



Evidence on the nature of sectarian animosity from a geographically representative survey of Iraqi and Iranian Shia pilgrims

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Sectarian tensions underlie conflicts across the Middle East, but little is known about their roots and associated beliefs. We conducted a large-scale empirical analysis, drawing on an original, geographically representative survey of over 4,000 devout Shiites across Iran and Iraq. We find that sectarian animosity is linked to economic deprivation, political disillusionment, lack of out-group contact and a sect-based view of domestic politics—paralleling patterns seen in ethno-nationalism elsewhere. In contrast, two alternative accounts are largely unsupported: sectarian animosity is not consistently associated with solidarity with a transnational sect-based community, nor does it seem to stem from disputes over religious doctrine. Nonetheless, this identity's religious roots manifest in differences from typical ethno-nationalism; practising men are less sectarian, consistent with official doctrine encouraging unity, whereas practising women are more sectarian. These gendered patterns suggest an understudied mechanism: religiously mediated socialization, or the transmission of non-religious norms through religious practice.

The past 50 years have seen a resurgence in sectarian tensions within Islam, in the Middle East and worldwide. Inter-sectarian suspicion and animosity have manifested in violent conflicts in Syria, Iraq, Yemen, Lebanon and South Asia, as well as in post-Arab Spring government clampdowns in Gulf states^{1,2}. Some argue that the Sunni-Shia religious divide will be the defining conflict of this century^{3,4}. Yet despite the evident importance of sectarian animosity—that is, antipathy to co-religionists based on membership in another sect—researchers know little about how individuals come to hold this animosity or what other social, religious or political attitudes are associated with it. Existing work has focused almost exclusively on societal factors that spur sectarian tensions, be they institutional or transnational^{5–7}. Research is particularly sparse compared with existing social-scientific work on ethnicity, nationalism and religion, even though in the Middle East and North Africa, sectarian identity arguably plays a more important role. This research deficit is even more severe for Shiites, who comprise at least 20% of Muslims worldwide and hold considerable sway in contentious parts of the Middle East. Due to the extreme difficulty of operating in these regions—including political instability, regime restrictions and social norms—research has focused disproportionately on Sunni Muslims and relies overwhelmingly on male respondents.

To gain a richer understanding of sectarian attitudes, we conducted in-person surveys of over 4,000 Shia pilgrims who travelled to the Iraqi city of Karbala for the holy day of Arba'een. The concept of pilgrimage is enshrined in Islam as one of the religion's five pillars. While the hajj is the most important pilgrimage for Sunni and Shiites alike, Shia scholars also emphasize travels (*ziyara*) to shrines of imams or Mohammed's companions. Arba'een, the religious occasion that serves as the backdrop for our survey, is a collective mourning ritual involving a pilgrimage on foot to the shrine of Imam Hussein

in Karbala. While not obligatory, the spiritual rewards of *ziyara* to Imam Hussein's shrine are often compared to the hajj. Individuals depart days or weeks in advance on foot from as far as Basra (500 kilometres away) or Baghdad (100 kilometres), engaging in recitations and lamentations during the journey. Banned for decades during Saddam Hussein's reign, the pilgrimage has since steadily grown in numbers, with Iraqis being the most frequent visitors, followed by Iranians. In 2015, when we conducted this survey, 22 million pilgrims reportedly visited the shrine, according to Iraqi state media official counts⁸. (We note that attendance is difficult to confirm. However, even with uncertainty over exact participation, the Arba'een pilgrimage is consistently regarded as among the largest human gatherings in existence.) In Supplementary Section 1.2, we detail the particular sectarian context and history in which this takes place.

Attendees are a regionally and socio-economically diverse sub-population united by the pilgrimage. While often understood to be central to politics and conflict in the region, these devout individuals are normally difficult to identify, let alone study. Our survey collects a geographically representative sample of them, including an unusually large number of women and individuals from inaccessible areas across Iraq and Iran. This geographic diversity allows us to assess the generality of our findings across local and national contexts. We then characterize this sample using self-reported religious practice, prior pilgrimage participation and anonymous smartphone location tracking of attendees. We examine variation along these dimensions, providing some indication of how they might generalize to less devout Shiites—though we emphasize that a key limitation of a pilgrimage-based study is that it cannot directly examine non-pilgrims.

Using the resulting data, this paper lays the groundwork for the systematic study of sectarian animosity in Islam in three ways. First, given the lack of standardized measures in this nascent research

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area, we develop a latent-variable measurement strategy for sectarian animosity and demonstrate its validity using alternative self-reported, experimental and behavioural measures. Second, we take stock of a literature that has theorized numerous underlying causes or risk factors that drive sectarian animosity, often on the basis of qualitative or case-specific evidence. We conduct a systematic, empirical evaluation of these claims. Third, we unpack the contents of the ‘sectarian worldview’—the bundle of social, religious and political beliefs that are assumed to correlate with sectarianism, often without evidence. Throughout, we use our sample’s breadth to examine how findings generalize. We begin by examining animosity among Iraqi Shiites, where sectarian diversity means that inter-sect relations are highly salient; the culturally similar Iranian Shia sample helps show which results are country-specific and which may be more generally applicable. And our large sample of women, often excluded from the public sphere in the Middle East, offers the rare opportunity to understand gender differences and how patterns of beliefs vary across genders.

Using these results, we empirically assess three widely espoused, non-exclusive theories about the nature of sectarian animosity by testing their observable implications. We emphasize that our analyses can only evaluate whether observational data are consistent with theorized mechanisms; they cannot test those mechanisms directly. Broadly speaking, our findings suggest that sectarian animosity is best conceived in terms of a national politicization of sectarian identities and the desire for sectarian control of national-level symbols and resources. Despite key differences, sectarianism presents many functional similarities to ethno-nationalism^{9–11}. These similarities include how economic deprivation, democratic disillusionment and lack of out-group contact correlate with out-group animosity across diverse contexts, and how individuals with high animus evaluate domestic politics, politicians and political parties through a sect-based lens. In contrast, we find little support for the prominent narrative of transnationalism—the notion that individuals’ sectarian animosity is tied to engagement with and allegiance to a global Shia community that is seen as persecuted in Sunni-dominated areas. Nor does sectarian animosity seem to be tied to religiosity—that is, grounded in piety, practice or doctrinal conflict with other sects. While these alternative perspectives are not necessarily mutually exclusive—and while failure to detect an observable implication does not falsify a theory—we find little empirical support for their predictions.

But the analogy to ethno-nationalism has its limits. We observe substantial gender heterogeneity in the correlates of sectarian animosity that existing models fail to explain. While women hold significantly less animosity than men, this does not seem to be inherent to gender. Rather, gender differences are closely linked to variation in women’s (typically limited) social exposure. Those participating regularly in public life—for example, working outside the home or engaging with the news—hold significantly higher levels of animosity, highlighting the social origins of sectarian norms. We find that religious practice—one of the most important channels for social interactions—is even more strongly associated with women’s beliefs, potentially because these channels help diffuse norms.

Using variation in the level and nature of religious practice, we show that the relationship between religion and sectarian animosity differs substantially between Iraqi men and women. Among women who do not work outside the home, those regularly participating in communal practice have levels of animosity that rival those of their male counterparts. In contrast, women who are similarly religious but lack this social contact (for example, consuming religious media at home) are far less sectarian. For men, who already have regular extra-familial interactions, this does not hold. We do not find evidence of these patterns in Iran, where women are far more integrated into the public sphere^{12,13} (our baseline results rule out correlations larger in magnitude than ± 0.1). We argue that these

differences are consistent with religiously mediated socialization—the transmission of non-religious norms acquired through religious practice among individuals who would otherwise be excluded from the broader social sphere. This is an important but often-overlooked correlate of sectarian animosity and a notable form of gendered variation in the broader role of religion^{14,15}.

The remainder of this paper proceeds as follows. The Results section presents the empirical results, beginning with commonly hypothesized drivers of sectarian animosity and then proceeding to other worldviews held by individuals with sectarian attitudes. In the Discussion section, we conclude with the implications of these results for common theoretical accounts of sectarian animosity. The technical details are reserved for the Methods section. These include (1) our sampling procedure, with specific mechanics of the pilgrimage and detailed tests of representativeness; (2) measurement based on Bayesian principal components analysis (BPCA), with numerous validity tests of the animosity measure; (3) regression analysis incorporating uncertainty from missingness, measurement and finite samples; and (4) multiple-testing corrections.

Results

What are the factors that might plausibly push individuals towards sectarian animosity, and are there discernible commonalities in how they operate across cultures? In this section, we conduct our primary confirmatory analyses to evaluate the numerous potential causes that prior work has proposed. To do so, we examine whether each theory’s observable implications—the correlations between a hypothesized driver and sectarian animosity—are in fact present in our data. We emphasize that when testing previously theorized causal effects with observational data, unobserved confounders can reinforce causal effects, leading to inflated estimates; alternatively, confounders can be countervailing, producing estimates that are attenuated or even entirely inverted in sign. Thus, these observational tests are informative to the extent that countervailing confounders are weak relative to theorized effects, and they can produce false positives if the theorized effect is non-existent. It is important to note that these conditions cannot be evaluated empirically.

We first assess these theories in the context of the Iraqi case, where sect plays an inescapable role not only in national politics but also in daily life. The regression results are reported in Fig. 1 and Supplementary Table 9; 95% credible intervals and additional details on multiple-testing-corrected P values (denoted P_{adj}) are given in Supplementary Tables 17 and 19.

Potential drivers of animosity. Religious practice. We first consider whether religious devotion might push individuals towards sectarian animosity. Our operationalization of devotion focuses on religious practice rather than making value judgements about particular beliefs. We extract the principal components of questions about the frequency of various acts (Supplementary Section 3.3) using a BPCA procedure described in the Methods section under ‘Measurement’. The first dimension captures overall religious practice; the second distinguishes respondents who practise more individually from those engaged in communal practice.

We find that religious practice is associated with attitudes towards religious out-groups, but the patterns are more context-dependent than existing theory predicts. Among Iraqi women, our baseline model indicates that those who are one s.d. more religiously practising are on average 0.10 s.d. more sectarian. Yet among Iraqi men, we observe a similarly strong but diametrically opposed association with tolerance (Supplementary Tables 9, 17 and 19; both $P_{\text{adj}} < 0.001$).

Closer examination suggests that these shifts are related to religiously mediated socialization, or transmission of non-religious norms through religious practice. Religious practice can influence individuals on two dimensions—doctrine and socialization. In the

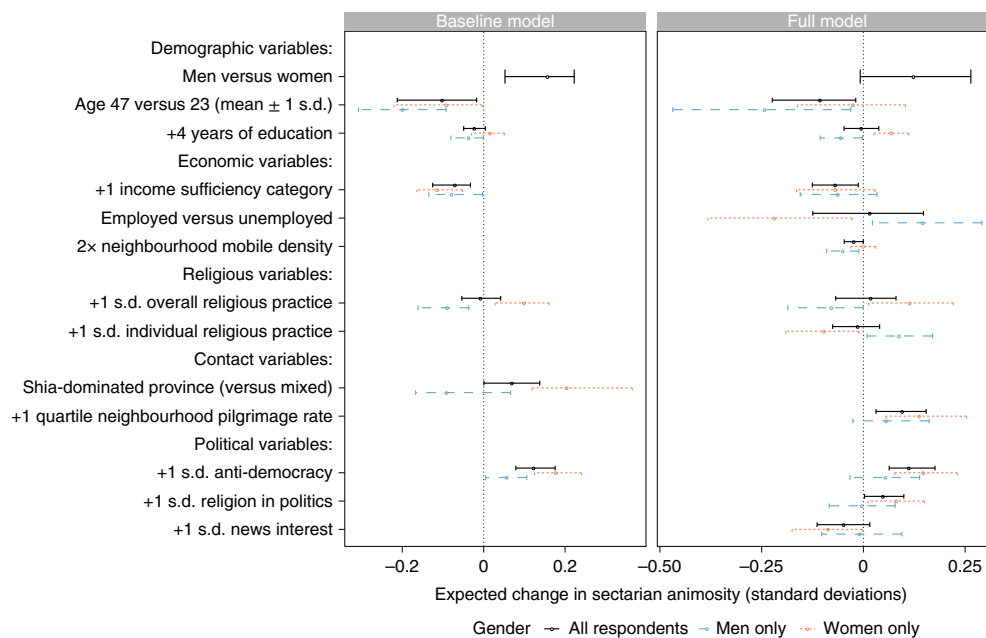


Fig. 1 | Testing theorized drivers of sectarian animosity among Iraqi respondents. The left (right) coefficient plot summarizes the regression results from a specification in which single (multiple) measures correspond to each hypothesized cause. The complete results are given in Supplementary Tables 9, 17 and 19. The points and error bars are posterior means and 95% credible intervals after accounting for uncertainty from missingness, measurement and finite samples. $N=2,231$ ($N=1,888$) for the baseline (full) results. The full specification includes province-fixed effects. A corresponding coefficient plot for Iranian pilgrims is given in Fig. 2.

case of sectarian animosity, these two dimensions pull in opposite directions: official Shia religious doctrines discourage sectarian animosity, while socialization encourages it, influenced by the relatively high levels of sectarianism in the public sphere. Individuals already socialized through other avenues—for example, through work outside the home or through news—will be minimally affected by further socialization in religious venues and more substantively influenced by moderating doctrines. Those whose primary socialization is religious practice, however, will be more impacted by the amplifying effect of religiously mediated socialization on sectarian animosity.

In Iraq, this phenomenon seems to break down largely on gender lines. The tolerance observed among practising Iraqi men (replicated in the Iranian case) is more consistent with the hypothesized effect of religious doctrine. However, our data also suggest a parallel process at work among Iraqi women, who have historically been excluded from public discourse. For these individuals, religious practice—particularly the communal variety—is the primary channel through which they interact with the public sphere. Because of this, women have baseline lower average levels of sectarian animosity. But when they participate in religious events, they seem to be socialized towards the male mean, overwhelming the moderating effect of doctrine. Men, however, are already socialized to this higher level of sectarianism through regular public interactions, so they receive only the doctrinal impact of religious practice, which encourages moderation.

These hypotheses are reinforced by further analysis. In our full specification, which probes different types of religious practice, we find that the apparent effects of religion are stronger when individuals participate in communal religious activities. Women who take part in collective worship are decidedly more anti-Sunni (Supplementary Tables 9, 17 and 19; $P_{\text{adj}}=0.033$), whereas communally practising men are perhaps more inclined towards coexistence ($P_{\text{adj}}=0.069$). Conversely, women (men) who are more devout but individually practising tend to respond in line with the

average woman (man). We ran additional models in which religiosity was interacted with individual or communal practice, although we view the interactive models as exploratory. The results were consistent with the religiously mediated socialization hypothesis. Men (women) who were 1 s.d. more religious and 1 s.d. more communally practising differed significantly ($P \leq 0.02$ for both): they were 0.25 s.d. less sectarian (0.30 s.d. more sectarian). We found no significant differences between average respondents and (1) highly devout, individually practising individuals of the same gender, or (2) less devout individuals who are communally oriented.

Together, these findings support an understanding of sectarian animosity as distinct from religiosity. But they strongly indicate that religious practice plays an important role in influencing sectarian animosity through moderating doctrines and religiously mediated socialization, which have important gender dimensions.

Economic deprivation. Next, we examine a potential driver of sectarian animosity that suggests similarities to ethno-nationalism⁹. We examine the relationship between economic well-being and sectarian animosity, using a four-point scale of household income sufficiency to measure overall economic well-being. Our findings are consistent with impoverishment making individuals susceptible to out-group resentment: a one-point increase on this scale (roughly 1 s.d.) is associated with a 0.07-s.d. decline in sectarian animosity ($P_{\text{adj}} < 0.001$).

We unpack this result using a richer specification that incorporates additional variables, including other economic measures. The results are virtually identical even after controlling for mobile phone density in the ten-kilometre radius around a respondent's home—a proxy for local urbanization and wealth that we compute from our location-tracking dataset, given the lack of fine-grained census statistics. This suggests that poverty operates individually, not on a community level. Employment, though, is more nuanced. Employed men are more sectarian than the unemployed, despite being better off (Supplementary Tables 9, 17 and 19; $P_{\text{adj}}=0.048$). Prior work has

found that government bureaucracies, a major employer of Iraqi men, assign jobs through sect-based patronage networks that exacerbate sect-based competition for scarce resources^{16–18}. In contrast, employed women are more moderate in their out-group views, as economic deprivation theory expects, although there is strong selection in the types of Iraqi women who work.

Taken together, the relationship between economic hardship and sectarian animosity forms one parallel between sectarian animosity and ethno-nationalism.

Democratic disillusionment. A third potential cause of animosity, democratic disillusionment, is often considered a core driver of modern ethno-nationalist movements. Research suggests that failures within a political system can encourage individuals to identify more strongly with other non-national identity cleavages^{10,19,20}. To test the micro-foundations of these arguments, we measure political disillusionment through a BPCA-based index that summarizes a battery of questions about the stability, economic performance and morality of democracy (Supplementary Section 3.3).

Our results lend credence to these arguments. We find that dissatisfaction with democratic governance is strongly associated with sectarian animosity, although this is primarily driven by women (Supplementary Tables 9, 17 and 19; 0.18 s.d. increase per s.d. increase in disillusionment, $P_{\text{adj}} < 0.001$). We speculate that attitudes towards the out-group are more malleable among Iraqi women who, having less exposure to the public arena, form beliefs from their own life experiences rather than by absorbing societal consensus²¹. The connection is markedly weaker among men (correlated at +0.06, $P_{\text{adj}} = 0.039$; heterogeneity $P_{\text{diff}} < 0.001$) and loses significance with additional controls—countering the widespread narrative of young, disillusioned men being the key actors in sectarian conflict.

One potential objection to our disillusionment proxy is that respondents may be opposed to democracy on moral principles rather than perceived disenfranchisement. To better understand how political factors may affect intergroup tensions, we construct two additional control variables with indices that capture each respondent's (1) views on the 'proper' role of religion in government, on the basis of questions about political fatwas and related issues, and (2) news interest, using self-reported consumption frequencies across six news types. Incorporating these and other controls into our full specification, we continue to find that women dissatisfied with Iraq's current mode of governance are significantly more anti-Sunni. Finally, we note that women who support greater religious involvement in government tend to be more sectarian (+0.08, $P_{\text{adj}} = 0.025$). One explanation is that anti-Sunni individuals want Shia religious leaders to have greater influence in order to reduce Sunni political power, but it is also plausible that individuals desiring a Shia religious state resent Sunnis because Iraq's consociational system of power-sharing impedes this goal.

The strong relationship between democratic disillusionment and sectarian animosity marks another parallel between sectarian animosity and ethno-nationalistic animosity.

Intergroup contact. A commonly cited driver of inter-ethnic animus is a lack of intergroup contact^{22,23}. It has long been argued that intergroup contact can soften prejudices, but rigorous tests are notoriously difficult because of measurement error and the self-selected nature of interpersonal interaction. Our study is no exception. We operationalize contact in three ways, each making trade-offs between specificity and susceptibility to bias. At the crudest level, we use a binary indicator for whether a respondent lives in a homogeneously Shia province or a mixed Sunni-Shia province, as measured by the proportions from each group on the Iraqi Council of Representatives. While individuals can and do migrate, the cost of migration makes it less likely that this explanatory variable is causally affected by sectarian animosity. We find that women in

Shia-dominant provinces are 0.2 s.d. more sectarian than those in mixed provinces (Supplementary Tables 9, 17 and 19; $P_{\text{adj}} < 0.001$), but we see no such relationship among men.

However, merely living in a mixed province does not indicate direct or even indirect exposure to the out-group, particularly in areas with hyperlocal neighbourhood segregation, such as Baghdad. Therefore, we next use respondents' self-reports of whether they had Sunni friends. We find a strong negative correlation between Sunni friendships and sectarian animosity. But while self-reported relationships are a more accurate measure of contact, obvious self-selection issues make it impossible to interpret unreported results.

We therefore construct a third contact proxy based on our mobile location dataset. For each respondent reporting a geocodable home city or neighbourhood, we identify tracked mobile devices based in the surrounding area and monitor whether they appear at the Imam Hussein shrine during Arba'een week. These proportions are ranked to reduce leverage and rescaled to [0, 1]. Neighbourhood attendance rates are then used to proxy for the proportion of Shia residents. (Supplementary Section 2.2 examines this proxy in detail; the results indicate that it is high in areas known to be homogeneously Shia and appropriately lower in known mixed and Sunni-dominated areas.) While this measure is imperfect—because it might also capture unmodelled neighbourhood devoutness—we believe it strikes a balance between granularity and self-selection. This measure is included in our preferred model specification. We find that among Iraqi women, a ten-percentile increase in this proxy—indicating lower Sunni presence and fewer opportunities for contact—is associated with a 0.06 s.d. increase in sectarian animosity ($P_{\text{adj}} < 0.001$).

