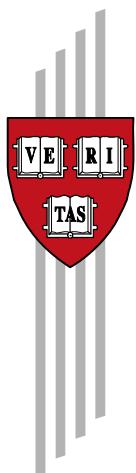


# **Estimating the Impact of the Hajj: Religion and Tolerance in Islam's Global Gathering**

David Clingingsmith, Asim Ijaz Khwaja, and Michael Kremer

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# **Estimating the Impact of the Hajj: Religion and Tolerance in Islam's Global Gathering**

David Clingingsmith, Asim Ijaz Khwaja, and Michael Kremer\*

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## **Abstract**

We estimate the impact on pilgrims of performing the Hajj pilgrimage to Mecca. Our method compares successful and unsuccessful applicants in a lottery used by Pakistan to allocate Hajj visas. Pilgrim accounts stress that the Hajj leads to a feeling of unity with fellow Muslims, but outsiders have sometimes feared that this could be accompanied by antipathy toward non-Muslims. We find that participation in the Hajj increases observance of global Islamic practices such as prayer and fasting while decreasing participation in localized practices and beliefs such as the use of amulets and dowry. It increases belief in equality and harmony among ethnic groups and Islamic sects and leads to more favorable attitudes toward women, including greater acceptance of female education and employment. Increased unity within the Islamic world is not accompanied by antipathy toward non-Muslims. Instead, Hajjis show increased belief in peace, and in equality and harmony among adherents of different religions. The evidence suggests that these changes are more a result of exposure to and interaction with Hajjis from around the world, rather than religious instruction or a changed social role of pilgrims upon return.

JEL codes: D74, D02, D83, Z12, Z13

Keywords: Religion, Institutions, Social Interaction, Identity, Beliefs.

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\* Clingingsmith: Department of Economics, Weatherhead School of Management, Case Western Reserve University; [dlc43@case.edu](mailto:dlc43@case.edu). Khwaja: Kennedy School of Government, Harvard University; [akhwaja@ksg.harvard.edu](mailto:akhwaja@ksg.harvard.edu). Kremer: Department of Economics, Harvard University, the Brookings Institution, and NBER; [mkremer@fas.harvard.edu](mailto:mkremer@fas.harvard.edu). This paper has benefited from discussions with Alberto Abadie, May Al-Dabbagh, Tahir Andrabi, Ali Asani, Eli Berman, Amitabh Chandra, Lou Christillo, Jamal Elais, Carl Ernst, Raymond Fisman, Ed Glaeser, Bill Graham, Hamid Hasan, Sohail Hashimi, Alaka Holla, Larry Iannaccone, Guido Imbens, Emir Kamenica, Ijaz A. Khwaja, Charles Kurzman, Erzo Luttmer, Brigitte Madrian, Rachel McCleary, Atif Mian, Rohini Pande, Barbara von Schlegel, Nasim Sherazi, Tarik Yousef, Asad Zaman, and seminar audiences at Harvard University, Georgetown University, the University of Southern California, the London School of Economics, University College London, the Dubai School of Government, Stanford University, the University of California–Berkeley, Tufts University, Case Western Reserve University, the 6<sup>th</sup> ASREC conference, the NBER National Security Working Group, and the International Islamic University Islamabad. Erin Baggott, Katalin Blankenship, Dan Choate, Alexandra Cirone, Benjamin Feigenberg, Martin Kanz, Supreet Kaur, Bilal Malik, Jeanette Park and most notably Hisham Tariq provided excellent research assistance. We gratefully acknowledge financial support for this project from the Spiritual Capital Research Program of the Metanexus Foundation and the Weatherhead Center for International Affairs at Harvard University. Khwaja thanks the Dubai Initiative at the Kennedy School and the HKS Dean's Research Fund for financial support. We also thank Pakistan's Ministry of Religious Affairs for graciously sharing data.

## 1. Introduction

Every year, more than two million Muslim men and women from over a hundred countries gather in Mecca to undertake the Hajj pilgrimage. Although the Hajj takes place on five specified days each year, pilgrims often spend a month engaged in prayer and ritual in Mecca and Medina. Pilgrims mix across the lines of ethnicity, nationality, sect, and gender that divide them in everyday life and affirm a common identity by performing the same rituals and dressing in similar garments that emphasize their equality.

Understanding the impact on pilgrims of participation in the Hajj sheds light not only on Islam and its institutions, but also on the shaping of beliefs and identity more generally. Of particular interest is how this experience affects views towards others – not only fellow Muslims with whom the pilgrim interacts but also with non-Muslims. Theories of social interaction suggest that exposure to other groups may promote empathy or antipathy towards them depending on the nature of the interaction (Pettigrew and Tropp, 2006; Stephan, 1978). In addition, the literature on social identity suggests that strengthened attachment to a group through interaction may be accompanied by negative feelings toward those outside the group (Tajfel and Turner, 1986).

Numerous pilgrim accounts suggest that the Hajj inspires feelings of unity with the worldwide Muslim community (Wolfe, 1997). Malcolm X's experience is a vivid example. In 1964, Malcolm X broke from the heterodox Nation of Islam to become a Sunni Muslim and perform the Hajj. In a letter from Mecca, he wrote: "There were tens of thousands of pilgrims, from all over the world... We were all participating in the same ritual, displaying a spirit of unity and brotherhood that my experiences in America had led me to believe never could exist between the white and non-white... [W]hat I have seen, and experienced, has forced me to rearrange much of my thought-patterns previously held, and to toss aside some of my previous conclusions" (Malcolm X with Haley, 1965).

Some have worried that by promoting greater unity among Muslims, the Hajj could have negative implications for non-Muslims. This was a concern of colonial authorities (Bose 2006, Low 2007). More recently, after it emerged that some of the July 7<sup>th</sup> bombers had undertaken the Hajj, the British intelligence services began monitoring pilgrims, fearing that the Hajj may help spread radical views (*Sunday Times*, 2007). Others have expressed concern that the Hajj induces shifts toward a particular type of Islam. Naipaul (1981) laments what he sees as the erosion of local religious traditions in South Asian Islam in favor of a Saudi or Arab version of Islam.

Of course, it is difficult to isolate the causal impact of the Hajj based on examples like those of Malcolm X or the July 7<sup>th</sup> bombers. Individuals who choose to undertake the Hajj differ from those who do not, and the choice to do so may reflect other life changes. Thus, changes in pilgrims' views and behavior after the Hajj may not reflect its impact.

We assess the causal impact of the Hajj using data from a 2006 survey of more than 1,600 Sunni Muslim applicants to Pakistan's Hajj visa allocation lottery. Saudi Arabia uses country-specific quotas to limit the number of Hajj pilgrims each year for safety and logistical reasons. Pakistan allocates a large share of its quota through a lottery. By comparing successful and unsuccessful applicants to this lottery, we construct causal estimates of the effect of performing the Hajj on this population, five to eight months after the completion of the Hajj.

Our results tend to support the idea that the Hajj helps to integrate the Muslim world, leading to a strengthening of global Islamic beliefs, a weakened attachment to localized religious customs, and a sense of unity and equality with others who are ordinarily separated in everyday life by sect, ethnicity, nationality, or gender, but who are brought together during the Hajj. While the Hajj may help forge a common Islamic identity, there is no evidence that this is defined in opposition to non-Muslims. On the contrary, the notions of equality and harmony tend to extend to adherents of other religions as well.

We find that Hajjis (those who have performed the Hajj) are more likely to undertake universally accepted global Muslim religious practices such as fasting and performing obligatory and supererogatory (optional) prayers. The Hajj reduces performance of less universally accepted, more localized practices such as using amulets and the necessity of giving dowry. For example, the Hajj increases regularly praying in the mosque by 26% and almost doubles the likelihood of non-obligatory fasting. At the same time, it reduces the practice of using amulets by 8% and the South Asian belief of according unequal marriage priority to widows relative to unmarried women by 18%.

The evidence suggests that the Hajj increases tolerance, which seems to apply not just within the Islamic world but also beyond it. Hajjis return with more positive views towards people from other countries. Hajjis are also more likely to state that various Pakistani ethnic and Muslim sectarian groups are equal, and that it is possible for such groups to live in harmony. These views of equality and harmony extend to non-Muslims as well. Hajjis are 22% more likely to declare that people of different religions are equal and 11% more likely to state that adherents of different religions can live in harmony.

We also find evidence that Hajjis are more peacefully inclined. For example, while not many in our sample are willing to publicly condemn the goals of Osama Bin Laden, Hajjis are almost twice as likely to do so. Hajjis are also more likely to express a preference for peace with India and are 17% more likely to declare that it is incorrect to physically punish someone who has dishonored the family.

There is little evidence that participating in the Hajj increases support for an enhanced role of religion in the state or politics, or that it induces negative views of the West. Hajjis are in fact less likely to believe that the state should enforce religious injunctions and that religious leaders should be able to dispense justice. Hajjis and non-Hajjis report similar views regarding the adoption of Western values and on the plausibility of conspiracy theories regarding the Sept 11<sup>th</sup> and July 7<sup>th</sup> attacks.

The feelings of unity and equality brought about by the Hajj extend across gender lines to an extent. Hajjis report more positive views on women's attributes and abilities. For example, they are 6 percentage points more likely to think women are spiritually better than men, an increase of over 50%. They also express greater concern about women's quality of life in Pakistan relative to other countries and about crimes against women in Pakistan. Hajjis are also more likely to support girls' education and female participation in the professional workforce. Hajjis show an 8% increase in their declared preference for their daughters or granddaughters to adopt professional careers. While these effects are larger for female Hajjis, male Hajjis show similar changes in views.

However, not all views on gender change. In particular, Hajjis are no more likely to question Islamic doctrine, such as unequal inheritance laws across gender, or to express views that potentially challenge male authority within the household, such as the correctness of a woman divorcing her husband. This suggests that Pakistani Hajjis' altered views on women reflect a movement away from local prejudices against women and towards fairer treatment within Islam, rather than a more general trend towards feminism.

Hajjis, primarily women, report lower levels of emotional and physical well being. This may be due to the physically taxing nature of the Hajj rituals, as well as changed beliefs and greater awareness of the Muslim world outside Pakistan, particularly for women.

Contrary to some of the historical literature on the Hajj (c.f. Azarya, 1978; Donnan, 1989; Yamba, 1995), we do not find evidence in our sample of major changes, at least in the medium term, in the social engagement or role of Hajjis after their return.

While it is difficult to isolate what drives the impact of the Hajj, the evidence suggests that exposure to Muslims from around the world during the Hajj is important. While we find that Hajjis do not acquire greater formal religious knowledge, they do gain experiential knowledge of the diversity of Islamic practices and beliefs, gender roles within Islam, and, more broadly, the world beyond Pakistan. The Hajj's impact on such knowledge and on some of the tolerant attitudes toward other groups tends to be larger for those traveling in smaller groups, who are more likely to have a broad range of social interactions with people from different backgrounds during the Hajj. Hajjis also show the largest positive gain in their views of other nationalities for Indonesians, the group they are most likely to observe during the Hajj other than Saudis. Hajjis' changed views toward women also reflect the exposure channel since the Hajj offers Pakistani pilgrims a novel opportunity to interact with members of the opposite gender in a religious setting, and to observe interactions across the sexes among Muslims from nations which are more accepting of such interactions.

Further work is needed to examine how each of these effects generalize to other populations and how they may vary over time. For example, the impact of the Hajj on gender attitudes towards pilgrims from other countries where mixed gender interaction is more common may be smaller than the impact we see for Pakistani pilgrims. Moreover, to the extent the gender results reflect a convergence to the mean views of Hajjis, the Hajj may instead induce more conservative gender views for pilgrims from countries with more liberal gender attitudes than those of the average Hajji.

Our results connect to a broad literature on social interaction and the shaping of beliefs and identity that spans social psychology, political science, and economics. This literature uses evidence from laboratory experiments to suggest that while group interactions in competitive settings can exacerbate conflict, interactions that reward cooperation can improve relations among groups (Aronson and Patnoe, 1997; Johnson and Johnson, 1983; DeVries and Slavin, 1978; Slavin and Cooper, 1999). Given the dearth of natural experiments such as ours that randomly mix representative populations, it is difficult to determine how exposure to others in various real-world contexts affects relations between groups. Boisjoly et al. (2006) report evidence that exposure to African-American roommates generates more positive attitudes toward African-Americans among white students. Putnam (2007) suggests that, in the US context, religion may play a particularly important role as “glue” that unites disparate groups.

Our results also shed light on social identity theory, in particular the idea that strengthening the attachment to an in-group may lead to more negative feelings towards an out-group (Sherif et. al. 1954; Tajfel, 1970; Tajfel and Turner, 1986). Our evidence suggests that while Hajjis positively update their views towards groups they were exposed to on the Hajj, this positive updating also extends to their views on groups they were not exposed to.

Our findings also relate to a question in the sociology and economic modeling of religion about why religions often incorporate individually costly practices, and more broadly about the impact of religion on development (Barro and McCleary, 2003; Berman, 2000; Glaeser and Glendon, 1998; Guiso et al, 2003; Iannaccone 1992; Sacerdote and Glaeser, 2001). Iannaccone (1992) suggests a model in which these practices serve a signaling role. Pilgrimage could potentially be seen in this light, but our results suggest that the Hajj may play a more direct role in contributing to the survival of Islam as a unified world religion. Over time, religions with far-flung adherents tend to evolve separate strands which may eventually break away into different religions. Our analysis suggests that the Hajj may reduce dissent and splits in Islam by moving Hajjis toward a common set of practices, making them more tolerant of differences among Muslims, and by creating a stronger shared identity. This may be particularly significant for a religion, such as Islam, without a centralized hierarchy that can enforce common practices and beliefs and promote unity among followers.

The remainder of this paper is organized as follows. Section 2 gives some background on the Hajj, focusing on aspects that contextualize our findings. Section 3 lays out our statistical approach, outlines aspects of the visa application process that are important for our identification strategy, and gives details of the survey. Section 4 presents the main empirical results on religious practice and belief, tolerance, gender, and well-being. Section 5 explores potential channels for the observed effects. Section 6 concludes with some underpinnings and broader implications of our results.

