaves no visible sign, and no one in her village, not even her husband, could find out.¹³ The question keeps the hypothetical story in front of the respondent, but removes all observable social consequences, since no one could observe her choice. It also differs from the primary outcome in that it names a specific method and a distant clinic, and is answered yes or no, so I only compare the two in the same story and treat the comparison as suggestive.

Balance The three treatment factors and the profile are assigned at random. Hence, they should be uncorrelated with one another and with the women who receive them. Appendix Table B2 reports that the social norm, the leader’s stance, and the scripture frame are mutually uncorrelated across the 5,080 stories and uncorrelated with story position and respondent characteristics. Appendix Table B3 reports that the profiles are balanced up to chance variation, with a few characteristics differing about as often as chance would produce.¹⁴ The independence between treatment factors, profiles, respondents’ characteristics, and the order of the stories ensures that the treatment effects are identified from exogenous variation.

3.3 The Pebble-Allocation Game

I complement the vignette experiment with a first-person pebble-allocation game (Delavande et al., 2011). The game asks each woman directly what drives her own FP decision. This lets me compare what women say drives their decision with how they respond to the vignettes. Each woman is given 12 pebbles and four labeled boxes, shown in Figure 5, representing her personal preference, scripture, the community, and her religious leader, and she distributes the pebbles to reflect how much each force weighs in her choice. As with the vignettes, the physical pebbles keep the exercise concrete for respondents with

¹³See Appendix B.2 for the full wording of each instrument.

¹⁴The one result that compares profiles, the lifecycle ladder of Section 5.1, is unchanged when respondent characteristics are controlled for.

limited numeracy. The game is also familiar to respondents, as it shares elements with Kiothi, a local board game played with nickernuts or pebbles.

Figure 5: The Four Boxes of the Pebble-Allocation Game



NOTE: The four picture cards used in the first-person pebble-allocation game. Each respondent divided 12 pebbles across the four boxes: her personal preference, scripture, the community, and her religious leader.

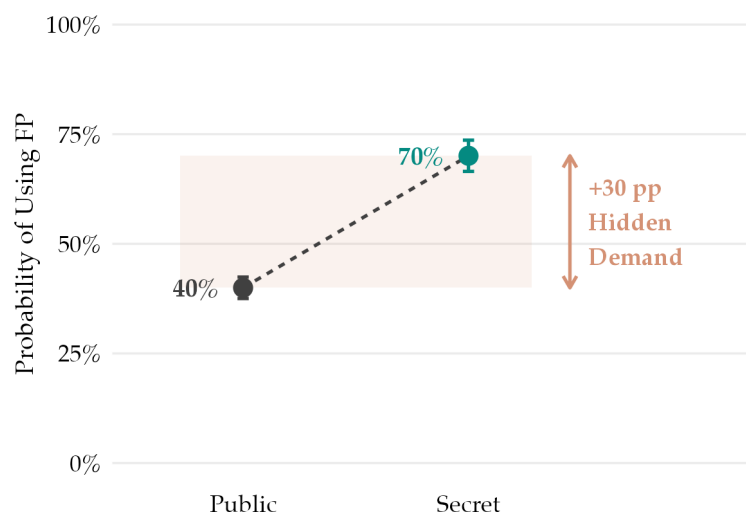
Each woman played the game six times. For half of the games, she was asked to allocate the pebbles based on how much each force weighs on her choice to use FP, to practice female genital cutting, and to report gender-based violence. For the other half, she was asked about issues on which she holds views rather than actions she might take. Specifically, she was asked to allocate the pebbles according to how much each force shapes what she thinks about children living on the street, traditional gender roles, and teenage pregnancies. All six issues are governed by social norms. FP is the one issue I can directly compare with the vignettes, while the other five provide a broader view of how the same four forces organize other norm-governed behaviors.

3.4 Descriptive Evidence

To understand how each force shapes behavior, I outline descriptive evidence from the primary survey. First, I show how the secret-injection question reveals hidden demand for FP use. Then, I show that the vignette experiment shifts the whole distribution of beliefs and isolate each force's impact on expected behavior, with the norm changing it the most and both the religious leader and scripture showing an endorsement premium. Next, I show how these forces interact in the raw data. Relative to where behavior starts, the religious leader's message has the largest effect when it counters the norm, and the norm's pull weakens whenever an authority speaks. Lastly, I present the results of the pebble-allocation game, noting that women weigh their personal preferences and scripture the most.

Hidden Demand To understand whether and how religious leaders change the social norm, one needs to understand whether the norm holds back FP use. This is where the secret-injection question carries its weight. Figure 6 shows that for the same story, women judge Kendi’s chance of using FP at 40% when her choice is observed, while 70% say she would obtain the secret injection.¹⁵ The 30-percentage-point gap reveals the hidden demand for FP and suggests that the constraint holding FP use down is social. The gap between women’s endorsement and expectation of FP is also largest when the social norm or the religious leader is against FP use, consistent with a social penalty of acting against the norm. In the story that carries the secret-injection question, a supportive leader raises the observed chance by 15 percentage points but leaves the secret answer unchanged.¹⁶ These results suggest that religious authority shifts expected FP use when others can see the action, but not when it can be done in secret.

Figure 6: Hidden Demand (the Secret Wedge)



NOTE: Mean elicited chance that Kendi uses family planning when her choice is observable, shown as a probability, against the share of respondents who say she would obtain the injection in secret, on the 635 stories carrying the secret-injection question, with 95% confidence intervals.

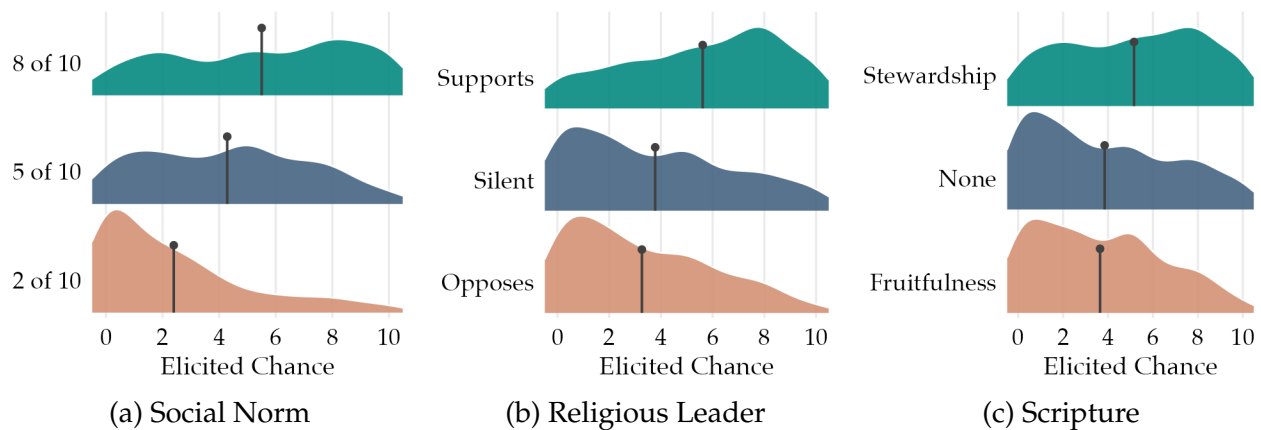
Shifting Beliefs Figure 7 shows how each randomized factor moves the full distribution of all 5,080 vignette responses. When the norm is against FP (2 out of 10 women use), the distribution is strongly right-skewed, with almost half of the responses at a chance of 0 or 1. The distribution of an opposing leader or a fruitfulness passage (Genesis 1:28) looks much like the neutral level of each factor. When the norm is neutral (5 out of 10 women use), the distribution is the most even. At the supportive level, all three distributions shift toward

¹⁵Treating the primary outcome as a binary indicator, with a cutoff of at least 4, 5, or 6 out of 10, gives the probability of using FP when observed as 51%, 44%, and 32% against 70% in secret, so the wedge remains significant and between 19 and 38 percentage points. See Appendix Table C1.

¹⁶See Appendix Table C2 and Appendix Figure C2.

the right (higher chances), with about a third of all responses at a chance between 8 and 10. Furthermore, the social norm and religious leader distributions turn left-skewed. The mean rises at each step as the cues shift from against FP to neutral to supportive of FP. Relative to the neutral level, a supportive cue also moves the mean far more than an opposing one, for both the religious leader and scripture, an early sign that religious authority carries an endorsement premium.

Figure 7: Belief Distributions



NOTE: Distribution of the elicited chance that Kendi uses family planning at each level of one card, pooled over the levels of the other two cards and the 5,080 vignette responses. The black marker shows its mean. Card levels that are against, neutral, and for family planning use are shaded salmon, slate, and teal.

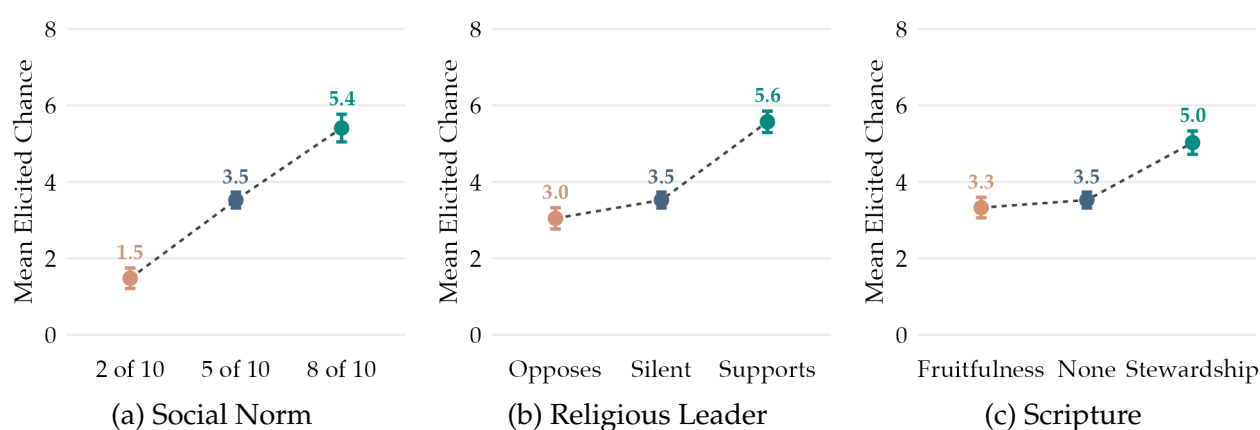
The Pull of the Norm To isolate the influence of each force, I look at how the elicited chance changes when the other two treatment cards are at their neutral level. I show this in Figure 8. Throughout, I read the elicited chance as the expected probability that Kendi uses FP, so that a chance of 4 out of 10 corresponds to a probability of 40%. Across the range of its card, the social norm shifts expected behavior the most, with the probability of FP use increasing from 15% (when 2 out of 10 women use) to 54% (when 8 out of 10 women use). In these single-card stories, the norm also pulls in both directions about equally. Relative to the neutral norm, a low-use norm decreases the probability of use by 20 percentage points (pp), and a high-use norm increases it by 19 pp. Pooled over all stories, including those where the leader or scripture also speaks, the low norm pulls harder than the high norm.¹⁷

The Endorsement Premium Unlike the norm, both the religious leader and scripture have an asymmetric effect, as Figure 8 shows. The asymmetry of the scriptural frame may partially reflect familiarity. If Genesis 1:28 is already the frame most women expect from scripture, restating this passage will add little compared to no passage at all. The

¹⁷See Appendix Table C4, which also reports the effect of each card with respondent controls and fixed effects.

data reflect this with a fruitfulness passage and no passage only differing by 2 percentage points, while a stewardship passage raises the probability of FP use by 15 percentage points. For the leader, an opposing leader decreases the probability of FP use by only 5 percentage points, while an endorsement from the leader increases it by 20 percentage points. A prohibition largely restates a constraint the social norm already imposes, while an endorsement speaks to the demand that the norm holds back. So, while the norm has the strongest pull, both the religious leader and scripture carry an endorsement premium, where a position that favors FP use moves expected use far more than a position against it.