While no individual test is definitive, the results among women consistently support the contact hypothesis—that exposure can decrease intergroup tensions. For Iraqi men, however, we find no evidence that contact matters. In the Discussion, we consider the possibility that the structure of Iraqi society leads male attitudes towards the out-group to crystallize earlier, leaving less room for influence by the life experiences described here.

These findings again highlight the importance of gender in understanding sectarian animosity, while also offering another parallel to the role of intergroup contact in ethno-nationalism. We also examine associations with violence exposure and find evidence that complicates straightforward narratives about violence causing intergroup hatred¹¹ (Supplementary Section 5.1).

Generalizing to Iran. To evaluate the generality of our results, we next assess the extent to which these patterns hold in our Iranian sample. In the context of the Arba'een pilgrimage, we can reduce typical concerns about cross-national comparability. Both Iraqi and Iranian respondents belong to the same sect, are more devout than their respective countries as a whole and often follow the same religious authorities. Through comparing the two countries, we gain a better understanding of which phenomena are salient only in the Iraqi context and which might generalize to the broader Shia world. However, we note that the Shia homogeneity of Iran complicates this assessment of generalizability; here, sectarian animosity is largely an abstract concept rather than a lived experience. To address this, rather than attempting to explain raw differences in sectarian animosity, we focus on whether hypothesized drivers (to the extent feasible) correlate with anti-Sunni sentiment similarly in each country. Such shared patterns are an observable implication of broader theories that claim to operate across contexts.

We find that economic deprivation seems to operate similarly. Better-off Iranians are generally less susceptible to sectarian prejudice (Supplementary Tables 10, 18 and 20; $P_{\text{adj}} < 0.001$)—a result that is primarily driven by employment. However, the general importance of economic factors mirrors our finding in Iraq, despite potential differences in mechanisms, lending credence to the view

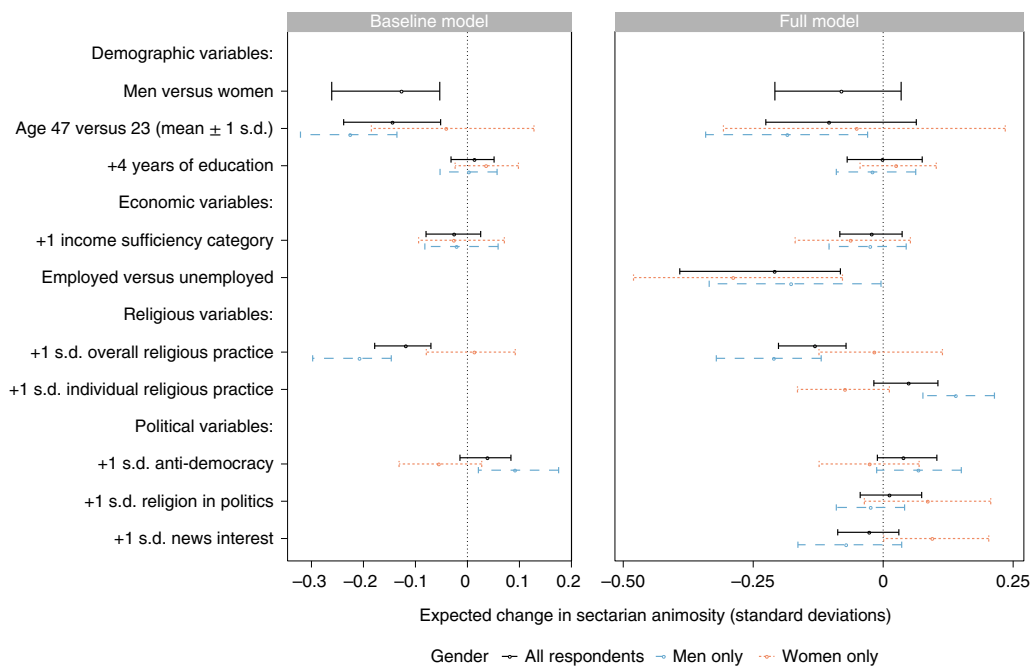


Fig. 2 | Testing theorized drivers of sectarian animosity among Iranian respondents. The left (right) coefficient plot summarizes the regression results from a specification in which single (multiple) measures correspond to each hypothesized cause. The complete results are given in Supplementary Tables 10, 18 and 20. The points and error bars are posterior means and 95% credible intervals after accounting for uncertainty from missingness, measurement and finite samples. $N=1,362$ ($N=1,325$) for the baseline (full) results. The full specification includes province-fixed effects. A corresponding coefficient plot for Iraqi pilgrims is given in Fig. 1.

that sectarian animosity represents a form of ethno-nationalism. At the same time, other implications of this theory cannot be evaluated in the Iranian context due to a lack of variation in the explanatory variable (for intergroup contact) or political sensitivity (for anti-regime attitudes, the Iranian analogue of anti-democratic attitudes in the Iraqi context). These limitations suggest caution in conclusions about generality, and they highlight the fact that even fully general theories will inevitably manifest differently in different settings.

In the religious realm, the results among Iranian men support our previous arguments about the moderating influence of mainstream religion. Men who are more religiously practising by one s.d. are significantly less sectarian by 0.21 s.d. ($P_{\text{adj}} < 0.001$). This correlation with tolerance is amplified among men who practise communally, as in Iraq. Among Iranian women, religious devotion has no discernible association with out-group attitudes (our baseline results rule out associations larger in magnitude than ± 0.1). We interpret this as a result of Iranian women's greater political integration compared with their Iraqi counterparts, highlighting that this might be a potential long-term equilibrium that Iraqi women are moving towards, as political integration and exposure to public discourse increase.

The complete regression results are reported in Fig. 2 and Supplementary Table 10; 95% credible intervals and additional details on multiple-testing corrections are given in Supplementary Tables 18 and 20.

Worldviews associated with sectarian animosity. The rise in sectarian conflict in the Middle East has been accompanied by numerous societal shifts, including a backlash in some quarters against liberalizing gender roles, blurring between political and religious domains, and the emergence of religious organizations that recruit members and solicit financial assistance across national borders. Scholars often theorize links between these phenomena, yet no evidence exists to test whether these correlations indeed exist.

To address this gap, we examine four worldviews commonly associated with sectarian animosity. These include (1) a desire for more religious involvement in political decision-making, (2) support for Iranian involvement in the domestic politics of other countries in the region, (3) support for foreign Shia groups and (4) a sect-based political outlook that emphasizes the importance of Shia representation. Though these exploratory analyses do not necessarily test theories of sectarianism directly, associated worldviews provide insight into the plausibility of different conceptualizations that are common in the literature, targeting the link between sectarian animosity and (1) religiosity, (2) and (3) transnationalism, and (4) the political implications of ethno-nationalism.

We construct BPCA-based measures of each worldview following Supplementary Section 3.1. The component questions, loading plots and diagnostics are in Supplementary Section 3.3. The regression results are reported in Supplementary Tables 13–16 and summarized in Fig. 3; 95% credible intervals and multiple-testing-adjusted P values are presented in Supplementary Table 21.

In Iraq, we find that individuals with sectarian views tend to also hold a somewhat more sect-oriented view of politics, including the belief that out-group politicians cannot represent one's interests. (We do not examine this association in Iran, where sectarian politics are non-existent.) This is consistent with the ethno-nationalist view¹⁰, where disempowerment leads individuals to blame the out-group. The result is intuitive, but it shows that sect is more than just a cognitive shortcut for whether a party will deliver material benefits. Rather, citizens that see national politics as a sectarian competition for resources also hold direct animosity for out-group members at the individual level. The relationship is highly significant among both Iraqi men and women (Supplementary Tables 13 and 21; $P_{\text{adj}} \leq 0.002$ for both), corresponding to a roughly 0.10-s.d. increase per s.d. increase in sectarian animosity, on average. The relationship was roughly twice as large in male respondents, but gender heterogeneity is not statistically significant.

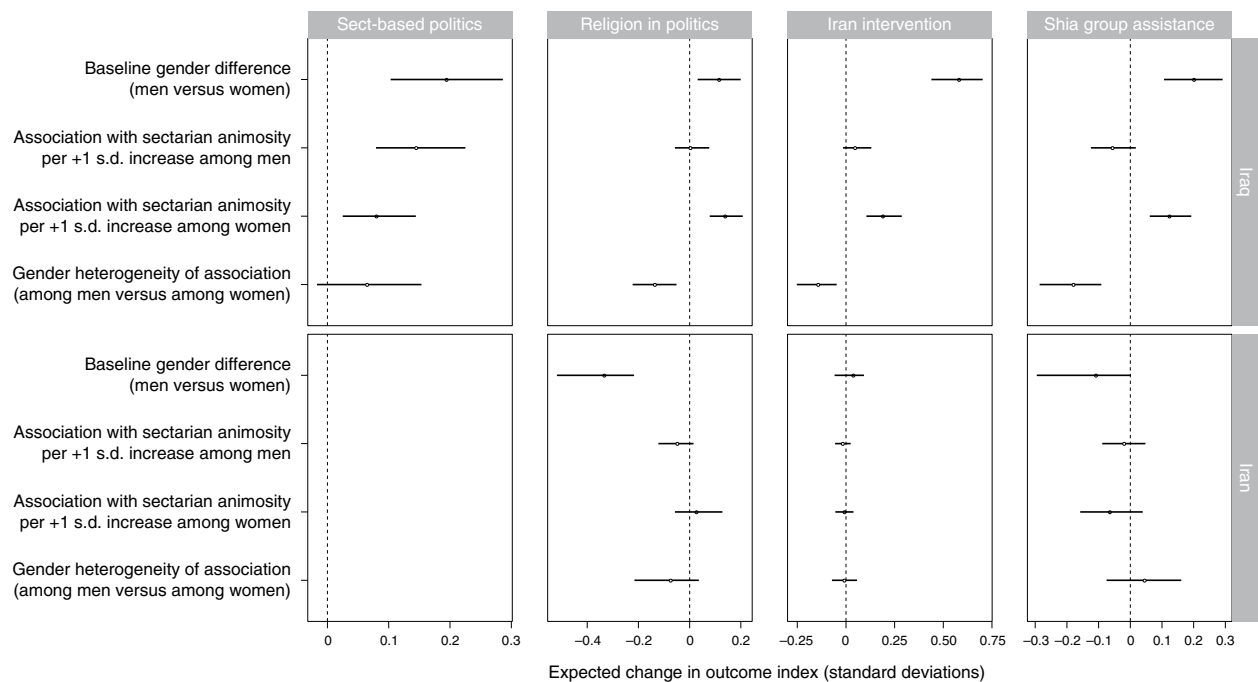


Fig. 3 | Worldviews associated with sectarian animosity, by gender. This plot summarizes regressions of each worldview on sectarian animosity, interacted with gender, along with demographic controls and province-fixed effects (not depicted). The points and error bars are posterior means and 95% credible intervals after accounting for uncertainty from BPCA-based indices. The complete results are reported in Supplementary Tables 13–16 and 21.

Surprisingly, all other attitudes that we examine follow a consistent but distinct pattern. We note three stylized facts that we suggest, in the Discussion, are consistent with ongoing belief transmission as Iraqi women increasingly enter a male-dominated public sphere. First, on every worldview, we observe that Iraqi men and women hold differing average attitudes: men desire deeper involvement by religious leaders in political decision-making, look more favourably on Iranian foreign policy interventions and support external Shia groups. Second, on every dimension, sectarian Iraqi women gravitate significantly towards the typical male position. Lastly, shifts in the beliefs of Iraqi women cannot be explained by sectarian animosity alone, because there is no apparent relationship between out-group animosity and these attitudes in any other subgroup.

Discussion

These findings provide a framework for understanding theorized origins of sectarianism among a central but understudied population. Despite the clear importance of the Saudi-Iranian conflict to geopolitics^{4,24}, we find no support for an individual-level understanding of sectarian animosity as a transnational movement, either with or without Iran as its leader. On a personal level, individuals with sectarian views did not show more affinity for fellow Shiites who were not co-nationals or co-ethnics. Similarly, individuals with sectarian views were not generally more aware of sectarian conflicts, nor were they generally more supportive of Shia groups within these conflicts. We do not observe the expected widespread support for the foreign policy objectives of Iran, suggesting that it is not seen as a flagbearer for Shia regional interests. Nor do we see evidence of a singular sectarian perspective in Iran and Iraq, either within our sample as a whole or among more sectarian respondents, highlighting the lack of a unified ‘sectarian mindset’ across the two countries.

We do, however, find that individuals with sectarian views tended to also hold attitudes resembling those of ethno-nationalists. They preferred sectarian political parties and were more critical of (non-sectarian) democratic institutions, a marker of disillusionment that often underlies ethno-national movements¹⁰. Similarly, various

drivers often associated with ethnicity and ethno-nationalism seem to hold within this sectarian context. In our survey, increased intergroup contact is associated with lower levels of sectarian animosity^{25,26}. Real economic concerns are closely tied to sectarian animosity, much like ethnic attitudes^{27,28}. Exposure to violence may also be associated with greater sectarian animosity, as with ethnic polarization¹¹.

The relationship between religion and sectarian animosity is less straightforward. Sectarian animosity is clearly not a manifestation of dogmatism; in fact, greater religiosity is strongly associated with less hatred among men. We propose two mechanisms, doctrine and socialization, through which religion might influence sectarian animosity. This moderating effect is consistent with a doctrinal effect, as the ayatollahs emulated by the majority of our sample explicitly promote sectarian unity. (For details on changes in emulation over time, see Supplementary Section 2.7.)

Among women, we see a highly significant correlation in the opposite direction, with more religious practice being associated with greater sectarian animosity. We suggest that this difference may be due to the second mechanism, which we term religiously mediated socialization—the transmission of (potentially non-religious) norms through religious practice—which is most salient among individuals who would otherwise be excluded from the broader social sphere. For many Iraqi women, religious practice represents one of the few opportunities to interact with society more broadly, whether through attending Friday prayers, participating in pilgrimages such as Arba’een or listening to religious teachings on political or social topics.

Four pieces of evidence point to the importance of religiously mediated socialization in explaining gender differences. First, women who engage with the public sphere through other channels—such as news consumption or work—also diverge in their sectarian animosity, suggesting that the differences are not the result of gender itself but rather of the different socialization experiences of men and women in Iraqi society. Second, the role of religious practice is magnified among women who participate in communal

events, where socialization is most likely to occur, whereas it diminishes for those who practise alone. Third, religiously practising women tend to lie much closer to the male average in terms of sectarian animosity, consistent with acceptance of mainstream social norms, rather than being spurred towards extreme levels of sectarian animosity by religious teachings. Fourth, as seen in the Results section under ‘Generalizing to Iran’, we do not see similar patterns in Iran, where, since 1979, women have held a larger place in the public sphere. Because Iranian women are already more involved in mainstream social and political discourses, it stands to reason that religiously mediated socialization will play a weaker role.

The parallels and contrasts between the Iranian and Iraqi samples demonstrate both the importance of broad examination and the perils of overgeneralization. In both contexts, however, sectarianism takes a decidedly nationalist bent, with its closest parallel being ethno-national movements in other contexts. Yet the inextricably religious nature of sect adds an additional layer of complexity, with official doctrine moderating anti-Sunni hatred and religiously mediated socialization seeming to aggravate it. These results highlight the unquestionably complex nature of religiously affiliated identities.

We emphasize that while this study tests the implications of various causal theories, the observational nature of the data—as well as the self-selected nature of the pilgrim respondent pool—limits the conclusions that can be drawn. Future research must examine the causal mechanisms behind these relationships in more detail, both to develop a clearer understanding of the interactions between religion, ethnicity and nationalism and to create more effective policies at the national and international levels.

Methods

Statistics. Sampling design. Our study aims for a geographically representative, gender-balanced sample of devout individuals across Iran and Iraq. The logistics and rituals of the pilgrimage offer a rare opportunity to access this difficult-to-reach group. We recruited across Karbala and the 80-kilometre road from Najaf, the most frequented portion of the pilgrimage route. Clusters of service tents (*mawakib*) with distinct regional identities dot this road, offering food and shelter to pilgrims from different governorates and provinces in Iraq and Iran. Travellers stop here for long periods to dine, drink water and tea, recharge mobile phones, repair shoes or take shelter for the night.

By identifying *mawakib* serving each locality, we cleanly recruited a diverse and geographically representative sample (see Supplementary Section 2.1 for details). The survey was administered to 2,410 Iraqi and 1,668 Iranian pilgrims of mixed gender; we sought roughly equal numbers of male and female respondents between the ages of 18 and 60. We provide detailed descriptive statistics on our sample in Supplementary Section 2.3. The survey research and data analysis were conducted under MIT COUHES no. 1508154225, with additional data analysis conducted under Princeton IRB no. 10942. Informed consent was obtained from all participants. About 15% of men and 20% of women declined to participate, primarily due to lack of time before their group had to depart the tent. We attribute the high response rate primarily to the structure of the pilgrimage (though the participants were also compensated with a small religious gift and a charitable donation made on their collective behalf). Individuals were resting inside tents when approached, and this natural pause made interviewees open to taking time to respond to the survey, as the pilgrimage is a highly social event conducive to interactions.

We validate our sampling strategy using a mobile-location dataset of individuals in Iraq who voluntarily share their device location with installed mobile applications. Safegraph, a location data clearinghouse, aggregated these data in an anonymized form spanning September to December 2017. In Supplementary Section 2.2, we describe how we computed the home districts of over 300,000 individuals across Iraq. For each district, we then calculated the proportion of tracked residents visiting the shrine during Arba'een week.

Supplementary Fig. 3 shows that average participation rates in Shia-dominated provinces hover around 6%; there is no evidence that geographic distance reduces attendance, with the sole exception of Karbala locals, for whom proximity leads to far higher participation. This suggests that despite variation in the cost of attendance—both economic and otherwise—these costs do not substantially influence Iraqi pilgrimage participation (or, by extension, survey sampling).

Rather, extrapolating from analyses of repeat pilgrimage participation in Supplementary Section 2.6 and Supplementary Table 5, we conclude (perhaps unsurprisingly) that religious devotion is the main dimension on which survey respondents differ from the broader Shia population. Repeat pilgrims also tend to

be wealthier in Iran, suggesting that financial considerations are more important for this group than for domestic Iraqi pilgrims. We find that religious practice is significantly associated with repeat pilgrimaging in both Iraq and Iran. Moving from the 2.5th to the 97.5th percentile in religious practice is associated with roughly a 12-percentage-point increase in the proportion of respondents who are repeat pilgrims. While this difference is substantial, it also leaves considerable room for other factors influencing participation. Moreover, the large overlap in religious practice between first-time and repeat pilgrims suggests that pilgrims in general also overlap the general population on this attribute (assuming that the factors driving repeat pilgrimage also drive first-time pilgrimage).

Using a similar strategy, we show that our sampling strategy is unlikely to produce overestimates of sectarian animosity. Repeat attendees are not more polarized, even after adjusting for a range of respondent characteristics, implying that the pilgrimage does not preferentially attract individuals with high animosity.

Finally, additional results presented in Supplementary Section 2.8 and Supplementary Table 2 show that the pilgrim sample is broadly comparable to nationwide and Shia-specific Iraqi samples obtained by the World Bank Living Standards Measurement Survey²⁹ and the Arab Barometer^{30,31} in terms of distributions of age, education and income sufficiency. In light of these results—on the geographic representativeness of the pilgrim sample, the demographic representativeness of the pilgrim sample and the likely substantial overlap in religious practice between pilgrims and the broader Shia population—we posit that the results will generalize to a substantial portion of non-pilgrimaging Iraqi Shiites, though as noted above, a key limitation of our sampling approach is that we cannot directly examine this group. The scope of these conclusions is examined in the Results under ‘Generalizing to Iran’.

Measurement. To aggregate various measures of sectarian animosity, we develop a latent-dimension measurement strategy based on self-reported attitudes towards Sunnis. We then conduct numerous tests to assess its quality, including vignette experiments, conjoint experiments and a behavioural measure based on donations to sectarian organizations. We find that the proposed measure strongly and consistently explains anti-Sunni behaviour across five scenarios of varying realism (detailed in Supplementary Section 4), alleviating concerns that our metric captures salience or social desirability rather than sectarian animosity.

Our measure of sectarian animosity uses BPCA³² to aggregate multiple questions, each imperfectly proxying the same unobservable construct, into a weighted index. Principal component analysis is a widely used technique (including in the study of Islam³³) and reduces reliance on individual questions. However, in using the resulting proxies to test causal theories, we follow ref.³⁴ by ensuring that subsequent analyses—regressions using the resulting index—accurately reflect uncertainty from dimension reduction and missing data.