## 2. The Hajj Experience

The pilgrimage to Mecca is one of the five pillars of Islam and is obligatory for those with sufficient financial means. Many Hajjis describe it as the most significant religious event in their lives. During the Hajj, pilgrims engage in prayers and reflection. The focus is primarily on practice and less on building religious knowledge. Pilgrims seek forgiveness under the belief that, if performed with sincerity, the Hajj expiates past sins. While the Hajj originated earlier, its current form was institutionalized with the emergence of Islam in the seventh century A.D. Formal Hajj rituals are clearly prescribed and last for five specific days each year, though pilgrims may spend over a month worshipping in Mecca and Medina (see Appendix 1, Table 1 and Figure 1).<sup>1</sup>

Among world religions, communal rituals are particularly important in Islam (McCleary, 2007). The Hajj is an inherently communal experience, with over two million pilgrims gathering in Mecca (see Appendix 1, Figure 2). During daily prayer, hundreds of thousands of pilgrims stand shoulder to

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<sup>1</sup> While Muslims may make a minor pilgrimage to Mecca known as an *umrah* at any time, the Hajj occurs only from the 8<sup>th</sup> to 12<sup>th</sup> day of the last month of the lunar Islamic calendar.

shoulder in concentric circles facing the *Ka'ba*. They spread over the 36 hectare structure of the mosque itself and onto the surrounding plaza and streets. Hajjis travel *en masse* to Mount Arafat on the second day of the Hajj, and pass the night together in the open. There is a belief that each Hajji's performance positively reinforces that of others, providing a shared aspect to individual worship.

The sheer size of the Hajj entails that during these times there is a great deal of mixing among nations with participants simultaneously undertaking the same activities. Two-thirds of respondents to our survey reported that it was very likely they would interact with people from other countries during the Hajj. This diversity is accompanied by an emphasis on equality and unity. The pilgrims' common identity is emphasized both through common dress—a simple white garment known as the *ihram*—and standardized ritual practices.<sup>2</sup> While the opportunities for in depth inter-group interactions are limited both by language barriers and by the fact that pilgrims stay and typically move in smaller groups of their own countrymen, the group nature of the experience makes observations of the contrasting practices and social dynamics of other groups even more salient.

In addition to mixing across nationalities, the Hajj involves more gender mixing than is typical among the Pakistani pilgrims we study. In Pakistan, women rarely go to mosque and when they do, they typically pray in a separate area from men. Even in social settings, interaction between men and women who are strangers is uncommon. With equal numbers of male and female Hajjis (Bianchi, 2004) such gender interactions are a natural part of the Hajj. Parties of pilgrims stay and move together for ease of planning and safety, and parties often include non-family members. Moreover, the sheer numbers also imply that men pray alongside women, both Pakistani and non-Pakistani, during the Hajj. Our qualitative interviews revealed that these experiences were both very salient and unusual for Hajjis, and that most viewed them positively. One male Hajji we interviewed said: "I felt good about the fact that women and men can pray together. It was not distracting at all. I liked the fact that even when men and women were moving and bumping into each other, this was not leading to squabbles over issues of honor and hence hampering the Hajj of others. It was good to see men and women together in a desegregated environment."

Moreover, Muslim countries vary greatly in the roles and behavior considered appropriate for women, and Pakistan lies on the conservative end of the spectrum. Thus the Hajj provides Pakistani pilgrims an opportunity to observe the more liberal gender roles of Muslims from other nations.

While the focus is on common practices and rituals, within those Hajjis are likely to be exposed to a degree of religious diversity within recognized schools of thought, and its acceptance. Regarding

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<sup>2</sup> The *ihram* requirements for men are two white sheets. The requirements for women are less stringent as long as they dress according to the Islamic conditions of public dress. In practice they typically also wear white.

prayer at Mecca, 14<sup>th</sup> century Muslim explorer Ibn Battuta wrote: “As for the Maghrib prayer [performed at sunset] they [the four schools] pray at the same time... This causes mixing of practices, so that for example you might see a follower of the Maliki school kneeling as a Shafi'i, or a Hanafi kneeling as a Hanbali” (Ibn Battuta, 2002 [1355]).

The Hajj is also physically and financially taxing for many pilgrims. Over the course of the Hajj, a pilgrim may travel over 80 km across different sites (see Appendix 1, Figure 2). Most pilgrims elect to cover at least part of this distance on foot. Further, the extreme congestion of accommodations and Hajj activities heightens the risks of injury and infectious disease (Ahmed et al., 2006). Hajjis typically also sacrifice rest in order to maximize prayers during their stay. In terms of financial costs, those traveling with visas from Pakistan’s Hajj lottery pay about US \$2,000 per person for the trip. This is roughly two and half times Pakistan’s 2006 per capita GDP, which the median respondent in our survey took four years to accumulate in savings.

### 3. Methodology and Data

#### A. Methodology

We estimate whether performing the Hajj impacts the pilgrim along a variety of outcomes. For individual  $i$ , let  $Hajj_i$  be an indicator variable for whether they performed the Hajj and  $Y_i^k$  be an outcome of interest  $k$ . The simple specification

$$Y_i^k = \alpha^k + \beta^k Hajj_i + \varepsilon_i^k \quad (1)$$

will be biased if Hajjis differ from non-Hajjis along characteristics that directly affect the outcomes of interest; in other words, if  $\text{Corr}(Hajj_i, \varepsilon_i^k) \neq 0$ . Introducing demographic controls in equation (1) is unlikely to help much – individuals who choose to perform the Hajj are likely to be motivated by a wide spectrum of factors that are hard to identify *ex ante*. Even obvious determinants of participation, such as religious commitment or the desire for spiritual transformation, are difficult to measure accurately.

Pakistan’s Ministry of Religious Affairs allocates the majority of its quota of Hajj visas through a public lottery, which we discuss in detail below. We use an individual’s lottery outcome as an instrument for participation in the Hajj.

Success in the lottery is a strong but not perfect predictor of participating in the Hajj. Among successful Hajj applicants we surveyed, 99% went on the Hajj. Some unsuccessful lottery applicants may secure a place with a private Hajj operator or access a special quota. Thus, 11% of those who were unsuccessful in the government lottery still performed the Hajj that year.

To the extent that lottery success does not have a direct effect independent of Hajj participation, using individual  $i$ 's success in the lottery,  $SUCCESS_i$ , as an instrument in equation (1) provides unbiased estimates of  $\beta^k$ . While it does not seem likely that success in the lottery has direct effects, since our survey period was 8 to 11 months after the lottery, we have no explicit way of ruling this out. Were this the case, a regression of the outcomes of interest directly on lottery status would nevertheless yield a valid intention to treat (ITT) estimate. Such estimates are readily obtained by scaling our estimates down by around 0.9, the correlation coefficient between  $SUCCESS_i$  and  $Hajj_i$ .

Instrumental variables estimation of equation (1) produces a local average treatment effect (LATE), which is the impact of the Hajj on those who comply with the lottery. LATE can be interpreted as the “treatment on the treated” (TOT) if those not offered the treatment cannot take it. In our case, while almost everyone who was selected in the lottery went on the Hajj (i.e. there are very few never takers), some people who lost the lottery were also able to go. In this case the LATE can be interpreted as the effect of “treatment on the untreated.” More intuitively, if the treatment is defined as “not being able to perform the Hajj,” LATE captures the counterfactual impact of the Hajj on a person who was unable to go on the Hajj and is a lottery complier (i.e. is unable to use a private Hajj operator or special quota if unsuccessful). This is the estimate needed to evaluate the policy question of the marginal impact of more people being allowed to perform the Hajj.

### *The Hajj Lottery*

For the January 2006 Hajj that we study, Pakistan’s total quota was 150,000 visas. 90,000 visas were directly allocated by the government. The majority (89%) of these were part of the randomized lottery, with the remaining fraction (11%) reserved for those who were unsuccessful in both the 2004 and 2005 lotteries and for special quotas that include government and military personnel. The remaining 60,000 were allocated through private tour operators. We focus our analysis on the lottery applicants. The lottery is the primary source of visas for the average Pakistani, as most Pakistanis are not eligible for the special quotas and the private operators are typically more expensive.

Applications to the Hajj lottery were open between July 20 and August 15, 2005. The application was a simple two-sided form that the applicant submitted with a deposit to one of 1,559 bank branches across Pakistan. Approximately 138,000 people applied to the lottery, which was held publicly on October 3, 2005. The overall success rate was 59%. The first daily flights left for Saudi Arabia in early December from seven departure points across Pakistan and continued for over a month until immediately before the Hajj.

The lottery process is a bit more complicated than random selection of individual applicants. First, Sunni women are required to travel with a close male relative, known as a *mehrem*. In order to avoid a woman being selected without her *mehrem* and to avoid splitting groups who want to perform the Hajj together, the lottery is conducted over *parties* of up to 20 individuals who will travel and stay together during the pilgrimage. Parties are formed either voluntarily, often along family lines, or by staff of the bank branches.<sup>3</sup>

Second, parties are assigned into separate strata for the two main Islamic sects (Sunni/Shia), eight regional cities of departure, and two types of accommodation that vary slightly in housing quality. Parties are picked randomly from each stratum until the quota of individuals for that stratum is full. This process leads to a slightly lower chance of success for larger parties; If the selected party is larger than the remaining quota, it is set aside and another is randomly chosen from the remaining pool.

We therefore define stratum-by-party size cells  $c$  and modify our initial estimating equation (1) to include cell dummy variables:<sup>4</sup>

$$Y_i^k = \alpha^k + \beta^k \text{Hajj}_i + \lambda_c + \varepsilon_i^k \quad (2)$$

As before,  $\text{Hajj}_i$  is instrumented by the individual's lottery status. Standard errors are clustered at the individual's party level. Given that quotas for departure city were proportional to applications, and the very slight penalty for large parties, results are similar without the cell dummies.

Both the institutional details and empirical tests below offer evidence that the Hajj lottery was conducted fairly and resulted in a random assignment of visas, which is critical for lottery success to be a valid instrument for participation in the Hajj.

While corruption allegations are not uncommon in other public services in Pakistan, we are not aware of any reports of Hajj visa lottery manipulation. Not only did examination of the lottery selection algorithm suggest no grounds for suspicion, but it was designed and implemented by an independent and reputable third party. Moreover, wealthy or connected individuals typically go through a private Hajj tour operator or the special quota rather than participating in the Hajj lottery.

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<sup>3</sup> In our survey sample, 34% of applicants were in a party with fewer than 5 people (only 1% were in a party of 1), and 70% were in a party with 10 or fewer people. The remaining 30% were in groups of size 11 to 20.

<sup>4</sup> Given our sampling (described below) each cell in our data consists of one of four places of departure, one of two accommodation types, and one of 6 party size bins (of sizes 1 to 5, 6 to 10, 11 to 15, 16 to 19, 20, and more than 20). Our results are similar if we assign each party size a separate bin.

To test for random assignment, we check whether success in the Hajj lottery is correlated with applicant characteristics listed on the Hajj application forms, such as gender, marital status, year of birth, education, branch of application, and whether applicants listed a telephone number.<sup>5</sup> If applicants were able to circumvent the lottery *ex ante*, one would have expected significant differences by education level in lottery success as more educated people are likely to have more influence. In fact, the education variables are all precisely estimated zeros. A joint F-test fails to reject the null hypothesis of random assignment with a p-value of 0.98 (Table 1, Panel A).

While we believe our estimates are internally valid, caution is warranted in generalizing beyond the sample population. Since we only sample Sunni applicants from several geographically contiguous districts in Pakistan, we cannot test whether results would differ for Shia applicants or for those from other geographic regions. They may also differ for non-applicant Pakistanis and for Muslims from other countries.

Nevertheless, Hajj lottery applicants are likely to represent a wide range of Pakistanis. Table 2 compares characteristics of our surveyed applicants to Pakistan's adult population. Hajj applicants are similar to the adult population in education and household expenditures, though they are older and more likely to be married. The slightly higher literacy rates and slightly lower levels of higher education in our Hajj sample suggest both poor and rich are a bit underrepresented. While the very poor are unlikely to be able to afford the trip, the rich are more likely to travel with a private Hajj operator, both because there is no uncertainty (there is no lottery) and because private operators generally provide better accommodation and flexibility.

### *Indices*

Since our survey frequently includes several questions that attempt to capture the same underlying outcome, for ease of exposition we present our main results in the form of thematic indices that group related questions. For example, for views on female education we construct a single index that combines a series of questions such as whether girls should receive education, the level of schooling they should receive, etc. Results for each component question are reported in Appendix Tables 3-6.

An additional advantage of using indices is that while results on any single question could potentially be due to chance (Type I error), this is less likely when one simultaneously considers several related

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<sup>5</sup> This test is reasonably powerful both because of the large sample size (we use the full data on all 134,948 lottery applicants) and generally high quality data. Given the importance of this data in the selection process, applications are cleaned using several automatic and manual errors checks and applicants whose forms are not complete or verified at the time of the lottery are excluded from it.

questions in an index. Moreover, averaging helps reduce noise in the data, which is useful as sample size limits due to survey costs and logistics put us at risk of low statistical power (Type II error).

We report the index results using two methods. One approach constructs an overall index by averaging over individual variables. We normalize variables by their standard deviations, which ensures the indices are not affected by different scaling. We then average over all observations where at least one index component has a non-missing value. The downside of this approach is that it puts more weight on questions with fewer missing observations.