Figure 8: Isolating Each Force



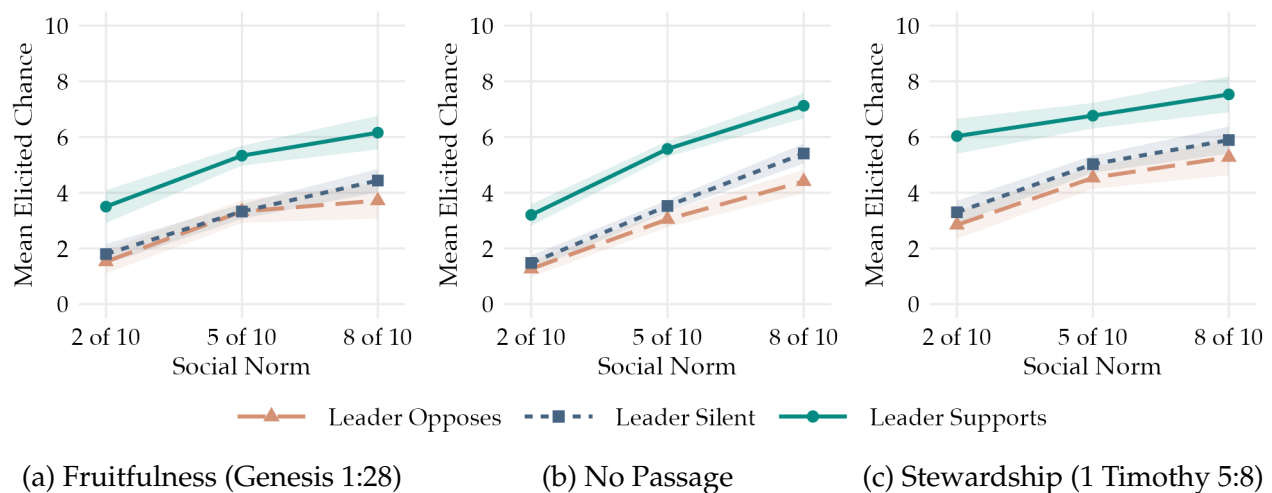
NOTE: Mean elicited chance that Kendi uses family planning at each level of one card while the other two cards are neutral. Story 1, in which all three cards are neutral, and the single-card Stories 2–4 of Table 1 are used, with 95% confidence intervals clustered by respondent.

Preaching Against the Choir Figure 9 illustrates all three forces together. The upward slope in all three panels shows the impact of the social norm. That is, the more supportive the norm, the higher the probability of use. The level shift between panels (a) and (c) indicates the movement caused by scripture. Lastly, the vertical gap between the lines shows the influence of the religious leader, with leader support increasing the likelihood of FP use consistently across all levels of the norm and scriptural passage. Relative to where expected use starts, the leader’s message carries the most weight when it runs counter to the norm. Averaging over the scripture frames, when the norm is against FP use (2 out of 10 women use), a supportive leader raises the probability of use from 20% to 39%, nearly doubling it.¹⁸ In contrast, the same support increases the probability by only about a third when the norm is already supportive, from 53% to 70%. Leader opposition works in the same way. An opposing leader barely decreases expected use when few women use FP (by about 3 percentage points), but lowers it by 8 percentage points where FP use is common.

¹⁸See Appendix Table C5.

Authority Loosens the Norm A second pattern is visible. The norm’s slope is flatter whenever a religious authority speaks, whether the message is for or against FP. In Figure 9b, with a silent leader and no passage, moving from a village where 2 out of 10 women use FP to one where 8 out of 10 do raises the elicited chance by about 39 percentage points. When the leader takes either stance, that rise shrinks by about a tenth. An opposing and a supportive leader each shrink it by a similar amount.¹⁹ When a passage is read, it shrinks by about a third. Hence, religious authority does more than push expected use up or down. It weakens the extent to which the social norm matters, a pattern I formalize in the model.

Figure 9: Elicited Chance by Social Norm, Leader Stance, and Scripture



NOTE: Mean elicited chance that Kendi uses family planning against the social norm, by the religious leader’s stance (see legend), separately for each scripture frame, with 95% confidence bands clustered by respondent.

What Women Say When women divide 12 pebbles across the four forces for their own FP decision, they assign most to their personal preference (52%) and, among the social forces, name scripture the loudest (21%), followed by the community (14%) and their religious leader (13%).²⁰ These results are expected. Women are likely to be more aware of their personal preferences, whereas the community’s influence is more subtle. Furthermore, acknowledging scripture as a driver of behavior is more socially acceptable and expected in a highly religious setting.

This ranking runs opposite to the vignettes. Asked directly, women rank the community near the bottom of what drives their decision, but in the vignettes, the social norm moves expected use the most, while scripture moves it the least.²¹ Since the two instruments differ

¹⁹See Appendix Table C6. With respondent fixed effects, a test of equality is also not rejected.

²⁰See Appendix Figure C3 and Appendix Table C7.

²¹A separate first-person question, in which women rate how likely they would be to use FP under different combinations of friends’ use and leader stance, also does not register peers as the strongest influence.

in what they ask and how they are scaled, only the ordering is comparable.²² Admitting that what others do drives one's own choices is uncomfortable, so the same pressure that makes the social norm powerful may also make women reluctant to name it. This is why the psychological distance of the third-person vignette proves informative.

4 A Model of Authority, Conformity, and Social Norms

To formalize how a trusted authority shapes social norms, I extend a discrete-choice model of social interactions (Brock & Durlauf, 2001), and use it to separate an individual's personal preference from conformity to social norms, authority, and scripture. Although I study family planning (FP) in a context where the authority is a religious leader, the framework generalizes to any setting in which a trusted authority interacts with a norm-governed behavior. In the model, an individual's utility is shaped not only by the personal costs and benefits of acting, but by a system of social influence. The system includes the social norm, which is what other women in her village do and approve of. It also captures the authority's stance, which raises or lowers the payoff of adoption, and the pull of scriptural or doctrinal teaching that an individual internalizes. In this section, I start with a simplified model and show its equilibrium properties, similar to Calvi et al. (2026). Then, guided by the patterns in the raw data, I extend the model to capture the endorsement premium and authority salience. I also extend the model to include respondent heterogeneity. Lastly, I show how the vignette experiment maps to the model and how it is identified and estimated.

4.1 Model Setup

Each individual i in a large and finite population of I agents chooses a binary action $y_i \in \{1, -1\}$. I apply the model to FP and reproductive-age women, where $y_i = +1$ denotes the use of an FP method and $y_i = -1$ denotes non-use. The choice responds to four forces: (1) the individual's personal preference, (2) a normative frame, (3) the social norm, and (4) the stance of a trusted authority. The trusted authority is the religious leader whose stance is R_i , and the normative frame is the scripture S_i that the individual internalizes. Abstracting from within-household bargaining, the utility of woman i choosing y_i is

$$U_i(y_i) = y_i \left[\underbrace{x_i \beta}_{\text{Personal Preference}} + \underbrace{\delta S_i}_{\text{Scripture}} + \underbrace{\alpha E_i[\bar{y}_{-i}]}_{\text{Social Norm}} + \underbrace{\gamma R_i}_{\text{Religious Leader}} \right] + \underbrace{\varepsilon_i(y_i)}_{\text{Type I EV}} \quad (1)$$

²²The ordering reverses in every one of 1,000 bootstrap draws. See Appendix Table C8.

where x_i is a vector of individual characteristics and β captures the baseline personal preference for FP in a norm- and religious-neutral environment. That is, the community is evenly split ($E_i[\bar{y}_{-i}] = 0$), the woman feels neither morally obligated nor morally prohibited ($S_i = 0$), and the religious leader is neither in favor of nor against the use of FP methods ($R_i = 0$). A positive value for $x_i\beta$ implies that the individual derives higher utility from FP use, while a negative value implies the individual derives higher utility from non-use. These personal preferences may reflect beliefs about health complications, desire for more children, or economic factors.

The parameter δ governs the weight the individual places on scripture, and $S_i \in \{-1, 0, 1\}$ is the scriptural frame the individual holds. Here, $S_i = 1$ corresponds to a reading that supports spacing and contraception, while $S_i = -1$ corresponds to a pronatalist reading that opposes it.²³ The average scriptural frame the community holds is then defined as $\bar{S} \in [-1, 1]$. The parameter α represents the strength of conformity to social norms. If the individual is very concerned about her status in the community or fears ostracism, the parameter will be large. $E_i[\bar{y}_{-i}]$, where $\bar{y}_{-i} = \frac{1}{I-1} \sum_{j \neq i} y_j$, denotes the individual's belief about the average action of the other women in her village. It is close to 1 when the individual believes most women use an FP method, and close to -1 when they believe few do. Therefore, a value of 0 represents a point of social ambiguity (a perceived 50/50 split in the village). The social term $y_i \alpha E_i[\bar{y}_{-i}]$ is positive when the woman's action matches what she expects others to do and negative otherwise.

The parameter γ measures the individual's deference to the religious leader. A high value of γ implies that the individual weighs the leader's position heavily. The religious leader's stance on FP is denoted $R_i \in \{-1, 0, 1\}$, where $R_i = 1$ signals support, $R_i = -1$ signals opposition, and $R_i = 0$ indicates a neutral or silent position.²⁴ Similarly to scripture, the average stance women hear in the community is then $\bar{R} \in [-1, 1]$. The model places the leader in the payoff of acting. It does not separate a moral payoff from a social one. The secret-injection question speaks to this in Section 5. Lastly, $\varepsilon_i(y_i)$ is an idiosyncratic preference shock, assumed to be i.i.d. Type I Extreme Value, which yields the standard logistic choice probabilities. It captures individual-specific factors that affect the desirability of the action. In observed data, the social norm, a leader's stance, and the scriptural frame are entangled (Manski, 1993). To break this entanglement, I independently randomize the three in the survey experiment, which identifies α , γ , and δ from exogenous variation.

²³In the simplified model, S_i can be read as the intensity of the scriptural stance. For example, a woman holding a lukewarm pronatalist stance will have $S_i = -0.5$.

²⁴Similar to scripture, R_i in the simplified model can be read as the intensity of the leader's stance. For example, a religious leader with lukewarm support will have a value of $R_i = 0.5$.

4.2 Equilibrium Analysis

Equilibrium depends on the magnitude of α , and it opens two routes for how a community responds to its religious leader. If α is below one, the community has a single equilibrium. A leader's endorsement or a change in scripture can move behavior, and neighbors' reactions amplify it through a social multiplier. In this case, the leader slides the norm and the shift in equilibrium lasts only as long as the advocacy. If α is above one, multiple equilibria can coexist and a sufficient push can carry the community from widespread non-use to widespread use in a self-reinforcing cascade that does not require continuous advocacy. In this case, religious leaders may tip the norm.

Following Brock and Durlauf (2001), I assume individuals have rational expectations, so their subjective expectation of others' behavior equals the actual average behavior in the community. Furthermore, in a large village, every woman holds the same belief about others, and by the law of large numbers, the realized average equals the expected one, so $E_i[\bar{y}_{-i}] = \bar{y} \in [-1, 1]$ for every i . Given the i.i.d. Type I Extreme Value distribution of the error terms ε_i , the probability that individual i chooses to use FP is

$$\Pr(y_i = 1) = \frac{\exp(x_i\beta + \delta S_i + \gamma R_i + \alpha\bar{y})}{\exp(x_i\beta + \delta S_i + \gamma R_i + \alpha\bar{y}) + \exp(-(x_i\beta + \delta S_i + \gamma R_i + \alpha\bar{y}))}.$$

Using the identity $\tanh(z) = \frac{e^z - e^{-z}}{e^z + e^{-z}}$, this probability can be expressed as

$$\Pr(y_i = 1) = \frac{1 + \tanh(x_i\beta + \delta S_i + \gamma R_i + \alpha\bar{y})}{2}. \quad (2)$$

The Self-Consistency Condition Since $y_i \in \{-1, 1\}$, woman i 's expected action is $E[y_i] = 2\Pr(y_i = 1) - 1 = \tanh(\cdot)$. Averaging over the women in the village yields the self-consistency condition:

$$\bar{y} = \int \tanh(x\beta + \delta S + \gamma R + \alpha\bar{y}) dF(x, S, R),$$

where F is the joint distribution of characteristics, the scriptures women hold, and their religious leaders' stances in the village. The deterministic utility (h) is linear, so averaging it over F is exact and yields

$$\int (x\beta + \delta S + \gamma R) dF = \bar{x}\beta + \delta\bar{S} + \gamma\bar{R} \equiv h,$$

where $\bar{x}$ is the village's average profile. I define $\bar{S} = f_S^+ - f_S^-$ as the share of women holding a stewardship reading minus the share holding a pronatalist one, and $\bar{R} = f_R^+ - f_R^-$ is the share of women whose leader supports FP minus the share whose leader opposes it. The approximation lies in the step that evaluates the hyperbolic tangent ($\tanh$) at this average instead of averaging it across women. This approximation is exact when the community is homogeneous, but otherwise it can overstate how far the community moves.²⁵ The equilibrium is then a fixed point of the mapping

$$\bar{y} = \tanh(h + \alpha \bar{y}). \quad (3)$$

Since $\tanh(\cdot)$ is continuous and maps $[-1, 1]$ into itself, Brouwer's Fixed Point Theorem guarantees at least one equilibrium. How many exist and whether the leader slides or tips the norm depend on the strength of conformity relative to the deterministic utility.