We apply this procedure to a battery of questions relating to out-group perceptions and stereotypes. For simplicity, a uniform prior is used in all analyses; due to the size of the data, the results are not sensitive to this choice. Survey question wordings, loadings and diagnostics for the BPCA measures are reported in Supplementary Section 3.3; the measures are robust to dropping component questions, minimizing concerns that a flaw in any individual question leads to incorrect results. BPCA measurement is similarly applied to question groups about attitudes towards democracy, self-reported religious practice, desire for religious involvement in government, news consumption, support for Iranian interventions in other countries, support for foreign Shia movements and sect-based views on politics (see Supplementary Section 3.3 for details).

Regression analysis. Our analysis of each potential driver progresses in three parts. First, we regress sectarian animosity on demographic controls (ancillary covariates including gender, income sufficiency, a quadratic term for age and years of education) and an overall summary indicator for each hypothesized driver using the Bayesian regression procedure below. We refer to this as the ‘baseline specification’. The analyses are conducted one country at a time to avoid partial pooling. Next, we examine important gender heterogeneity by further disaggregating to female and male respondents in each country; the model specifications remain unchanged except for the omission of gender indicators. Finally, we conduct a more robust analysis that further incorporates multiple measures relating to each theorized driver—for example, to understand the role of economic deprivation, we use household income sufficiency, employment status and local mobile-phone density (a proxy for wealth and urbanization). This ‘full model’ represents our preferred specification, as it best captures the richness of existing theories (p. 7). Like the baseline model, this full model is applied to Iraq and Iran separately, both pooling and disaggregating respondent genders. (We note that the tests of drivers are limited to those implied by the religiosity and ethno-nationalism theories. The key driver implied by the transnationalism theory, exposure to information about in-group persecution, is difficult to disentangle from the factors examined in the Results under ‘Worldviews associated with sectarian animosity’.)

All regressions that utilize BPCA variables, whether individually or in combination, incorporate their uncertainty by taking repeated draws from the BPCA posterior—where a draw is a vector representing each of the *N* respondents’ positions on the latent dimension of interest—and, for each draw, conducting a

Bayesian linear regression. The reported results account for uncertainty from both the dimension reduction procedure and the regression analysis by numerically integrating over the BPCA and regression posteriors. The technical details are given in Supplementary Section 3.2.

Multiple testing. The reported analyses include a wide range of outcomes and alternative specifications. To control the false-discovery rate in the face of multiple testing, we compute Bayesian P values based on two-sided tail probabilities and then apply an adjustment (P_{adj}) according to the hierarchical testing procedure of ref. ³⁵. To deal with a nested testing structure in which several tests belong to a ‘family’ bearing on one overarching hypothesis, this approach computes and adjusts both overall family P values (for example, whether any economic factors matter) and within-family P values for individual hypotheses (which specific economic indicators matter). Briefly, this procedure relies on a combination of (1) the Simes method³⁶ for testing the intersection null for all hypotheses within a family and (2) the Benjamini-Hochberg procedure³⁷ for controlling the false-discovery rate when examining multiple families or unpacking constituent hypotheses within a family. See Supplementary Section 6 for details and Supplementary Tables 17–21 for the results.

Reporting summary. Further information on research design is available in the Nature Research Reporting Summary linked to this article.

Data availability

The replication data are available via CodeOcean at <https://doi.org/10.24433/CO.1650288.v1>.

Code availability

Reproducible code and third-party verified results are available via CodeOcean at <https://doi.org/10.24433/CO.1650288.v1>.

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References

- Matthiesen, T. *Sectarian Gulf: Bahrain, Saudi Arabia, and the Arab Spring That Wasn't* (Stanford Univ. Press, 2013).
- Abdo, G. *The New Sectarianism: The Arab Uprisings and the Rebirth of the Shi'a-Sunni Divide* (Oxford Univ. Press, 2016).
- Caryl, C. *Strange Rebels: 1979 and the Birth of the 21st Century* (Marshall Poe, New Books in History, 2013).
- Nasr, V. *The Shia Revival* (W. W. Norton, 2016).
- Khouri, D. R. The security state and the practice and rhetoric of sectarianism in Iraq. *Int. J. Contemp. Iraqi Stud.* **4**, 325–338 (2010).
- Haddad, F. *Sectarianism in Iraq: Antagonistic Visions of Unity* (Oxford Univ. Press, 2011).
- Cammatt, M. & Luong, P. J. Is there an Islamist political advantage? *Annu. Rev. Polit. Sci.* **17**, 187–206 (2014).
- George, S. Millions of Shiites gather in Iraq's Karbala for Arbadeen, AP News, 2 Dec 2015. <https://apnews.com/article/fcb7d64aaf724877877cb5ca62dfc19b> (Accessed on 7 May 2022).
- Horowitz, D. L. *Ethnic Groups in Conflict* (Univ. of California Press, 2000).
- Petersen, R. D. *Understanding Ethnic Violence: Fear, Hatred, and Resentment in Twentieth-Century Eastern Europe* (Cambridge Univ. Press, 2002).
- Fearon, J. D. & Laitin, D. D. Violence and the social construction of ethnic identity. *Int. Organ.* **54**, 845–877 (2000).
- Mir-Hosseini, Z. *Debating Women: Gender and the Public Sphere in Post-Revolutionary Iran in Civil Society in Comparative Muslim Contexts* (ed. Sajoo, A.) (I.B. Tauris and Institute of Ismaili Studies, 95–122 (2002)).
- Koolae, E. Iranian women from private sphere to public sphere, with focus on Parliament. *Iran Caucas* **13**, 401–414 (2009).
- Kucinskas, J. A research note on Islam and gender egalitarianism: an examination of Egyptian and Saudi Arabian youth attitudes. *J. Sci. Study Relig.* **49**, 761–770 (2010).
- Scheible, J. & Fleischmann, F. Gendering Islamic religiosity in the second generation: gender differences in religious practices and the association with gender ideology among Moroccan- and Turkish-Belgian Muslims. *Gend. Soc.* **27**, 372–395 (2013).
- Blaydes, L. *State of Repression: Iraq under Saddam Hussein* (Princeton Univ. Press, 2018).
- Abdullah, S., Gray, T. & Clough, E. Clientelism: factionalism in the allocation of public resources in Iraq after 2003. *Middle East. Stud.* **54**, 665–682 (2018).
- Hamilton, A. *The Political Economy of Economic Policy in Iraq* LSE Middle East Centre Paper Series No. 32 (2020), LSE Middle East Centre, London, UK.
- Dekeyser, E. *Islam, Exclusivity, and the State in France*. PhD thesis, Massachusetts Institute of Technology (2019).
- Akerlof, G. A. & Kranton, R. E. Economics and identity. *Q. J. Econ.* **115**, 715–753 (2000).
- Al-Ali, N. Iraqi women and gender relations: redefining difference. *Br. J. Middle East. Stud.* **35**, 405–418 (2008).
- Allport, G. W., Clark, K. & Pettigrew, T. *The Nature of Prejudice* (1954), Addison-Wesley Publishing Company, Reading, MA.
- Pettigrew, T. F. Intergroup contact theory. *Annu. Rev. Psychol.* **49**, 65–85 (1998).
- Mabon, S. *Saudi Arabia and Iran: Power and Rivalry in the Middle East* Vol. 132 (IB Tauris, 2015).
- Allport, G. W. in *The Self in Social Interaction: Classic and Contemporary Perspectives* Vol. 1 (eds Gordon, C. & Gergen, K. J.) (John Wiley & Sons, 1968).
- Clingingsmith, D., Khwaja, A. I. & Kremer, M. Estimating the impact of the Hajj: religion and tolerance in Islam's global gathering. *Q. J. Econ.* **124**, 1133–1170 (2009).
- Kalyvas, S. N. Ethnic defection in civil war. *Comp. Polit. Stud.* **41**, 1043–1068 (2008).
- Collier, P. & Hoeffler, A. Greed and grievance in civil war. *Oxf. Econ. Pap.* **56**, 563–595 (2004).
- Household Socio-economic Survey, Second Round (Iraq, 2012–2013): Living Standards Measurement Study* (World Bank Development Data Group, 2013).
- Alkhatib, W. *Iraq Public Opinion Survey Report, 2013/2014* (Arab Barometer III, 2014).
- Iraq Country Report* (Arab Barometer IV, 2019).
- Tipping, M. & Bishop, C. Probabilistic principal component analysis. *J. R. Stat. Soc. B* **61**, 611–622 (2014).
- Pepinsky, T., Liddle, R., & Mujani, S. (2018-03-29). Piety and Public Opinion: Understanding Indonesian Islam. Oxford University Press. Retrieved 7 May 2022, from <https://oxford.universitypressscholarship.com/view/10.1093/oso/9780190697808.001.0001/oso-9780190697808>
- Knox, D., Lucas, C. & Cho, W. K. T. Testing causal theories with learned proxies. *Annu. Rev. Polit. Sci.* **25**, 419–441 (2022).
- Peterson, C. B., Bogomolov, M., Benjamini, Y. & Sabatti, C. Many phenotypes without many false discoveries: error controlling strategies for multitrait association studies. *Genet. Epidemiol.* **40**, 45–56 (2016).
- Simes, R. An improved Bonferroni procedure for multiple tests of significance. *Biometrika* **73**, 751–754 (1986).
- Benjamini, Y. & Hochberg, Y. Controlling the false discovery rate: a practical and powerful approach to multiple testing. *J. R. Stat. Soc. B* **57**, 289–300 (1995).

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Author contributions

F.C. collected the data. E.D. and D.K. analysed the data. F.C., E.D. and D.K. wrote the paper.

Competing interests

The authors declare no competing interests.

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Supplementary information

Evidence on the nature of sectarian animosity from a geographically representative survey of Iraqi and Iranian Shia pilgrims

In the format provided by the authors and unedited

This file contains supplementary information for the following paper:

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1 Background on Sectarian Animosity

1.1 Prior Work on Sectarianism

Sectarianism plays a central role in discussions of politics and conflict in the Middle East. The vast majority of recent Middle Eastern conflicts have a highly visible sectarian dimension, including deadly conflicts like the Iraq war and Yemen crisis. Here and elsewhere, transnational and national-level political dialogues often draw on sectarian discourse. Yet like other identities, sectarian identity can be both constructed and instrumental [1, 2, 3]. This malleability highlights the need for a rigorous understanding of how sectarianism in Islam operates at the individual level.

The study of sectarianism within Islam remains limited in four ways. First, research is sparse compared to existing social-scientific work on ethnicity, nationalism, and religion. Yet in the Middle East and North Africa, sectarian identity arguably plays a more important role. Second, existing discussions of sectarianism tend to operate at the institutional or transnational level. While this work is important, large gaps remain in our understanding of individuals' sectarian animosity, its antecedents, and associated worldviews. Third, limited existing data individual-level data skews heavily toward Sunni populations, due to ongoing conflicts and regime restrictions. Finally, virtually all work examines sect within the male-dominated public space.

Social-scientific work on sect and sectarian animosity has largely focused on Christianity, with an established church and subversive sect [4, 5, 6, 7, 8, 9], or alternately sectarianism within a particular conflict, such as the Irish troubles [10]. This typology clearly does not translate to the Islamic context [11], and we thus focus on developing an understanding of the nature and origins of sectarian animosity among Shi'a Muslims. By examining Iran and Iraq, we explore what varies and what remains constant in two very different contexts.

Most social-scientific work on Islamic sect concurs that the Sunni-Shi'a conflict is not an inevitable product of doctrinal divisions within Islam [12, 13, 14, 15], despite frequent claims to the contrary by politicians and pundits. But sectarian divisions can take on a religious dimension for individuals. As [16] notes, during the 20th century, the ethnic *al-ajam* ("non-Arab," meaning Iran and its sympathizers), was a common insult for Shi'a. More recently, the religious *al-rafidah* ("rejectors") is used, highlighting a shifting understanding of sect from one that focused on national and ethnic allegiances to a divine battle for Islam's soul. Some work on identity in the social 10 sciences argues that religious cleavages are often more salient than ethnic or national allegiances, due to their inherent ideological, moral, and supernatural claims and organizational demands [17, 18, 19, 20].

Even if sectarian animosity is not synonymous with religiosity, religiosity can influence sectarian animosity through two potential channels. The first is through official doctrines, which could encourage unity or conflict. Most official Shi'a teachings encourage sectarian unity, though more marginal groups teach otherwise. The second is through religious socialization, or the transmission of (potentially non-religious) norms through religious practice. Participating in religious activities can encourage ideological convergence, even on norms that have little to do with official religious beliefs. (This is consistent with work showing that religious influence on views toward the state can operate through communal religious practice [21, 22, 23].) With these two independent drivers, religiosity's influence may not always operate simplistically [24].

Another understanding of sect is as an identity much like ethnonational movements in its structure and aims. Structurally, some have argued that religion—and by extension, sect—is no different than any other identity cleavage [25, 26]. Schisms with religious or doctrinal origins can also take on symbolic, cultural, behavioral, and linguistic differences associated with ethnicity [27, 2]. In Islam, while the Sunni-Shi'a schism traces its roots to seventh-century debates on religious succession, a millennium of divergence has produced differences in cultural symbols, practices, and traditions that rival theological disputes [13]. Others note that modern sectarian movements hold similar goals to ethnonational movements, seeking to control national government, resources, and identities [28, 2]. These parallels support a second conceptualization of sectarianism as a form of ethno-nationalism.

Other work focuses on the growth of a transnational sectarian movement in the modern Middle East. The regional rivalry for soft power is central to this geopolitical understanding [29]. In this interpretation, the rise and fall in Saudi-Iranian tensions, especially post-1979, are reflected in fluctuations in sectarian an-

animosity throughout the region [30]. These transnational tensions are believed to shape individual attitudes through two avenues: (1) Saudi and Iranian funding of sectarian groups, including humanitarian organizations, political parties, and militant groups [31, 32]; and (2) individuals identifying with broader sectarian conflicts, leading to greater sectarian polarization at the individual level, a phenomenon arguably amplified by YouTube, social media, and other forms of online communication [33, 34].

Within these conceptualizations, gender is often a secondary discussion. Yet prior work on gender in the Middle East has highlighted the vastly different experiences of men and women, predominantly due to differing exposure to the public sphere [35, 36, 37]. The pilgrimage allows unusual access to a wide-ranging pool of female respondents, offering opportunities to evaluate how theoretical accounts generalize across both gender and national contexts; the differences we observe shed light on scope conditions and possible mechanisms. In one prominent example, we show that the link between religiosity and sectarianism is entirely reversed between women and men. Men engaging in frequent, communally-oriented religious practice tend to hold more moderate attitudes toward Sunnis, but the opposite is true for women. In Section Discussion, we propose a concise theoretical explanation, revolving around the socialization that occurs during communal religious interaction, which helps explain this and other surprising gender patterns.

1.2 Sectarian Animosity in Iraq

Scholars that have examined sectarian animosity in Iraq have highlighted its politico-historical drivers. They see it as driven by political realities and access to power and resources, rather than a form of ancient hatred attributable to the 632 AD religious schism over Prophet Muhammad’s successor. As such, animosity has waxed and waned in intensity. This literature recognizes and highlights the roots of sectarian cleavage that elites have used to mobilize sectarian identities over time. For example, 16th-century Ottoman and Persian competition in Iraq led to institutional discrimination against Iraqi Shi’ites.

During the British invasion, there was a notable period of Sunni-Shi’ite unity against British control and in favor of national self-determination. Standardized education aided sectarian unity; the entrenchment of Sunnis in the bureaucracy solidified their advantage during the British mandate and monarchy of King Faisal. This continued until after WWII, when more Shi’ites joined the civil administration, leading to increased inter-sectarian interaction among the middle class in urban centers. In the 1950s, nationalist loyalty was seen as triumphing over sect or tribe. There was also notable economic progress and increased social mobility for Shi’ites, prompting intermarriage. Yet while Baathists, who took power in 1963, first aimed for unity, the growth in state-run economy and repressive politics pushed the Shi’a to the margins again.

Relations worsened with the Iran-Iraq war and Iranian revolution, when Shi’ites were seen as potential Iranian allies, leading to surveillance, informing, and indoctrination that entrenched sectarian dynamics. After the Iran-Iraq war, Saddam Hussein openly targeted Shi’ites, culminating in the violent repression of the 1991 Shi’ite rebellion. The ensuing indiscriminate violence and punishment led to over 30,000 dead within three weeks and approximately 70,000 fleeing, mainly to Iran. By the 2003 US invasion, sectarian animosity was deeply entrenched. The fall of the Baathist regime led to a decline in Sunni dominance and subsequent resentment. The civil war over the next decade was fought largely along sectarian lines, leading to massive deaths, internal displacement, and ethnic cleansing in the mixed neighborhoods of Baghdad. Despite the official end of sectarian violence in 2008, it never fully disappeared. ISIS’ rise in 2012 and shifts in the sectarian nature of political leadership have led to continued fluctuation in sectarian animosity. As such, sectarian tensions remain one of the most pressing social issues in contemporary Iraq.

2 Survey Sampling

2.1 Survey Sampling

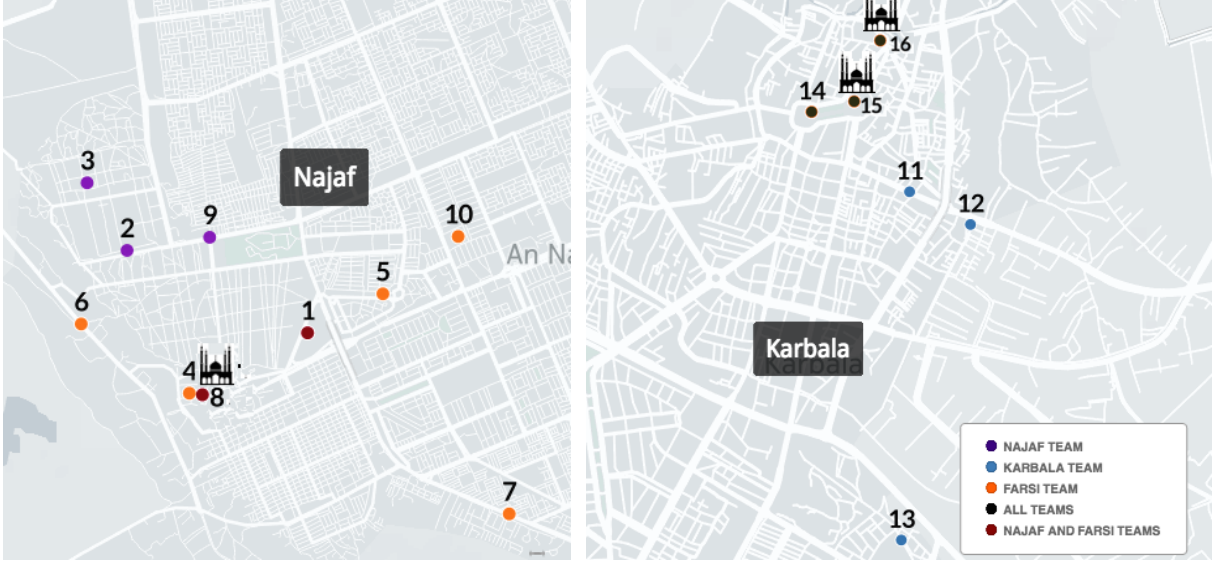
The Arbaeen commemoration is a collective procession, with groups walking from all over Iraq. Our sampling strategy is built around the logistics and rituals of the procession. The pilgrimage starts several days ahead of Arba’een so people can reach Karbala in time. The exact start date depends on the distance to Karbala

from their point of origin. We began surveying two weeks in advance of the celebration, working from the heavily trafficked cities of Karbala and Najaf. The 80-kilometer section between these cities is the most frequented route of the pilgrimage, as many Iranians and Iraqis begin their walk from Najaf in order to visit the shrine of Imam Ali (Imam Hussein’s father) before heading to Karbala. This route is especially popular for pilgrims from South Iraq and for Iranians. On the northern side of Karbala, we also sampled pilgrims walking along the Baghdad-Karbala route, often frequented by pilgrims from the capital and from Northern Iraq. The sides of these routes are dotted with clusters of service tents, known as mawkib/mawakib (singular/plural), which offer food and shelter to pilgrims. Mawakib tend to have a specific regional identity, hosting people from different governorates and provinces in Iraq and Iran, with separate tents for men and women. Travelers stop for long periods of time, not only to dine or drink water and tea, but to also recharge cell phones, repair shoes, or even get weary feet and legs massaged by local volunteers. Mawakib are also full at night, when pilgrims use them to sleep. Our enumerators were students of political science from the University of Kufa, the most established university in southern Iraq. Our liaison with the University of Kufa, Professor Hassan Nadhem, who holds the UNESCO Chair for Inter-religious Dialogue Studies in the Islamic world, identified highly motivated and well-suited students for survey training. The students were trained in the survey instrument, including the process of gaining informed consent. Enumerator teams were selected after (1) a test of candidates’ classroom command of the instrument and (2) an evaluation of their performance during a field test, held prior to the start of the survey. We trained both male and female enumerators, who surveyed only pilgrims of their own gender. All enumerators wore clothing similar to the pilgrims. Women wore a full abaya, mirroring the dress of interviewees. A total of 30 enumerators carried out the survey in Arabic, with one team of nine (5 men and 4 women) working in Karbala and another team of 21 (9 men and 12 women) working in Najaf and along the Najaf-Karbala road. A total of 21 enumerators (11 men and 10 women) carried out the survey in Farsi. Farsi enumerators were all Iraqi citizens who had grown up as children in Iran and whose families returned to Iraq after the collapse of Saddam’s regime. Though bilingual in Farsi, they were immediately distinguishable as Iraqis based on their name, look and dress. We assessed that for a survey taking place in Iraq, Iranian respondents would find it more natural to interact with local enumerators. The survey was administered via Qualtrics using Lenovo tablets, and it was conducted in Arabic for Iraqis and in Farsi for Iranians. In terms of incentives, participants were informed during the consent process that “The potential benefit of this study is that it will enhance our understanding of the attitudes of religious Shi’ites on the contemporary politics of the Middle East... On a personal level, you will be receiving a small gift of a prayer stone, a shrine cloth, a key chain and a meal voucher that you can cash at your hotel. We will also be making a charitable donation on your behalf.”