Our preferred approach is to compute the average effect size (AES) (see O'Brien, 1984; Kling et al. 2004), which gives equal weight to all index components. Consider a family of  $K$  related outcomes  $Y^*$ , with local average treatment effects due to the Hajj  $\pi_k$ . We define the average effect size of the

Hajj on the family of outcomes as  $\tau = \frac{1}{K} \sum_{k=1}^K \frac{\pi_k}{\sigma_k}$ , where  $\sigma_k$  is the standard deviation of outcome  $k$  in

the comparison group. To test for  $\tau$  against the null hypothesis of no average effect, we account for the covariance between the effects  $\pi_k$  by jointly estimating the  $\pi_k$  in a seemingly unrelated regression framework. We stack the  $k$  outcomes and use our treatment effects regression fully interacted with dummy variables for each outcome as the right-hand side. The coefficients  $\pi_k$  are the same as those estimated in the outcome-by-outcome regressions. Our stacked regression now gives us the correct covariance matrix to form a test of  $\tau$ .

## B. The Survey

As mentioned above, we surveyed successful and unsuccessful applicants to the 2006 Hajj lottery five to eight months after the Hajj.<sup>6</sup> The survey was translated into Urdu and subjected to three rounds of piloting. Its design included feedback from experts on religion, Islam, and Pakistan. The survey includes questions on religious knowledge and practice, tolerance, views on gender, social interaction and roles, political involvement and beliefs, physical and mental health, and business and employment, as well as background information on the household and its members.

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<sup>6</sup> While long-term effects are interesting, applicants can and do reapply in subsequent years, which raises issues with power and makes identification more complex. If the effects differ at different time horizons, then it would not be possible to separately identify them without information on lottery status from each lottery round. This is because the control group for performing the Hajj two years ago, for example, will include people who performed the Hajj a year ago.

Conducting a baseline survey was infeasible since the lottery took place less than a month after applicant data were available. Moreover, surveys after the lottery would not constitute a valid baseline because the successful applicants are preparing to leave and differentially affected.

The initial sampling frame was the list of all Hajj lottery applicants obtained from the Ministry. The survey area was limited for logistical ease to nine administrative districts in Punjab province.<sup>7</sup> The sample was also restricted to Sunni applicants, because there are too few Shia applicants to draw meaningful inferences and because the selection rules for Shia applicants are slightly different, as Shia women do not require male *mehrems*.

We then randomly selected parties that had applied from within these districts, and within each party randomly selected an individual to interview. If other members of the party of the opposite gender were identified as living with the individual, a second person (of opposite gender) was randomly selected for interviewing. We selected equally from successful and unsuccessful parties to maximize statistical power.

#### *Survey Logistics*

The survey was typically conducted at the respondents' place of residence. The surveyors were all Urdu speakers with facility in the regional languages (such as Punjabi) spoken in the survey area and were of the same gender as the respondent. The purpose of the survey was introduced as soliciting the opinions of both successful and unsuccessful Hajj applicants on a variety of issues. Interviewers were careful not to explicitly ask about the impact of the Hajj so as not to bias responses. Questions directly related to views on the Hajj were asked at the end of the survey.

Surveyors used addresses and telephone numbers provided in the applications to locate applicants. This was challenging since addresses were often hard to find, and applicants sometimes lived in a different location from the one given (which might belong to a relative they had traveled with, for instance). Moreover, while at least two subsequent attempts were made to contact applicants who were not initially available, it was not always possible to interview everyone selected.

Surveyors attempted to find 2,537 applicants and successfully completed 1,605 interviews, yielding an overall interview success rate of 63% (Table 3, Panel A). In about three-quarters of the unsuccessful attempts, the surveyors were unable to locate the applicant. In many cases, the applicant had never lived in the province but had applied there to be able to travel with their family.

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<sup>7</sup> The districts were Attock, Islamabad, Rawalpindi, Jhelum, Chakwal, Faisalabad, Sargodha, Multan, and Gujrat.

In other cases, an incomplete or incorrect address had been given. However, the overall refusal rate was only 8%. Excluding people who could not be contacted, the survey completion rate was 88%.

Successful applicants completed the survey at a 66.5% rate, higher than the 60.0% rate for unsuccessful applicants. This difference is statistically significant at the 1% level and is primarily due to a somewhat higher probability of finding and lower refusal rate for successful applicants (Table 3, Panel A). The former potentially arises because Hajjis are easier to locate: they have recently traveled abroad and are thus better known in their locality. This is especially true in rural areas where physical addresses are not sufficient to locate a person. The latter may arise because our interview introduction procedures may have lead successful applicants to be slightly more willing to give the interview.<sup>8</sup>

The unbalanced interview completion between successful and unsuccessful lottery applicants could potentially introduce selection and bias our estimate of the Hajj effect.<sup>9</sup> Therefore, we provide three robustness checks against selection concerns. First, Table 1 Panel B shows that for *completed* interviews, lottery success is not correlated with applicant characteristics. Thus, non-responses did not result in the successful and unsuccessful interviewed applicants being unbalanced on observable characteristics. None of these observable characteristics are individually or jointly significant.

Second, our results are robust to demographic controls. The forms of selection that are most likely should be correlated with controls such as education level, which is a good proxy for opportunity cost of time and hence willingness to give an interview. None of our 25 index results qualitatively change in the primary IV specification with controls for district, urban or peri-urban location, and individual characteristics. Moreover, on average, there is no change in the point estimates either.<sup>10</sup>

Finally, we examine the robustness of our results to a restricted subsample (Table 2) that excludes nine out of the 49 *tehsils* (sub-districts) in our survey area that were particularly difficult to survey. This subsample is balanced on survey completion and reasons for non-completion. It excludes *tehsils*

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<sup>8</sup> Our survey was introduced as soliciting opinions on a whole range of topics from Hajj applicants. Human subjects procedures required us to inform respondents that their names had been randomly selected from the list of Hajj applicants. Despite our assurances otherwise, some unsuccessful respondents may have been more likely to decline giving the interview thinking they would have less to say if there were questions directly on the Hajj.

<sup>9</sup> A selection effect would imply the marginal surveyed successful applicant is less willing to give an interview (more uncooperative) and harder to locate. This is because the initial randomization guarantees successful and unsuccessful applicants are distributed identically along any attribute. For example, if a selection effect is introduced by successful applicants gaining incremental visibility from traveling, the marginal successful applicant found is slightly less well known *ex ante* than the marginal unsuccessful applicant found.

<sup>10</sup> We can use additional data such as assets and expenditure from survey data and the results are robust to these as well. We prefer not to present these as primary controls due to their potential endogeneity.

with more than 25 selected applicants (*tehsils* with smaller samples may generate imbalance mechanically) where the completion rate for successful applicants exceeded unsuccessful ones by more than 7%. This subsample contains 81% of the total interviews. In the restricted subsample, having gone on the Hajj did not play as large a role in our ability to locate respondents and refusals were less unbalanced. While the completion rate was still somewhat higher for successful applicants (65.8% vs. 64.0%), we fail to reject the null hypothesis of an identical completion rate with a p-value of 0.66. As in the full sample, lottery success in the interviewed sub-sample is uncorrelated with applicant characteristics (Table 1, Panel B). There is no qualitative change in any of the indices and point estimates are similar on average. Only two of the indices that were statistically significant at conventional levels in the main sample fall below conventional significance levels in the restricted subsample, and even these still remain marginally significant at 11% and 12%.

## 4. Main Results

This section presents our main results on the impact of the Hajj. Subsections A-D examine religious behavior and practices, tolerance, gender attitudes, and well-being, respectively.

Tables 4-7 present results for each index in a separate row. The first three columns present the average effect size (AES) estimates for our base specification followed by the control and restricted subsample specifications. The last columns present the regression result using the averaged index method for the base specification. Given the robustness of our results to these alternative specifications, we will focus primarily on the first column AES estimates. Appendix tables present the details of every component question in each index, including Hajj impact estimates on each component question.

Our estimates capture the medium-term effect of the Hajj, i.e. five to eight months after pilgrims return. While we have limited statistical power to detect whether our estimates decay over time, we do not find any significant changes over the four-month period of the survey.

### A. Religious practices and beliefs

Hajjis are 13% more likely to report they are regarded as a religious person, a one-quarter standard deviation increase relative to the control group (Table 4, Row 1).<sup>11</sup>

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<sup>11</sup> We asked about religiosity in this indirect way since the Islamic doctrine on modesty may lead the pious to not want to claim that they are so. Of course, this introduces the possibility that Hajjis will think that others will regard them as religious merely because they went on the Hajj.

Three indices explore how the Hajj affects religious practice and belief. The first measures global Islamic religious practice, meaning the performance of rites universally acknowledged within the Muslim world. Questions include whether the applicant prayed five times per day, prayed in congregation, fasted, recited the *Qu'ran*, and engaged in religious remembrance and dialogue. The Hajj increases the global religious practice index by 0.16 standard deviations (Row 2). This is a fairly large effect, particularly since it reflects practice five to eight months post-Hajj, and not the fervor of a recently returned pilgrim. Most of the components of the index registered an increase (Appendix 2). Hajj nearly doubled the number of individuals regularly fasting outside of *Ramadan* (the obligatory month of fasting) to around 9% and increased praying *Tahajjud* (supererogatory) prayers by two-thirds.

In most Muslim countries, there are a variety of Islamic traditions that are not as universally accepted as the global practices discussed above. While some of these localized beliefs and practices are common to multiple countries, others are specific to particular countries or regions. The rituals performed on the Hajj highlight global practices. Localized practices might decline either because global and localized practices compete for time and attention, or because the Hajj induces a shift in belief.

Rows 3 and 4 of Table 4 provide evidence of an absolute shift away from localized beliefs and practices. The localized belief index combines ten questions about aspects of Islam that are fairly common in South Asia but not common to Muslims globally. Some involve rites that have roots in Sufi tradition, while others reflect local interpretation of Islamic doctrine. Further questions concern the long syncretic interaction between Islam and Hinduism. While most pilgrims initially have moderately high levels of localized beliefs, the Hajj reduces them by 0.10 standard deviations. Specific examples of these beliefs related to ritual include whether it is beneficial to visit tombs of religious figures such as saints, to use amulets, or to perform the 40-day death ceremony (*chaleeswan*). Doctrinal questions reflecting a greater local influence include the necessity of wearing a cap during prayer (a belief common in Pakistan), of giving a dowry in marriage (Islam instead emphasizes *mehr*, where a man commits to a payment to his wife in case of divorce) and the priority that widows ought to be accorded in remarriage compared to unmarried women. In South Asia, women lose a great deal of status when their husbands die and prospects for remarriage are bleak; in Islam, marriage is a contract that dissolves with the death of the husband, and a widow can remarry after a short waiting period.

We construct a similar index of localized religious practice (Row 4). The components mainly relate to participation in Sufi traditions. They include obtaining religious amulets, visiting *pirs* (holy men) and the tombs of saints, and attending religious gatherings known as *maulud mehfil*. Consistent with

the impact on localized religious beliefs, we see that the Hajj reduces the index of localized religious practices by about 0.10 standard deviations.

Does this effect on religious belief and practice emphasizing more global, *Qu'ranic* traditions reflect the exposure to diversity we highlighted in our description of the Hajj, or a shift towards a more Saudi/*Hanbali* interpretation of Islam? Given that the latter also emphasizes *Qu'ranic* traditions, it is possible that greater adherence to its tenets could lead to the shifts in belief and practice we observe. We will show below and in further discussion in Section 5 that the weight of the evidence points more towards the exposure channel.

## B. Tolerance

The social psychology literature suggests that the interactions on the Hajj among pilgrims from different countries and backgrounds could lead to more or less positive feelings toward others, depending on whether the interaction is cooperative or competitive. Empirically, Hajjis show more positive views towards other nationalities and social groups, greater tolerance, and are more peacefully inclined.

We examine an index of individuals' views about people from other countries in Table 5, Row 1. The component questions ask what respondents think of people from different countries, ranging from very positive to very negative. Hajjis experience a 0.15 standard deviation increase in positive views, a more than 33% increase relative to the control group. The individual questions suggest that Hajjis update their beliefs most positively about nationalities they are likely to interact with frequently (Appendix 3). The largest positive impact (an increase of 0.32 standard deviations) is on views towards Indonesians, who form the largest non-Saudi pilgrim group and whom Hajjis in our survey also report as observing the most. Hajjis also have a more positive view of Saudis, though the effect is a smaller 0.14 standard deviations. Hajjis are also significantly more likely to declare that Indonesians are the best practitioners of Islam (regression not reported). In follow-up open-ended interviews, Pakistani Hajjis also reported positive interactions with Indonesians. For example, one older female Hajji said, "I had a very good experience with female Hajjis from Indonesia. They would make space for me whenever I was walking if I gestured for them to do so. One of them even gave me Vicks VapoRub when she found out that I had the flu."

We examine views on equality of different social groups in Table 5, Row 2. The components of this index ask respondents to rank other groups relative to their own. The groups considered are religious sects within Islam, Pakistani ethnicities, and different religions. There is considerable tension along all of these dimensions in Pakistan. Hajj increases the belief that other groups are

equal to one's own by 0.13 standard deviations. In contrast to the views on different nationalities, the largest move towards equal status is for the group that Hajjis would *not* have encountered during the Hajj – people of a different religion – as only Muslims are permitted to attend. This, and the results on harmony across different groups examined next, suggest that Hajjis may be willing to further extend their notions of tolerance beyond the Muslim world.

If Hajj leads to more positive views towards others and increased belief in equality – even towards groups not present on the Hajj – how does it affect beliefs about how groups get along? We construct a harmony index in Row 3 that separately asks Hajj applicants whether they think people from different ethnic groups, Islamic sects, and religions could live together in harmony in the same society by making agreements with respect to their differences. The index also includes a practice-based question about how frequently the respondent prays in a mosque of a different school of thought.<sup>12</sup> Hajjis experience an increase of 0.13 standard deviations in the harmony index. As with the equality-across-groups questions, examining the individual questions shows that the effect is largest for religion, about which the control group has the lowest belief regarding harmony. The effect on praying in a different mosque is also large, almost doubling the control group mean of 4.5%.