Equilibrium Multiplicity A feature of this framework is that the strength of social conformity (α) determines whether multiple self-fulfilling equilibria are possible. The response curve $g(\bar{y}) = \tanh(h + \alpha \bar{y})$ is steepest at its center, where its slope equals α . An equilibrium is a crossing with the 45-degree line, whose slope is one. Therefore, a second crossing requires the curve to be steeper than the line, that is $\alpha > 1$. Whether multiple equilibria exist then depends on the vertical position of the curve, which is dictated by h . Proposition 1 adapts the framework of Brock and Durlauf (2001) and Calvi et al. (2026) to this paper's setting.²⁶

Proposition 1. *Let $h = \bar{x}\beta + \delta\bar{S} + \gamma\bar{R}$.*

1. *If $\alpha \leq 1$, there exists a unique equilibrium.*
2. *If $\alpha > 1$, there exists a tipping point $h^* > 0$ such that:²⁷*
 - *If $|h| > h^*$, the equilibrium is unique.*
 - *If $|h| < h^*$, there are three equilibria, two stable steady states (a "low-use norm" and a "high-use norm") and one unstable middle equilibrium.*
 - *If $|h| = h^*$, there are two equilibria with one being a double root.* ■

An equilibrium is stable when the curve crosses the 45-degree line from above, so that small deviations die out. With three equilibria, the stable ones are the outer two and the unstable one is in the middle. The multiplicity explains why two villages with nearly

²⁵The average of $\tanh(\cdot)$ need not equal $\tanh(\cdot)$ at the mean.

²⁶Proofs for Proposition 1 and all subsequent results are provided in Appendix D. Figure D1 in the appendix displays possible equilibrium outcomes.

²⁷ $h^* = \alpha u - \tanh^{-1}(u)$ with $u = \sqrt{1 - 1/\alpha}$.

identical demographic characteristics, $\bar{x}$, and average religious leanings, $\bar{R}$ and $\bar{S}$, can exhibit different uptake rates. When $\alpha > 1$, a village where $\bar{y}$ is near -1 is stuck in a norm trap, so even if private forces favor FP ($0 < h < h^*$), the fear of social sanction keeps the community anchored at a low-use steady state. Which regime a community occupies is an empirical question that I resolve in Section 5.

The Social Multiplier A shift in the deterministic utility h , whether from the leader's stance R or the scriptural frame S , moves the equilibrium norm by more than its direct effect, because neighbors respond to one another.²⁸ In the single-equilibrium realm ($\alpha < 1$), this multiplier is finite. The leader smoothly slides the norm. The multiplier diverges only as the community approaches a tipping point.

Proposition 2. *Any deterministic shift in a community's utility is amplified by the social multiplier M , which depends on the strength of conformity α . Holding demographics $\bar{x}$ fixed, the marginal effects of the mean leader stance $\bar{R}$ and the mean scriptural frame $\bar{S}$ on the aggregate adoption rate $\bar{y}$ are*

$$\frac{\partial \bar{y}}{\partial \bar{R}} = \gamma (1 - \bar{y}^2) M(\bar{y}; \alpha), \quad \frac{\partial \bar{y}}{\partial \bar{S}} = \delta (1 - \bar{y}^2) M(\bar{y}; \alpha),$$

where the social multiplier M is defined as:

$$M(\bar{y}; \alpha) = \frac{1}{1 - \alpha(1 - \bar{y}^2)}. \quad (4)$$

The multiplier M satisfies $M \geq 1$ for all $\alpha \in [0, 1)$, and $M \rightarrow \infty$ as the system approaches a tipping point where $\alpha(1 - \bar{y}^2) \rightarrow 1$. ■

4.3 The Endorsement Premium and Authority Salience

The Endorsement Premium Thus far, the model restricts the direct authority effect to the symmetric term γR_i , which forces a supportive and an opposing message to carry the same weight in opposing directions. However, the raw data patterns suggested that religious leaders and scripture have an endorsement premium, so I relax this restriction. Allowing a blessing and a prohibition to operate separately, the direct leader effect becomes

$$y_i (\gamma^+ \mathbb{1}[R_i = 1] + \gamma^- \mathbb{1}[R_i = -1]),$$

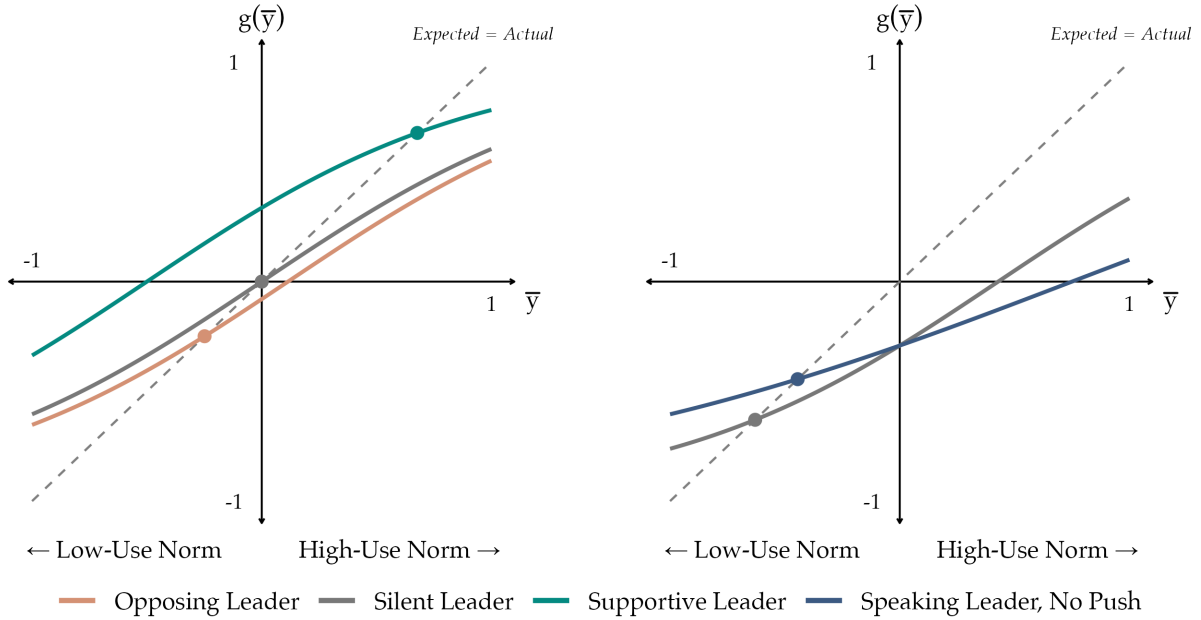
where γ^+ is the response to a supportive leader and γ^- to an opposing one. Scripture enters similarly, through δ^+ and δ^- . The symmetric baseline is the restriction $\gamma^+ = -\gamma^-$,

²⁸Figure D1 in the Appendix illustrates this dynamic.

which can be tested empirically.

The endorsement premium term enters the deterministic utility h additively and leaves the equilibrium analysis unchanged. The only difference now is that a supportive leader and an opposing leader will cause different-sized shifts of the response curve, as shown in Figure 10a. The patterns in the raw data suggest that a supportive message licenses behavior a woman already favors, while an opposing one merely restates a constraint she already feels, i.e., $|\gamma^+| > |\gamma^-|$. With separate weights, the community's direct effect no longer depends only on the net stance $\bar{R}$. The average direct leader effect is $\bar{\gamma} = \gamma^+ f_R^+ + \gamma^- f_R^-$. This reduces to $\gamma \bar{R}$ only when $\gamma^- = -\gamma^+$. Therefore, a village whose leaders split evenly may still increase use if a blessing outweighs a prohibition. Scripture aggregates the same way, with the average direct scripture effect being $\bar{\delta} = \delta^+ f_S^+ + \delta^- f_S^-$.

Figure 10: Shifting Versus Bending the Response Curve



(a) Shifting: The Endorsement Premium

(b) Bending: Authority Salience

NOTE: Each panel plots the average behavior $g(\bar{y}) = \tanh(h + \alpha\bar{y})$ against the expected social norm $\bar{y}$. Equilibria, marked with dots, lie on the dashed 45-degree line. Panel (a) holds conformity at $\alpha_0 = 0.70$ and shifts the curve with a supportive ($\gamma^+ = 0.35$) or an opposing ($\gamma^- = -0.08$) leader. Panel (b) holds the direct push fixed in a community that leans against FP ($h = -0.30$) and lowers conformity from $\alpha_0 = 0.70$ to 0.40 when the leader speaks, which rotates the curve around $\bar{y} = 0$. All values are illustrative.

Salience and the Substitution Effect So far, the baseline model holds the conformity weight α fixed. However, an authority cue may do more than shift utility through γR_i and δS_i . When a leader speaks (or scripture is invoked), that may change how strongly the social norm binds. For example, a salient authority can pull behavior toward their own message and away from others' behavior, thereby displacing the norm. It may also

reinforce the norm if the leader's message causes people to align more closely with it. The first case makes religious authority a substitute for conformity, the second a complement.

The patterns in Figure 9 reveal that both a supportive and an opposing religious leader flatten the slope. Similarly, both the stewardship and fruitfulness scriptural framings flatten the slope. This suggests that both religious elements act as substitutes, displacing conformity to the social norm. Under substitution, the value of that displacement depends on whether the leader is fighting the norm or echoing it. When their message runs counter to the prevailing norm, pulling behavior off the norm moves it toward their message, so their direct push and the loosened norm reinforce one another. When they echo the prevailing norm, they are redundant, and loosening the norm undercuts the very behavior they favor. Therefore, a leader's leverage is greatest against a strong, misaligned norm and weakest when reinforcing an aligned one.

I capture this by letting the conformity weight respond to the cues an individual faces, which yields the extended utility function

$$U_i(y_i) = y_i [x_i \beta + \gamma^+ \mathbb{1}[R_i=1] + \gamma^- \mathbb{1}[R_i=-1] + \delta^+ \mathbb{1}[S_i=1] + \delta^- \mathbb{1}[S_i=-1]] + \alpha(R_i, S_i) y_i E_i[\bar{y}_{-i}] + \varepsilon_i(y_i), \quad (5)$$

identical to the baseline except for the asymmetric leader and scripture effects and a conformity weight that now depends on the salience of the authority cues,

$$\alpha(R_i, S_i) = \alpha_0 + \alpha_R |R_i| + \alpha_S |S_i|, \quad (6)$$

where α_0 is conformity in an authority vacuum. Here, the absolute value makes salience blind to direction, since a religious cue acts on the norm whether it points for or against.²⁹

Women have different religious leaders, so they hear different messages. This implies that women vary in how strongly they conform to the social norm, since a woman whose leader speaks has weight $\alpha_0 + \alpha_R$ and one whose leader is silent has α_0 . The community's conformity weight is its population average,

$$\bar{\alpha} = \alpha_0 + \alpha_R (f_R^+ + f_R^-) + \alpha_S (f_S^+ + f_S^-),$$

²⁹I test this restriction by estimating a separate salience weight for each direction (Table 2, column 3). I find that both opposing and supportive leaders lower the conformity weight by a statistically significant amount. The same holds for scripture on stewardship and fruitfulness. Neither pair differs significantly, although the design cannot rule out moderate differences. I read this as evidence that a blessing and a prohibition bend the norm the same way, not that they bend it by the same amount. If anything, an opposing leader displaces the norm more, so imposing a common weight understates the endorsement premium in the counterfactuals.

which depends on the share of women who hear an authority speak. Since $f_R^+ + f_R^- \geq |\bar{R}|$, a village whose leaders have opposing messages still conforms less to the norm even if the messages cancel each other out. The community's response curve is the population-weighted average of the women's curves, $G(\bar{y}) = \int \tanh(h(\tau) + \alpha(\tau)\bar{y}) dF(\tau)$. In the representative-member form of Section 4.2, this becomes $g(\bar{y}) = \tanh(h + \bar{\alpha}\bar{y})$, with $h = \bar{\alpha}\beta + \bar{\gamma} + \bar{\delta}$. A speaking leader does two things to that curve. The direct push, through $\bar{\gamma}$, shifts it, and salience, through $\bar{\alpha}$, bends it, which rotates the curve around $\bar{y} = 0$. Figure 10b shows this phenomenon under substitution. Leader salience increases equilibrium FP use when the norm runs counter to FP use and decreases it when the norm favors FP.