One of our primary objectives was to obtain a sample that reflected the geographic distribution of Iraqi and Iranian Shi’a in general. In Iran, where the population is overwhelmingly Shi’a, we used 2011 census data to construct geographic targets. We identified mawakib serving the corresponding localities (locations depicted in Supplementary Figure 1) to meet these targets.

However, geographic targeting of Iraqi respondents was complicated by limited data availability. The country has not held a census since 1997, and other surveys that have targeted the country do not claim to provide a representative sample, and mass displacement since the 2000s have invalidated most prior metrics. Therefore, we sampled Iraqi pilgrims according to the number of Shi’a politicians in the Iraqi parliament, the Council of Representatives (COR).

The COR has a total of 328 seats across Iraq’s 18 governorates. The allocation of seats is based on each governorate’s estimated population size. We identified the sect of the parliamentarians holding these seats, and used the Shi’a seats as a metric for the Shi’a proportion of the population in that area. (The sect of parliamentarians was identified using their party affiliation as well as their name. Some governorates are almost purely Shi’a. This includes Dhiqar, Najaf, Wasit, Karbala, Qadisiyya, Missan, and Muthanna. Other governorates, such as Baghdad and Basra, are Shi’a majority; still others, such as Deyala, are split between Sunni and Shi’a representatives. Salaaddin, Ninewa, and Kirkukko are primarily Sunni, and Anbar is exclusively Sunni. Erbil, Suleimania, and Dhuk are Kurdish governorates with very limited Shi’a representation.) Our sample generally meets this target. Supplementary Table 1 indicates that the absolute difference between the region’s proportion of Shi’a-held seats and their proportion in the sample was between



Supplementary Figure 1: **Recruitment locations.** In Najaf: 1 = Bus station Najaf, 2 = Sayed Sadr shrine on Najaf-Karbala Street; 3 = The graveyard of Wadi Assalam, Najaf; 4 = Souk Alkabbeer near Imam Ali shrine, Najaf; 5 = Kumail Bin Zeyad shrine, Najaf; 6 = Hannana mosque, Najaf; 7 = Abuskhair Street adjacent to southern bus station (Al Garage al Janubi), Najaf; 8 = Imam Ali Shrine, Najaf; 9 = Al Ashreen Road Area, Najaf; 10 = Center of ministry of youths and sports in Najaf. In Karbala: 11 = Maitham al Tamar Road, east of Karbala; 12 = Bab Toyridge, east of Karbala; 13 = South Karbala, near al Kafeel hospital; 14 = Bab Baghdad area, Karbala; 15 = Shrine of Imam Hussein, Karbala; 16 = Shrine of Imam Abbas, Karbala. Additional undepicted locations outside Najaf and Karbala centers: Kufa mosque, Kufa; Maamal Street, Najaf; Sahla, Kufa; Abuskhair Street adjacent to Ghammas Crossing; Karbala Street, Najaf; Center of the Ministry of Youths and Sports in Najaf; Khan Alnus, between Najaf and Karbala. Map produced with CARTO using OpenStreetMap data. ©OpenStreetMap contributors, ©CARTO.

zero and two percentage points for all provinces except Baghdad and Najaf, where the gap was roughly five percentage points. We hypothesize that Baghdad underrepresentation was due to a large portion of individuals pilgrimaging along an alternative northern route, and Najaf overrepresentation was due to an inflated number of individuals pilgrimaging on the Najaf-to-Karbala route along which we recruited.

Better data availability in Iran made our sampling procedure more direct. Because the vast majority of the population is Shi'a, we use the regional population breakdown from the most recent 2011 census as a proxy for Shi'a residents. The 2011 census data from Iran indicate that 99.4% of the population is Muslim. Though they do not differentiate by sect, Muslim Iranians are overwhelmingly Shi'a. There are also some Sunni, Jewish, Zoroastrian, and Christian residents. The Iranian sample also correlates closely with the census regional distribution, with the greatest overrepresentation being from Tehran (19%) and under-representation from Esfahan (12%).

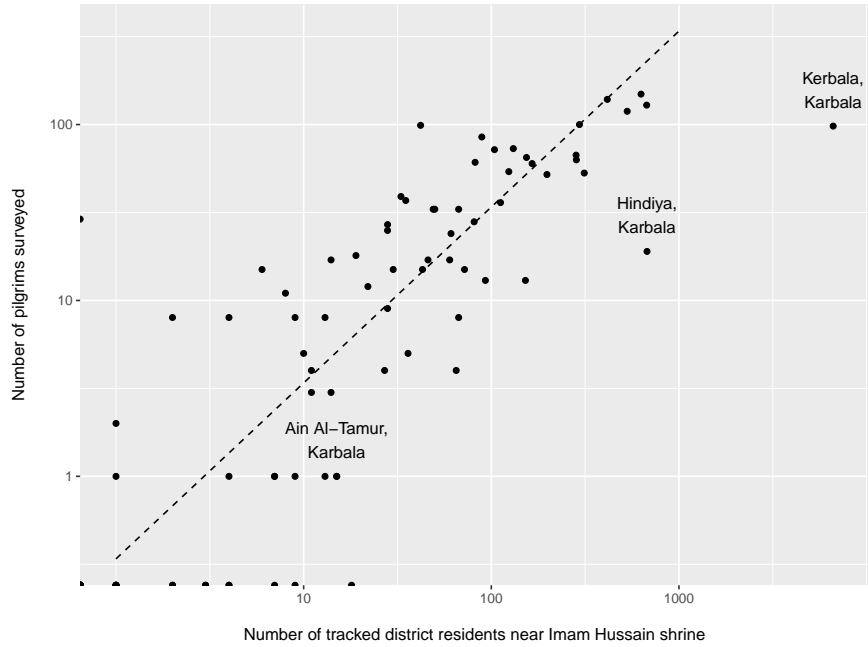
2.2 Pilgrimage Patterns in Mobile Location Data

We further validate the sampling strategy using mobile data aggregated by Safegraph, a location data clearinghouse, and provided in an anonymized form spanning September to December 2017. (This analysis was conducted under Princeton IRB #10942). Each record in this dataset corresponds to a device “ping,” its location at a particular moment, and includes entries for latitude, longitude, time, the accuracy of the estimated location, and an anonymous device identifier assumed to represent an individual. We compute accuracy-weighted median weekly positions for each individual in the dataset, then subset to individuals

Governorate	% Seats	% Survey	Governorate	% Seats	% Survey
Anbar	0.00	0.04	Karbala	5.85	5.61
Babil	7.98	6.11	Kirkuk	0.00	0.37
Baghdad	30.32	25.70	Missan	5.32	5.24
Basra	12.23	14.01	Muthanna	3.72	1.95
Dewaneya	5.85	5.28	Najaf	6.38	11.85
Dhiqar	10.11	10.81	Ninewa	1.60	2.87
Dhuk	0.00	0.00	Salahaddin	1.06	0.83
Diala	3.72	2.62	Suleimania	0.00	0.00
Erbil	0.00	0.12	Wasit	5.85	6.57

Supplementary Table 1: **Iraq by Governorate:** Percentages of Shi’a-held COR seats and survey respondents.

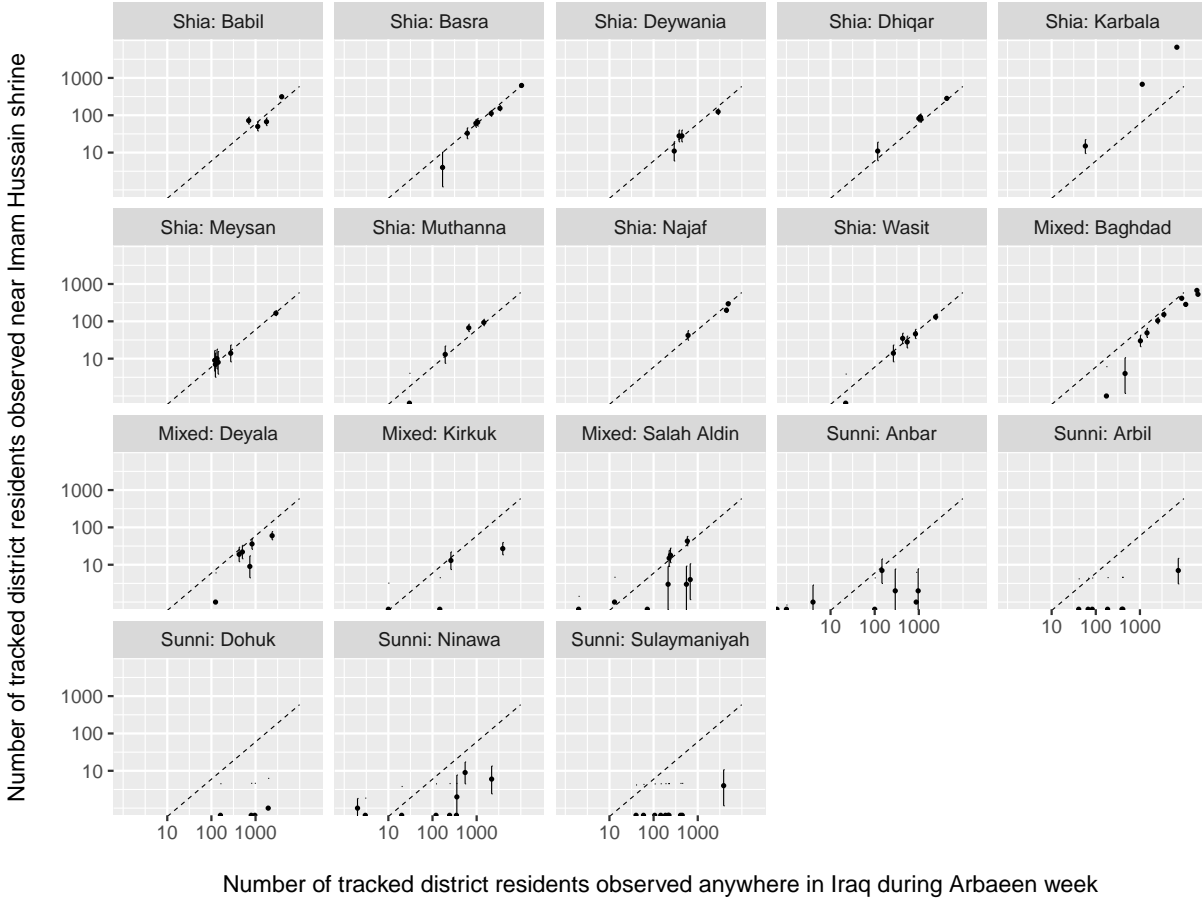
that can be consistently localized to an administrative district for at least four weeks in the observation period (“district residents”, numbering nearly 310,000). (Total smartphone ownership is estimated at 20%; the group for which we are able to identify home districts is roughly 0.8% of the population of Iraq, or 4% of smartphone owners.) We further define a “neighborhood” corresponding to the 10-kilometer radius around each survey respondent’s geocoded home location and similarly identify “neighborhood residents” in the mobile location data. The number of tracked individuals in this neighborhood—the tracked mobile density, which is closely related to population density and mobile device ownership—is used as a proxy for urbanization and development, which are otherwise difficult to measure on a neighborhood level.



Supplementary Figure 2: **District participation in Arba‘een as proxied by mobile tracking data versus number of survey respondents per district.** After excluding Karbala, district-level counts have a Pearson correlation coefficient of 0.87, or 0.97 when aggregating by province.

The period used for pilgrimage participation tracking, 2–10 November 2017, includes the actual Arba‘een dates (9–10 November), as well as the preceding week in which pilgrims begin to arrive from their travels. Because pings may not be available for each individual-day for a number of reasons, we scale an area’s pilgrim

counts by the number of residents that are observed anywhere in Iraq during the same period (55% of tracked individuals in aggregate) to obtain district pilgrimage ratios. The findings from this analysis are reported in Supplementary Figure 3. Supplementary Figure 2 further shows that the number of survey respondents from a region is closely tied to the actual number of tracked pilgrims, despite the use of COR-based quotas rather than random sampling. However, we correctly undersample Karbala locals, who are heavily overrepresented at the pilgrimage relative to the overall Shi'a Iraqi population.



Supplementary Figure 3: **Estimated participation rates in 2017 pilgrimage from mobile location data, by province and district.** Dashed line corresponds to a 6.0% participation rate, the average participation rate in Shi'a provinces excluding Karbala. In Shi'a provinces, districts rarely deviate far from this average participation rate (except in Karbala, where easy access produces higher engagement). In mixed but segregated provinces, Shi'a-heavy districts can attain similar participation rates (e.g. Daquq, Kirkuk). Participation in mixed and Sunni districts is markedly lower.

The similarity in district-level Shi'a pilgrimage rates in Supplementary Figure 3 suggests that religious devotion does not vary dramatically by region. While these conclusions are in part based on technologically savvy individuals that select into our mobile location dataset, differences in pilgrimage behavior between tracked individuals and the general population are unlikely to correlate heavily with geographic distance. In Iran, we do not have access to comparable data to assess the role of geography in pilgrimage attendance. While it might seem that the cost of the pilgrimage would deter less-devout Shi'ites from far-away parts of Iran, in practice, substantial government subsidies help offset the difference in costs. For both Iraq and Iran,

we examine region fixed effects for overall religious practice and find that they are virtually all less than one standard deviation and noisily estimated, providing little evidence of drastic geographic heterogeneity.

2.3 Descriptive Statistics

Here, we report overall sample descriptives. While we intended to survey equal numbers of men and women, an imbalance in enumerator gender resulted in slight overrepresentation of Iraqi women (54% of respondents in Iraq, vs 40% in Iran). Respondent age largely followed our goal of sampling respondents between 18 and 60. About 45% of Iraqis were employed and typically had “some difficulty” meeting financial needs. The average Iraqi respondent had a middle school education. On these characteristics, our sample is midway between other surveys conducted in Iraq.

Respondents were in general highly religious, as expected. For example, virtually all respondents reported praying daily. Nonetheless, substantial variation existed in the nature and frequency of other religious activities: 64% read the Koran or other religious texts daily, 45% consumed religious media daily, and only 43% reported attending religious lessons at a mosque. A high percentage of respondents also paid *khoms*—for Shi’a, the obligatory Islamic tax of one-fifth of surplus income—with 53% of those in the lowest income-sufficiency bracket paying, versus 75% in the highest. In Supplementary Information 2.7, we examine how this has evolved over time through a pseudo-panel based on respondents’ fathers’ beliefs.

Other differences between Iraqi and Iranian respondents appear to reflect general differences between the two countries. A larger proportion of Iranians were employed (61%, vs 45% of Iraqis). Average Iraqi age was 35 (with a standard deviation of 12), vs 37 (12) in Iran, and the average Iraqi respondent had 8 years of education (6), versus 11 (5) in Iran. We elaborate further in Supplementary Information 2.5.

		Pilgrim Sample	World Bank (2012)	Arab Barometer (2013)	Arab Barometer (2018, Shi’a)
GENDER	Male	45.9	49.6	50.00	50.2
AGE	18–29	44.8	42.6	45.30	43.7
	30–49	42.4	40.2	37.90	38.3
	50+	12.8	17.2	16.80	18.0
EDUCATION	None	19.6	16.5	8.60	6.0
	Primary	23.1	52.2	28.10	29.5
	Middle School	17.4	14.7	26.10	21.3
	High School	20.6	12.6	23.20	17.4
	College and Above	19.4	3.9	12.20	25.8
INCOME	Significant difficulty meeting needs	16.80	—	20.30	11.0
	Some difficulty meeting needs	34.60	—	32.70	29.0
	Covered expenses and no notable difficulty	37.80	—	34.70	38.2
	Covered expenses and saved	10.80	—	9.70	20.8

Supplementary Table 2: **Iraq Comparisons**

2.4 Survey Non-Response

Overall, survey noncompletion rates among respondents were very low. However, non-response on individual questions showed significant variation. Non-response for all questions within the survey was as follows. The median non-response for Iraqi respondents was 6.4%. Questions with high levels of non-response included pseudo-panel questions about elders’ views on religious, political, and gender issues (non-response rate of 45% in Iraq); and questions that focused on regional politics and Iran’s foreign policy involvement (28% in Iraq). Disaggregating non-response by gender provides additional insight into topical sensitivity. Overall, Iraqi women had the highest average non-response rate, at 7.4%, with Iraqi men at 4.9%. Yet interestingly, women showed lower rates of non-response than men for questions that dealt with gender.

We anticipated that non-response would vary by enumerator, as enumerator assignments to different mawakib produced correlations with respondents' home regions. Seven (fourteen) enumerators had significantly higher (lower) non-response rates. However, these differences were at most a few percentage points. When we analyzed variation in response time by enumerator, 90% of enumerators were within one standard deviation of the mean enumerator responses.

2.5 Iraqi and Iranian Sample Comparisons

Within our survey, the differences between the Iraqi and the Iranian samples appeared to be largely reflective of differences between the two countries as a whole. As we reported in Supplementary Information 2.3, Iranian respondents were significantly wealthier and more educated than Iraqi respondents, as well as more likely to be employed. One concern in comparing the two nationalities is that the greater cost to travel from Iran means that Iranians were more religious than their Iraqi counterparts, compared to their country averages. While Iranians did engage in more communal religious practice, Iraqis engaged in more individual practice, indicating that while the expression of religiosity differs across national boundaries, both groups engage with their religion to a similar extent. The modes of travel were also similar between the two groups. In both, individuals were more likely to travel with their family than friends, with the vast majority of women traveling with their families (see Supplementary Table 3). Iraqis were much more likely to have been to Karbala before, which is unsurprising given the lesser travel constraints available to them. Iranians, however, were more likely to have gone on other pilgrimages, including the Hajj, and unsurprisingly significantly more likely to go on pilgrimages in Iran such as Masshad (Supplementary Table 4). While not conclusive, we find no evidence that Iraqis and Iranians differ significantly in how devout they are compared to their countries as a whole.

	Female (Iraq)	Male (Iraq)	Female (Iran)	Male (Iran)
Family	0.81	0.30	0.76	0.29
Friends	0.11	0.61	0.15	0.58
Town	0.06	0.10	0.05	0.12
Group	0.03	0.01	0.02	0.06
Alone	0.04	0.13	0.07	0.10

Supplementary Table 3: **Travel Companions**

	Female (Iraq)	Male (Iraq)	Female (Iran)	Male (Iran)
Karbala: for Holiday	0.91	0.78	0.26	0.33
Karbala: for Shaaban	0.50	0.70	0.08	0.04
Karbala: for Arba'eeniya	0.97	0.99	0.58	0.51
Karbala: for Ashoura	0.31	0.53	0.10	0.14
Hajj	0.03	0.04	0.17	0.11
Omra	0.13	0.07	0.23	0.14
Najaf	0.99	0.97	0.86	0.73
Khadmiya	0.86	0.90	0.65	0.63
Massouma	0.33	0.31	0.95	0.94
Masshad	0.33	0.32	0.96	0.95
Sayeda Zainab	0.18	0.13	0.29	0.18
Samara	0.52	0.65	0.39	0.36

Supplementary Table 4: **Prior Pilgrimages**

2.6 Pilgrimage Travel and History

Part of the concern about comparing Iranians and Iraqis as representative of their countries as a whole is that the pilgrimage implies greater opportunity costs for Iranians than their Iraqi counterparts, because of the greater amount of travel. Supplementary Tables 3 and 4 highlight that though Iraqis were more likely to travel to pilgrimages in Iraq, Iranians were similarly likely to travel to pilgrimages in Iran. They also had relatively similar rates of travelling with different companions, whether family, friends, town, in a group, or alone.