We complement the harmony index by exploring the extent to which the Hajj leads to greater inclination towards peace. Hajjis exhibit a 0.11 standard deviation increase in peaceful inclination (Row 4). Questions in the index include views on the correctness of both the goals and methods used by Osama Bin Laden, on suicide bombing and attacking civilian targets, and on the importance of peace with India and support for those fighting the Indian government in Kashmir. We also ask whether it is appropriate to inflict punishment on those who have dishonored the family, to indirectly explore views on honor killings.

Examining the component questions, we find that while slightly more than half the respondents state that the goals for which Osama bin Laden is fighting are correct, Hajj almost doubles the number of respondents who are willing to explicitly declare that these goals are incorrect from 6.8% to 13.1%. While a third of respondents agree with the methods bin Laden uses, Hajj increases the fraction explicitly declaring them to be incorrect from 16% to 21%. Hajjis are significantly more likely to think that peace with India is important. They are also 17% more likely to say it is never correct to physically punish someone who has dishonored the family.

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<sup>12</sup> There are four different mutually recognized schools of thought in Sunni Islam. Within these there are further variants.

A concern is that Hajj may have different effects on tolerance and peaceful inclination for young and old, with young people potentially more susceptible to intolerance. Although our power to detect small interaction effects is limited, it is worth noting that the Hajj effects on the four tolerance indices examined do not show any differential effect for younger pilgrims (regressions not reported). In fact, the harmony index shows a larger effect on the young. We view this as consistent with the updating of beliefs on Hajj as younger people's beliefs are likely to be more flexible.

We now tie our results on tolerance and peaceful inclination to the earlier results on increased global religious practice. One might suspect that increased orthodoxy in religious practice could be associated with the desire for a closer relationship between religion and politics, and potentially also affect perceptions of the West. Our results below show no increases in either the role of religion in politics (in fact there is slight decrease) and no worsening in views towards the West. One possibility is that increased tolerance tempers such desires and perceptions, if they do in fact go along with increased orthodoxy.

The Hajj reduces support for political Islam, although the effect is only weakly significant at 15% (Table 5, Row 5). The political Islam index includes questions on whether the state should enforce religious injunctions, if religious leaders should influence the state and be able to dispense justice, and whether politicians' religious convictions are deemed important. While the average respondent is likely to see a role for religion in matters of the state, Hajjis are no more likely to do so in spite of an increased attachment to global Islam. In fact, the Hajj significantly reduces beliefs that the state should enforce religious injunctions and that religious leaders should be able to dispense justice on their own.

The Hajj does not lead to any increase in an index of negative attitudes toward the West (Row 6). The index encompasses views on adopting Western social values and technologies, on how much the West keeps Pakistan's interests in mind, and whether events such as the Sept 11<sup>th</sup> attack in the United States and the 2005 London bombings were not carried out by Muslims but had a Western/Jewish role.

Moreover, we find no evidence that the Hajj affects the tails of the distribution of attitudes towards political Islam and views toward the West or that it had differential effects on these attitudes for potentially more susceptible younger respondents.

## C. The Hajj and Gender

When describing the Hajj, we drew attention to two classes of opportunities to observe and interact with others that we believe are particularly salient for Pakistanis: those involving other nationalities and those across gender. Does the increased tolerance we see Hajjis expressing toward other social groups have a parallel in their views of women? Recall that the Hajj not only provides Pakistani pilgrims a novel opportunity in which men and women perform rituals as equals and mix with individuals outside their family group, but also allows them to observe the gender roles of other nationalities.

Hajjis show a 0.12 standard deviation increase in an index of questions about the status of women relative to men along intellectual, spiritual, and moral dimensions (Table 6, Row 1). The effect is largest on the spiritual dimension with an increase of over 50% (from 11% to 17%) in believing that women are better (Appendix 4). Hajjis are also more likely to believe that while there are differences between women and men, women's overall status is equal.

To see whether respondents become more aware of difficulties that women face in Pakistan after observing gender roles of other Muslims on the Hajj, we construct an index that captures respondents' beliefs about the relative quality of women's lives in Pakistan.

The index includes respondents' rating of women's quality of life in Saudi Arabia, Indonesia/Malaysia, and the West relative to Pakistan, and questions about the extent of crimes against women in Pakistan, both absolutely and relative to crimes against men. Hajjis show an increase of 0.16 standard deviations in the index (Table 6, Row 2), indicating a greater awareness of the issues that women face in Pakistan.

Hajj has the largest effect on the view that women in Indonesia/Malaysia have a higher quality of life relative to Pakistan, paralleling the previous results on views of other nationalities. Moreover, Hajjis show a larger increase in their views on the relative quality of life of women in the West compared to Saudi Arabia (Appendix 4). While this is partly because the average control group applicant has a lower opinion of women's quality of life in the West than in Saudi Arabia, it is nevertheless interesting given limited opportunities to observe or interact with Westerners on the Hajj. Results on women's relative quality of life are driven both by a slight decrease in views regarding Pakistan and by absolute increases in views regarding other countries. Hajjis are also more likely to think that crimes against women are high, both on an absolute scale and relative to crimes against men.

Do the more favorable assessment of women's qualities and the more negative view of their quality of life in Pakistan go along with a changed view of the role women ought to take in society? We construct three indices to explore the areas of girls' education, women's workforce participation and choice of professions, and the willingness to challenge the authority of men relative to women within the household and in social contexts (Table 6, Rows 3-5).

The Hajj increases favorable views toward education for girls by about 0.09 standard deviations (Row 3). Index questions cover school attendance for girls, coeducation, and education of girls relative to boys. We find positive Hajj effects on all components except equal educational attainment across gender, which is perhaps the most demanding. For example, Hajjis are more willing to allow both their boys and girls to attend coeducational schools at all levels (around an 8% increase for both).

Further, the Hajj increases an index of questions about women's workforce participation and profession choice by 0.12 standard deviations (Table 6, Row 4). The index combines views on daughters/granddaughters working, type of profession, and the importance of a prospective wife for a son or grandson being employed. The Hajj has a substantial impact on each component. For example, Hajjis are 8% more likely to desire their daughters/granddaughters work, and 12% more likely to think it is important that their future daughter-in-law be employed.

However, Hajjis' more favorable views of women do not extend to challenging male authority in the household (Table 6, Row 5). Our index includes questions on domestic matters, such as a woman's ability in managing daily affairs and wives' say relative to husbands' in deciding how many children to have. It also includes views on the correctness of a woman unilaterally seeking divorce from her husband, of marrying against her parents' wishes, and of women's employment rights over men in times of scarcity. It further includes opinions on Islamic rules that accord men higher status: unequal inheritance laws (sons get twice the share of daughters) and the relative weight of women as witnesses (a male's testimony is considered the equivalent of that of two women in financial transactions). The fact that the Hajj has little or no impact on this index despite our previous results showing positive impact on women's qualities, education, and work is not surprising given the greater authority and responsibility typically accorded to men along several dimensions within Islam.

Nevertheless, the changed perceptions about gender roles do seem related to more everyday changes in household behavior. The Hajj increased the fraction that reported having disagreements with their spouse at least some of the time by 10 percentage points, a large increase relative to the comparison mean of 15% (regression not reported). Since most married couples perform the Hajj together, it is

not possible to separate this effect by gender of the respondent (since it will reflect both their own and their spouse's Hajj impact).

While sample size limitations do not readily allow us to examine heterogeneity of the impact of the Hajj, nevertheless we find that among our gender indices, only the girls' education index shows a smaller increase for men than women (regressions not reported).<sup>13</sup> In fact, the Hajj leads to somewhat larger changes in the indices of views on women and quality of life for male Hajjis than for female ones.

## D. Well-Being

Given the nature of the Hajj experience and in light of the significant attitudinal and behavioral changes we have found, we now examine the effect of the Hajj on emotional and physical well-being.

The results show that Hajjis, primarily women, are more likely to report negative feelings that suggest distress, and are less likely to report positive feelings of well-being (Table 7, Rows 1-2 and 5-6). This could potentially be due to the changes in Hajjis' beliefs and frame of reference discussed above (which the psychology literature suggests can lead to stress), to financial distress associated with the cost of the Hajj (for which we find little evidence), or to the impact of the Hajj on physical health.

Hajjis report somewhat higher distress, as measured by a version of the K6 screening scale (Kessler et al., 2003).<sup>14</sup> Our rescaled index aggregates respondents' experience of six negative feelings in the past month, individually measured on a 0 to 4 scale, where 4 represents no negative feelings. A higher value on our index thus represents less distress. Hajj applicants had a low level of underlying distress: the mean sum of the six components was 21 out of a possible 24. The Hajj reduces our rescaled K6 index by 0.21 standard deviations (Table 7, Row 1).

The Hajj also reduces an index of positive feelings composed of five questions by 0.11 standard deviations (Row 2). The average comparison group respondent reports positive feelings some of the time. Three questions ask how often the respondent felt relaxed and peaceful, content, or joyful in the past 30 days. Two further questions solicit how much respondents enjoy life and how happy

<sup>13</sup> The differential effect is driven primarily by the question on whether boys and girls should receive equal schooling. There is also a mechanical effect from the question about whether girls should be educated: the mean level for unsuccessful male applicants is higher than for corresponding females, and the Hajj effect pushes women close to 100% agreement. Since the level for male Hajjis cannot exceed 100%, the Hajj mechanically has a larger effect on females.

<sup>14</sup> We should caution that, to our knowledge, the K6 index has not been formally validated for Pakistan.

they feel. In the restricted subsample, the Hajj effect drops slightly to 0.08 standard deviations with a marginal significance of 11%.

As highlighted above, the increase in distress falls entirely on women (Table 7, Rows 5-6). On both the rescaled K6 index and the positive feelings index, there is no significant effect of the Hajj on men. Increased distress might be due to the stark contrast between the typical Pakistani woman's daily life and the relatively greater equality and integration experienced during the Hajj. The impact of the Hajj on gender attitudes suggests an increased realization that several of the constraints women are accustomed to in Pakistan – such as gender-related restrictions – may not be part of global Islam. A literature in psychology (Crosby, 1991; Lantz, et al., 2005) suggests that such changes in people's frame of reference can induce significant stress, although eventually such stress helps deal with the change. Alternatively, it may be due to the effect of the Hajj on physical health for women.

We construct an index that includes questions on satisfaction with life overall, the extent to which there was room for improvement in life, and satisfaction with one's financial situation. While the Hajj has a negative impact on a female pilgrim's emotional state, it does not affect overall life satisfaction, either on average or for females (Rows 3 and 7).

Moreover, the lack of any effect on the individual question on financial satisfaction suggests that the negative impact on emotional state does not appear to be related to the financial expenditures incurred on the Hajj (Appendix 5). In fact, 90% of respondents say the Hajj would/did not change their income.<sup>15</sup> Our interviews reveal that most do not consider the pool of savings for the Hajj as fungible; those unable to go keep these Hajj funds in order to reapply in the future. We further find the Hajj does not affect monthly household consumption expenditures or a measure of household assets (regressions not reported).

The Hajj leads to a 0.21 standard deviations reduction in an index of physical health (Table 7, Row 4). Index components ask respondents to rate their physical health and to report whether they had sustained a serious illness or injury<sup>16</sup> in the past year. While the decrease in self-perceived health could be due to a change in the reference group for Hajjis from local people to those encountered from other countries on the Hajj, it is not clear that this could account for the doubling in reports of serious physical injury or illness.

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<sup>15</sup> 84% of business owners stated that the Hajj expenses did not take away from their business investments or affect business returns.

<sup>16</sup> We define an illness as serious if it has lasted seven days or longer and has prevented someone from doing their normal activities.

The negative physical health effects are also stronger for women (Row 8), suggesting that part of the negative effect of the Hajj on women's feelings of well-being could be explained by poorer physical health.<sup>17</sup> However, the negative point estimates on men's physical health are larger than the effect on the K6 index (0.11 vs. 0.04 standard deviations) suggesting the two do not exactly co-move. Also, the coefficient on Hajj lottery success in a regression predicting the K6 index is similar whether or not one controls for physical health, providing further suggestive evidence that the channel for Hajj effects on emotional health is not simply through physical health.

## 5. Potential Channels

This section attempts to shed some light on the potential mechanisms that may explain our findings. In subsection A, we argue that the impact of the Hajj is not likely due to the changes in the social role of Hajjis upon their return. In subsection B, we present evidence that the Hajj impact is likely due to exposure to others from different backgrounds on the Hajj.

### A. Engagement

The Hajj could potentially affect the pilgrim by altering the pilgrim's social status and engagement upon his or her return. In turn, these social changes may indirectly induce some of changes in views noted above. Historical accounts suggest the Hajj confers social prestige, potentially leading to greater social and economic engagement and benefits (Donnan, 1989; Yamba, 1995; Eickelman and Piscatori, 1990). Hajjis are thought to be treated with increased deference and respect, with pilgrims using the title of Hajji/Hajjin. However, some have argued that as the number of pilgrims has increased in recent years, this aspect of the Hajj is becoming less salient (Scupin, 1982).

We construct an index of the effect of the Hajj on social status and engagement, and find no overall impact (Table 8, Row 1). The 15 components include the frequency with which respondents receive or make various social visits; how often they gave advice on family, business or religious matters to close and distant friends/relatives; membership in religious, professional, or educational organizations; and employment status.<sup>18</sup>

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<sup>17</sup> Negative physical health effects are not, however, larger for older people.

<sup>18</sup> All except two component questions are not significant even at the 20% level (Appendix 5). These two show that Hajjis are slightly more likely to have visitors from out of town, and slightly more likely to be self-employed (p-values 0.14). However, the magnitudes of these effects are small (5% and 3%).

If Hajjis indeed took on a greater role in their communities after their return, we might expect them to be more aware of and engaged in political affairs. In fact we find no impact of the Hajj on a political engagement index (Table 8, Row 2) either comprised of seven questions on voting in recent elections, interest in national affairs, having opinions about politicians, and membership in political parties and other political or civic organizations.