Proposition 3. *Let each woman's conformity weight $\alpha(R_i, S_i)$ be nonnegative, and let $h(\tau)$ and $\alpha(\tau)$ denote the deterministic utility and conformity weight of a woman of type $\tau = (x, R, S)$. An equilibrium of the community,*

$$\bar{y} = \int \tanh(h(\tau) + \alpha(\tau)\bar{y}) dF(\tau),$$

always exists. If $\bar{\alpha} < 1$, the equilibrium is unique and stable. ■

Proposition 3 extends the uniqueness part of Proposition 1 to the extended model, where the multiplicity condition depends on the population conformity weight, $\bar{\alpha}$. The threshold remains one. Under substitution ($\alpha_R, \alpha_S < 0$), every speaking authority lowers $\bar{\alpha}$, so $\bar{\alpha} \leq \alpha_0$, and $\alpha_0 < 1$ alone guarantees a unique equilibrium for any combination of leader stances and scriptural frames. Two consequences follow. First, since $\bar{\alpha} \leq \alpha_0$, a speaking authority lowers the social multiplier, so a leader's influence is amplified less than in the constant- α model. Second, this same loosening allows a leader to shift a community away from a low-use norm and break a norm trap. That is, multiple equilibria require $\bar{\alpha} > 1$ and a salient authority can reduce this weight. A religious leader's intervention can move a community away from the tipping threshold, and where population conformity exceeds one, may completely remove the low-use equilibrium. The opposite holds under complementarity ($\alpha_R, \alpha_S > 0$), and a speaking leader carries the community toward the tipping threshold.

Corollary 1. *In the representative-member form of the extended model, the marginal effect of the share of women who hear a supportive leader is*

$$\frac{\partial \bar{y}}{\partial f_R^+} = (\gamma^+ + \alpha_R \bar{y}) (1 - \bar{y}^2) M, \quad M = \frac{1}{1 - \bar{\alpha} (1 - \bar{y}^2)},$$

with γ^- and f_R^- for an opposing leader, and $\delta^\pm, \alpha_S$ and $f_S^\pm$ for scripture. ■

Corollary 1 states where the endorsement premium and authority salience enter. For the religious leader, the endorsement premium sits in the direct shift γ^+ . The salience enters twice. First, it enters the effective push, $\gamma^+ + \alpha_R \bar{y}$. A negative α_R increases a supportive leader's push when the norm runs counter to FP ($\bar{y} < 0$). In contrast, when the norm favors FP, a negative α_R takes away from the effective push. For an opposing leader, the effective push is $\gamma^- + \alpha_R \bar{y}$, so when people conform less to the norm, a prohibition has a greater effect where the norm favors FP ($\bar{y} > 0$), and is offset where the norm runs against FP. Together, these generate the against-the-choir asymmetry, since a leader of either stance has the most leverage against a norm that opposes their message. Second, salience also enters the social multiplier, M . A negative α_R lowers $\bar{\alpha}$, which decreases the value of the social multiplier. This implies that neighbors in the community amplify the leader's push less than they would in an authority vacuum. All effects reverse when salience complements the norm ($\alpha_R > 0$). Scripture works the same way through $\delta^\pm$ and α_S .

4.4 Heterogeneity Across Respondents

The parameters in Sections 4.1 and 4.3 do not depend on who the woman is. However, women with certain characteristics may respond more to the social norm, the leader, and scripture. This differs from the salience mechanism, in which one woman's weight shifts in response to the cues she hears. Here, weights differ between women with different traits. In the extended model, I let the vacuum weight, α_0 , and the direct authority effects vary with the respondent's own observed characteristics Z_i , such as her age, education, parity, income, trust in her leader, and religious tradition,

$$\alpha_{0i} = \alpha_0 + Z_i' \alpha_{0Z}, \quad \gamma_i^\pm = \gamma^\pm + Z_i' \gamma_Z^\pm, \quad \delta_i^\pm = \delta^\pm + Z_i' \delta_Z^\pm.$$

The cards are randomized within respondents, so each interaction is identified from the same experimental variation as the pooled weights. I hold the salience terms α_R and α_S constant, since the design lacks sufficient power to detect differences between them across respondents' characteristics. I also estimate these weights separately for each of Kendi's five profiles, which shows how the forces differ across life stages. Equilibrium depends on the vacuum weight. Under substitution, a woman's conformity is highest when no authority speaks, and by Proposition 3, uniqueness depends on the population-average weight. Therefore, a specific group whose vacuum weight approaches one does not by itself produce multiple equilibria, but it marks the communities in which uniqueness holds by the thinnest margin.

4.5 Identification and Estimation

The vignette experiment is used to identify the response curve and not the equilibrium. The social-norm card establishes the behavior and beliefs of other women, so the norm is set by design and not determined by anyone's choices. Therefore, I circumvent the correlation and simultaneity that prevent observational data from disentangling conformity from the other social forces. The norm-cards set three levels, so I have three points on the response curve to trace, and the slope determines α . The equilibrium is never observed in the vignette, but it is a fixed point where the response curve crosses the 45-degree line, given the population distribution of characteristics and leader stances. By Proposition 3, this is unique when the population conformity estimate is less than one.

For respondent i and story k , the elicited chance $m_{ik} \in \{0, 1, \dots, 10\}$ is read as the respondent's stated probability that Kendi uses FP, i.e., $\hat{p}_{ik} = m_{ik}/10$. In the model, this probability is predicted as

$$\Pr(y_{ik} = 1) = \frac{1 + \tanh(x_i\beta + \delta S_k + \gamma R_k + \alpha E_k)}{2}. \quad (7)$$

Since it is a discrete-choice model, with $+1$ indicating the use of FP and -1 its non-use, the expected action is $2\hat{p}_{ik} - 1$, which equals $\tanh(\cdot)$ of the deterministic utility. Therefore, applying the inverse hyperbolic tangent gives the utility itself and yields the linearized estimating equation

$$\tanh^{-1}(2\hat{p}_{ik} - 1) = x_i\beta + \delta S_k + \alpha E_k + \gamma R_k + v_i + \eta_{ik}, \quad (8)$$

where v_i is a respondent-level random effect and η_{ik} is vignette-level noise. The transformation is exact under the logistic error assumption, so the estimated coefficients map directly to the structural utility weights. Given that $\tanh^{-1}(\cdot)$ explodes at the boundary ($\hat{p}_{ik} = 0$ or 1), these are recoded to 0.05 and 0.95, respectively, before applying the transformation.³⁰

The $\{-1, 1\}$ coding also implies that the vignette cards will take certain values in the model. The social-norm card shows 2, 5, or 8 of ten women using FP, so the card enters as $E_k \in \{-0.6, 0, +0.6\}$, the stand-in for Kendi's belief $E_i[\bar{y}_{-i}]$.³¹ Therefore, the norm regressor lies on the same $[-1, 1]$ scale as the average behavior, and the conformity parameter α can

³⁰The level of the $\tanh^{-1}$ weights depends on this choice, because a tighter recode stretches the outcome scale and scales every weight together. I also estimate the model with a fractional logit and a binomial GLMM, which need no recoding. I use them to judge the level of α_0 against the threshold of one.

³¹If a share p_k of the village uses FP, the average action is $p_k(+1) + (1 - p_k)(-1) = 2p_k - 1$. Table D1 in the appendix summarizes the coding for each vignette treatment card.

still be compared with the slope of one. The religious leader and scripture cards enter as $R_k, S_k \in \{-1, 0, 1\}$, as in Section 4.1.

The estimated model includes the endorsement premium and religious salience terms, following the extensions of Section 4.3. This yields the estimating equation

$$\begin{aligned} \tanh^{-1}(2\hat{p}_{ik} - 1) = & \underbrace{x_i\beta}_{\text{Between}} + \underbrace{\gamma^+ \mathbb{1}[R_k=1] + \gamma^- \mathbb{1}[R_k=-1]}_{\text{Leader (asymmetric)}} + \\ & \underbrace{\delta^+ \mathbb{1}[S_k=1] + \delta^- \mathbb{1}[S_k=-1]}_{\text{Scripture (asymmetric)}} + \underbrace{\alpha_0 E_k + \alpha_R |R_k| E_k + \alpha_S |S_k| E_k}_{\text{Norm with authority salience}} + \\ & \underbrace{v_i + \eta_{ik}}_{\text{Composite error}}, \end{aligned} \quad (9)$$

where $v_i \sim N(0, \sigma_v^2)$ is similarly defined as in Equation (8). The structural parameters, given by

$$\beta, \gamma^+, \gamma^-, \delta^+, \delta^-, \alpha_0, \alpha_R, \alpha_S$$

and variance components $(\sigma_v^2, \sigma_\eta^2)$ are estimated jointly by maximum likelihood, integrating out v_i , with enumerator fixed effects and standard errors clustered at the respondent level.³² The random effects estimator draws on two sources of variation. Since each respondent sees eight stories and treatment factors are varied across them, all parameters except β are identified within respondents, with each woman serving as her own control. Kendi's profile remains constant across all eight stories each respondent sees, so β is identified from between-respondent variation (a fixed-effects estimator would absorb β). The cards and the profile are randomized, so the respondent effect is independent of every regressor.

The set of stories, numbered and presented in Table 1, identifies every within-respondent parameter. Stories 1–4 isolate the first-order effects since only a single factor is varied. That is, relative to Story 1 (the baseline), Story 2 varies the social norm and identifies the vacuum-conformity weight, α_0 . Similarly, Story 3 identifies the religious leader effects γ^+ and γ^- , and Story 4 the scripture effects δ^+ and δ^- . Stories 5 and 6 recover the salience terms, α_R and α_S , through two-factor variation. That is, the stories measure the slope when either the religious leader or scripture is active. Although the raw data did not show any patterns suggesting a leader-scripture interaction, Story 7 is used to test this formally. Story 8 is used as a specification test, and no parameter identification depends on it.

Since this is a stated-choice experiment and Kendi is the decision-maker in each vignette,

³²I also estimate $\alpha_R^+, \alpha_R^-, \alpha_S^+$, and α_S^- , to test the absolute value restriction on the salience terms empirically.

x_i is Kendi's profile attributes consisting of her age, marital status, and parity. The profiles are randomly assigned between respondents, so β is identified from between-respondent variation. The four lifecycle contrasts created by the profiles recover the single-attribute effect of each. The heterogeneity extension of Section 4.4 interacts the vignette factors with respondent characteristics Z_i . These are identified from the within-respondent variation and add no new estimation complications. For robustness, I also re-estimate Equation (9) as a fractional logit and binomial GLMM on the untransformed $\hat{p}_{ik}$ scale.³³

5 Empirical Results

In this section, I outline the structural estimates of the model. First, I show the weights individuals place on social norms, religious leaders, and scriptural frames. I find that people weigh the norm the most, followed by the religious leader's position, and then scripture. I also find that the social conformity parameter is below one in all headline results, placing the community in the unique equilibrium regime. Second, I show the endorsement premium and that religious authority substitutes for conformity to the social norm. I also test the absolute-value specification and show that religious salience substitutes for the norm, regardless of which position is taken. This also implies that a leader's message carries the most weight when it runs counter to the norm. Looking at the lifecycle contrasts, I find that a first child raises the perceived preference for FP. Lastly, I explore heterogeneity in respondent characteristics and test the robustness of the estimates and the model's functional form.

5.1 Structural Estimates

The Social Weights Table 2 reports the structural estimates. Column (1) shows the estimates for the simplified model in Equation (1). All parameters are significant, showing that each force matters in decision-making. Conformity to the social norm carries the most weight (0.70), ahead of deference to the religious leader (0.31), and adherence to a scriptural frame (0.22). These results also reverse the ordering produced by a first-person elicitation. There, among these three forces, scripture carried the most weight. This bias is consistent with social desirability, where women state that they are more religious, especially in a very religious community.

The Endorsement Premium In Panel A, Columns (2) and (3) show the endorsement

³³Both specifications use a logit link that returns twice the utility, so their coefficients are halved before they are compared with the headline weights.