While we are unable to reach non-pilgrims due to the study’s design, we did ask respondents whether they had previously participated in Arba’een. This question helped shed light on demographic and attitudinal correlates of pilgrimage participation, assuming that the same factors driving initial visits also lead to subsequent reattendance. For example, if Arba’een preferentially attracts religiously practicing individuals, then highly practicing individuals should, on average, have attended more often. (In fact, we find this to be true; Supplementary Table 5 presents regression analyses examining correlates of repeat attendance. However, the correlation is far from perfect; a 1-s.d. increase in religious practice is associated with a several percentage point increase in the repeat participation.)

However, we do not find that sectarian individuals pilgrimage more; if anything, the reverse is true among Iraqis. Thus, our sampling strategy is unlikely to overstate the severity of sectarian animosity in devout Iraqis and Iranians more generally. These findings correspond to qualitative accounts and our own observations of the pilgrimage’s atmosphere—while Arba’een is a holiday dedicated to religious mourning, the environment is nevertheless festive and religious, not sectarian and confrontational.

We also find that wealthier Iranians are also more able to participate—an unsurprising finding, given the greater commitment involved, although substantial Iranian government subsidies help offset monetary costs.

	Dependent variable: Repeat participation	
	Iraq (1)	Iran (2)
Male	−0.022* (0.013)	−0.046** (0.029)
Age	0.002 (0.004)	0.026*** (0.005)
Age ²	−0.000 04 (0.000 05)	−0.0003*** (0.0001)
Education (years)	−0.001 (0.001)	−0.003 (0.003)
Income sufficiency	0.011 (0.008)	0.094*** (0.014)
Anti-democracy	−0.0002 (0.007)	0.015 (0.014)
Religious practice (overall)	0.030*** (0.009)	0.070*** (0.016)
Sectarian animosity	−0.014** (0.007)	0.017 (0.014)
Province FE	Yes	Yes
Observations	1.860	1.332
R ²	0.057	0.117

Note:

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Supplementary Table 5: **Selection into pilgrimage.** Regressions of each respondent’s prior participation. The outcome is constructed so that 1 indicating at least one prior visit to Karbala during Arba’een and 0 indicates first-time participation.

2.7 Evolution from Father’s Emulation

To understand the evolution of religious practices, we asked each respondent about their own beliefs and emulation authority (the ayatollah whose teachings they follow) and those of their father. Differences in the views of male respondents from their fathers’ show shifts in leaders’ power bases. After the death of Ruhollah Khomeini in 1989, two-thirds of his followers’ households shifted to Iranian Supreme Leader Khamenei, with the remainder split between Shirazi and Sistani. In contrast, the passing of Mohammad Va’ez Abaee-Khorasani in 2004 led to far greater fractionalization, with only half of his households shifting allegiance to the Supreme Leader. The current generation is more open to emulating multiple ayatollahs—a further decentralization of religious authority. These intergenerational differences also shed light on societal shifts beyond the religious realm. Notably, the gender beliefs of Iraqi and Iranian men appear to have liberalized markedly. We find that men are more likely to support equal rights and recognize the importance of university education for women, relative to their retrospective evaluation of their father’s beliefs.

2.8 Comparison to Other Survey Sources

While Iraq has not had a census since 1997, there have been other large-scale public opinion and development surveys, notably the Arab Barometer [38, 39] and the 2012 World Bank Living Standards Measurement Survey (LSMS) [40]. The Arab Barometer has had three waves that included Iraq: in 2011, 2013 and 2018. We compare our sample against the 2012 World Bank LSMS and the 2013 and 2018 Arab Barometers. We note that the 2012 World Bank LSMS and the 2013 Arab Barometer encountered similar challenges with conflict and recent displacement, and additionally do not ask respondents about their sect; here, we note that these comparisons are to nonrepresentative samples that include Sunni, Shi’a, and Kurdish respondents. However, the 2018 Arab Barometer does report respondent sect; it contains 46.6% self-described Shi’a and 33.5% self-described Sunni, though interpretation is complicated by the 17.0% of respondents that describe themselves as “just a Muslim.” Supplementary Table 2 compares our sample to the Arab Barometer and World Bank Iraqi respondents (specifically Shi’a respondents where possible). Our respondents are slightly more concentrated in the 30-to-49 age range; they lie between Arab Barometer and World Bank respondents in terms of education. They report being slightly more financially secure than a nonrepresentative nationwide sample of Arab Barometer respondents in 2013, but somewhat less financially secure than Shi’a Arab Barometer respondents in 2018. There is limited overlap with our survey’s questions on political, social, and religious topics.

3 Statistical Methods

3.1 Bayesian Principal Component Measurement Procedure

In this section, we provide details of the Bayesian PCA procedure. In the Bayesian formulation of PCA [BPCA, 41], each individual i has Q latent attributes, $\mathbf{x}_i = [x_{i1}, \dots, x_{iQ}]$, which are assumed to follow $\mathbf{x}_i \sim \mathcal{N}(\mathbf{0}, \mathbf{I})$. These attributes are translated into the individual’s responses to D survey questions, $\mathbf{t}_i = [t_{i1}, \dots, t_{iD}]$, according to $\mathbf{t}_i = \mathbf{W}\mathbf{x} + \boldsymbol{\mu} + \boldsymbol{\epsilon}_i$, where \mathbf{W} is a loading matrix representing the contribution of each attribute to each question, μ_d is the average response to question d , and $\boldsymbol{\epsilon}_i \sim \mathcal{N}(\mathbf{0}, \sigma^2 \mathbf{I})$. Standard PCA implicitly computes maximum-likelihood estimates for \mathbf{x} and \mathbf{W} under this model, neglecting uncertainty from noisy responses or few individuals.

Thus, \mathbf{x} and $(\mathbf{t} \mid \mathbf{x})$ are both multivariate Gaussian-distributed, and their joint distribution is also multivariate Gaussian. Their covariance is given by

$$\begin{aligned} \text{Cov}(\mathbf{t}, \mathbf{x}) &= \mathbb{E}[\mathbf{t}\mathbf{x}^\top] - \mathbb{E}[\mathbf{t}]\mathbb{E}[\mathbf{x}^\top] \\ &= \mathbb{E}[(\mathbf{W}\mathbf{x} + \boldsymbol{\mu} + \boldsymbol{\epsilon})\mathbf{x}^\top] \\ &= \mathbf{W}\mathbb{E}[\mathbf{x}\mathbf{x}^\top] + \boldsymbol{\mu}\mathbb{E}[\mathbf{x}^\top] + \mathbb{E}[\boldsymbol{\epsilon}\mathbf{x}^\top] \\ &= \mathbf{W} \end{aligned}$$

noting that $\mathbb{E}[\mathbf{x}] = \mathbf{0}$ and $\mathbb{E}[\mathbf{t}] = \boldsymbol{\mu}$. The joint distribution is then

$$\begin{bmatrix} \mathbf{x} \\ \mathbf{t} \end{bmatrix} \sim \mathcal{N}\left(\begin{bmatrix} \mathbf{0} \\ \boldsymbol{\mu} \end{bmatrix}, \begin{bmatrix} \mathbf{I} & \mathbf{W}^\top \\ \mathbf{W} & \boldsymbol{\Sigma} \end{bmatrix}\right)$$

We now solve for $\boldsymbol{\Sigma}$. The joint log density, up to a normalizing constant, is

$$\ln f(\mathbf{x}, \mathbf{t}) = -\frac{1}{2} \left(\begin{bmatrix} \mathbf{x} \\ \mathbf{t} \end{bmatrix} - \begin{bmatrix} \mathbf{0} \\ \boldsymbol{\mu} \end{bmatrix} \right)^\top \left(\begin{bmatrix} \mathbf{I} & \mathbf{W}^\top \\ \mathbf{W} & \boldsymbol{\Sigma} \end{bmatrix} \right)^{-1} \left(\begin{bmatrix} \mathbf{x} \\ \mathbf{t} \end{bmatrix} - \begin{bmatrix} \mathbf{0} \\ \boldsymbol{\mu} \end{bmatrix} \right) + C.$$

which, after blockwise inversion, simplifies to

$$\begin{aligned} -2 \ln f(\mathbf{x}, \mathbf{t}) = & \mathbf{x}^\top (\mathbf{I} + \mathbf{W}^\top (\boldsymbol{\Sigma} - \mathbf{W} \mathbf{W}^\top)^{-1} \mathbf{W}) \mathbf{x} \\ & - (\mathbf{t} - \boldsymbol{\mu})^\top (\boldsymbol{\Sigma} - \mathbf{W} \mathbf{W}^\top)^{-1} \mathbf{W}^\top \mathbf{x} \\ & - \mathbf{x}^\top \mathbf{W}^\top (\boldsymbol{\Sigma} - \mathbf{W} \mathbf{W}^\top)^{-1} (\mathbf{t} - \boldsymbol{\mu}) \\ & + (\mathbf{t} - \boldsymbol{\mu})^\top (\boldsymbol{\Sigma} - \mathbf{W} \mathbf{W}^\top)^{-1} (\mathbf{t} - \boldsymbol{\mu}) + C. \end{aligned} \quad (1)$$

Equivalently, the joint density can be written as

$$\begin{aligned} \ln f(\mathbf{x}, \mathbf{t}) = & \ln f(\mathbf{t} | \mathbf{x}) + \ln f(\mathbf{x}) \\ = & -\frac{1}{2} (\mathbf{t} - \mathbf{W} \mathbf{x} - \boldsymbol{\mu})^\top (\sigma^2 \mathbf{I})^{-1} (\mathbf{t} - \mathbf{W} \mathbf{x} - \boldsymbol{\mu}) - \frac{1}{2} \mathbf{x}^\top \mathbf{I}^{-1} \mathbf{x} + C \\ -2 \ln f(\mathbf{x}, \mathbf{t}) = & \frac{1}{\sigma^2} (\mathbf{t} - \mathbf{W} \mathbf{x} - \boldsymbol{\mu})^\top (\mathbf{t} - \mathbf{W} \mathbf{x} - \boldsymbol{\mu}) + \mathbf{x}^\top \mathbf{x} + C \\ = & \frac{1}{\sigma^2} \mathbf{x}^\top \mathbf{W}^\top \mathbf{W} \mathbf{x} - \frac{1}{\sigma^2} (\mathbf{t} - \boldsymbol{\mu})^\top \mathbf{W} \mathbf{x} - \frac{1}{\sigma^2} \mathbf{x}^\top \mathbf{W}^\top (\mathbf{t} - \boldsymbol{\mu}) \\ & + \frac{1}{\sigma^2} (\mathbf{t} - \boldsymbol{\mu})^\top (\mathbf{t} - \boldsymbol{\mu}) + \mathbf{x}^\top \mathbf{x} + C \end{aligned} \quad (2)$$

Rearranging terms, it can be seen that equations (1) and (2) are identical when $(\boldsymbol{\Sigma} - \mathbf{W} \mathbf{W}^\top)^{-1} = \frac{1}{\sigma^2}$, so that $\boldsymbol{\Sigma} = \mathbf{W} \mathbf{W}^\top + \sigma^2 \mathbf{I}$.

It follows from properties of the multivariate normal distribution that $\mathbb{E}[\mathbf{x} | \mathbf{t}] = \mathbf{W}^\top \boldsymbol{\Sigma}^{-1} (\mathbf{t} - \boldsymbol{\mu})$, as stated in the main text. Similarly, given partially observed survey responses $\mathbf{t}_{i,r}$, it can be seen that the distribution of plausible values for the missing data, $\mathbf{t}_{i,m}$, follows

$$\mathcal{N}\left(\boldsymbol{\mu}_m + \mathbf{W}_m \mathbf{W}_r' (\mathbf{W}_m \mathbf{W}_m' + \sigma^2 \mathbf{I})^{-1} (\mathbf{t}_{i,r} - \boldsymbol{\mu}_r), \mathbf{W}_m \mathbf{W}_r' (\mathbf{W}_m \mathbf{W}_m' + \sigma^2 \mathbf{I})^{-1} \mathbf{W}_r \mathbf{W}_m'\right),$$

where subscript r (m) denotes submatrices corresponding to recorded (missing) variables.

3.2 Regression Analyses Incorporating Bayesian PCA Measures

We account for uncertainty due to both missingness and finite data through a Markov chain Monte-Carlo procedure that alternately samples (1) plausible missing responses from their conditional distribution, given observed responses and the current BPCA parameters; and (2) BPCA parameters from a Laplace approximation to the complete-data posterior, $\mathcal{N}\left(\left[\hat{\boldsymbol{\mu}}^\top, \text{vec}(\hat{\mathbf{W}}), \hat{\sigma}^2\right], -\mathbf{H}^{-1}\right)$, with $\mathbf{H} = \nabla_{\boldsymbol{\mu}, \mathbf{W}, \sigma^2}^2 \frac{1}{2} \ln |\boldsymbol{\Sigma}| + \frac{1}{2} (\mathbf{t} - \boldsymbol{\mu})' \boldsymbol{\Sigma}^{-1} (\mathbf{t} - \boldsymbol{\mu})$. Rotation invariance is handled by a Procrustes transformation of the sampled loading matrix back to the maximum likelihood loading matrix estimate, which is computed by the expectation-maximization analogue of the iterative procedure described above.

All regressions that utilize BPCA variables, whether individually or in combination, incorporate their uncertainty by taking a single draw from the BPCA posterior—a vector representing each respondents' position on the latent dimension of interest—and conducting a Bayesian linear regression. Uniform priors

are used for all parameters for both dimension reduction and regression analyses. We note that by the Bernstein-von Mises theorem, the posterior is dominated by the data and the specific choice of prior is of little consequence; broadly speaking, the theorem also implies that Bayesian and frequentist approaches to quantifying uncertainty are asymptotically equivalent, justifying our use of Bayesian p -values based on posterior tail probabilities. Ten samples are drawn from the multivariate posterior on regression coefficients. This process is repeated 1,000 times, for a total of 10,000 posterior draws, which are then used to compute posterior means, symmetric 95% credible intervals, and Bayesian p -values based on (two-sided) posterior tail probability mass. Thus, uncertainty from the BPCA is propagated forward into the regression, but this factorization means that information from the regression is not propagated back into the BPCA, producing slight attenuation bias.

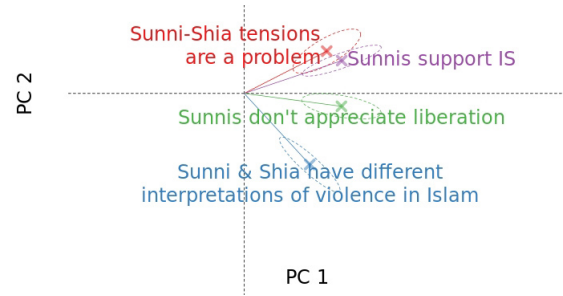
3.3 Bayesian PCA: Basis Survey Questions and Results

The precise wordings of questions used in the construction of the sectarian animosity index are reported in Supplementary Table 6, along with response proportions by country. The wording of questions used in other indices (religious practice, anti-democracy attitudes, religion and politics, news consumption, Iran interventions, sectarian politics, and assistance to Shi'a groups) are listed below.

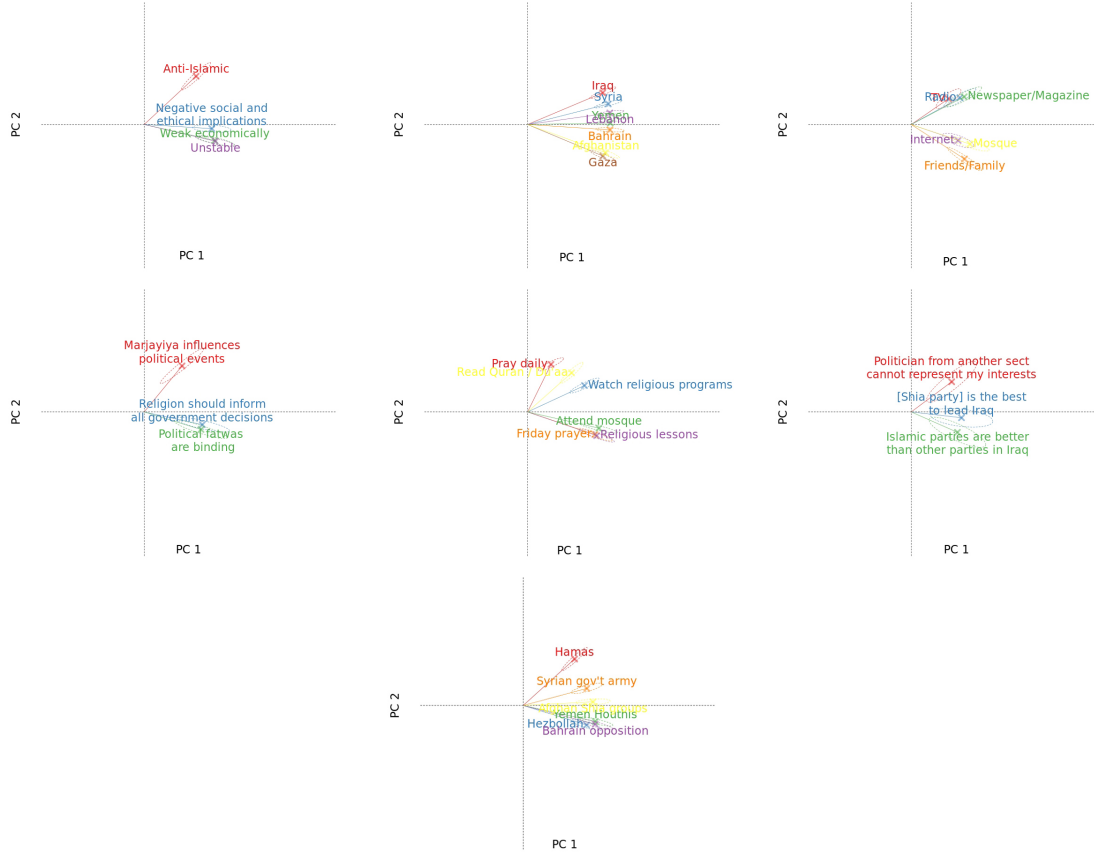
Question	Responses	Iraq	Iran
In your opinion, how big of a problem are tensions between Sunni and Shi'a in Iraq?	Not a Problem	18%	12%
	Small Problem	19%	18%
	Moderate Problem	16%	23%
	Big Problem	48%	48%
Do Sunni and Shi'a have different interpretations of violence in Islam?	Similar	21%	33%
	Very different	79%	67%
How much do you think the Sunnis in areas under IS control appreciate the efforts of Hashd Shabi to liberate them?	Don't Appreciate at all	23%	14%
	Don't Appreciate much	28%	18%
	Appreciate Somewhat	38%	31%
	Appreciate a lot	12%	38%
In your opinion, how many Iraqi Sunnis support IS?	A small minority	32%	48%
	About half	31%	30%
	Most	37%	22%

Supplementary Table 6: **Basis Questions in Sectarian Animosity Index.** The index is the first Bayesian principal component of four questions. Responses were converted to integer scale and standardized before analysis. The final principal component is robust to dropping any single input, minimizing concerns that a question introduces bias in results.

Before conducting BPCA, we convert component questions to an equally-spaced numeric scale, flip questions so that more positive values have roughly the same meaning, and then standardize each question. The estimated latent positions constructed by this procedure are also rescaled for interpretability so that a one-unit increase corresponds to a standard deviation in the outcome. Loadings for the sectarian animosity measure are plotted in Supplementary Figure 4. All remaining measures are summarized in Supplementary Figure 5 and Supplementary Table 7. While all questions in each battery map strongly onto the first dimension obtained by Bayesian PCA, providing statistically significant information about the latent trait of interest, we caution that inter-item correlations are relatively low by conventional standards. For example, while questions in the religious practice battery generally relate to the overarching concept, questions load differently for the secondary dimension (individual vs. communal practice), lowering inter-item correlation. This suggests that refining measurement and question formulation is an important direction for future work.



Supplementary Figure 4: **Bayesian Principal Components of Sectarian Animosity.** Posterior means and 95% ellipses for question loadings onto principal components. Each question loads strongly onto the first component, representing overall animosity, with larger weights for negative stereotypes and lower weights for more abstract questions. The second component appears to distinguish a theological question from more practical assessments of current events, though we note that this interpretation is tentative. We analyze only the first.