Our findings are consistent with anecdotal evidence from Pakistan that suggests that Hajjis no longer experience the increased social status and attendant greater engagement they once experienced. In fact, only 16% of our survey respondents declare a preference for using the title *Hajji/Hajjin*. While it is possible that Hajjis' social status and engagement changes will show more change over the longer term, the changes we see in religious belief and practice, tolerance, and gender attitudes do not seem to be driven by changed social engagement and status of Hajjis.

## B. Exposure

What aspect of the Hajj changes the pilgrim's religious belief and practice, tolerance, and gender attitudes? While one cannot rule out the possibility that these changes are due purely to the religious element of the Hajj, we now present evidence that points towards Hajjis' increased exposure to Muslims from around the world.

We construct indices that measure the Hajji's knowledge of formal religious matters, the diversity of opinion within Islam, gender within Islam, and the world at large (Table 8, Rows 3-6). While the diversity and gender knowledge indices also include questions pertaining to religion, we separate them from formal religious knowledge because they are more likely to be affected by observations and interactions during the Hajj and thus reflect the exposure channel.

The results are quite stark: Hajjis experience no increase in formal religious knowledge but show an increase in experiential knowledge about diversity of opinion within Islam, gender within Islam, and the world more broadly.

The Hajj has no impact on the index of formal religious knowledge that covers questions such as how many chapters there are in the *Qu'ran*, whether the details of daily prayer are described in the *Qu'ran*, and how long one must hold wealth for it to have *Zakat* (religious tax) due on it. (Table 8, Row 3). This may not be surprising since the Hajj is more about religious practice than pedagogy.

In contrast, the Hajj increases the index measuring knowledge of the diversity of opinion within Islam by 0.15 standard deviations (Table 8, Row 4). Index components include knowing how many

accepted schools of thought there are in Sunni Islam and how they differ on some religious matters, such as the necessity of wearing a prayer cap and the validity of divorcing by verbal pronouncement.

The Hajj increases the index of gender knowledge and awareness by 0.13 standard deviations (Table 8, Row 5).<sup>19</sup> This index combines eight questions on gender and marriage in Islam and more generally having an opinion on women's issues. Components include whether dowry is mandatory in Islam, the permissibility of marriage to non-Muslims, and whether the respondent expresses an opinion about quality of women's life in other countries.

The Hajj also increases the index of global knowledge by 0.08 standard deviations (Table 8, Row 6). We should note that the effect falls slightly to 0.07 standard deviations and is marginally significant at 12% in the restricted subsample. The index reflects awareness of the world. The questions include asking what is the largest Muslim country, what percentage of Nigerians are Muslim, who is the Prime Minister of India, which countries border Pakistan, what are the two largest countries in the world, and whether the UK or US is further away from Pakistan. These changes in experiential knowledge point to the exposure channel and the importance of interaction with and observation of other groups.<sup>20</sup>

We can offer some explicit tests of the importance of group observation and interaction by examining whether Hajjis' informational gains differ depending on party size. Recall that Hajjis travel in parties of different sizes that range from 1 to 20 people. Assuming that Hajjis in smaller parties of fellow Pakistanis are more likely to interact with non-Pakistanis, larger effects for smaller parties would lend further support to the importance of the group interactions channel. Along all three knowledge indices – diversity, gender, and global – Hajjis that belong to smaller (below median) parties experience larger gains. The coefficients on the interaction between the Hajj and small party size are large and significant at conventional levels for the gender and global knowledge indices (the effect on smaller groups sizes is 0.13 and 0.14 standard deviations larger, respectively, with p-values of 0.07 and 0.10). Similarly, the index that captures positive views towards other countries also shows a greater increase for Hajjis in smaller parties (a 0.14 standard deviations larger effect, p-value 0.06). Point estimates for the interaction between Hajj and group size on the other

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<sup>19</sup> Four of the eight questions in the gender knowledge and awareness index are about awareness rather than knowledge: whether the respondent has heard of the Islamic law against adultery and whether they have an opinion on women's lives in three different countries. The Hajj has a somewhat smaller, but still significant, effect on a pure gender knowledge index that is constructed without these questions.

<sup>20</sup> While some of our results could be due to a generic effect of traveling to a different country rather than the experience of the Hajj, it seems unlikely this accounts for all of the results. For example, it is hard to see why a pure travel effect would lead to more positive beliefs about Indonesians. Moreover, the Hajj has no, or at best a negative, impact on willingness to migrate for work-related reasons to another part of Pakistan; a richer; Arab; Muslim or a Western country. One may have expected this to increase if the pure travel effect was an important driver.

tolerance indices also point to a similar story, although the standard errors are large enough that the interactions are not statistically significant. There is also some evidence that members of smaller parties are more likely to shift away from localized religious practices. The party size interactions are robust to including other demographic controls and their interactions with the main effect, though it is of course impossible to rule out the possibility that other unobservable differences between parties of different sizes account for the larger treatment effect in smaller parties.

While Hajjis are also likely to observe and interact extensively with Saudis and are exposed to the country, it is unlikely that the effects we observe are driven by this experience alone. The move away from localized religious practices could be seen as an influence of the Saudi view of Islam, but both the fact that the Hajj encouraged greater tolerance towards other sects and our results on gender suggest that this is unlikely. Saudi Arabia is generally less accepting of other schools of thought and enforces strict gender segregation; Hajj impacts on gender views are more in line with the more liberal attitudes in other Muslim countries. A comparison of gender views across questions from the World Values Surveys shows that Saudis indeed have more conservative gender views than Pakistanis, while Pakistanis in turn are more conservative than Indonesians.<sup>21</sup>

In addition to the effect of being exposed to diversity and cooperative interactions with others, the exposure channel may induce a convergence towards the Islamic mean. Hajjis are likely to be influenced by the practices and beliefs of the typical pilgrim that they encounter during the Hajj, with possibly greater salience to those groups that are more visibly different or are regarded as better in some way, such as in their behavior or organization (factors often mentioned in our interviews).

To the extent that this convergence is a significant force, some of our results may differ for pilgrims from other countries. While this is less likely to be the case for the results on tolerance, which we believe to be generated via social interactions and exposure to diversity, the impact on gender may differ for pilgrims from more liberal countries, such as Indonesia or Turkey. Were the convergence effect more powerful than the effect of gender mixing, the Hajj could conceivably move these pilgrims towards relatively more conservative attitudes on gender.

Regardless of the relative importance of these factors and the potential for regional heterogeneity, our results suggest that overall global exposure is likely an important channel in explaining the change we observe in Hajjis' beliefs and attitudes.

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<sup>21</sup> 62% of Saudis believe a university education is more important for men than women, compared to 24% Pakistanis and 17% Indonesians. Similarly, 34% of Saudis do not think that both husband and wife should contribute to household income, compared to 30% Pakistanis and 15% of Indonesians.

## 6. Conclusion

Our findings show that, despite pilgrims being past the age at which belief and identity are considered most malleable, the Hajj has quite a remarkable effect in shaping the views of Pakistani pilgrims. It induces a shift from localized beliefs and practices towards global Islamic practice, increases tolerance, and leads to more favorable attitudes toward women. We find no evidence that by raising cohesion within the Muslim community, the Hajj threatens non-Muslims. On the contrary, the Hajj makes pilgrims more peacefully inclined, and increased tolerance extends to adherents of other religions. We conclude with some tentative implications of our results on how social institutions help shape individual beliefs and identity and, at a macro-level, how they may foster unity within belief systems.

While there is no natural experiment that can isolate the impact of different elements of the Hajj, we have argued that an important channel is increased exposure mediated through social interactions. Drawing on the experimental literature on social psychology suggests that the Hajj is able to induce positive views toward others by providing a cooperative setting for interaction. This is likely created by the pilgrims' common religious goals and rituals and by several aspects of the Hajj that emphasize their common identity. People leave their everyday environments and restrictions on mixing across certain lines (Islamic sect or gender, for example), and enter a setting in which they dress identically and collectively undergo an intense and likely bonding experience.

Although we cannot rule out the possibility that a month long *non-religious* interaction with others from around the world would have similar impacts as the Hajj, our results are consistent with the view that religion serves to bind people who would otherwise not socialize (Putnam, 2007). In addition, the changes in attitudes observed seem to be shaped by the religious context. For example, Hajjis' changed attitudes on gender appear to be circumscribed by those norms broadly accepted in Islam. It is also possible that the religious context may provide the legitimacy that makes it acceptable for adherents to alter their views. If a Pakistani woman observes her Indonesian counterpart engage equally with her spouse without comprising her piety, she may also consider it permissible to do so. If pilgrims see others praying somewhat differently yet without interference in the holiest of Muslim places, they may reason that some degree of religious diversity is acceptable.

Whereas the Hajj shapes belief and identity in an Islamic way, a wide variety of other social institutions, including non-religious ones, also forge common aspirations and identity among participants. While these institutions undoubtedly differ in myriad ways, and it would be reductionist to view an institutional feature as having a particular goal, it is nevertheless noteworthy that they share many features with the Hajj that might foster common identity. Consider examples such as

medical education, police training, military basic training, and international peace camps.<sup>22</sup> Like the Hajj, they all remove participants from their everyday environments and place them in a new setting in which mixing across groups such as ethnicity, which might otherwise be limited, is both sanctioned and unavoidable. Participants are typically exposed to a strenuous experience that often requires cooperation from others. They perform similar actions and rituals together at the same time. Moreover, some participants also alter their appearance in ways that accentuate their similarity by taking on common dress or hairstyle<sup>23</sup> during the event and a common title afterwards.

Our results also raise questions from the standpoint of the economic study of religion, pioneered by Iannaccone (1992), Berman (2000), and Fink and Stark (2005), about why particular religious institutions, including pilgrimage, are so common despite the costs they may impose on participants. While pilgrimage is central in Islam, it is also a feature of other religions. Catholics travel to Lourdes and Rome. Ancient Jews regularly gathered in a central temple in Jerusalem until its destruction by the Romans. Hindus travel to the Kumbh Mela. While religions may explain their existence by their divine sanction, from the standpoint of the economics of religion, it is not obvious why religions that incorporate such costly practices have been successful in competing for adherents.

Iannaccone (1992) argues that costly religious practices serve to signal commitment to the religion and screen out people who might free ride on public goods provided by a religious community. While this explanation fits many contexts, it is not clear that it provides an adequate explanation for the role of the Hajj. Only mandated on those with financial means, the Hajj is not required to become a part of the Muslim community. More generally, it is unclear why costly practices that serve only a signaling function would not be outcompeted in a religious marketplace by practices that directly promote the survival and growth of the religious community.

Historically, the Hajj created significant trade benefits and may have also allowed for diffusion of economic, cultural, and scientific ideas (Bose, 2006). Our results on the present-day Hajj suggest that the Hajj may help enable Islam to overcome an evolutionary hurdle faced by potential world religions: maintaining coherence and unity in the face of the tendency for practices and beliefs to diverge through local adaptations, potentially leading to splits. A number of religious institutions, including written holy texts, can potentially help overcome this hurdle. In the Catholic faith, central authorities can enforce uniformity to some extent. In Sunni Islam, there is no central authority, which may make the role of pilgrimage particularly important. Our findings are consistent with the

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<sup>22</sup> One such camp, Peace Camp Canada, brings Israeli and Palestinian youth to Canada each summer for two weeks to engage in an intensive, cooperative activity, such as filmmaking.

<sup>23</sup> Male Hajjis typically shave their heads following the completion of the Hajj.

idea that by moving pilgrims toward the religious mainstream and promoting tolerance, the Hajj reduces tendencies for splits.

To the extent that the Hajj promotes a convergence among participants, the question of who can participate in the Hajj assumes central importance. While people of different faiths made the pilgrimage to Mecca in pre-Islamic times (Armstrong 1997), its institutionalization with the emergence of Islam was accompanied by preventing non-Muslims from performing it and disallowing rituals considered un-Islamic. Our results suggest that this may have helped impede non-Islamic practices from spreading within the Muslim world.

The findings in this paper also pose the question of whether pilgrimages or central gatherings may foster such unity in other beliefs systems, religious or otherwise, and conversely, whether their absence increases susceptibility to schisms. The Kumbh Mela, bringing together millions of Hindus every three years, may play such a cohesive role. Non-religious examples include national political conventions in the United States that may promote party unity and exchange among delegates from different regions. Conversely, the split between Judaism and Christianity occurred shortly after the destruction of the Jewish temple in the year 70. One may even conjecture whether the multiplication of Protestant sects would have been muted had there been a central holy site for pilgrimage among Protestants.

Our findings on the Hajj suggest several avenues of enquiry that may further illuminate how social interactions and institutions shape belief and identity and influence the evolution of ideologies and belief systems. While Angrist (1990) uses the random assignment of the military draft to estimate the impact of veteran status on civilian earnings, similar techniques could be used to examine the impact on political attitudes and civic cohesion. Our study investigates the impact of a particular pilgrimage, the Hajj, on pilgrims from one country, Pakistan. Investigating the impact of other pilgrimages and of the Hajj on pilgrims from other countries that differ from Pakistan in their attitudes and exposure is likely to generate further insights. Since several other countries also allocate Hajj visas by lottery, it should be possible to use the same methodology to isolate the impact. Building up evidence from a series of such studies would shed additional light on the broader roles played by institutions in the evolution of ideologies and belief systems.