Table 2: Structural Estimates

	(1) Simplified	(2) Extended	(3) Split Salience
<i>Panel A. Social and Religious Weights</i>			
Social Norm Conformity (α ; α_0 in (2)–(3))	0.70*** (0.02)	0.90*** (0.04)	0.90*** (0.04)
Religious Leader (γ)	0.31*** (0.01)		
Supports (γ^+)		0.50*** (0.02)	0.50*** (0.02)
Opposes (γ^-)		-0.12*** (0.02)	-0.12*** (0.02)
Scripture (δ)	0.22*** (0.01)		
Stewardship (δ^+)		0.38*** (0.02)	0.38*** (0.02)
Fruitfulness (δ^-)		-0.06*** (0.02)	-0.06*** (0.02)
<i>Panel B. Authority Salience</i>			
Leader Salience (α_R)		-0.15*** (0.03)	
Supports (α_R^+)			-0.11** (0.05)
Opposes (α_R^-)			-0.18*** (0.04)
Scripture Salience (α_S)		-0.24*** (0.04)	
Stewardship (α_S^+)			-0.26*** (0.05)
Fruitfulness (α_S^-)			-0.23*** (0.05)
<i>Panel C. Private Preference (β): Lifecycle Ladder Contrasts</i>			
Age (16 to 22)	0.08 (0.05)	0.08* (0.05)	0.08* (0.05)
Marriage	0.01 (0.04)	0.00 (0.04)	0.00 (0.04)
First Child	0.51*** (0.05)	0.50*** (0.05)	0.50*** (0.05)
Age (22 to 28)	-0.09* (0.05)	-0.09* (0.05)	-0.09* (0.05)
Social Multiplier M ($\bar{y} = 0$)	3.29	9.62	9.58
Conformity = 1, p -value	<0.001	0.007	0.007
Equal Leader Salience ($\alpha_R^+ = \alpha_R^-$), p -value			0.209
Equal Scripture Salience ($\alpha_S^+ = \alpha_S^-$), p -value			0.584
Respondent SD (σ_v)	0.32	0.32	0.32
Residual SD (σ_η)	0.56	0.54	0.54
Respondents	635	635	635
Stories	5,080	5,080	5,080

NOTE: Random-effects maximum-likelihood estimates with a respondent random intercept, enumerator fixed effects, and standard errors clustered by respondent in parentheses. Column (1) is the simplified model, column (2) the extended model, and column (3) the extended model with a separate salience weight for each direction of the cue. Panel C reports adjacent contrasts on Kendi's lifecycle ladder. σ_v and σ_η are the standard deviations of the respondent intercept and the story-level residual. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

premium both the religious leader and scripture carry. Holding the norm fixed, a supportive leader shifts the response curve by $\gamma^+ = 0.50$. This is about four times the shift from an opposing leader, $\gamma^- = -0.12$. Scripture shows the same, with $\delta^+ = 0.38$ against $\delta^- = -0.06$. The symmetry test is rejected in both cases and the premium is robust across different estimators. The two halves of the premium could have different explanations. A leader's prohibition is weak because it might restate what a low-use norm already imposes. For scripture, it restates what a familiar pronatalist reading already says.

On the other hand, a blessing is strong because it licenses women to act on latent demand, as found in Section 3.4. I explore potential channels for both a supportive leader and a stewardship passage.³⁴ If a stewardship passage worked through correcting a belief that scripture is pronatalist, one would expect it to move women with a weaker stewardship view the most. I find the opposite. The effect of a stewardship passage increases significantly more with a woman's own stewardship orientation. Among women with a stronger stewardship view, the stewardship passage also increases observed use, whereas secret use does not change. These results are consistent with women hearing a passage that reinforces their convictions, making them willing to act openly because scripture provides justification, a resonance effect. Women who expect their religious leader to discourage them from using FP are moved more than twice as much by a supportive cue as women who expect encouragement. This suggests that a supportive leader is news to women, and the leader provides the social backing or initial permission that women did not expect to have.

Salience and the Substitution Effect Panel B shows that both the religious leader and scripture substitute for conformity to the norm. Both $\alpha_R = -0.15$ and $\alpha_S = -0.24$ bend the response curve flatter. Hence, speaking leaders pull behavior toward their own message, and people will conform less to the social norm. When a leader speaks, conformity to social norms decreases from 0.90 to 0.75. Column (3) tests whether this salience depends on whether the leader supports or opposes FP use. In both cases, the leader substitutes for the norm by a similar amount. For both the leader and the scripture, the test that salience is the same for supportive and opposing cues is not rejected. The design cannot rule out moderate differences, but can conclude that both α_R^+ and α_R^- are negative and significant, i.e., religious leaders loosen norm conformity, regardless of the message they share. Scripture also substitutes for the norm, and to a greater extent. This shows that, regardless of direction, when religious authority gives a signal, people weigh what their

³⁴See Appendix Table E1. The secret-use comparison and the leader split rest on small groups and are suggestive in nature.

neighbors do and approve of less.

Preaching Against the Choir Together, the shift (endorsement premium) and the bend (saliency) imply that a leader’s message carries the most weight when it counters the prevailing norm. Following Corollary 1, a leader’s effective push is $\gamma^{\pm} + \alpha_R \bar{y}$. Section 4.3 discusses the implications and Figure 9 displays the pattern in the raw data. Here, the results in Column (2) from Table 2 quantify it. Evaluated at each level of the three norm cards, a supportive leader’s net effect is 0.59 against a low-use norm, 0.50 at the neutral norm, and 0.41 against a high-use norm.³⁵ An opposing leader’s net effect is -0.03 , -0.12 , and -0.21 , respectively. Scripture follows a similar pattern. Hence, a leader’s leverage is greatest against a strong, misaligned norm and weakest when reinforcing an aligned one.

The Equilibrium Regime A feature of the model framework is the two possible equilibrium regimes a community can find itself in. The first row in Table 2 shows that the sample is in the unique equilibrium regime since all estimates lie below one, and the test that conformity equals one is rejected in every column.³⁶ Since the saliency terms are negative, the population-average conformity parameter, $\bar{\alpha}$, cannot exceed α_0 , and thus remains below 1. The vacuum-conformity weight, α_0 , is 0.90, somewhat larger than the constant-weight estimate of 0.70, since it isolates conformity when no authority speaks.³⁷ Nonetheless, conformity is strong enough to matter. The social multiplier is approximately 3.3, averaged over the religious cues, so a shift in the deterministic utility is amplified about threefold as neighbors respond to one another. In an authority vacuum, this increases to about 10. When just a religious leader speaks, the multiplier drops from about 10 to about 4. This quantifies the amplification a speaking leader gives up at the point of maximum ambiguity. The leader increases FP use directly with a shift in $\gamma^+ = 0.5$, but the substitution effect more than halves the neighbor conformity multiplier.

Lifecycle Ladder Panel C shows the private preferences for FP use over the lifecycle ladder. There are no noticeable differences between the simplified model and the extended model. The private preference for FP that respondents attribute to Kendi rises by 0.50 with the birth of her first child. By design, this step also introduces the birth-spacing

³⁵The net effect of a leader’s stance at norm card E is the change in deterministic utility relative to a silent leader, $\Delta^{\pm}(E) = \gamma^{\pm} + \alpha_R E$, evaluated at $E \in \{-0.6, 0, 0.6\}$. For example, a supportive leader facing a low-use norm gives $\Delta^+(-0.6) = 0.50 + (-0.15)(-0.6) \approx 0.59$.

³⁶This holds for the pooled sample. Section 5.2 shows that some groups sit closer to the threshold.

³⁷Under tighter recode values, α_0 increases to between 1.05 and 1.25, because pulling boundary answers further out stretches the outcome scale and scales every weight together. The fractional logit and the binomial GLMM, which require no recoding, place the conformity parameter at 0.81 and 0.88, respectively. Interval regressions, which also require no recode, place it between 0.98 and 1.15. See Appendix Tables E5 and E8.

frame in Kendi’s story, so the estimate captures both the first child and the spacing motive. Nevertheless, the result aligns with a birth-spacing motive that activates once the first child arrives. The slight decrease of 0.09 when moving from age 22 to 28 also aligns with this. When women are older and still only have one child, the inclination is to prefer FP use less since desired fertility remains high at around four children. The slight increase of 0.08 between a 16-year-old and a 22-year-old is consistent with the stigma associated with teenage use. Traditional values expect 16-year-olds to abstain rather than to be sexually active and require FP. The stigma seems to hold more with age than marital status, with marriage not increasing the perceived stance at all.

Expectation vs. Endorsement The companion question on whether the respondent personally agrees that Kendi should use FP provides another angle on the channels through which a religious leader may operate. Table E4 in the Appendix shows that the ordering, the endorsement premium, and both substitution terms are reproduced on this normative scale. Most weights are smaller on endorsement, with conformity at 0.68 against 0.90 and a supportive leader at 0.36 against 0.50.³⁸ Therefore, the normative question confirms the structure of the estimates rather than separating a social payoff from conviction. The secret-injection story in Section 3.4 speaks to the conviction. There, a supportive leader raises public but not secret use, consistent with a leader who changes the social payoff of using FP more than the conviction behind it.

5.2 Heterogeneity

Across Respondents The design in Section 4.4 allows each weight to vary with a respondent’s characteristics. Appendix Figure E2 shows that a woman’s age, education, parity, and household assets do not move any of the five estimated weights (α_0 , γ^+ , γ^- , δ^+ , δ^-). Tested jointly across these weights, marital status and employment leave them unchanged as well. Conformity is also unmoved by direct measures of how embedded a woman is in her community, namely, her membership in a local women’s group, her years in the village, and the size of her close female friend network. Conformity to the social norm and the effect of the fruitfulness passage differ by religious tradition within Christianity, although the estimates for individual traditions are too imprecise to rank them.³⁹

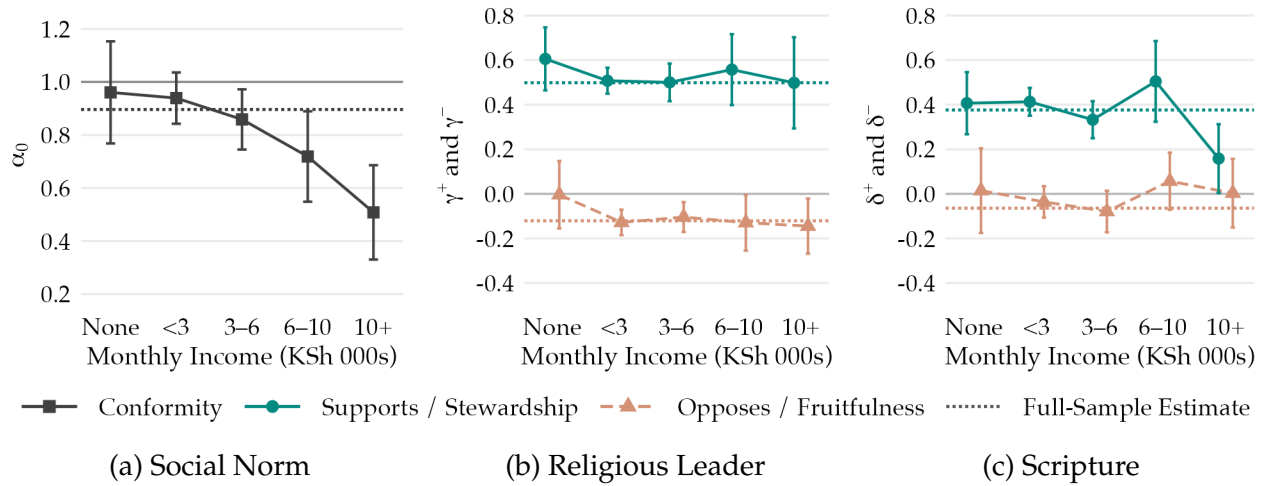
Appendix Figure E2 also shows that the weights on the religious leader and on scripture remain stable, regardless of whether the cue is for or against FP, with one exception. The

³⁸The five-point scale is rescaled to the unit interval before the transformation, so, as with the boundary recodes in Section 5.3, its weights are not on the same scale as the chance outcome.

³⁹See Appendix Table E2, Panel B, and Appendix Figure E1.

more a woman trusts her religious leader, the more weight she places on a supportive message. This suggests a credibility channel. A blessing carries more weight when it comes from a trusted religious leader, since a woman can expect that leader to publicly stand behind it. Figure 11 shows that household income moves conformity to the norm more than any other trait. Conformity to the norm declines steadily as income increases, from about 0.96 among women in households with no income to 0.51 in the highest-income band. By contrast, the religious leader's weight remains stable across income bands. The weight on scripture is similarly stable, except for the 44 women in the highest-income band, for whom a stewardship passage has a weaker effect.