Supplementary Figure 5: **Bayesian Principal Components of Additional Measured Concepts.** Posterior means and 95% ellipses for question loadings for (top row, left to right) anti-democracy, Iran intervention, news consumption, (middle row) religion-in-politics, religious practice, sect-based political outlook, and (bottom row) Shi'a group assistance. Questions in each battery load significantly onto the first component. The second component is not analyzed for any concept other than religious practice, where it plays a strong and substantively interpretable role in distinguishing individual practice from communal practice.

To assess the robustness of our dimension-reduction approach, we compare our BPCA-based index to an alternative method using unidimensional graded response model analyses [GRM, 42], one for each Bayesian PCA analysis previously reported in the paper. We find that averaging over different concepts, GRM and first-dimension Bayesian PCA indices correlate at 0.96. Concept-specific correlations are as follows: Iran interventions (0.93), Shi'a group assistance (0.93), religion in government (0.96), sectarian animosity (0.96), news consumption (0.97), religious practice (0.97), sect-based political views (0.98), and anti-democratic attitudes (0.98).

Anti-democracy: How strongly do you agree or disagree with the following statements: Under a democratic system, economic performance is weak. Democratic regimes are not effective at maintaining order and stability. Democracy negatively affects social and ethnical values in Iraq. Democracy is a system that contradicts the teachings of Islam.

Iran intervention: Have Iran's interventions in the countries below had a positive or negative impact?

News consumption: How often do you get your news from...

Religious practice: Do you pray every day? How often do you... Attend Friday prayers/womens prayer? Attend religious lessons in the mosque? Visit a mosque? Watch or listen to religious programs/sermons? Read or listen to the Quran or Dua?

Supplementary Table 7: **Question loadings for BPCA-based indices.** Rotated 95% credible intervals are reported in parentheses. For full question wordings, see main appendix.

Anti-Democracy ($\alpha = 0.73$)			Religious Communalism (2nd dim., $\alpha = 0.74$)		
Contradicts Islam	0.59	(0.50, 0.83)	Pray Daily	-0.54	(-0.73, -0.46)
Negative Social/Ethical Values	0.76	(0.66, 1.09)	Religious Programs	-0.30	(-0.42, -0.24)
Economically Weak	0.80	(0.69, 1.12)	Mosque	0.18	(0.14, 0.25)
Ineffective at Order and Stability	0.80	(0.69, 1.14)	Religious Lessons	0.27	(0.22, 0.37)
Iran Intervention, ($\alpha = 0.93$)			Friday Prayer	0.25	(0.21, 0.36)
In Iraq	0.85	(0.78, 1.06)	Koran/Dowa	-0.44	(-0.61, -0.37)
In Syria	0.91	(0.84, 1.13)	Religion in Politics, ($\alpha = 0.38$)		
In Yemen	0.93	(0.86, 1.16)	Marjayiya Guides Politics	0.43	(0.32, 0.71)
In Lebanon	0.93	(0.85, 1.15)	Religion in Government	0.66	(0.50, 1.09)
In Bahrain	0.93	(0.85, 1.16)	Political Fatwas Binding	0.64	(0.49, 1.07)
In Afghanistan	0.88	(0.80, 1.10)	Sectarian Animosity, ($\alpha = 0.47$)		
In Gaza	0.85	(0.78, 1.06)	Tensions are a Problem	0.54	(0.43, 0.87)
News consumption, ($\alpha = 0.62$)			Interpretation of Violence	0.43	(0.33, 0.69)
Source: TV	0.42	(0.34, 0.62)	Don't Appreciate Liberation	0.64	(0.51, 1.01)
Source: Radio	0.55	(0.45, 0.80)	Support Islamic State	0.64	(0.52, 1.01)
Source: Newspaper/Magazine	0.60	(0.50, 0.88)	Sectarian Politics, ($\alpha = 0.21$)		
Source: Internet	0.53	(0.44, 0.78)	Politician from Other Sect	0.46	(0.29, 0.84)
Source: Friends/Family	0.60	(0.50, 0.88)	Shi'a Party Best	0.57	(0.36, 1.05)
Source: Mosque	0.66	(0.55, 0.99)	Islamic Parties Better	0.52	(0.34, 0.95)
Overall Religious Practice (1st dim., $\alpha = 0.74$)			Shi'a Financial Assistance, ($\alpha = 0.81$)		
Pray Daily	0.26	(0.22, 0.37)	Hamas and Islamic Jihad	0.58	(0.51, 0.78)
Religious Programs	0.64	(0.56, 0.88)	Hezbollah	0.72	(0.63, 0.97)
Mosque	0.80	(0.71, 1.10)	Yemen Houthis	0.81	(0.72, 1.11)
Religious Lessons	0.78	(0.68, 1.05)	Bahrain Opposition	0.81	(0.72, 1.09)
Friday Prayer	0.76	(0.67, 1.03)	Syrian Government and Army	0.72	(0.64, 0.96)
Koran/Dowa	0.50	(0.43, 0.68)	Afghan Shi'a Groups	0.79	(0.70, 1.06)

Religion in politics: How strongly do you agree or disagree with the following statements? Religion should inform all political decisions the government makes. A marjahs political fatwas are as binding as his ibadat fatwas. How important do you feel is the Marjayiyas role in guiding political events in Iraq?

Sectarian politics: Do you agree that a politician belonging to a sect different than yours can represent your concerns or solve the problems you and your community face? Would you say the Islamic political parties are better, worse, or about the same as the other political parties in Iraq? In your opinion, which party is most suitable to lead Iraq?

Shi'a groups: Do you support or oppose financial assistance to each of the following groups?

4 Validating the Sectarian Animosity Measure

In this section, we report results from five separate experiments about out-group attitudes. Despite being the fact that it is based on self-reported responses to abstract survey questions, the sectarian animosity principal component nonetheless strongly predicts respondent decisions in a wide range of realistic scenarios. These validation exercises also offer the opportunity to test whether the consistent gender heterogeneity that we find in our main results could have been driven by differential mismeasurement between men and women. For each scenario described above, we evaluate whether a comparable increase in sectarian animosity is associated with a different change in the outcome for men, versus the corresponding change for women. If such a gap existed, it might indicate that our sectarian animosity index failed to capture the same latent concept in men and women. We find no evidence of such gender disparities in the meaning of our sectarian animosity measure.

	Dependent variable:				
	Prayer (Iraq)	Execution (Iraq)	Execution (Iran)	Donation (Iraq)	Donation (Iran)
Endorser: Imam	0.028* (0.012)				
Endorser: Mayor	0.0004 (0.013)				
Victim: Sunnis		-0.027 (0.019)	0.028 (0.024)		
Capturer: Iraqi army		-0.003 (0.018)	-0.028 (0.017)		
Endorser: Shia politicians		-0.016 (0.027)			
Endorser: Shia religious leaders		-0.067 (0.034)			
Endorser: Sunni politicians		-0.006 (0.032)			
Endorser: Sunni religious leaders		-0.043 (0.023)	0.019 (0.022)		
Sectarian animosity	-0.045*** (0.008)	0.086*** (0.017)	0.119*** (0.029)	-0.076*** (0.013)	-0.093*** (0.026)
Male \times sectarian animosity	-0.013 (0.011)	-0.019 (0.022)	-0.039 (0.033)	-0.021 (0.017)	-0.005 (0.029)
Demog. controls	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes
Observations	2337	2132	1341	2340	1438
R ²	0.067	0.122	0.103	0.084	0.143

Note:

*p<0.1; **p<0.05; ***p<0.01

Supplementary Table 8: **Validation of Sectarian Animosity Measure by Vignette and Behavioral Experiments.** Regression results from validation exercises demonstrating that the proposed sectarian animosity measure is highly predictive of (1) self-reported willingness to support a joint Sunni-Shi'a prayer initiative at their own mosques; (2–3) self-reported support for summary execution of suspected war criminals belonging to the Islamic State, a Sunni extremist organization, without trial; and (4–5) willingness to vote for the donation of \$1,000 to a Sunni group in order to secure a matching donation to their preferred Shi'a organization. Estimates for sectarian animosity reflect the effect of a one-standard-deviation increase. Other reported coefficients reflect the effect of manipulations in vignette experiments (relative to the baseline categories of no endorsement, capture by Shi'a militant groups, and Shi'a victims).

4.1 Vignette Experiment Validation

As a first test of our measurement strategy, we asked Iraqi respondents whether they would support an initiative in which Shi'a and Sunni prayed together at their own mosques. Surprisingly, the vast majority (92%) indicated support—a result that we attribute largely to social desirability bias, given clear evidence of anti-Sunni bias elsewhere. Yet despite the distortion of these answers, we find that sectarian animosity is a major predictor of responses: a standard-deviation (s.d.) increase in sectarian animosity is associated with an average 5-percentage-point (p.p.) decrease in willingness to pray together; as a point of reference, this change in support is roughly twice as strong as that produced by the hypothetical endorsement of the respondent's own imam. Similarly, our measure of sectarian animosity strongly predicts stated support for the summary execution of suspected (Sunni) Islamic State war criminals: those with sectarian animosity BPCA scores that are one s.d. higher are roughly 8 p.p. more likely to call for execution without a trial (all p -values < 0.001). Regression results for these tests are reported in Supplementary Table 8; demographic controls in each test are gender, age (linear and quadratic), years of education, and income sufficiency.

4.2 Neighbor- and Marriage-choice Conjoint Experiment Validation

To ameliorate potential concerns about reporting biases, we next turn to paired-profile conjoint experimental questions in which Iraqi respondents made choices in hypothetical scenarios with randomly assigned characteristics. Such experiments, while still based on self-reports, have been shown to track actual behavior closely due to their design [43]. Individuals were faced with a series of choices between two candidate neighbors, potential spouses for their son, or politicians (see example below). They were given randomly varied information on a few attributes of those individuals, such as religiosity or political experience. Our analyses show that hypothetical Sunni neighbors and daughter-in-laws were considered less desirable than Shi’a ones across the board. But as expected, the “Sunni penalty” increased dramatically with the respondent’s measured sectarian animosity, thereby confirming the proposed measure in two additional experimental settings. For those who were one s.d. above the mean in sectarian animosity, Sunni neighbor (daughter-in-law) profiles were roughly 25 (31) p.p. less likely to be selected, whereas the Sunni penalty was only 21 (26) for the average respondent (difference-in-difference p -values < 0.001). As a point of reference, those who consumed alcohol—viewed as a serious moral failing—were 47 p.p. less likely to be seen as a desired neighbor, and divorcees were 16 percentage points less likely to be preferred as daughters-in-law (Supplementary Figure 6 presents full conjoint plots.)

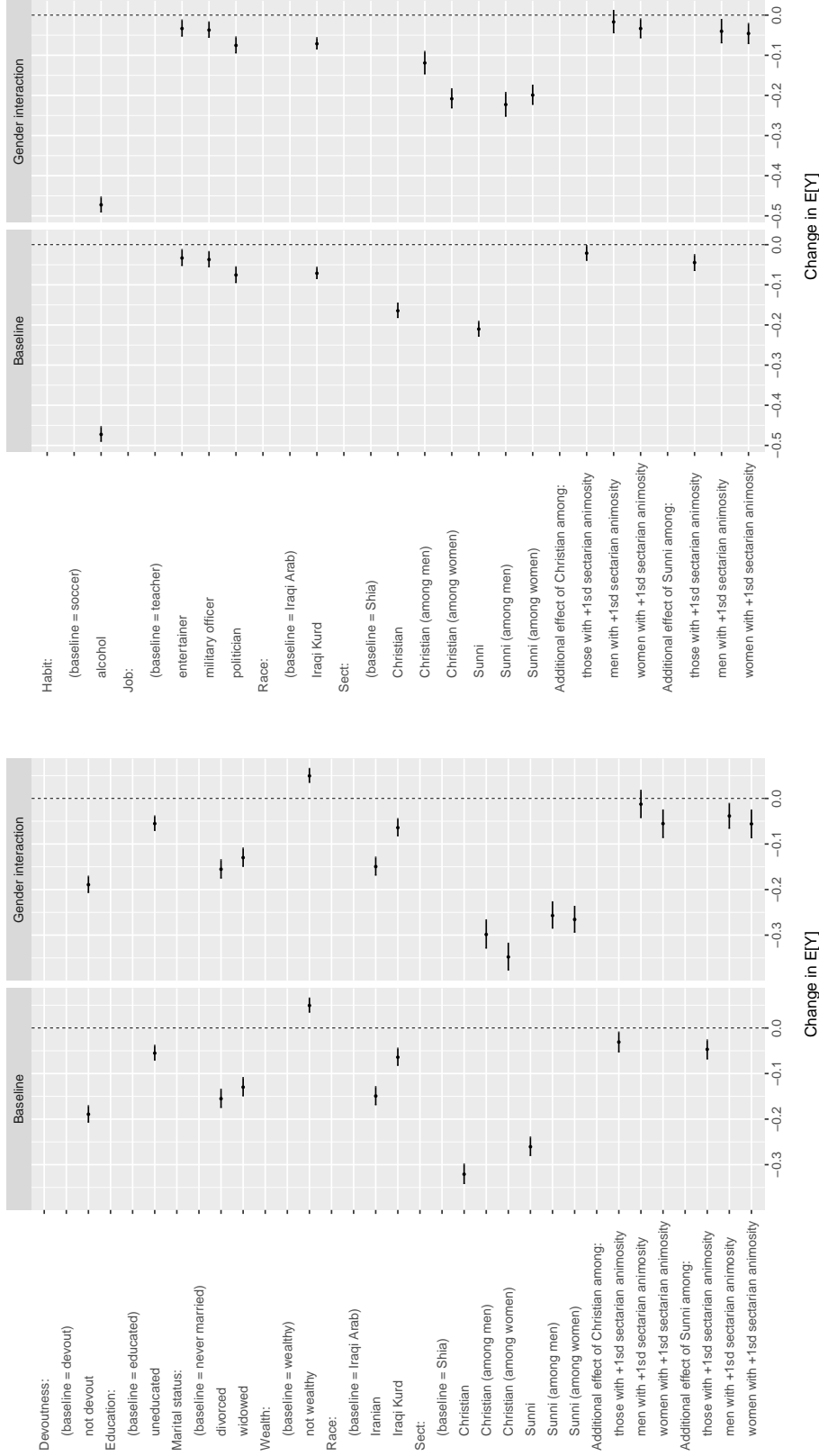
4.3 Behavioral Validation

In what we take to be the most credible test of our sectarian measure’s validity, we measured actual decisions through a deception scenario in which respondents believed that sectarian animosity behavior would incur real-world costs. We first asked both Iraqis and Iranians to select their preferred organization from a list, informing them that the most popular would receive a donation of \$1,000. (Respondents selected from among Hamas, Hashd Shabi, Hezbollah, Red Crescent, and Syrian volunteer forces helping the Syrian army. This question was approved to utilize deception, because research funds could not in fact have been donated to the listed organizations. Donation questions appeared roughly halfway through the survey, well after individuals had consented; by design, the deception could not influence their decision to participate.) After naming their choice, respondents were asked whether they would support our doubling the donation if it meant that a Sunni organization would also receive \$1,000. Overall, 20% of Iraqi respondents and 32% of Iranians would rather decline the additional donation to their preferred organization than see a Sunni group benefit, and their decisions are closely tied to our metric: those who are one s.d. more sectarian are roughly 9 p.p. more opposed ($p < 0.001$). Results are reported in Supplementary Table 8. Taken together, these results indicate that despite being based on self-reported responses to abstract survey questions, the sectarian animosity principal component nonetheless strongly predicts respondent decisions in a wide range of realistic scenarios.

5 Detailed Results

5.1 Drivers of Sectarian Animosity

Supplementary Tables 9 and 10 report detailed regression results for findings discussed in the main text, under the “baseline” and “full” model specifications. For 95% confidence intervals and multiple-testing-adjusted p -values, see Supplementary Tables 17–20. In response to a reviewer’s suggestion, Supplementary Table 11 additionally presents a hybrid specification for the Iraqi analysis.



Supplementary Figure 6: **Conjoint Validation.** Horizontal points and errorbars reflect estimated effects and confidence intervals for randomly setting an attribute of the candidate daughter-in-law (top) or neighbor (bottom) to a particular value (versus the baseline value for that attribute) on the probability of a profile's selection. The "sect" coefficient estimates reflect estimated effects among respondents with average sectarian animosity; these show that on average, Christian and Sunni candidates are far less preferred than Sunnis. The "additional effect" coefficients correspond to the interaction between a candidate's sect and the respondent's sectarian animosity. These show that higher-scoring individuals are significantly more opposed to out-group candidates, confirming the measure experimentally.

	Dependent variable: Sectarian animosity					
	Pooled (baseline) (1)	Men (baseline) (2)	Women (baseline) (3)	Pooled (full) (4)	Men (full) (5)	Women (full) (6)
Male	0.156*** (0.044)			0.123* (0.066)		
Age	-0.025*** (0.008)	-0.017 (0.014)	-0.036** (0.014)	-0.015 (0.016)	-0.030 (0.026)	-0.016 (0.017)
Age ²	0.0003*** (0.0001)	0.0001 (0.0002)	0.0005** (0.0002)	0.0001 (0.0002)	0.0003 (0.0003)	0.0002 (0.0002)
Shia-dominated province	0.069** (0.040)	-0.092 (0.060)	0.203*** (0.061)			
Education (years)	-0.006 (0.004)	-0.009** (0.006)	0.004 (0.005)	-0.001 (0.006)	-0.014** (0.006)	0.017*** (0.006)
Income sufficiency	-0.071*** (0.024)	-0.079** (0.034)	-0.115*** (0.031)	-0.070*** (0.030)	-0.064 (0.053)	-0.070 (0.048)
Employment				0.015 (0.068)	0.145** (0.069)	-0.219*** (0.092)
Anti-democracy	0.122*** (0.026)	0.056** (0.027)	0.177*** (0.030)	0.111*** (0.029)	0.054 (0.042)	0.146*** (0.041)
Religious practice (overall)	-0.008 (0.026)	-0.090*** (0.031)	0.098*** (0.035)	0.017 (0.037)	-0.079** (0.050)	0.113** (0.052)
Religious practice (individualism)				-0.014 (0.031)	0.087** (0.042)	-0.098** (0.045)
Religion in politics				0.047** (0.026)	-0.005 (0.041)	0.080** (0.037)
News consumption				-0.049 (0.033)	-0.010 (0.049)	-0.088** (0.044)
Log mobile density				-0.035** (0.018)	-0.074*** (0.028)	-0.001 (0.021)
Local pilgrimage decile				0.038*** (0.014)	0.022 (0.021)	0.055*** (0.020)
Province FE	No	No	No	Yes	Yes	Yes
Observations	2,231	1,029	1,202	1,888	840	1,048
R ²	0.037	0.029	0.061	0.056	0.066	0.115

Note:

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Supplementary Table 9: **Potential drivers of sectarian animosity in Iraq.** Regression results from baseline and full specifications, using all Iraqi respondents and disaggregating by gender. Baseline models contain one covariate corresponding to each hypothesized driver, and the full specification incorporates additional measures. These drivers are out-group contact (respondent lives in Shi'a-dominated province; Shi'a pilgrimage participation rate in respondent's neighborhood), economic deprivation (four-point income sufficiency scale, employment status, urbanization proxy based on neighborhood mobile-phone density), democratic disillusionment (anti-democratic attitude BPCA score, religion-in-government BPCA score), and religiosity (religious practice BPCA score first and second dimensions, which correspond to overall frequency and individual practice as opposed to communal worship). For 95% confidence intervals and multiple-testing-adjusted p -values, see Supplementary Tables 17 and 19. Violence exposure is tested separately among Baghdadi respondents.