## Bibliography

- Ahmed, Q.A., Y.M. Arabi, and Z.A. Memish. 2006. Health Risks at the Hajj. *The Lancet* 367: 1008-1015.
- Angrist, Joshua. 1990. Lifetime Earnings and the Vietnam Era Draft Lottery: Evidence from Social Security Administrative Records. *American Economic Review*, 80(3): 313-336.
- Armstrong, K. 1997. *Jerusalem: One City, Three Faiths*. New York: Ballantine Books.
- Aronson, E. and Patnoe. S. 1997. *The Jigsaw Classroom*. New York: Longman.
- Azarya, V. 1978. *Aristocrats Facing Change: The Fulbe in Guinea, Nigeria, and Cameroon*. Chicago: University of Chicago Press.
- Barro, Robert, and McCleary, R.M. 2003. Religion and Economic Growth across Countries. *American Sociological Review* 68(5): 760-781.
- Berman, Eli. 2000. Sect, Subsidy, and Sacrifice: An Economist's View of Ultra-orthodox Jews. *Quarterly Journal of Economics*, 115(3): 905-953.
- Bianchi, R. 2004. *Guests of God: Pilgrimage and Politics in the Islamic World*. Oxford: Oxford University Press.
- Boisjoly, J., G. Duncan, M. Kremer, D. Levy, and J. Eccles. 2006. "Empathy or Antipathy? The Consequences of Racially and Socially Diverse Peers on Attitudes and Behaviors." *American Economic Review* 96(5): 1890-1906.
- Bose, Sugata. 2006. *A Hundred Horizons: the Indian Ocean in the Age of Global Empire*. Cambridge: Harvard University Press.
- Crosby, F. 1991. *Juggling: The Unexpected Advantages of Balancing Career and Home for Women and their Families*. New York: Free Press.
- DeVries, D.L., and R.E. Slavin. 1978. "Teams-Games-Tournaments (TGT): Review of Ten Classroom Experiments." *Journal of Research and Development in Education* 12: 28-38.
- Donnan, Hastings. 1989. "Symbol and Status: The Significance of the Hajj in Pakistan." *Muslim World* 79(3-4): 205-216.
- Eickelman, Dale F., and James Piscatori. 1990. "Muslim Travellers: Pilgrimage, Migration, and the Religious Imagination." In Barbara D. Metcalf, ed. *Comparative Studies on Muslim Societies*, Vol. 9. Berkeley: University of California Press.
- Finke, Roger and Rodney Stark. 2005. *The Churhing of America, 1776- 2005*. New Brunswick, NJ: Rutgers University Press.
- Glaeser, E. and S. Glendon (1998). "Incentives, Predestination and Free Will," *Economic Inquiry*, July, 429-443.
- Guiso, Luigi, Sapienza, Paola, and Luigi Zingales. 2003. "People's Opium? Religion and Economic Attitudes." *Journal of Monetary Economics*, 50(1): 225-282..
- Iannaccone, Laurence R. 1992. "Sacrifice and Stigma: Reducing Free-riding in Cults, Communes, and Other Collectives." *Journal of Political Economy* 100(2): 271-291.
- Ibn Battuta, 2002 [ca. 1355]. *Tuhfat al-Nuzzar fi Ghara'ib al-Amsar*. Beirut: Dar al-Kutub al-'Ilmiyya.
- Johnson, D.W., and R.T. Johnson. 1983. "The Socialization and Achievement Crisis: Are Cooperative Learning Experiences the Solution?" In L. Bickman, ed. *Applied Social Psychology Annual*, Vol. 4. Beverly Hills, CA: Sage.
- Kessler, R.C., Barker, P.R., Colpe, L.J., Epstein, J.F., Gfroerer, J.C., Hiripi, E., Howes, M.J., Normand, S-L.T., Manderscheid, R.W., Walters, E.E., Zaslavsky, A.M. 2003. "Screening for Serious Mental Illness in the General Population." *Archives of General Psychiatry*. 60(2): 184-189.

- Kling, J. R., J. B. Liebman, L. F. Katz, and L. Sanbonmatsu. 2004. "Moving to Opportunity and Tranquility: Neighborhood Effects on Adult Economic Self-Sufficiency and Health from a Randomized Housing Voucher Experiment," Princeton IRS Working Paper 481, April.
- Lantz, P., House, J., Mero, R. Williams, D. 2005. "Stress, Life Events, and Socioeconomic Disparities in Health: Results from the Americans' Changing Lives Study." *Journal of Health and Social Behavior* 46(3): 274-288.
- Low, Michael. 2007. *Empire of the Hajj: Pilgrims, Plagues, and Pan-Islam under British Surveillance*. Unpublished M.A. thesis.
- McCleary, R.M. 2007. "Salvation, Damnation, and Economic Incentives." *Journal of Contemporary Religion* 22(1): 49-74.
- Naipaul, V. S. 1981. *Among the Believers: An Islamic Journey*. New York: Vintage.
- O'Brien, Peter C. 1984. "Procedures for Comparing Samples with Multiple Endpoints." *Biometrics* 40(4): 1079-1087.
- Organization of Islamic Conference. 2007. *Report on the Seventeenth Islamic Conference of Foreign Ministers: Resolutions on Legal, Information, and Political Affairs*. <http://www.oicoci.org/english/conf/fm/17/17%20icfm-political-en.htm>.
- Pettigrew, T.F. and Tropp, L.R. 2006. "A Meta-Analytic Test of Intergroup Contact Theory." *Journal of Personality and Social Psychology*, 90(5): 751-783.
- Putnam, Robert. 2007. "American Grace: The Changing Role of Religion in America." Presentation, Fall 2007 Faculty Research Seminar. John F. Kennedy School of Government, Harvard University. September 26.
- Sacerdote, B. and E.L. Glaeser. 2001. "Education and Religion." *National Bureau of Economic Research Working Paper No.* 8080.
- Scupin, Raymond. 1982. "The Social Significance of the Hajj for Thai Muslims." *Muslim World* 72(1): 25-33.
- Sherif, M., Harvey, O., White, B., Hood, W., and Carolyn Sherif. 1954. *Intergroup Conflict and Cooperation: The Robber's Cave Experiment*. Norman: University of Oklahoma Press.
- Slavin, R. E. and R. Cooper. 1999. "Improving intergroup relations: Lessons learned from cooperative learning programs." *Journal of Social Issues* 55(4): 647-664.
- Stephan, W.G. 1978. "School Desegregation: An Evaluation of Predictions Made in Brown v. Board of Education." *Psychological Bulletin* 85: 217-38.
- The Sunday Times* "Terror Watch on Mecca Pilgrims," January 21.
- Tajfel, H. 1970. "Experiments in Intergroup Discrimination." *Scientific American* 223: 96-102.
- Tajfel, H. and Turner, J. C. (1986). "The Social Identity Theory of Inter-Group Behavior." In S. Worchel and L. W. Austin, eds., *Psychology of Intergroup Relations*. Chicago: Nelson-Hall.
- Wolfe, M. 1997. *One Thousand Roads to Mecca: Ten Centuries of Travelers Writing about the Muslim Pilgrimage*. Grove Press.
- X, Malcolm with Alex Haley. 1965. *The Autobiography of Malcolm X*. New York: Grove Press.
- Yamba, C. 1995. *Permanent Pilgrims: The Role of Pilgrimage in the Lives of West African Muslims in Sudan*. Edinburgh: Edinburgh Univ. Press.

**Table 1: Randomization Checks**

Applicant Characteristic	Panel A		Panel B			
	Success in Lottery		Success in Lottery		Among Interviewed, Restricted Sub-sample	
	Coef.	SE	Coef.	SE	Coef.	SE
Female	-0.001	(0.004)	-0.017	(0.022)	-0.026	(0.024)
Application Number <sup>A</sup>	0.001	(0.003)	-0.003	(0.015)	-0.015	(0.016)
Travel Party Number <sup>A</sup>	0.005	(0.006)	0.071	(0.068)	0.037	(0.072)
Year of Birth	0.000	(0.000)	0.001	(0.001)	0.001	(0.001)
Married	0.009	(0.008)	-0.017	(0.063)	0.006	(0.073)
Middle School	-0.001	(0.005)	-0.019	(0.037)	-0.012	(0.041)
High School	0.000	(0.006)	-0.045	(0.046)	-0.050	(0.051)
Intercollege and Up	0.002	(0.008)	-0.005	(0.052)	-0.006	(0.060)
Branch of Application <sup>A</sup>	0.005	(0.009)	-0.004	(0.042)	0.000	(0.000)
Provided Phone Number	-0.001	(0.011)	0.080	(0.060)	0.094	(0.064)
Constant	1.142	(0.264)	-1.464	(2.499)	-2.481	(2.689)
Observations	134,948		1,605		1,295	
R-squared	0.02		0.06		0.10	
Joint F-Test of Individual Characteristics (p-value)	0.98		0.89		0.81	

Notes: Robust standard errors in parentheses clustered at the party level: \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Regressions include dummies for place of departure X accomodation category X party size category.

<sup>A</sup> Application number is in units of 100,000; travel party number is in units of 10,000; Branch code is in units of 1,000.

**Table 2: Summary Statistics**

	Adult Pakistani Population (restricted >20 year old)		Full Sample		Restricted Sub-sample	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Age	40.16	16.244	54.575	13.240	55.039	13.246
Female	0.499	0.500	0.490	0.500	0.496	0.500
Married	0.703	0.497	0.943	0.232	0.948	0.222
Illiterate	0.482	0.458	0.402	0.490	0.417	0.493
Intercollege and Up	0.201	0.43	0.178	0.383	0.157	0.364
City <sup>A</sup>			0.400	0.490	0.372	0.483
Periurban/large village <sup>A</sup>			0.274	0.460	0.293	0.455
Rural <sup>A</sup>			0.325	0.470	0.335	0.472
Ballot Success			0.533	0.499	0.524	0.500
Monthly Expenditures (log)	8.678	0.641	8.832	0.783	8.896	0.726

Notes: N=1605 for full sample, N=1295 for subsample, and N=29,995 for Adult Pakistani Population. The Pakistani Adult population is from the MICS 2003-4 survey (restricted to the same districts as in our sample).

<sup>A</sup> City, periurban, and rural classifications comparable to our survey data are not available in the MICS.

**Table 3: Survey Completion Statistics**

	Panel A: Full Sample			Panel B: Restricted Sub-sample		
	Total	Lottery Status		Total	Lottery Status	
		Successful	Unsuccessful		Successful	Unsuccessful
Selected for interview	2537	1286	1251	1995	1032	963
Raw completed interviews	1605	855	750	1295	679	616
Completion rate	63.3%	66.5%	60.0%	64.9%	65.8%	64.0%
Not completed						
Dead/ill	2.1%	2.1%	2.1%	2.3%	2.2%	2.3%
Lives elsewhere	10.4%	10.0%	10.8%	9.8%	9.8%	9.8%
Not found	8.3%	6.4%	10.3%	7.7%	6.6%	8.9%
Not home	7.9%	8.7%	7.2%	8.2%	8.7%	7.6%
Refused	7.9%	6.3%	9.6%	7.2%	6.9%	7.5%

Notes: Interview completion percentages from surveyor reports.

**Table 4: Religion**

	Panel A: AES Coefficients			Panel B: Averaged Index			
	Restricted			Base	Obs	R-squared	SD
	Base	Controls	Sub-Sample				
(1) Regarded as Religious	0.238*** (0.06)	0.230*** (0.055)	0.258*** (0.061)	0.238*** (0.056)	1541	0.030	1.000
(2) Global Islamic Practice	0.163*** (0.030)	0.166*** (0.029)	0.171*** (0.033)	0.169*** (0.030)	1605	0.060	0.047
(3) Belief in Localized Muslim Practices	-0.101*** (0.032)	-0.094*** (0.031)	-0.074** (0.035)	-0.100*** (0.033)	1605	0.050	0.049
(4) Participation in Localized Muslim Practices	-0.097** (0.046)	-0.097** (0.045)	-0.085* (0.052)	-0.095** (0.048)	1605	0.030	0.750

Notes: Panel A gives AES estimates for our base, control, and restricted subsample specifications from running a SUR for each question in the indices in each row. Panel B gives the results from using the averaged index as the dependent variable. All regressions include dummies for place of departure X accomodation category X party size category. The AES control specification also includes dummies for each of the 9 districts in the survey, dummies for whether the respondent lives in an urban, peri-urban or rural setting, gender, age and educational level. All results come from IV regressions where the instrument is success in the Hajj lottery. Standard errors in parentheses clustered at the party level: \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

**Table 5: Tolerance**

	Panel A: AES Coefficients			Panel B: Averaged Index			
	Base	Controls	Restricted Sub-Sample	Base	Obs	R-squared	Comparison SD
(1) Views of Other Countries	0.150*** (0.04)	0.147*** (0.04)	0.151*** (0.04)	0.151*** (0.04)	1593	0.04	0.59
(2) Views of Other Groups	0.131*** (0.05)	0.108** (0.05)	0.122 ** (0.06)	0.131*** (0.05)	1604	0.03	0.82
(3) Harmony	0.128*** (0.04)	0.117*** (0.04)	0.126*** (0.05)	0.131** (0.05)	1577	0.02	0.85
(4) Peaceful Inclination	0.111*** (0.03)	0.121*** (0.03)	0.128*** (0.04)	0.100** (0.04)	1605	0.03	0.62
(5) Political Islam Index	-0.050 (0.04)	-0.044 (0.03)	-0.043 (0.04)	-0.055 (0.04)	1542	0.03	0.63
(6) Views of West	0.029 (0.04)	0.039 (0.04)	0.011 (0.04)	0.043 (0.04)	1605	0.05	0.64

Notes: Panel A gives AES estimates for our base, control, and restricted subsample specifications from running a SUR for each question in the indices in each row. Panel B gives the results from using the averaged index as the dependent variable. All regressions include dummies for place of departure X accomodation category X party size category. The AES control specification also includes dummies for each of the 9 districts in the survey, dummies for whether the respondent lives in an urban, peri-urban or rural setting, gender, age and educational level. All results come from IV regressions where the instrument is success in the Hajj lottery. Standard errors in parentheses clustered at the party level: \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

**Table 6: Gender**

	Panel A: AES Coefficients			Panel B: Averaged Index			
	Base	Controls	Restricted Sub-Sample	Base	Obs	R-squared	Comparison SD
(1) Views toward Women	0.120*** (0.04)	0.116*** (0.04)	0.139*** (0.04)	0.120*** (0.04)	1605	0.04	0.6
(2) Women's Quality of Life <sup>A</sup>	0.158*** (0.05)	0.138*** (0.05)	0.166*** (0.06)	0.101** (0.04)	1605	0.05	0.65
(3) Girls' Education	0.092** (0.04)	0.089** (0.04)	0.097** (0.04)	0.099** (0.04)	1604	0.04	0.74
(4) Women in Workforce/Professions	0.119*** (0.04)	0.112*** (0.04)	0.091** (0.04)	0.128** (0.05)	1605	0.03	0.84
(5) Gender Authority	-0.005 (0.02)	-0.010 (0.02)	0.005 (0.03)	-0.011 (0.02)	1605	0.03	0.43

Notes: Panel A gives AES estimates for our base, control, and restricted subsample specifications from running a SUR for each question in the indices in each row. Panel B gives the results from using the averaged index as the dependent variable. All regressions include dummies for place of departure X accomodation category X party size category. The AES control specification also includes dummies for each of the 9 districts in the survey, dummies for whether the respondent lives in an urban, peri-urban or rural setting, gender, age and educational level. All results come from IV regressions where the instrument is success in the Hajj lottery. Standard errors in parentheses clustered at the party level: \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

<sup>A</sup> The average index effect is smaller than the AES effect for this index because component questions on Indonesia/Malaysia and the West had relatively few observations, changing the weighting of outcomes as described in the Section 3.