Figure 11: Structural Weights by Household Income



NOTE: Extended-model weights by monthly household income band, with 95% confidence intervals, for the 555 respondents who reported income. Panel (a) plots the conformity weight α_0 against the tipping threshold of one (solid gray line). Panels (b) and (c) plot the leader effects (γ^+ , γ^-) and the scripture effects (δ^+ , δ^-). Dotted lines mark the full-sample estimates. The salience terms are common across bands, and the model is otherwise as in Table 2, column (2). Appendix Table E2 reports the estimates and tests.

Across Kendi's Life Stages How the story's own profile matters is a question about who is reached. Appendix Table E3 lets all five weights differ across Kendi's five lifecycle profiles. The estimates show how women expect the norm, leader, and scripture to bind a woman at a specific life stage, since each respondent judges a single profile of Kendi. The conformity weight ranges from 0.81 to 1.04 and is largest for the 28-year-old mother, whose weight sits at the tipping threshold of one. The norm binds a woman most in the latest life stage. The leader's weight does not differ across life stages. The supportive leader effect ranges from 0.42 to 0.57 around the pooled estimate of 0.50. The effect of an opposing message is small throughout. A leader's authority applies to every life stage, from the unmarried 16-year-old to the 28-year-old mother.

Across life stages, scripture behaves differently. Age drives changes in the stewardship

weight, and childbearing appears to drive changes in the fruitfulness weight. The weight of the stewardship passage more than doubles, from 0.21 for the unmarried 16-year-old to 0.44 for the 28-year-old mother, and nearly the entire increase is captured by the move to an unmarried 22-year-old. This reflects the message of the stewardship passage, which speaks to raising and providing for children, a concern that becomes real for a woman in her twenties but not yet for a 16-year-old girl. The fruitfulness passage lowers expected use more once Kendi has a child, with its weight jumping from close to zero to -0.11 , although the profiles do not differ significantly on it. The fruitfulness passage speaks to having many children, so a woman who has already started having children is expected to continue. Together, the results show that a religious leader moves women at every life stage by about the same amount. At the same time, the weight of scripture depends on whether the message fits a woman's current situation.

5.3 Robustness

The ordering of the forces, the endorsement premium, and the substitution effect do not depend on how the elicitation is scaled or which respondents are kept. Appendix Table E5 presents estimates from the extended model using alternative estimators and boundary recodes. Tighter recodes of the 0 and 10 answers stretch every weight by the same factor and leave their signs and ratios unchanged. Two other estimators, a fractional logit and a binomial random-effects model, use the raw answers with no recoding. Both reproduce the headline weights once placed on the same scale. Appendix Table E6 shows that restricting the sample to the 93% of respondents who correctly recall the manipulated factor leaves every weight essentially unchanged, as does adding fixed effects for the randomized order in which the eight stories appeared. That slot is itself jointly insignificant, so nothing in the estimates reflects fatigue or a story's position in the sequence. Dropping the enumerator effects, adding respondent controls, or identifying the weights only within respondents all keep the estimated parameters similar. The ordering, the endorsement premium, and both salience terms survive randomly offsetting responses by a point, reading answers as intervals, and treating the scale as ordinal.⁴⁰

Appendix Table E7 shows that the extended model is rejected against a saturated model with a separate mean for each of the 27 cells. Fit on the other seven stories, it also overpredicts the chance in Story 8, the one story on which no parameter depends, by about 0.3 points on the 10-point scale. This misfit comes from how the low-use and high-use

⁴⁰See Appendix Table E8. Only collapsing the scale to a binary answer, which discards the movement around the tails, loses the leader's salience term, which is close to zero at every cutoff from a chance of 4 to 7.

norm cards enter the model, not from how the religious authorities enter. In the single-card stories, Figure 8 shows that a low-use and a high-use norm move the chance by about the same amount in opposite directions. But because the expected FP use starts below 50%, the same change in probability requires a larger shift in utility for the low-use card, which implies a single norm weight cannot fit both sides exactly. Allowing the norm's weight to differ for a low-use norm and a high-use norm leaves the leader, scripture, and salience estimates unchanged.

Inference holds under a coarser clustering. The headline standard errors cluster at the respondent level, the level of randomization, but leaders and norms are also shared within a village. Recomputing the key tests with a wild cluster bootstrap over the 27 villages, the appropriate procedure when clusters are few, leaves the argument intact. The leader-salience term that carries the against-the-choir result stays significant at the village level, and conformity, scripture salience, and the endorsement premium hold. Only the small effect of the fruitfulness passage becomes marginally significant.

6 Counterfactual Simulations

The results suggested that religious leaders can change social norms. They do this through a direct shift, and by speaking, they weaken how much people conform to the norm. The structural weights from Section 5.1 can be mapped to the population equilibrium to explore the effect of religious leaders on the modern contraceptive prevalence rate (CPR). I calibrate two of the exercises to Meru County's modern CPR of 50.8% in the 2022 Kenya Demographic and Health Survey (KDHS). I also assume that leaders are silent at baseline and that no scripture frame is invoked.⁴¹ These counterfactuals assume that religious leaders reach an equal number of women, that those not reached have a silent leader, that all women conform to one village norm, and that a speaking leader has the same effect as the vignette card. In this section, I first perform a decomposition exercise to separate a supportive leader's direct effect, the substitution effect, and the social multiplier effect. Then, I explore how supportive and opposing leaders change modern CPR in Meru County. Lastly, I explore whether the shift will last once religious leaders stop advocating.

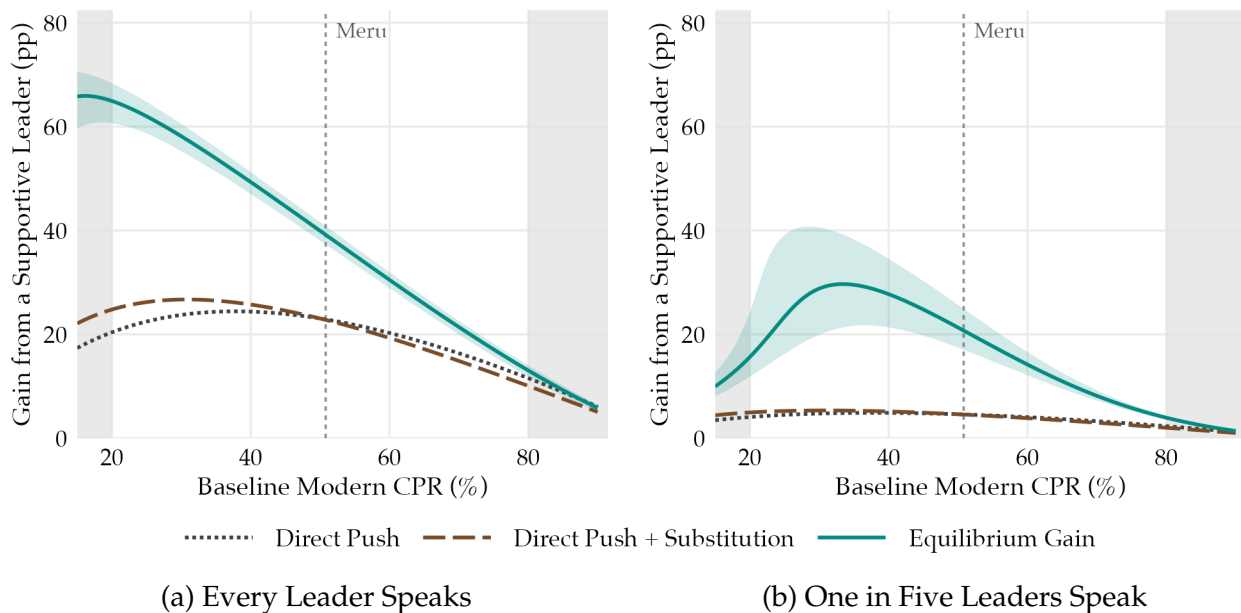
How a Leader Moves the Norm Figure 12a shows the effect if all leaders in a community support FP, relative to the baseline CPR. Looking at Meru's baseline, a direct push from

⁴¹The KDHS has no measure of which scripture women in Meru internalize. I also use my sample data to infer that religious leaders are initially silent, since only 7% have heard their leader speak publicly from the pulpit. See Appendix Table F1 where initial leader stances are also included in calibration.

religious leaders increases the CPR by around 23 percentage points (pp). At the 50.8% baseline CPR rate, the leaders have no substitution effect since the norm pulls neither way. Below 50%, the substitution increases FP use since the low-use norm pulls less. Above 50%, the substitution effect decreases FP use since a high-use norm pulls less. The leader's direct effect changes the prevailing norm, and neighbors respond to the new norm. This is the multiplier effect, and it increases the leader's effect at Meru's reference line from about 23 pp to around 39 pp.

At a baseline of 20% CPR, the leader's direct effect is about a 20 pp increase. Since the leader is now talking against the norm, the substitution effect increases it by a further 4 pp. Then, because neighbors respond, the multiplier effect makes the total impact an increase of 65 pp. Compared to a total increase of 13 pp at a baseline use of 80%, it is clear that leaders have the greatest effect when speaking against the norm. Figure 12b shows the same decomposition if only one in five leaders supports FP. With one in five leaders' support, the peak is around a baseline use of 33%, highlighting that neighbors amplify the effect most near an even split, and that in a very low-use norm, the majority who hear a silent leader keep the community anchored. So, with partial reach, a supportive leader has a greater effect when use is below an even split, but not near the floor.

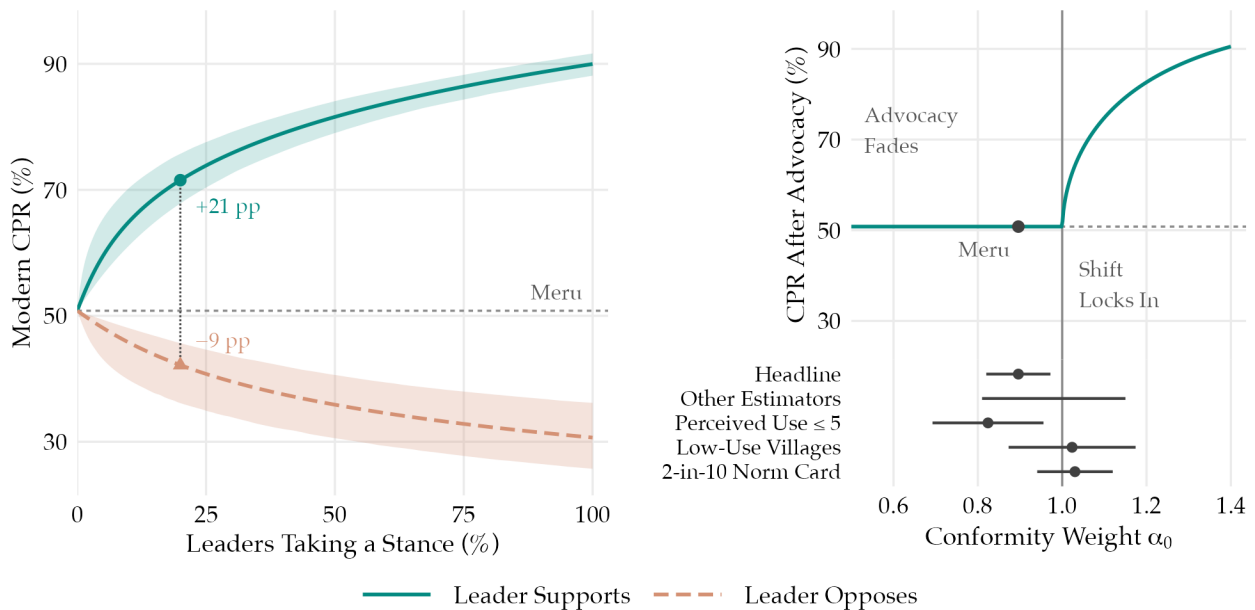
Figure 12: How a Supportive Leader Moves the Norm



NOTE: The gain in equilibrium FP use from a supportive leader, in percentage points, against the community's baseline use. The private-preference intercept is recalibrated at each baseline. Every leader speaks in panel (a) and one in five in panel (b). The lines are cumulative. The dotted line represents the leader's direct push with the village norm held at its baseline. The dashed line adds the weaker conformity weight (substitution), and the solid line represents the new equilibrium once neighbors respond. Bands are 95% intervals from a parametric bootstrap. Gray regions lie outside the norm cards, and the vertical line marks Meru's CPR of 50.8% in the KDHS.