	Dependent variable: Sectarian animosity					
	Pooled (baseline) (1)	Men (baseline) (2)	Women (baseline) (3)	Pooled (full) (4)	Men (full) (5)	Women (full) (6)
Male	−0.127*** (0.052)			−0.081 (0.065)		
Age	−0.020*** (0.007)	−0.042*** (0.012)	−0.005 (0.010)	−0.011 (0.011)	−0.039* (0.019)	−0.001 (0.016)
Age ²	0.0002** (0.0001)	0.0005** (0.0002)	0.000 05 (0.0001)	0.0001 (0.0001)	0.0005 (0.0003)	−0.000 02 (0.0002)
Education (years)	0.003 (0.006)	0.001 (0.007)	0.009 (0.008)	−0.0004 (0.009)	−0.005 (0.009)	0.006 (0.010)
Income sufficiency	−0.026 (0.028)	−0.021 (0.034)	−0.026 (0.040)	−0.022 (0.031)	−0.025 (0.037)	−0.063 (0.055)
Employment				−0.209*** (0.078)	−0.178** (0.096)	−0.289*** (0.113)
Anti-democracy	0.038 (0.026)	0.091*** (0.039)	−0.055 (0.039)	0.039 (0.029)	0.068 (0.042)	−0.026 (0.049)
Religious practice (overall)	−0.119*** (0.028)	−0.208*** (0.039)	0.013 (0.042)	−0.132*** (0.033)	−0.211*** (0.051)	−0.017 (0.062)
Religious practice (individualism)				0.049 (0.032)	0.139*** (0.034)	−0.074* (0.046)
Religion in politics				0.012 (0.030)	−0.024 (0.034)	0.086 (0.064)
News consumption				−0.027 (0.031)	−0.072 (0.050)	0.094* (0.051)
Province FE	No	No	No	Yes	Yes	Yes
Observations	1,362	851	511	1,325	844	481
R ²	0.026	0.062	0.007	0.074	0.138	0.096

Note:

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Supplementary Table 10: **Potential drivers of sectarian animosity in Iran** Regression results from baseline and full specifications, using all Iranian respondents and disaggregating by gender. Baseline models contain one covariate corresponding to each hypothesized driver, and the full specification incorporates additional measures. These drivers are economic deprivation (four-point income sufficiency scale, employment status), political views (anti-democratic attitude BPCA score, religion-in-government BPCA score), and religiosity (religious practice BPCA score first and second dimensions, which correspond to overall frequency and individual practice as opposed to communal worship). For 95% confidence intervals and multiple-testing-adjusted p -values, see Supplementary Tables 18 and 20. Out-group contact and violence exposure are not tested among Iranian respondents due to lack of variation.

	Dependent variable: Sectarian animosity		
	Pooled (full) (1)	Men (full) (2)	Women (full) (3)
Male	0.197*** (0.055)		
Age	-0.018 (0.011)	-0.036** (0.016)	-0.022 (0.015)
Age ²	0.0002 (0.0002)	0.0004 (0.0002)	0.0003 (0.0002)
Shia-dominated province	0.061* (0.036)	-0.105 (0.060)	0.169*** (0.052)
Education (years)	-0.003 (0.005)	-0.010 (0.007)	0.015** (0.007)
Income sufficiency	-0.073*** (0.023)	-0.067** (0.032)	-0.094*** (0.032)
Employment	-0.052 (0.051)	0.182*** (0.066)	-0.297*** (0.072)
Anti-democracy	0.108*** (0.027)	0.075** (0.032)	0.140*** (0.035)
Religious practice (overall)	-0.005 (0.028)	-0.086*** (0.042)	0.083** (0.043)
Religious practice (individualism)	-0.014 (0.023)	0.055* (0.033)	-0.084** (0.035)
Religion in politics	0.054** (0.023)	-0.007 (0.036)	0.106*** (0.033)
News consumption	-0.060*** (0.027)	-0.021 (0.033)	-0.091*** (0.034)
Province FE	No	No	No
Observations	2,221	1,023	1,198
R ²	0.043	0.037	0.093

Note:

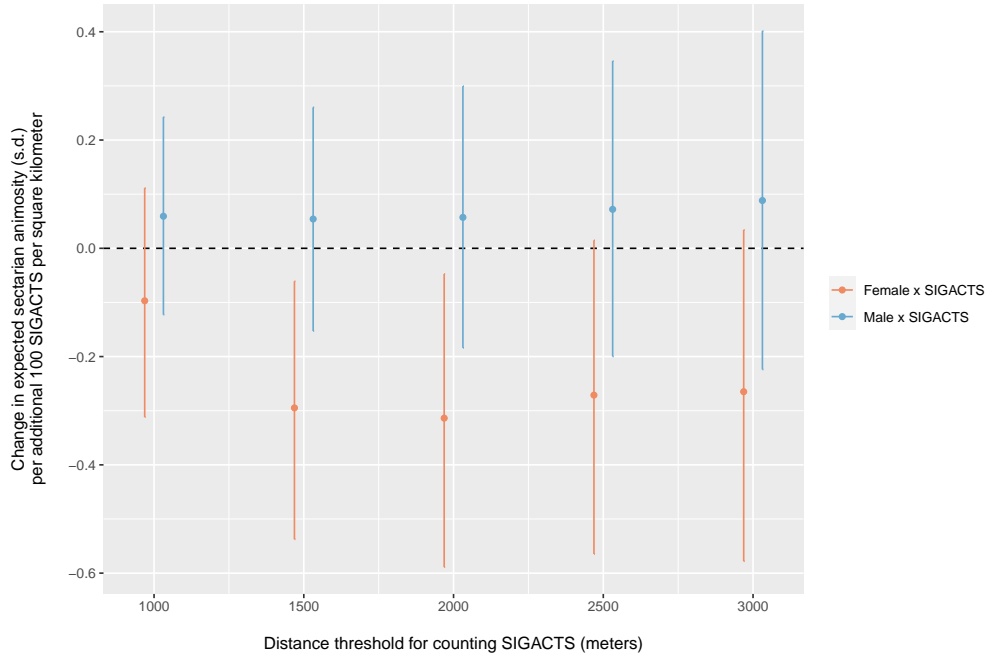
* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Supplementary Table 11: **Potential drivers of sectarian animosity in Iraq (hybrid specification)**. Alternative regression results from a hybrid specification (compare to main results in Supplementary Table 9). We thank an anonymous reviewer for this suggestion. Compared to the “full” specification, these alternative models eliminate mobile-based measures and province fixed effects; instead, Sunni contact is proxied by province composition, as in the “baseline” specification (i.e. “Shi’a dominated” versus “mixed sect”). This allows the retention of respondents for which mobile-based measures were missing.

Another commonly theorized driver of ethno-national tensions is an individual’s prior exposure to violence. Our sample is ill-suited to this analysis because we sample on current home and cannot reconstruct respondents’ trajectories during significant post-invasion migration. However, given the prominence of this hypothesis, we attempt to assess the impact of violence for completeness. Using a military significant-activities (SIGACTS) dataset covering violent incidents in Iraq in 2004–2011 [44], we proxy survey respondents’ exposure to violence with the number of SIGACTS within a particular radius of their current residence, ranging from one kilometer (roughly a neighborhood) to three kilometers (administrative district). We then evaluate whether local violence is associated with a resident’s sectarian attitudes. This measure is only a rough proxy for violence exposure, since heavily affected individuals often move elsewhere.

Given wide variation in SIGACTS incidence and coverage across provinces, we focus this analysis on Baghdad residents for whom neighborhood coordinates and our standard demographic controls (years of education, income category, employment status, and age) are fully observed. Operating at this scale allows us to introduce finer-grained geographic controls to address potential confounding by factors such as proximity to the city center, ensuring that results only reflect local variation in the density of SIGACTS. At the same time, restricting the analysis in this way reduces our sample size to a relatively small group of 565 residents.

We use various definitions of violence exposure that count SIGACTS within a radius ranging from one kilometer (roughly a neighborhood) to three kilometers (city district); for larger radii, individual variation is largely determined by the quadrant of the city in which they live. Our primary results are reported with a second-order expansion of latitude and longitude; we obtain virtually identical results using a general additive model with a bivariate smoothing spline.



Supplementary Figure 7: **Sectarian animosity and Exposure to Violence by Gender.** Coefficients from regressions of sectarian animosity on basic demographic, geographic controls, and SIGACTS within varying distances of respondent’s home neighborhood. For 95% confidence intervals and multiple-testing-adjusted p -values, see Supplementary Table 19.

Results are summarized in Supplementary Figure 7; details are given in Supplementary Information 5.1, regressions are in Supplementary Table 12, and 95% confidence intervals and multiple-testing-adjusted p -values are in Supplementary Table 19. For men, we see no association between violence exposure and sectarian animosity. Among women, we find some evidence of a counter-intuitive relationship—those living in violence-exposed areas have slightly less, not more, sectarian views. Coefficients indicate the predicted change in sectarian animosity for each 100 additional SIGACTS per square mile within a given radius, for comparability across different radii; this corresponds to a predicted decrease in sectarian animosity of 0.2 standard deviations for each additional 750 SIGACTS within two kilometers of home (one s.d. in violence exposure). However, the result vanishes when only considering SIGACTS within one kilometer, and results lose significance after adjusting for multiple testing of distances. However, we observe moderate gender heterogeneity for exposure radii greater than one kilometer ($p_{\text{adj}} = 0.049$). These results could suggest that individual exposure to violence alone is not a consistent driver of sectarian animosity and might sometimes encourage victims to adopt more empathetic views toward the other sect—this gendered reaction to violence has been seen elsewhere [e.g. 45]. At the same time, apparent heterogeneity could also be an artifact of differential post-violence migration.

While the complications that we describe above make it difficult to draw firm conclusions about the relationship between violence and sectarian animosity, these findings complicate the simplistic stories often told about violence creating inter-group hatred.

Dependent variable: Sectarian animosity					
	SIGACTS distance threshold:				
	1 km (1)	1.5 km (2)	2 km (3)	2.5 km (4)	3 km (5)
Education (years)	0.003 (0.011)	0.002 (0.009)	0.002 (0.010)	0.001 (0.009)	0.001 (0.009)
Income sufficiency	-0.107** (0.045)	-0.110*** (0.043)	-0.074 (0.053)	-0.074 (0.053)	-0.074 (0.053)
Employment	0.027 (0.090)	0.026 (0.089)	0.043 (0.106)	0.041 (0.105)	0.041 (0.105)
Age	-0.023 (0.037)	-0.004 (0.034)	-0.023 (0.037)	-0.023 (0.037)	-0.023 (0.037)
Age ²	0.0003 (0.0005)	0.00001 (0.0005)	0.0003 (0.0005)	0.0003 (0.0005)	0.0003 (0.0005)
Male	0.296*** (0.113)	0.296*** (0.114)	0.309*** (0.090)	0.309*** (0.092)	0.310*** (0.092)
SIGACTS	0.019 (0.055)	-0.063 (0.064)	-0.068 (0.083)	-0.049 (0.089)	-0.041 (0.096)
Observations	565	565	565	565	565
R ²	0.038	0.040	0.040	0.039	0.039

Note:

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Supplementary Table 12: **Exposure to violence.** Regression results from regressions of sectarian animosity on basic demographic controls and SIGACTS counts within varying distances of the respondent's home neighborhood, subsetting to the Baghdad region. All models include linear and quadratic controls for latitude and longitude that capture heightened violence near the urban core. For 95% confidence intervals and multiple-testing-adjusted p -values, see Supplementary Table 19.

5.2 Sectarian Worldviews

Supplementary Tables 13–16 report detailed regression results for worldview-related findings discussed in the main text. For 95% confidence intervals and multiple-testing-adjusted p -values, see Supplementary Table 21.

	Dependent variable: Sect-based politics	
	Iraq (pooled) (1)	Iraq (gender) (2)
Education (years)	−0.047*** (0.004)	−0.045*** (0.004)
Income sufficiency	0.057** (0.027)	0.059*** (0.020)
Employment	0.008 (0.053)	0.018 (0.054)
Age	0.002 (0.013)	0.001 (0.012)
Age ²	−0.0001 (0.0002)	−0.0001 (0.0002)
Male	0.222*** (0.042)	0.194*** (0.051)
Sect. anim.	0.104*** (0.024)	
Female × sect. anim.		0.080*** (0.030)
Male × sect. anim.		0.144*** (0.041)
Province FE	Yes	Yes
Observations	2,339	2,339
R ²	0.105	0.106

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Supplementary Table 13: **Sect-based Politics Worldview.** Iraq only. Results from regression of “sect-based political outlook” index on demographic controls and sectarian animosity (pooled and with gender interaction). Larger outcomes indicate a more sect-oriented perspective on politicians and parties. For 95% confidence intervals and multiple-testing-adjusted p -values, see Supplementary Table 21.

	Dependent variable: Religion in politics			
	Iraq (pooled) (1)	Iraq (gender) (2)	Iran (pooled) (3)	Iran (gender) (4)
Education (years)	−0.030*** (0.004)	−0.029*** (0.003)	−0.003 (0.004)	−0.004 (0.007)
Income sufficiency	0.024 (0.027)	0.025 (0.019)	0.130*** (0.024)	0.132*** (0.024)
Employment	−0.072 (0.054)	−0.036 (0.052)	0.016 (0.070)	0.023 (0.069)
Age	−0.003 (0.014)	−0.004 (0.012)	0.039*** (0.009)	0.039*** (0.011)
Age ²	0.0001 (0.0002)	0.0001 (0.0002)	−0.0004*** (0.0001)	−0.0004*** (0.0001)
Male	0.122*** (0.038)	0.115*** (0.049)	−0.323*** (0.090)	−0.334*** (0.073)
Sect. anim.	0.075*** (0.023)		−0.023 (0.028)	
Female × sect. anim.		0.138*** (0.033)		0.026 (0.046)
Male × sect. anim.		0.002 (0.038)		−0.049 (0.035)
Province FE	Yes	Yes	Yes	Yes
Observations	2,340	2,340	1,434	1,434
R ²	0.050	0.056	0.069	0.070

Note:

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Supplementary Table 14: **Religion and Politics Worldview.** Results from regression of “role of religion in politics” index on demographic controls and sectarian animosity (pooled and with gender interaction). Larger outcomes indicate support for a greater role by religious leaders in governance. For 95% confidence intervals and multiple-testing-adjusted p -values, see Supplementary Table 21.

	Dependent variable: Iran intervention			
	Iraq (pooled) (1)	Iraq (gender) (2)	Iran (pooled) (3)	Iran (gender) (4)
Education (years)	−0.001 (0.004)	0.001 (0.003)	−0.007*** (0.002)	−0.007 (0.004)
Income sufficiency	0.020 (0.032)	0.021 (0.020)	0.047*** (0.011)	0.049*** (0.013)
Employment	−0.216*** (0.064)	−0.199*** (0.064)	−0.043 (0.037)	−0.043 (0.044)
Age	0.052*** (0.017)	0.049*** (0.014)	0.021*** (0.005)	0.021*** (0.006)
Age ²	−0.001*** (0.0002)	−0.001*** (0.0002)	−0.0002*** (0.0001)	−0.0002*** (0.0001)
Male	0.564*** (0.060)	0.580*** (0.068)	0.045 (0.042)	0.037 (0.036)
Sect. anim.	0.121*** (0.028)		−0.017 (0.015)	
Female × sect. anim.		0.189*** (0.044)		−0.008 (0.025)
Male × sect. anim.		0.046 (0.043)		−0.017 (0.020)
Province FE	Yes	Yes	Yes	Yes
Observations	2,213	2,213	1,411	1,411
R ²	0.073	0.078	0.055	0.055

Note:

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Supplementary Table 15: **Iran Intervention Worldview**. Results from regression of “Iran intervention” index on demographic controls and sectarian animosity (pooled and with gender interaction). Larger outcomes indicate greater support for Iranian foreign interventions. For 95% confidence intervals and multiple-testing-adjusted p -values, see Supplementary Table 21.

	Dependent variable: Shia group assistance			
	Iraq (pooled) (1)	Iraq (gender) (2)	Iran (pooled) (3)	Iran (gender) (4)
Education (years)	0.001 (0.003)	0.003 (0.003)	−0.001 (0.004)	0.001 (0.007)
Income sufficiency	0.026 (0.027)	0.027* (0.019)	0.081*** (0.023)	0.078*** (0.025)
Employment	−0.157*** (0.055)	−0.120*** (0.050)	0.001 (0.081)	−0.011 (0.065)
Age	0.002 (0.013)	0.001 (0.011)	0.020** (0.009)	0.022** (0.011)
Age ²	0.000 04 (0.0002)	0.000 05 (0.0001)	−0.0002 (0.0001)	−0.0002 (0.0001)
Male	0.200*** (0.047)	0.201*** (0.051)	−0.100** (0.055)	−0.109* (0.077)
Sect. anim.	0.043** (0.023)		−0.044 (0.028)	
Female × sect. anim.		0.123*** (0.033)		−0.065 (0.049)
Male × sect. anim.		−0.056 (0.038)		−0.020 (0.034)
Province FE	Yes	Yes	Yes	Yes
Observations	2,296	2,296	1,414	1,414
R ²	0.019	0.029	0.041	0.042

Note:

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Supplementary Table 16: **Shi'a Group Assistance Worldview**. Results from regression of “Shi'a group support” index on demographic controls and sectarian animosity (pooled and with gender interaction). Larger outcomes indicate greater support for financial assistance to foreign Shi'a groups. For 95% confidence intervals and multiple-testing-adjusted p -values, see Supplementary Table 21.

6 Multiple Testing

6.1 Multiple Testing: Drivers of Sectarian Animosity

In the main text we examine five broad class classes of hypothesized drivers for sectarian animosity: out-group contact, economic deprivation, democratic disillusionment, religious devotion, and exposure to violence. These are first tested in a “baseline” regression specification of sectarian animosity on one measure for each hypothesized driver (excluding violence exposure, which is tested separately in a subset of respondents due to limited data availability.) This results in a total of five p -values for Iraqi respondents, which we adjust for multiple testing according to Benjamini and Hochberg [46]. Note that we inflate p -values by a multiplicative factor so they can be interpreted as usual, rather than utilizing a modified significance threshold.

We then repeat the Iraqi analysis, disaggregating by gender, and show that the pooled results mask significant gender heterogeneity in the drivers of sectarian animosity. The BH correction is applied to the ten resulting p -values (one per driver and gender). Both pooled and gender-specific results are presented in Supplementary Table 17. We emphasize that the “baseline” results presented in Supplementary Tables 17 and 18 are essentially cruder versions of the “full” analyses of Supplementary Tables 19 and 20, which probe the same hypotheses in greater depth and illustrate the robustness of our findings.

IRAQI RESPONDENTS, POOLING MEN AND WOMEN					
Hypothesis family	Coefficient	Estimate	95% CI	p -value	Adj. p
Contact	Shi’a province (vs mixed)	0.069	(−0.009, 0.147)	0.047	0.078
Economic	Income sufficiency	−0.071	(−0.118, −0.025)	<0.001	<0.001
Political	Anti-democracy	0.122	(0.073, 0.171)	<0.001	<0.001
Religious	Religious practice (overall)	−0.008	(−0.059, 0.043)	0.787	0.787
Violence	#SIGACTS ≤ 2 km	−0.103	(−0.305, 0.099)	0.320	0.400

IRAQI RESPONDENTS, DISAGGREGATING BY GENDER					
Hypothesis family	Coefficient	Estimate	95% CI	p -value	Adj. p
Contact (women)	Shi’a province (vs mixed)	0.203	(0.083, 0.324)	<0.001	<0.001
Economic (women)	Income sufficiency	−0.115	(−0.176, −0.054)	<0.001	<0.001
Political (women)	Anti-democracy	0.177	(0.117, 0.236)	<0.001	<0.001
Religious (women)	Religious practice (overall)	0.098	(0.029, 0.167)	<0.001	<0.001
Violence (women)	#SIGACTS ≤ 2 km	−0.315	(−0.587, −0.043)	0.024	0.039
Contact (men)	Shi’a province (vs mixed)	−0.092	(−0.209, 0.025)	0.200	0.222
Economic (men)	Income sufficiency	−0.079	(−0.145, −0.013)	0.038	0.048
Political (men)	Anti-democracy	0.056	(0.003, 0.109)	0.027	0.039
Religious (men)	Religious practice (overall)	−0.090	(−0.150, −0.030)	<0.001	<0.001
Violence (men)	#SIGACTS ≤ 2 km	0.058	(−0.185, 0.301)	0.631	0.631

Supplementary Table 17: **Multiple-testing adjustments, Iraq baseline specification.** The top (bottom) panel reports raw and BH-adjusted p -values for each hypothesized driver of sectarian animosity, pooling all Iraqi respondents (disaggregating by gender). Results are based on a single measure for each hypothesized driver.

Next, to better understand the mechanisms by which each driver operates, we use a more complete regression specification containing multiple measures for each of the broad hypothesis families. For example, predictors in this regression include three measures relating to the broader concept of economic deprivation:

household income sufficiency, employment status, and a proxy for wealth and urbanization based on mobile-phone density. Similarly, when examining violence exposure, we look at violent incidents within 500 meters of the individual’s home, then within 1000 meters, and so on. The “1000-meter incidents” measure contains a superset of the “500-meter incidents” measure, resulting in positive correlation between p -values under the null. Our goal is to reject an overarching null hypothesis for the family—i.e., a statement of the form “violence exposure, measured in any of the following ways, is not correlated with sectarianism”—while accounting for the fact that individual tests (at 500m, 1000m, 1500m, etc.) are dependent. We then seek to repeat this for another high-level hypothesis—“economic deprivation is not correlated with sectarianism”—for another family of closely related tests that bear on household income, employment. Ultimately, our goal is to control the familywise false discovery rate, i.e. to ensure that family-level hypotheses (violence, economic deprivation, etc.) are not falsely rejected at a rate greater than α . This requires a series of hierarchical multiple-testing corrections, both within and across families of hypotheses.