**Table 7: Well-Being**

Panel A: AES Coefficients				Panel B: Averaged Index			
	Base	Controls	Restricted Sub-Sample	Base	Obs	R-squared	Comparison SD
(1) Rescaled K6 Index	-0.206*** (0.05)	-0.206*** (0.05)	-0.200*** (0.05)	-0.208*** (0.05)	1601	0.04	0.77
(2) Positive Feelings	-0.109** (0.05)	-0.098** (0.04)	-0.079 (0.05)	-0.110** (0.05)	1605	0.04	0.75
(3) Index of Satisfaction with Life and Finances	-0.010 (0.04)	0.006 (0.04)	0.011 (0.04)	-0.005 (0.04)	1605	0.03	0.66
(4) Self-Rated Physical Health	-0.213*** (0.05)	-0.219*** (0.05)	-0.239*** (0.06)	-0.212*** (0.05)	1605	0.03	0.79
Panel C: AES				Panel D: Averaged Index			
	Main Effect	Male Interaction		Main Effect	Male Interaction	R-squared	Comparison SD
(5) Rescaled K6 Index	-0.369*** (0.08)	0.326*** (0.09)		-0.368*** (0.08)	0.329*** (0.10)	1601	0.13
(6) Positive Feelings	-0.149** (0.07)	0.079 (0.08)		-0.153*** (0.07)	0.084 (0.08)	1605	0.10
(7) Index of Satisfaction with Life and Finances	-0.028 (0.05)	0.036 (0.08)		-0.019 (0.05)	0.027 (0.08)	1605	0.03
(8) Self-Rated Physical Health	-0.320*** (0.07)	0.210** (0.10)		-0.318*** (0.08)	0.209*** (0.10)	1605	0.10
						0.79	

Notes: Panel A gives AES estimates for our base, control, and restricted subsample specifications from running a SUR for each question in the indices in each row. Panel B gives the results from using the averaged index as the dependent variable. Panel C adds a interaction between Hajj participation and a male variable to the base AES specification, while panel D does this for the average index. All regressions include dummies for place of departure X accommodation category X party size category. The AES control specification also includes dummies for each of the 9 districts in the survey, dummies for whether the respondent lives in an urban, peri-urban or rural setting, gender, age and educational level. All results come from IV regressions where the instrument is success in the Hajj lottery and additionally success interacted with male in the interaction specification. Standard errors in parentheses clustered at the party level: \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

**Table 8: Engagement and Exposure**

	Panel A: AES Coefficients			Panel B: Averaged Index			
	Base	Controls	Restricted Sub-Sample	Base	Obs	R-squared	Comparison SD
(1) Socioeconomic Engagement	-0.002 (0.02)	-0.008 (0.02)	0.011 (0.02)	-0.002 (0.02)	1605	0.05	0.42
(2) Engagement in Politics	-0.011 (0.03)	-0.010 (0.03)	-0.024 (0.03)	-0.011 (0.03)	1605	0.04	0.49
(3) Formal Knowledge of Islam	0.004 (0.04)	0.000 (0.03)	-0.003 (0.04)	0.005 (0.04)	1605	0.07	0.59
(4) Diversity Knowledge	0.146*** (0.04)	0.139*** (0.04)	0.133*** (0.05)	0.142*** (0.04)	1604	0.04	0.61
(5) Gender Knowledge	0.125*** (0.04)	0.116*** (0.03)	0.104** (0.04)	0.126*** (0.04)	1605	0.08	0.56
(6) Global Knowledge	0.083** (0.04)	0.086** (0.03)	0.072 (0.05)	0.083** (0.04)	1605	0.05	0.67

Notes: Panel A gives AES estimates for our base, control, and restricted subsample specifications from running a SUR for each question in the indices in each row. Panel B gives the results from using the averaged index as the dependent variable. All regressions include dummies for place of departure X accommodation category X party size category. The AES control specification also includes dummies for each of the 9 districts in the survey, dummies for whether the respondent lives in an urban, peri-urban or rural setting, gender, age and educational level. All results come from IV regressions where the instrument is success in the Hajj lottery. Standard errors in parentheses clustered at the party level: \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

## APPENDIX 1

Table 1: Outline of the Hajj Pilgrimage

<b>OVERALL TIME IN SAUDI ARABIA: 40 DAYS</b>						
<b>AFTER ARRIVAL</b>	<b>FORMAL RITUALS OF THE HAJJ--ALL PILGRIMS FROM ALL NATIONS PARTICIPATE SIMULTANEOUSLY, 5 DAYS</b>					<b>BEFORE DEPARTURE</b>
Pakistani pilgrims have a staggered arrival up to 35 days before the formal rituals of the Hajj. During this time, they typically perform <i>umrah</i> and pray in the Masjid al-Haram in Mecca. If they will not be in the country for long after the formal rituals, they may visit Medina, though this is typically done after.	Day 1 <i>Ihram</i> garments are donned. <i>Tawaf</i> and <i>sa'y</i> are performed in the Masjid al-Haram in Mecca.	Day 2 Travel to Mount Arafat at dawn, 25-30 kilometers away.	Day 3 Travel to Mina from Muzdalifah. Participate in <i>jamaraat</i> ritual. Pilgrims symbolically “stone the devil” by throwing the pebbles they have collected at three pillars.	Day 4 Return to Mina if night spent in Mecca.		Pakistani pilgrims have a staggered departure up to 35 days following the formal rituals of the Hajj. During this time, they typically make a trip to Medina for several days, where they pray at the prophet's mosque, the Masjid al-Nabawi. The trip to Medina is common for all nations. Outside this time, they perform <i>umrah</i> and pray in the Masjid al-Haram in Mecca.
	Afternoon Travel to the town of Mina, 5-6 kilometers away. Rest, prayer, and reading of the Qu'ran.	Stay on plain of Arafat until sunset in prayer and contemplation.	Sacrifice an animal. The meat is given to the poor. A voucher may be purchased for this.  Pilgrims released from most <i>ihram</i> restrictions. They have their heads shaved.	Complete <i>jamaraat</i> ritual, stoning all three pillars in Mina.	Complete <i>jamaraat</i> ritual, again stoning all three pillars in Mina.  Pilgrims must leave Mina for Mecca by sunset. Otherwise they must repeat the <i>jamaraat</i> the following day before returning.	
	Night Spend night in tents at Mina.	After sunset, begin journey to Muzdalifah, about 15 kilometers away.  Spend night in the open at Muzdalifah.  Pray and collect pebbles for <i>jamaraat</i> the next day.	Return to Masjid al-Haram to perform <i>tawaf</i> . Pilgrims may also do this the morning of the fourth day.  Spend night in either Mecca or Mina.	Spend night in Mina.	Spend night in Mecca. Pilgrims perform a farewell <i>tawaf</i> before leaving Mecca.	

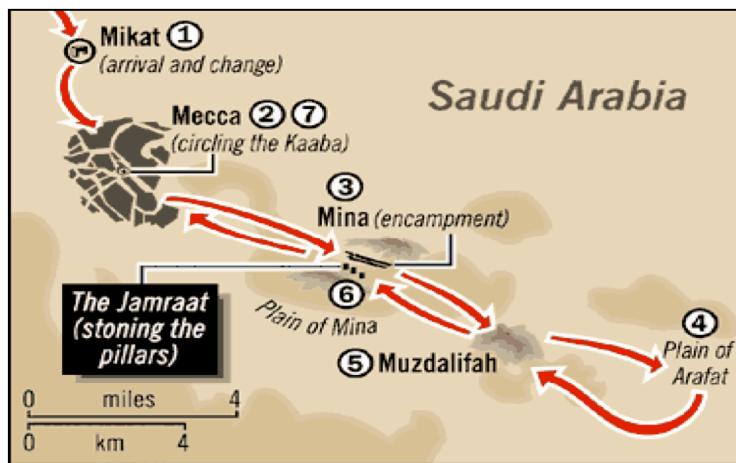
Notes:

*Tawaf*: Four quick circumambulations of the ka'ba followed by three leisurely circumambulations. Pilgrims say a set of prayers as they walk.

*Sa'y*: Walking seven times back and forth between the hills of Safa and Marwah, now enclosed in the Masjid al-Haram.

*Umrah*: A minor pilgrimage that can be done at any time, consisting of a *tawaf* and *sa'y* while wearing the *ihram*.

Figure 1: Map of Hajj Pilgrimage Sites



Source: Christian Science Monitor

**APPENDIX 1 CONTINUED**

Figure 2: Aerial view showing pilgrims in prayer in Mecca during the Hajj



**APPENDIX 2: RELIGION - INDEX COMPONENTS**

	<i>Index/ Question</i>	<i>Coding</i>	<b>Coef.</b>	<b>P-value</b>	<b>Comparison SD</b>	<b>Comparison Mean</b>	<b>Obs.</b>	<b>R<sup>2</sup></b>
Regarded as Religious AES			<b>0.238</b>	<b>0.000</b>				
Global Islamic Practice	Do you believe others regard you as religious	Binary: 1=Religious, 0=Not Religious	0.100	0.000	0.420	0.772	1541	0.033
	AES		<b>0.163</b>	<b>0.000</b>				
	How often do you pray Namaz?	Binary: 1= 5 times a day, 0= Less than 5 times a day	0.124	0.000	0.421	0.771	1605	0.054
	How often do you do tasbih after namaz?	Binary: 1= 5 times a day, 0= Less than 5 times a day	0.086	0.004	0.499	0.531	1605	0.043
	How often do you pray Namaz in congregation in the mosque?	Binary: 1= 5 times a day, 0= Less than 5 times a day	0.032	0.168	0.408	0.211	1605	0.026
	How often did you pray Namaz in congregation in the mosque last Sunday?	Binary: 1= Four or Five Times, 0=Less	0.080	0.005	0.463	0.312	1334	0.041
	Do you pray "Tahajjud Namaz"?	Binary: 1=Yes (regularly, occasionally), 0=No (rarely, never)	0.184	0.000	0.450	0.281	1605	0.047
	Are/were you able to read the Qu'ran?	Binary: 1=Yes fluently, 0=With some difficulty, No	0.024	0.416	0.475	0.658	1604	0.061
	How frequently do you recite the Qu'ran?	Binary: 1=Every day, 0=Less than every day	0.020	0.515	0.487	0.614	1433	0.026
	When you get together with your friends, would you say you discuss religious matters frequently, occasionally or never?	Binary: 1=Yes discuss religious matters, 0= Never discuss religious matters	0.046	0.016	0.328	0.877	1561	0.033
Belief in Localized Muslim Practices	Which of the following best applies to your experience of the most recent Ramadan?	Binary: 1=Kept the fast every day, 0=Did not keep the fast	0.025	0.137	0.300	0.900	1605	0.033
	How often did you fast outside of Ramadan during the past year?	Binary: 1=Several times per month or more, 0=Once per month or less	0.041	0.006	0.217	0.049	1605	0.030
	AES		<b>-0.101</b>	<b>0.002</b>				
	Which of the following best describes your views regarding pirs?	Binary: 1=Genuine pirs do exist, 0=There is no concept of pirs in Islam or there are no genuine pirs today	-0.025	0.413	0.462	0.693	1433	0.049
	Which statement best describes your opinion and behavior with respect to: visiting genuine pirs to seek their advice	Binary: 1=It is useful, 0=it is not useful	-0.028	0.285	0.418	0.774	1598	0.034
	Which statement best describes your opinion and behavior with respect to: visiting mazars	Binary: 1=It is useful, 0=it is not useful	-0.045	0.121	0.435	0.748	1603	0.032
	Which statement best describes your opinion and behavior with respect to: doing dam or getting a ta'wiz	Binary: 1=It is useful, 0=it is not useful	-0.042	0.123	0.417	0.777	1493	0.026
	Which statement best describes your opinion and behavior with respect to: doing "Chaliswaan" upon someone's death	Binary: 1=It is important and should be done, 0= it is not important or should not be done	-0.032	0.327	0.499	0.538	1542	0.028
	Which statement best describes your opinion and behavior with respect to: participating in maulid mehfils	Binary: 1=It is useful, 0=it is not useful	-0.038	0.037	0.251	0.933	1521	0.033
	Is it required that a cap be worn when praying Salat?	Binary: 1=Yes, 0=No/Depends on school of Islamic thought	-0.047	0.097	0.470	0.670	1604	0.031
	Is dowry (jehej) mandatory according to Islam?	Binary: 1=Yes, 0=No	-0.048	0.137	0.497	0.560	1562	0.038
Participation in Localized Muslim Practices	What priority should widowed women be given in getting remarried compared to unmarried women?	Binary: 1= Less or more priority, 0= Same priority	-0.100	0.002	0.498	0.549	1424	0.030
	On the Day of Judgment, people will be called to bear witness to your actions in life. Do you believe you will be held entirely responsible for your actions in life, or do you believe that over and above being a witness it is possible for someone to intercede with God on your behalf?	Binary: 1=There could be an intercession, 0=I will be held entirely responsible	-0.035	0.218	0.465	0.684	1604	0.023
	AES		<b>-0.097</b>	<b>0.038</b>				
	Visiting genuine pirs to seek their advice:	Binary: 1=Visit them, 0=Do not visit them	-0.050	0.099	0.479	0.643	1598	0.031
	Which statement best describes your opinion and behavior with respect to: visiting mazars	Binary: 1=Visit them, 0=Do not visit them	-0.054	0.068	0.466	0.682	1603	0.020
	Which statement best describes your opinion and behavior with respect to: doing dam or getting a ta'wiz	Binary: 1=Visit them, 0=Do not visit them	-0.051	0.098	0.488	0.612	1493	0.031
	Which statement best describes your opinion and behavior with respect to: participating in maulid mehfils	Binary: 1=Participate in them, 0=Do not participate	-0.024	0.320	0.377	0.829	1521	0.035

Notes: For the indices, outcome variables are expressed in terms of standard deviations, and the reported coefficient is the AES estimate. For each component question, the coding columns explains the measurement for each question. All regressions include dummies for place of departure X accomodation category X party size category.