How Far a Leader Reaches Figure 13a traces the equilibrium CPR as the share of leaders taking a stance rises, and the response is both strong and asymmetric. It compares the impact of supportive and opposing religious leaders, starting from the baseline modern CPR in Meru. If one in five leaders endorsed FP as clearly as the supportive cue in the vignette, the equilibrium FP use in Meru would rise by about 21 percentage points, as shown in Figure 12b. The same reach of opposition would lower it by only 9, a ratio of about 2.4 to 1. This is the endorsement premium of Section 5.1 carried to the community level, and conformity amplifies it. The curve is concave because of the multiplier effect. With silent leaders and near an even split, the multiplier effect is around 10. Once all leaders speak, this effect drops to around 4. Therefore, the first leaders to speak move people the most because they have a larger multiplier effect. The more religious leaders supporting FP in a community, the more the amplification is traded for a direct push.

Figure 13: A Religious Leader's Reach and Durability in Meru County



(a) Endorsement Premium

(b) Durability and the Tipping Threshold

NOTE: Panel (a) plots equilibrium modern prevalence in Meru against the share of leaders who take a stance. Reached women hear the full cue, the rest hear silence, and all conform to one village norm. Markers give the one-in-five reach. The upper part of panel (b) plots where prevalence settles after a full-reach supportive campaign ends, against the conformity weight α_0 . It is a comparative static, and above a weight of about one, the calibration places Meru on an unstable equilibrium. The lower part shows the estimates of α_0 in Appendix Table F2, with 95% intervals. Shaded bands are 95% intervals from a parametric bootstrap.

Whether the Shift Lasts Figure 13b is a comparative static. That is, it asks what happens to the leader's impact once advocacy stops. With conformity levels below one, a leader's effect returns to baseline, since the leader only slides the norm and does not tip it. The headline estimates from the model for Meru County sit just below one, but estimates relevant for

low-use villages span across one. Once a community is in a multiple-equilibrium regime, a push strong enough to remove the low-use equilibrium locks in the change. I reweight the whole sample on characteristics to match women in a low-use KDHS village and estimate the conformity parameter, which increases to 1.02. Here, a durable effect of the policy cannot be ruled out. The weight on the 2-out-of-10 norm card is similar, at 1.03. A religious leader's advocacy campaign can outlast itself only where conformity exceeds one, which the estimates allow but cannot establish for low-use villages.

Beyond Meru The structural weights come from Christian women in Meru County. The norm cards also set the social norm to 2, 5, and 8 out of 10 women using FP, so the design cannot speak to levels above 80% and below 20% use. For women in my sample who perceive that at most 5 out of 10 women in their village use FP, social norm conformity is lower at 0.82 (compared to 0.92 for the rest). This suggests that a community of such conservative women would gain less from a supportive leader. Reweighting my sample to low-use villages, I find that conformity to the social norm rises to about one, so increases in equilibrium FP use will be larger for those villages. These two tests proxy a low-use village differently. The first relies on how women perceive their own village, and the second reweights the sample by characteristics, so neither directly measures conformity in low-use villages. Across all seven sets of weights in Appendix Table F4, if all leaders support FP, the gain ranges from 56 to 66 pp in villages with a 25% baseline use rate, and from 36 to 41 pp in Meru County (50.8%). Therefore, the ordering that a leader has the greatest effect by preaching against the choir does not rest on Meru's estimated weights.

Several caveats exist when interpreting these results. These are upper bounds on what authority can do, not forecasts of what a program will deliver. They assume every reached woman hears a stance as salient as the vignette's and that the endorsement stays in place. They also assume that religious leaders have equal reach. However, some leaders might carry more weight than others. For example, the Methodist Bishop in Meru County might move more women than a recently ordained pastor. Lastly, the gains at one-in-five reach in low-use villages are imprecise, and when conformity may differ between a low-use and high-use norm card, Meru's one-in-five gain falls to 14.5 pp since it sits on the side with the weaker conformity weight.

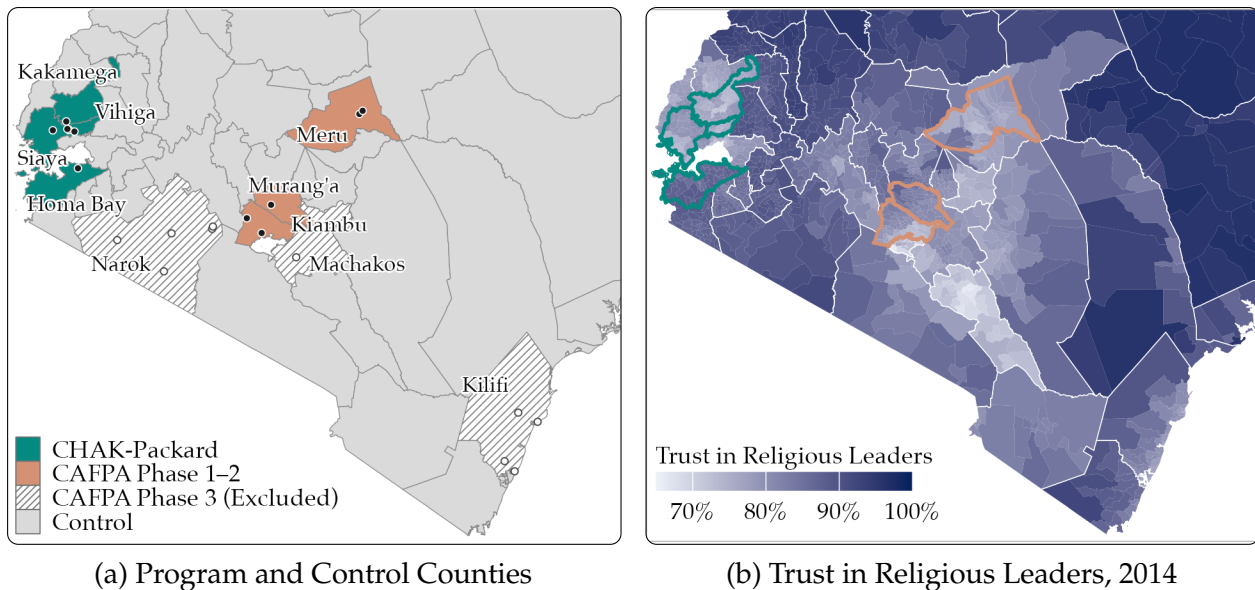
7 Evidence from Faith-Based Programs

In this section, I examine whether the vignette results carry over to real-world behavior. I analyze two faith-based programs that were implemented to increase family planning

(FP) uptake. Both the CHAK-Packard and the Christian Advocacy for Family Planning in Africa (CAFPA) programs trained religious leaders to advocate for FP and reduce the stigma around its use. The results show that the CHAK-Packard program lengthened birth spacing, with larger effects in areas where individuals trust their religious leaders more. First, I summarize the setting and programs, touch on the design and data I use, and discuss where the programs worked and through which channels.

Setting and Programs Both programs ran in phases between 2013 and 2021. They were implemented by the Christian Health Association of Kenya (CHAK), with support from the Christian Connections for International Health (CCIH) (Bormet et al., 2021; Ruark et al., 2019). Both programs gave religious leaders similar training and aimed to increase FP use, but differed in the drivers to achieve that goal. CHAK-Packard, concentrated in the western Lake Victoria basin, coupled leader engagement with community health volunteers and its own network of faith-based facilities. CAFPA, in Kiambu, Murang'a, and Meru in central Kenya, coupled the same engagement with county government policy advocacy. Appendix G contains more details on the two programs, their health and religious infrastructure, and the data. Figure 14a shows the locations of church health facilities that were involved, as well as the targeted counties.

Figure 14: Program Counties and Baseline Trust in Religious Leaders



NOTE: Panel (a) shows program and control counties, with dots marking the church-affiliated facilities that anchor treatment. CAFPA Phase 3 counties are excluded because of concurrent family planning programs, and Nairobi is excluded from the controls. Panel (b) shows the estimated 2014 ward-level share of adults who trust religious leaders at least somewhat (Appendix G.3). Data are from program records, the KMHFR, the Afrobarometer, and the 2019 Kenya Population and Housing Census.

Design I evaluate the programs using a 2×2 difference-in-differences design, comparing

the 2014 and 2022 waves of the Kenya Demographic and Health Survey (KDHS). Treatment is anchored to the church-affiliated health facilities where training occurred, since the specific religious leaders are unobserved. Exposure is measured both as a binary indicator for program counties and as a continuous measure of distance to the nearest program facility. Baseline trust in religious leaders is calculated from a ward-level small-area estimator, shown in Figure 14b for the wards in southern and western Kenya. Data on faith-based and government facilities are from the Kenya Master Health Facility Registry (KMHFR). Table 3 reports the results. I also plot birth spacing and the five-year birth rate over time in Appendix Figure G6 and the event-study estimates in Appendix Figure G7.⁴²

Findings Appendix Table G6 reports the CAFPA estimates. CAFPA program counties experienced an increase in birth spacing between 2008 and 2014, as well as a decrease in births, but the opposite occurred between 2003 and 2008, as Appendix Figure G6 shows. Hence, I focus on the CHAK-Packard program, whose counties have relatively stable pre-trends, especially for birth spacing. Table 3 shows the results for the CHAK-Packard program, for four indicators of interest: (1) birth spacing, (2) total births in the previous five years, (3) unmet need, and (4) use of modern contraception. Unmet need and modern contraceptive use are a single snapshot and do not capture the overall use of contraceptives. Both measures also fail the conventional pre-trend test.

Nevertheless, CHAK-Packard increased the average birth interval by 5.5 months. It also lowered the five-year birth rate by roughly eight percentage points. The increase in spacing and reduction in births are not artifacts of a single estimator. The results hold under a synthetic DiD design and when using distance as a continuous measure of program exposure. The decrease in total births is also larger under the Callaway–Sant’Anna estimator (Callaway & Sant’Anna, 2021), while its spacing estimate is smaller and not significant. The spacing effect survives the bounds of Rambachan and Roth (2023) until the allowed violation of parallel trends equals the largest pre-treatment deviation, while the birth effect does so only up to half of it.⁴³

Where It Worked To explore the channels through which the programs have an effect, I interact the program indicator with religious and health-infrastructure moderators.⁴⁴ The most robust moderator is trust in religious leaders, corroborating the experimental finding. Where trust in religious leaders is one standard deviation higher, the CHAK-Packard

⁴²See Appendix Equations G4 and G5 for the exact design. Appendix G.3 lays out the small-area estimation procedure. With four treated counties and two sparse pre-treatment waves, the pre-trend test has low power.

⁴³See Appendix Table G9.

⁴⁴See Appendix Equation G7 for the specification and Appendix Tables G4 and G5 for the results.

Table 3: CHAK-Packard Effects on Fertility and Its Channels

	Birth Spacing (1)	Births (2)	Unmet Need (3)	Modern CPR (4)
<i>Panel A. Average Effects</i>				
County TWFE	5.54*** (0.99) [0.03]	-0.077*** (0.025) [0.06]	-0.003 (0.028) [0.92]	-0.007 (0.023) [0.75]
Synthetic DiD	4.08** (1.94)	-0.096** (0.038)	-0.050** (0.020)	0.035 (0.033)
Callaway–Sant’Anna	2.31 (2.64)	-0.114*** (0.031)	-0.039** (0.016)	0.001 (0.034)
Distance to Facility (per SD of Exposure)	3.25*** (0.63) [<0.01]	-0.049*** (0.010) [<0.01]	-0.008 (0.007) [0.31]	0.006 (0.008) [0.50]
<i>Panel B. Moderated Effects</i>				
Trust in Leaders × DiD (Authority)	4.05*** (1.28) [0.04]	-0.046** (0.017) [0.25]	-0.049*** (0.014) [0.58]	0.015 (0.017) [0.77]
CHAK Facilities × DiD (Program Network)	2.13** (1.01) [0.09]	-0.033*** (0.011) [0.04]	-0.006 (0.009) [0.46]	-0.015 (0.013) [0.42]
FBO Facilities × DiD (All Faith-Based)	1.92 (1.22) [0.16]	-0.017 (0.014) [0.27]	-0.033** (0.016) [0.30]	0.028** (0.012) [0.37]
MoH Facilities × DiD (Falsification)	-0.63 (1.00) [0.56]	-0.032 (0.031) [0.60]	-0.008 (0.020) [0.73]	-0.009 (0.023) [0.72]
2014 Control Mean	46.9	0.654	0.136	0.369
Observations	20,017	52,900	26,519	52,900
Counties (Treated / Control)	4 / 36	4 / 36	4 / 36	4 / 36
Pre-Trend Test, p -Value	0.77 [0.79]	0.12 [0.23]	<0.01 [0.03]	<0.01 [0.18]

NOTE: County TWFE is the 2×2 difference-in-differences (2014 against 2022), with standard errors clustered by county in parentheses and wild cluster bootstrap p -values in brackets (Rademacher weights, 999 replications). Stars use the conventional standard errors. Synthetic DiD follows (Arkhangelsky et al., 2021), and Callaway–Sant’Anna reports the overall average treatment effect on the treated (Callaway & Sant’Anna, 2021). Distance to Facility replaces the program indicator with the standardized log inverse distance to the nearest program facility. Panel B interacts treatment and post with a standardized 2014 ward-level moderator. The bottom rows refer to the County TWFE sample, and the pre-trend test jointly tests the 2003 and 2008 event-study coefficients relative to 2014. Birth spacing is the mean preceding birth interval, in months, for births in the last five years, and births is the five-year birth indicator. Nairobi is excluded. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

program effect on birth spacing is about four months larger. Furthermore, where CHAK facilities are denser, births fall more and are spaced further apart. The density of ordinary

Ministry of Health facilities does not act as a significant moderator of the outcomes, so it is the faith-based network specifically that matters.