As discussed, all covariates are included in a single regression except for violence exposure. (This is due to the fact that violence analyses are feasible for the Baghdad subsample. Five separate regressions are run in this subsample, in which various distance thresholds are used to define exposure to military “significant activities.”)

In order to control false discoveries while properly accounting for the nested nature of these tests, we use the procedure of [47], which proceeds as follows. First, the Simes’ test [48] is applied within each hypothesis family (e.g., “economic deprivation”) to test whether all constituent hypotheses are null. In the pooled model, this produces five family-specific p -values. Then, a Benjamini-Hochberg correction [46] is applied to inflate the Simes p -values. Hypothesis families that exceed some significance threshold are discarded; among the remainder, we then unpack the constituent hypotheses for further analysis. Within each surviving family, (1) another BH correction is applied, and (2) the resulting hypothesis-specific BH p -values are inflated once more by the inverse proportion of rejected families. In our analysis, we arbitrarily set the family threshold at 0.1; however, this procedure has been shown to control the average within-family error rate at nominal or better levels under typical dependence structures, regardless of the specific threshold. The raw, adjusted family, and adjusted hypothesis-specific p -values for pooled Iraqi respondents (five hypothesis families) are reported in the top panel of Supplementary Table 19, followed by gender-disaggregated results (ten hypothesis families).

6.2 Multiple Testing: Sectarian Worldviews

Finally, in the main text, we report associations between sectarian animosity and various beliefs or attitudes that may reflect the worldviews of sectarian individuals. We consider five candidate attitudes among Iraqi respondents. Each is tested among both men and women; the resulting ten p -values are adjusted for multiplicity according to [46]. In Iran, where Shi’a dominance means that survey questions about sectarian politics would be implausible, this battery of questions was dropped for a total of four attitudes and eight tests. The results of these adjustments are reported in Table 21.

IRANIAN RESPONDENTS, POOLING MEN AND WOMEN					
Hypothesis family	Coefficient	Estimate	95% CI	<i>p</i> -value	Adj. <i>p</i>
Economic	Income sufficiency	−0.026	(−0.081, 0.030)	0.375	0.375
Political	Anti-democracy	0.038	(−0.012, 0.089)	0.180	0.270
Religious	Religious practice (overall)	−0.119	(−0.174, −0.064)	<0.001	<0.001

IRANIAN RESPONDENTS, DISAGGREGATING BY GENDER					
Hypothesis family	Coefficient	Estimate	95% CI	<i>p</i> -value	Adj. <i>p</i>
Economic (women)	Income sufficiency	−0.026	(−0.105, 0.052)	0.421	0.565
Political (women)	Anti-democracy	−0.055	(−0.131, 0.020)	0.152	0.304
Religious (women)	Religious practice (overall)	0.013	(−0.069, 0.095)	0.698	0.698
Economic (men)	Income sufficiency	−0.021	(−0.088, 0.046)	0.471	0.565
Political (men)	Anti-democracy	0.091	(0.016, 0.167)	0.006	0.019
Religious (men)	Religious practice (overall)	−0.208	(−0.284, −0.132)	<0.001	<0.001

Supplementary Table 18: **Multiple-testing adjustments, Iran baseline specification.** The top (bottom) panel reports raw and BH-adjusted *p*-values for each hypothesized driver of sectarian animosity, pooling all Iraqi respondents (disaggregating by gender). Results are based on a single measure for each hypothesized driver.

IRAQI RESPONDENTS					
Outcome	Subgroup	Estimate	95% CI	<i>p</i> -value	Adj. <i>p</i>
Sect-based politics	Women	0.080	(0.025, 0.144)	0.001	0.002
Sect-based politics	Men	0.144	(0.079, 0.225)	<0.001	<0.001
Religion in politics	Women	0.138	(0.078, 0.208)	<0.001	<0.001
Religion in politics	Men	0.002	(−0.057, 0.077)	0.887	0.887
Iran intervention	Women	0.189	(0.105, 0.287)	<0.001	<0.001
Iran intervention	Men	0.046	(−0.015, 0.130)	0.233	0.267
Shi'a group assistance	Women	0.123	(0.061, 0.192)	<0.001	<0.001
Shi'a group assistance	Men	−0.056	(−0.124, 0.017)	0.203	0.267

IRANIAN RESPONDENTS					
Outcome	Subgroup	Estimate	95% CI	<i>p</i> -value	Adj. <i>p</i>
Religion in politics	Women	0.026	(−0.058, 0.128)	0.552	0.683
Religion in politics	Men	−0.049	(−0.122, 0.015)	0.141	0.530
Iran intervention	Women	−0.008	(−0.055, 0.038)	0.774	0.774
Iran intervention	Men	−0.017	(−0.056, 0.024)	0.380	0.663
Shi'a group assistance	Women	−0.065	(−0.158, 0.039)	0.177	0.530
Shi'a group assistance	Men	−0.020	(−0.088, 0.048)	0.547	0.663

Supplementary Table 21: **Worldviews of Sectarian Iraqis and Iranians.** Reported results reflect the estimated change in the outcome, as calculated from a regression on sectarian animosity (interacted with gender), years of education, income sufficiency, age (linear and quadratic), and province fixed effects. Benjamini-Hochberg *p*-value adjustment [46] is applied to 10 (8) hypotheses for Iraqi (Iranian) respondents.

IRAQI RESPONDENTS, POOLING MEN AND WOMEN

Hypothesis family	Coefficient	Estimate	95% CI	p-value	Family p	Adj. p
Contact	Pilgrimage decile	0.038	(0.010, 0.066)	< 0.001	< 0.001	< 0.001
Economic	Income sufficiency	-0.070	(-0.128, -0.012)	0.007	0.036	0.036
Economic	Employment	0.015	(-0.118, 0.148)	0.755		1.000
Economic	Log mobile residents	-0.035	(-0.069, -0.000)	0.048		0.121
Political	Anti-democracy	0.111	(0.055, 0.168)	< 0.001	< 0.001	< 0.001
Political	Religion in politics	0.047	(-0.003, 0.098)	0.039		0.061
Religious	Religious practice (overall)	0.017	(-0.055, 0.090)	0.539	0.733	-
Religious	Religious practice (individual)	-0.014	(-0.076, 0.047)	0.733		-
Violence	#SIGACTS ≤ 1 km	-0.007	(-0.157, 0.144)	0.927	0.733	-
Violence	#SIGACTS ≤ 1.5 km	-0.093	(-0.266, 0.081)	0.292		-
Violence	#SIGACTS ≤ 2 km	-0.103	(-0.305, 0.099)	0.320		-
Violence	#SIGACTS ≤ 2.5 km	-0.091	(-0.317, 0.136)	0.433		-
Violence	#SIGACTS ≤ 3 km	-0.089	(-0.337, 0.160)	0.493		-

IRAQI RESPONDENTS, DISAGGREGATING BY GENDER

Hypothesis family	Coefficient	Estimate	95% CI	p-value	Family p	Adj. p
Contact (women)	Pilgrimage decile	0.055	(0.015, 0.094)	< 0.001	< 0.001	< 0.001
Economic (women)	Income sufficiency	-0.070	(-0.163, 0.024)	0.155	0.055	0.333
Economic (women)	Employment	-0.219	(-0.399, -0.040)	0.009		0.039
Economic (women)	Log mobile residents	-0.001	(-0.043, 0.041)	0.973		1.000
Political (women)	Anti-democracy	0.146	(0.066, 0.227)	< 0.001	< 0.001	< 0.001
Political (women)	Religion in politics	0.080	(0.007, 0.153)	0.017		0.025
Religious (women)	Religious practice (overall)	0.113	(0.012, 0.215)	0.022	0.055	0.033
Religious (women)	Religious practice (individual)	-0.098	(-0.185, -0.011)	0.023		0.033
Violence (women)	#SIGACTS ≤ 1 km	-0.097	(-0.311, 0.117)	0.369	0.084	0.527
Violence (women)	#SIGACTS ≤ 1.5 km	-0.295	(-0.536, -0.055)	0.015		0.084
Violence (women)	#SIGACTS ≤ 2 km	-0.315	(-0.587, -0.043)	0.024		0.084
Violence (women)	#SIGACTS ≤ 2.5 km	-0.272	(-0.566, 0.021)	0.070		0.166
Violence (women)	#SIGACTS ≤ 3 km	-0.261	(-0.571, 0.049)	0.094		0.168
Contact (men)	Pilgrimage decile	0.022	(-0.018, 0.062)	0.268	0.335	-
Economic (men)	Income sufficiency	-0.064	(-0.167, 0.040)	0.310	0.038	0.442
Economic (men)	Employment	0.145	(0.009, 0.281)	0.022		0.048
Economic (men)	Log mobile residents	-0.074	(-0.129, -0.019)	0.004		0.016
Political (men)	Anti-democracy	0.054	(-0.029, 0.137)	0.206	0.459	-
Political (men)	Religion in politics	-0.005	(-0.085, 0.076)	0.875		-
Religious (men)	Religious practice (overall)	-0.079	(-0.178, 0.019)	0.050	0.080	0.071
Religious (men)	Religious practice (individual)	0.087	(0.004, 0.170)	0.024		0.069
Violence (men)	#SIGACTS ≤ 1 km	0.060	(-0.128, 0.249)	0.527	0.639	-
Violence (men)	#SIGACTS ≤ 1.5 km	0.052	(-0.158, 0.263)	0.639		-
Violence (men)	#SIGACTS ≤ 2 km	0.058	(-0.185, 0.301)	0.631		-
Violence (men)	#SIGACTS ≤ 2.5 km	0.072	(-0.208, 0.352)	0.609		-
Violence (men)	#SIGACTS ≤ 3 km	0.090	(-0.217, 0.396)	0.561		-

Supplementary Table 19: **Multiple-testing adjustments, Iraq full specification.** Top (bottom) panel reports various p -values for nested hypothesis testing, following the procedure of [47] among all Iraqi respondents (disaggregated by gender). Groups of analyses are organized into higher-level hypothesis families; for each, an adjusted family p -value is reported based on the raw p -values of the constituent hypotheses. Among selected hypothesis families, corrected p -values for constituent hypotheses are also reported.

IRANIAN RESPONDENTS, POOLING MEN AND WOMEN						
Hypothesis family	Coefficient	Estimate	95% CI	p-value	Family p	Adj. p
Economic	Income sufficiency	-0.022	(-0.083, 0.038)	0.462	} 0.001	0.693
Economic	Employment	-0.209	(-0.362, -0.057)	< 0.001		0.001
Political	Anti-democracy	0.039	(-0.018, 0.095)	0.140	} 0.280	-
Political	Religion in politics	0.012	(-0.047, 0.071)	0.713		-
Religious	Religious practice (overall)	-0.132	(-0.196, -0.067)	<0.001	} <0.001	<0.001
Religious	Religious practice (individual)	0.049	(-0.015, 0.112)	0.122		0.182

IRANIAN RESPONDENTS, DISAGGREGATING BY GENDER						
Hypothesis family	Coefficient	Estimate	95% CI	p-value	Family p	Adj. p
Economic (women)	Income sufficiency	-0.063	(-0.170, 0.044)	0.239	} 0.002	0.717
Economic (women)	Employment	-0.289	(-0.510, -0.068)	<0.001		0.002
Political (women)	Anti-democracy	-0.026	(-0.122, 0.070)	0.609	} 0.391	-
Political (women)	Religion in politics	0.086	(-0.040, 0.211)	0.196		-
Religious (women)	Religious practice (overall)	-0.017	(-0.139, 0.104)	0.742	} 0.255	-
Religious (women)	Religious practice (individual)	-0.074	(-0.164, 0.017)	0.099		-
Economic (men)	Income sufficiency	-0.025	(-0.097, 0.047)	0.484	} 0.162	-
Economic (men)	Employment	-0.178	(-0.365, 0.010)	0.041		-
Political (men)	Anti-democracy	0.068	(-0.014, 0.149)	0.106	} 0.255	-
Political (men)	Religion in politics	-0.024	(-0.091, 0.043)	0.480		-
Religious (men)	Religious practice (overall)	-0.211	(-0.311, -0.110)	< 0.001	} < 0.001	< 0.001
Religious (men)	Religious practice (individual)	0.139	(0.072, 0.207)	< 0.001		0.001

Supplementary Table 20: **Multiple-testing adjustments, Iran full specification.** Top (bottom) panel reports various p -values for nested hypothesis testing, following the procedure of [47] among all Iranian respondents (disaggregated by gender). Groups of analyses are organized into higher-level hypothesis families; for each, an adjusted family p -value is reported based on the raw p -values of the constituent hypotheses. Among selected hypothesis families, corrected p -values for constituent hypotheses are also reported.

References

- [1] Dina Rizk Khoury. The security state and the practice and rhetoric of sectarianism in Iraq. *International Journal of Contemporary Iraqi Studies*, 4(3):325–338, 2010.
- [2] Fanar Haddad. *Sectarianism in Iraq: Antagonistic visions of unity*. Oxford University Press, USA, 2011.
- [3] Melani Cammett. *Compassionate communalism: Welfare and Sectarianism in Lebanon*. Cornell University Press, 2014.
- [4] Howard Becker. *Systematic Sociology on the Basis of the Beziehungslehre and Gebildelehre of Leopold von Wiese*. John Wiley & Sons, New York, NY, 1934.
- [5] J Milton Yinger. *Religion in the Struggle for Power: A Study in the Sociology of Religion*. Duke University Press, Durham, NC, 1947.
- [6] Richard H. Niebuhr. *The social sources of denominationalism*. Cleveland; New York: Meridian Books, World Publishing Company, 1962.
- [7] Benton Johnson. On church and sect. *American Sociological Review*, pages 539–549, 1963.
- [8] Rodney Stark and William Sims Bainbridge. *A theory of religion*. New Brunswick. Rutgers University Press, New Brunswick, NJ, 1987.
- [9] Ernst Troeltsch. *The social teaching of the Christian churches*. Westminster John Knox Press, 1992.

- [10] Miles Hewstone, Ed Cairns, Alberto Voci, Stefania Paolini, Frances McLernon, Richard J Crisp, Ulrike Niens, and Jean Craig. *Intergroup Contact in a Divided Society: Challenging Segregation in Northern Ireland*. Psychology Press, 2005.
- [11] Michael Cook. Weber and islamic sects. *Max Weber and Islam*. London: Transaction Publishers, 1999.
- [12] Vali Nasr. *The Shia Revival*. WW Norton & Company, 2016.
- [13] Nader Hashemi and Danny Postel. *Sectarianization: Mapping the new politics of the Middle East*. Taylor & Francis, 2017.
- [14] Ussama Makdisi. The problem of sectarianism in the middle east in an age of western hegemony. In Nader Hashemi and Danny Postel, editors, *Sectarianization: Mapping the new politics of the Middle East*, chapter 1. Oxford University Press, Oxford, 2017.
- [15] Simon Mabon. Desectarianization: Looking beyond the sectarianization of middle eastern politics. *The Review of Faith & International Affairs*, 17(4):23–35, 2019.
- [16] Fanar Haddad. Sectarian relations in arab iraq: Contextualising the civil war of 2006–2007. *British Journal of Middle Eastern Studies*, 40(2):115–138, 2013.
- [17] Rodney Stark and Roger Finke. *Acts of faith: Explaining the human side of religion*. Univ of California Press, 2000.
- [18] Kenneth D Wald, Adam L Silverman, and Kevin S Fridy. Making sense of religion in political life. *Annu. Rev. Polit. Sci.*, 8:121–143, 2005.
- [19] Ashutosh Varshney. Ethnicity and ethnic conflict. *Oxford handbook of comparative politics*, pages 274–95, 2007.
- [20] Anna Grzymala-Busse. Why comparative politics should take religion (more) seriously. *Annual Review of Political Science*, 15:421–442, 2012.
- [21] David E Ludden. *Making India Hindu: Religion, community, and the politics of democracy in India*. Oxford University Press, 2005.
- [22] Steven Wilkinson. *Religious politics and communal violence*. Oxford University Press, USA, 2005.
- [23] Claire Mitchell. *Religion, identity and politics in Northern Ireland: Boundaries of belonging and belief*. Routledge, 2017.
- [24] Jochen E Gebauer, Wiebke Bleidorn, Samuel D Gosling, Peter J Rentfrow, Michael E Lamb, and Jeff Potter. Cross-cultural variations in big five relationships with religiosity: A sociocultural motives perspective. *Journal of Personality and Social Psychology*, 107(6):1064, 2014.
- [25] Kanchan Chandra. What is ethnic identity and does it matter? *Annu. Rev. Polit. Sci.*, 9:397–424, 2006.
- [26] Daniel N Posner. *Institutions and ethnic politics in Africa*. Cambridge University Press, 2005.
- [27] David Little. Religion, nationalism and intolerance. *Between Terror and Tolerance: Religious Leaders, Conflict, and Peacemaking*, pages 9–28, 2011.
- [28] Mohammed Ayoob. Challenging hegemony: political islam and the north–south divide. *International Studies Review*, 9(4):629–643, 2007.
- [29] Simon Mabon. *Saudi Arabia and Iran: Power and Rivalry in the Middle East*, volume 132. IB Tauris, 2015.
- [30] F Gregory Gause III. Beyond sectarianism: The new middle east cold war. *Brookings Doha Center Analysis Paper*, 11:1–27, 2014.
- [31] Nazif M Shahrani. War, factionalism, and the state in afghanistan. *American Anthropologist*, 104(3):715–722, 2002.

- [32] Peter Salisbury. Yemen and the saudi-iranian ‘cold war’. *Research Paper, Middle East and North Africa Programme, Chatham House, the Royal Institute of International Affairs*, 11, 2015.
- [33] Gilles Kepel. *Jihad: The trail of political Islam*. IB Tauris, 2002.
- [34] Gilles Kepel. *Terror in France: The rise of jihad in the west*, volume 64. Princeton University Press, 2017.
- [35] Jaime Kucinkas. A research note on islam and gender egalitarianism: An examination of egyptian and saudi arabian youth attitudes. *Journal for the Scientific Study of Religion*, 49(4):761–770, 2010.
- [36] Jana Scheible and Fenella Fleischmann. Gendering islamic religiosity in the second generation: Gender differences in religious practices and the association with gender ideology among moroccan- and turkish-belgian muslims. *Gender & Society*, 27(3), 2010.
- [37] Michael Hoffman and Elizabeth Nugent. Communal religious practice and support for armed parties: Evidence from lebanon. *Journal of Conflict Resolution*, 61(4):869–902, 2017.
- [38] Walid Alkhatib. Iraq public opinion survey report, 2013/2014. Arab Barometer III, 2014.
- [39] Arab Barometer. Iraq country report. Arab Barometer IV, 2019.
- [40] World Bank Development Data Group. Household socio-economic survey, second round (iraq, 2012–2013). Living Standards Measurement Study, 2013.
- [41] Michael Tipping and Christopher Bishop. Probabilistic principal component analysis. *Journal of the Royal Statistical Society, Series B*, 61:611–622, 2014.
- [42] Fumi Samejima. Estimation of latent ability using a response pattern of graded scores. *Psychometrika Monograph Supplement*, 34:100–114, 1969.
- [43] Jens Hainmueller, Dominik Hangartner, and Teppei Yamamoto. Validating vignette and conjoint survey experiments against real-world behavior. *Proceedings of the National Academy of Sciences*, 112(8):2395–2400, 2015.
- [44] Andrew Shaver and Alexander Bollfrass. Emotions and institutional constraints: A demonstration case of temperature and insurgent violence, 2018.
- [45] Nichole M Bauer. Emotional, sensitive, and unfit for office? gender stereotype activation and support female candidates. *Political Psychology*, 36(6):691–708, 2015.
- [46] Yoav Benjamini and Yosef Hochberg. Controlling the false discovery rate: a practical and powerful approach to multiple testing. *Journal of the Royal statistical society: series B (Methodological)*, 57(1):289–300, 1995.
- [47] Christine B Peterson, Marina Bogomolov, Yoav Benjamini, and Chiara Sabatti. Many phenotypes without many false discoveries: error controlling strategies for multitrait association studies. *Genetic epidemiology*, 40(1):45–56, 2016.
- [48] Robert Simes. An improved bonferroni procedure for multiple tests of significance. *Biometrika*, 73(3):751–54., 1986.