Limitations Two features of the design temper these estimates. With four treated counties, conventional standard errors understate uncertainty, so Table 3 also reports wild cluster bootstrap p -values. Under this inference, the spacing effect and its interaction with trust remain significant. A Goodman–Bacon decomposition confirms that the estimate is effectively a clean two-by-two.⁴⁵ A strong test of parallel trends is also infeasible because the survey offers only two pre-treatment waves, which are sparsely sampled and unevenly covered. The 2014 wave is itself also mid-treatment for CHAK’s first phase. Therefore, the program evidence corroborates the structural estimates and does not identify the mechanism on its own. Regardless of the limitations, the quasi-experimental results suggest that religious leaders move real-world behavior, especially when they are trusted and can pair their message with a means to act on it.

8 Discussion and Policy Implications

In this paper, the experimental design allows me to separate four forces that are entangled in observed behavior. One of those forces is religious leaders, who I show can shift social norms, and the program evidence suggests leaders have done so in practice. From the results, latent demand for family planning (FP) is high, but the binding constraint is social. In this section, I discuss where religious leader engagement pays off, how the message should be framed, what religious leaders require to be effective, how this framework holds beyond FP, and the limits of the evidence.

Environments for Effective Religious Advocacy First, religious leader engagement works best where conformity to the social norm is strong, since the multiplier that carries a leader’s push is largest there and the community sits close to a tipping point. Section 5.2 shows that conformity is higher among poorer women. Second, it works best where trust in religious leaders is high, since that is what gives a leader’s stance its weight. Third, it works best where FP use is low, because that is where the norm most opposes FP use. Hence, the same effort buys a far larger shift in a high-conformity, high-trust community whose norm resists FP use. A fourth condition concerns time. A leader’s push slides the norm while the leader advocates, but does not hold it in place once the push stops. Advocacy that arrives as a burst fades, and a program evaluated years later can show little,

⁴⁵See Appendix G.6.

even after moving behavior while it ran.

Framing the Message The results suggest that a leader who supports FP is news to women, which fits how rarely leaders speak on it. Nearly 6 in 10 women have never heard their leader speak on FP, and for those who have, it was mostly in small groups. This implies there is room for leaders to say more and a supportive message moves women sharply. However, how a leader frames the message also matters. Scripture is a strong force in the estimates, but it is a limited lever a program can pull, since neither the text nor a community's reading of it is easily changeable. The resonance result of Section 5.1 shows that a stewardship passage moves a woman most when it aligns with a conviction she already holds. So, a religious leader can choose which reading to invoke to ensure the message has the largest effect.

Message and Means The durability of religious advocacy points to a complementarity that the structural model can only half describe. The model holds access fixed, so it speaks to the demand side and it is silent on supply. However, the program evidence shows the heterogeneity concentrating in the faith-based delivery network rather than in the general health infrastructure, and a shifted norm is worth little if women cannot act on it. Therefore, engaging leaders and building the means to act on a changed norm are complements. My interviews with religious leaders in the study area suggest that both halves are within reach.⁴⁶ Most were willing to speak to their congregations about FP, and most were willing to back health clinics that their own churches would keep running.

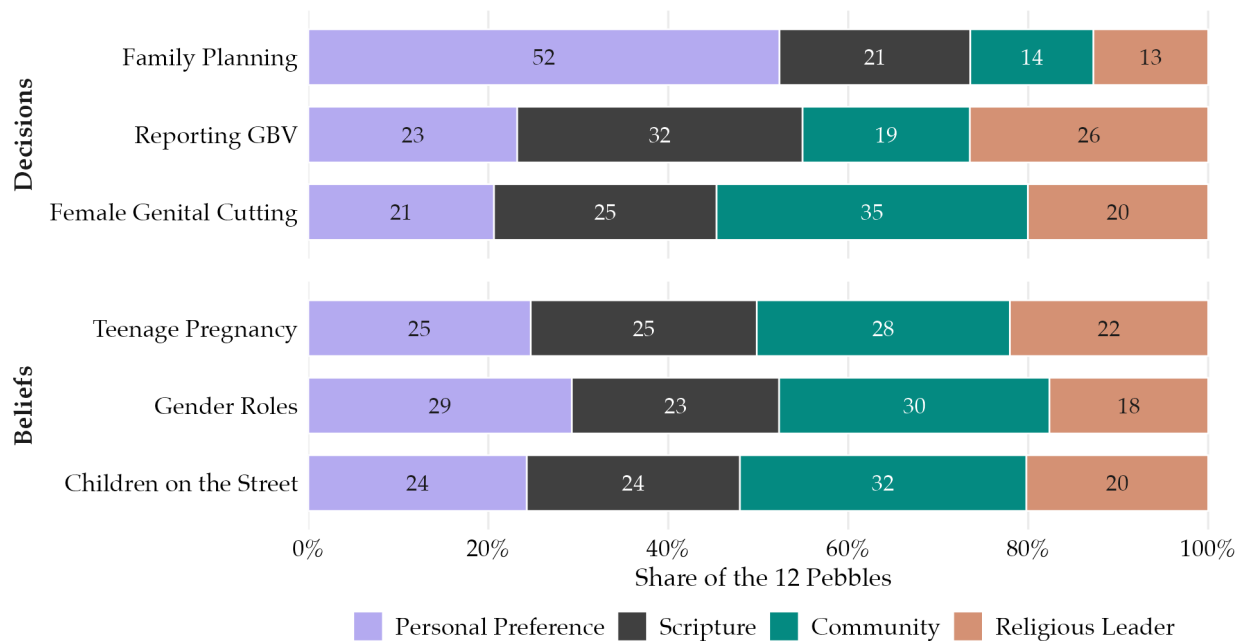
Engaging religious leaders also builds on existing infrastructure. That is, the congregations, the religious leaders, and, where a church health network exists, the facilities are in place before any program arrives. Women should also have the means to use FP discreetly, especially where the norm opposes use the most, as seen in Section 3.4. Teenage pregnancies remain prevalent and a concern (KNBS & ICF, 2023). The leaders I interviewed were also less willing to advocate for teenage FP use, because they believe teenagers should abstain from sexual activity. For teenagers, the religious leader may be the barrier rather than the community, since Section 5.2 shows the norm binds a woman less at younger life stages. Therefore, teenagers may need discreet access that does not run through religious channels.

Beyond Family Planning The model describes any decision that an individual weighs

⁴⁶Alongside the women's survey, and over the same period, I interviewed 17 religious leaders in the Maua area of Meru County. Each interview ran about 30 minutes, was conducted in English, and paired a short structured questionnaire on traditional social norms with a closing open-ended question. Hence, the evidence is both quantitative and qualitative. Given the small number of leaders, I read it as suggestive rather than representative.

against personal preference, a social norm, a scriptural passage, and a trusted religious leader. So the framework should apply to other norms that hold women back. Section 2 highlights that female genital cutting still affects one in seven women, and 41% of women report violence from a partner. The primary survey offers a first look at whether the same forces influence other norms. For the pebble game, each respondent divided pebbles over the same four forces for five other issues, from female genital cutting to gender roles to teenage pregnancy. Figure 15 shows the percentage of pebbles allocated to each force.

Figure 15: The Same Four Forces Across Six Norm-Governed Behaviors



NOTE: Mean share of the 12 pebbles each respondent allocated across personal preference, scripture, the community, and the religious leader, for six social issues. GBV is gender-based violence. Bars sum to 100%. The allocations are first-person self-reports and descriptive in nature.

The four forces are important in each of these issues. Where they differ is the weight placed on each. FP is the outlier, with only 13% of the pebbles allocated to the religious leader. However, the structural estimates give the leader the second-largest weight after the norm. Therefore, self-reports understate the leader's role in FP. For the other five issues, women already credit the leader with 18 to 27% of the pebbles, suggesting leaders may matter at least as much there. For female genital cutting, teenage pregnancies, gender roles, and children on the street, the community is the largest force and draws more than twice the share it draws for FP. A norm that a community will openly enforce is one that a trusted authority is well placed to move. I do not push this further than the design allows. The pebble allocations are first-person self-reports. The cross-domain evidence shows that the ingredients the model needs are present across these behaviors, not that a leader moves them. Testing whether the endorsement premium, the substitution effect, and the social

multiplier recur for female genital cutting or gender-based violence would take the same vignette design into those domains.

Limitations Several limits bound these conclusions. The decomposition separates a woman's personal preference, scripture, social norms, and her religious leader, but it excludes her husband, who may outweigh all four forces. The vignette is also hypothetical and third-person, which guards against social-desirability bias but means the counterfactual magnitudes rest on a cue that may be more salient than a religious leader's actual message in the field. Moreover, it only captures whether a fictional woman uses FP, not the method or continuation. In the design, a leader also speaks or does not, so it cannot say how often a leader must speak. Lastly, the structural weights are drawn from a survey conducted in a single county. So whether the same weights hold in different settings is a question the design cannot settle.

9 Conclusion

Across the developing world, religious institutions hold an authority that few others rival. Religion can shape culture, beliefs, and behavior, and when paired with the trust individuals place in their religious leaders, may change underlying social norms in societies. In this paper, I explore whether religious leaders simply reflect the social norms in their communities or change them, and, if so, how. I ground this question in the persistent challenge of reproductive norms across sub-Saharan Africa. For decades, the unmet need for family planning (FP) methods has been attributed to a supply-side problem, often citing the lack of physical and economic access. I present evidence suggesting that the binding constraint is social and that a trusted religious authority has the influence to loosen it.

I use a vignette experiment from a primary survey of 635 Christian women in Meru County, Kenya, to isolate a woman's personal preference from the social norm, a scriptural frame she internalizes, and her religious leader's stance. Latent demand for FP is high, with women predicting a fictional woman's likelihood of using FP to be 40% when her choice is observed, while 70% say she would use it in secret. Conformity to social norms is the strongest force shaping FP use, although women do not openly acknowledge this. A religious leader changes the social norm in two ways. A supportive message directly pushes up FP use. This increase carries an endorsement premium, with a supportive message shifting FP use far more than an equal opposing message. Whenever religious leaders take a stance, they substitute for conformity to the prevailing norm. That is, women conform less to what their neighbors do and approve of, and more to the leader's message.

The results imply that a religious leader is most influential when the message runs counter to the social norm. The lever remains bounded in my setting because conformity sits just below the tipping threshold, so the increase in FP use fades once the advocacy stops.

To examine whether these results generalize to real-world behavior, I analyze the impact of two faith-based programs in Kenya, which trained religious leaders as advocates for FP. Using a difference-in-differences design on four waves of the Demographic and Health Survey, I find that the CHAK-Packard program, whose counties show relatively stable pre-trends, increased birth spacing by roughly 5.5 months and reduced the five-year birth rate by roughly 8 percentage points. I show that the effects are largest where trust in religious leaders is high and where the faith-based health network is dense. The aggregate data cannot separate the channels on their own, but the role of trust aligns with the patterns observed in the experimental findings.

The conclusions refine the familiar policy call to “involve religious leaders” into a targeted, testable, and scalable design. Religious leader engagement yields the highest returns where social norm conformity is strong, FP use is low, trust in religious leaders is high, and a faith-based network can fulfill the latent demand individuals are now free to act on. The framework is not specific to FP and may extend to other norm-governed behaviors where the same four forces have influence, such as female genital cutting and gender-based violence. The design offers a way to measure how far a trusted authority can shift the norms that hold a community in place. More broadly, this paper positions religion not just as a historical determinant but as a contemporary instrument of development policy, and shows that religious leaders are most effective when they preach against the choir.

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