**APPENDIX 3: TOLERANCE - INDEX COMPONENTS**

<i>AES Index/Question</i>	<i>Coding</i>	<b>Coef.</b>	<b>P-Value</b>	<b>Comparison SD</b>	<b>Comparison Mean</b>	<b>Obs.</b>	<b>R<sup>2</sup></b>
<b>Views of other countries</b>	<b>AES</b>	<b>0.150</b>	<b>0.000</b>				
	Is your general view of Saudi people: (Scale -2 to 2) 2=Very Positive, -2=Very Negative	0.110	0.026	0.781	1.034	1593	0.026
	Is your general view of Indonesian people: (Scale -2 to 2) 2=Very Positive, -2=Very Negative	0.217	0.000	0.675	0.362	1583	0.055
	Is your general view of Turkish people: (Scale -2 to 2) 2=Very Positive, -2=Very Negative	0.147	0.001	0.621	0.234	1583	0.043
	Is your general view of African people: (Scale -2 to 2) 2=Very Positive, -2=Very Negative	0.052	0.181	0.554	0.046	1583	0.026
	Is your general view of European people: (Scale -2 to 2) 2=Very Positive, -2=Very Negative	-0.019	0.710	0.796	-0.141	1583	0.010
	Is your general view of Chinese people: (Scale -2 to 2) 2=Very Positive, -2=Very Negative	0.084	0.036	0.653	0.351	1585	0.049
<b>Views of Other Groups</b>	<b>AES</b>	<b>0.131</b>	<b>0.009</b>				
	In your opinion, overall how are people of a different sect compared to your people? Binary: 0=Better or Worse, 1=Same	0.066	0.024	0.482	0.633	1604	0.039
	In your opinion, overall how are people of a different religion compared to your people? Binary: 0=Better or Worse, 1=Same	0.084	0.004	0.488	0.389	1604	0.025
	In your opinion, overall how are people of a different ethnicity compared to your people? Binary: 0=Better or Worse, 1=Same	0.038	0.156	0.456	0.705	1604	0.029
<b>Harmony</b>	<b>AES</b>	<b>0.128</b>	<b>0.003</b>				
	Do you believe that people of different sects of Islam can live in unity & agreement (harmony) in a given society by making agreements over their differences? Binary: 1=Yes, 0=No	0.046	0.075	0.403	0.797	1346	0.037
	Do you believe that people of different religions can live in unity & agreement (harmony) in a given society by making agreements over their differences? Binary: 1=Yes, 0=No	0.063	0.074	0.492	0.589	1270	0.036
	Do you believe that people of different ethnicities (e.g. Pathan, Punjabi, Sindhi, Baluchi) can live in unity & agreement (harmony) in a given society by making agreements over their differences? Binary: 1=Yes, 0=No	0.041	0.071	0.363	0.844	1355	0.047
	Do you ever pray in the mosque of a different maslak than your own? Binary: 1=Frequently, 0=Less Often/Never	0.034	0.021	0.215	0.049	1463	0.027
<b>Peaceful Inclination</b>	<b>AES</b>	<b>0.111</b>	<b>0.001</b>				
	Do you believe the goals for which Ossama is fighting are correct? Binary: 1=Not Correct at All/Slightly Incorrect, 0=Correct/Absolutely Correct	0.063	0.014	0.252	0.068	761	0.054
	Do you believe the methods Ossama uses in fighting are correct? Binary: 1= Absolutely Never/Almost Never Correct, 0=To Small Extent/Some Extent/Strongly Correct	0.051	0.112	0.366	0.159	761	0.063
	How important do you believe peace with India is for Pakistan's future? Binary: 1=Important, 0= Not Important	0.044	0.016	0.283	0.913	1155	0.020
	How would you view the establishment of the Line of Control/current borders as the final international boundary between India and Pakistan if it led to peace between the two countries? Binary: 1= Very Favorably, 0=Favorably to Very Unfavorably	0.035	0.164	0.297	0.097	900	0.041
	What kind of support do you think Pakistan should give to those fighting against the Indian government in Kashmir? 2= No or only political support, 1= Only military support, 0=Military and political support	0.041	0.487	0.832	0.511	1236	0.034
	Please tell me what you think about the correctness of the following: Family members physically punishing someone who has dishonored the family Binary: 0=Correct, 1=Never Correct	0.044	0.112	0.440	0.261	1459	0.033
	Please tell me what you think about the correctness of the following: Suicide attacks of military targets Binary: 0=Always/Sometimes Correct, 1=Rarely/Never Correct	0.035	0.237	0.481	0.637	1605	0.023
	Please tell me what you think about the correctness of the following: Attacks on civilian targets during war Binary: 0=Always/Sometimes Correct, 1=Rarely/Never Correct	0.003	0.915	0.433	0.751	1605	0.031
<b>Political Islam</b>	<b>AES</b>	<b>-0.050</b>	<b>0.149</b>				
	The government should force people to conform to all Islamic injunctions like praying, fasting, etc and punish those who violate any of these injunctions Binary: 1=Agree Strongly/Agree, 0=Neutral/Disagree/Strongly Disagree	-0.033	0.065	0.271	0.920	1505	0.027
	Religious leaders have a right to dispense justice on their own, even if it goes against the government Binary: 1=Agree Strongly/Agree, 0=Neutral/Disagree/Strongly Disagree	-0.059	0.070	0.498	0.552	1315	0.036
	Religious leaders should not directly influence government decisions Binary: 1=Disagree Strongly/Disagree, 0=Neutral/Agree/Strongly Agree	0.022	0.458	0.428	0.241	1357	0.030
	It would be better for Pakistan if all politicians and government officials had strong religious beliefs Binary: 1=Agree Strongly/Agree, 0=Neutral/Disagree/Strongly Disagree	0.008	0.746	0.432	0.752	1393	0.048
	In voting for a candidate for public office, how important would you consider the candidate's religious beliefs to be? Binary: 0=All other responses, 1=Very Important	-0.039	0.195	0.478	0.646	1498	0.031
<b>Views of West</b>	<b>Index</b>	<b>0.029</b>	<b>0.431</b>				
	Do you believe it is good for Pakistanis to adopt Western social values? Binary: 0=Yes, 1=No	-0.009	0.719	0.404	0.795	1572	0.060
	Do you believe it is good for Pakistanis to adopt technologies developed in the West? Binary: 0=Yes, 1=No	0.012	0.657	0.468	0.323	1605	0.023
	How likely do you think it is that events like the Sept 11 <sup>th</sup> attack in the US and the 2005 London bombings were not done by Muslims but had a Western/Jewish hand behind them? Binary: 0=Unlikely, 1=Very likely/likely	0.017	0.540	0.444	0.732	1342	0.042
	To what extent do you think the West takes into account the interests of countries like Pakistan? Binary: 0=A Great deal/Fair amount, 1=Not too much/Not at all	0.029	0.308	0.401	0.799	1109	0.066

Notes: For the indices, outcome variables are expressed in terms of standard deviations, and the reported coefficient is the AES estimate. For each component question, the coding columns explains the measurement for each question. All regressions include dummies for place of departure X accomodation category X party size category.

**APPENDIX 4: GENDER - INDEX COMPONENTS**

<i>AES Index/Question</i>	<i>Coding</i>	<b>Coef.</b>	<b>P-Value</b>	<b>Comparison SD</b>	<b>Comparison Mean</b>	<b>Obs.</b>	<b>R<sup>2</sup></b>
<b>Views towards Women</b>	<b>AES</b>	<b>0.120</b>	<b>0.001</b>				
	In your opinion, how do men and women compare to each other with respect to the following traits: Mentally/ intellectually	Binary: 0=Men are Better/Equal, 1=Women are Better	0.030	0.084	0.265	0.076	1525 0.027
	In your opinion, how do men and women compare to each other with respect to the following traits: Spiritually	Binary: 0=Men are Better/Equal, 1=Women are Better	0.057	0.006	0.314	0.111	1497 0.034
	In your opinion, how do men and women compare to each other with respect to the following traits: Morally/ ethically	Binary: 0=Men are Better/Equal, 1=Women are Better	0.030	0.210	0.392	0.189	1516 0.024
	Which of the following statements best describes your view about the relative status of men and women: (different vs identical scale)	Binary: 0=Men are Better/Worse, 1=Women are Equal	0.054	0.070	0.500	0.527	1605 0.032
<b>Women's Quality of Life</b>	<b>AES</b>	<b>0.158</b>	<b>0.002</b>				
	What is your opinion about the quality of women's lives in each of the following countries/regions? Saudi Arabia	Binary: 1=Greater than in Pakistan, 0=Lower than or equal than in Pakistan; Base variables 5=Very High, 1=Very Low	0.051	0.145	0.468	0.322	1180 0.048
	What is your opinion about the quality of women's lives in each of the following countries/regions? Indonesia/ Malaysia	Binary: 1=Greater than in Pakistan, 0=Lower than or equal than in Pakistan; Base variables 5=Very High, 1=Very Low	0.094	0.088	0.441	0.262	551 0.058
	What is your opinion about the quality of women's lives in each of the following countries/regions? West	Binary: 1=Greater than in Pakistan, 0=Lower than or equal than in Pakistan; Base variables 5=Very High, 1=Very Low	0.087	0.051	0.390	0.186	646 0.091
	Do you think there are too many crimes against Women in Pakistan? Overall	Binary: 0=No, 1=Yes	0.052	0.075	0.491	0.597	1605 0.045
	Do you think there are too many crimes against Women in Pakistan? Relative to Men	1=Against Women Score < Against Men Score, 0=Against Women Score>=Against Men Score; Base scores 1=Yes, a lot; 4=No, not at all	0.053	0.052	0.376	0.171	1135 0.026
<b>Girls' Education</b>	<b>AES</b>	<b>0.092</b>	<b>0.019</b>				
	In your opinion, girls should attend school	Binary: 0=Disagree, 1=Agree	0.028	0.039	0.250	0.933	1604 0.027
	Until what level would you prefer allow/permit girls in your family to attend coeducational schools(boys and girls in the same school)?	Binary: 0=Never, 1=Primary, Secondary, or All Levels	0.055	0.036	0.448	0.722	1550 0.035
	Until what level would you prefer allow/permit boys in your family to attend coeducational schools (boys and girls in the same school)?	Binary: 0=Never, 1=Primary, Secondary, or All Levels	0.059	0.024	0.445	0.729	1550 0.036
	Until what level do you think coeducational schools (boys and girls in the same school) should be allowed to operate by the government?	Binary: 0=Never, 1=Primary, Secondary, or All Levels	0.040	0.133	0.451	0.717	1548 0.037
	How many years should girls study in school compared to boys?	Binary: 0=Less than boys, 1=As many or more than boys	0.002	0.943	0.427	0.760	1548 0.041
<b>Women in Workforce/ Professions</b>	<b>AES</b>	<b>0.119</b>	<b>0.003</b>				
	Would you like for your daughters or female grandchildren to have a career other than caring for the household?	Binary: 0=No, 1=Yes	0.045	0.156	0.499	0.540	1605 0.029
	What profession would you like your daughters, female grandchildren to have?	Binary: 0=Non-professional Occupations (e.g. farm workers, seamstress), 1=Professional Occupations (e.g. Doctor, government employee)	0.057	0.056	0.356	0.851	862 0.073
	How important are the following characteristics in your son's, grandson's wife?: Good Employment or Business	Binary: 0=Not Important, 1=Important	0.054	0.073	0.498	0.457	1562 0.028
<b>Gender Authority</b>	<b>AES</b>	<b>-0.005</b>	<b>0.821</b>				
	In your opinion, how do men and women compare to each other with respect to the following traits: Management of daily affairs	Binary: 0=Men are Better, 1=Women are Better/bot are the same	-0.016	0.537	0.446	0.726	1536 0.036
	Who should have more say in deciding how many children to have?	Binary: 0=Husbands/God's will, 1=Wives/Equal say	0.006	0.827	0.489	0.608	1605 0.029
	Please tell me what you think about the correctness of the following: A woman divorcing her husband	Binary: 0=Other Responses, 1=Sometimes/Always Correct	-0.051	0.104	0.489	0.606	1462 0.032
	Please tell me what you think about the correctness of the following: Someone marrying against their parent's wishes	Binary: 0=Other Responses, 1=Sometimes/Always Correct	0.011	0.616	0.345	0.138	1492 0.045
	When jobs are scarce, men should always have more right to a job than women	Binary: 0=Generally agree, 1=Generally Disagree	-0.010	0.598	0.322	0.117	1605 0.022
	What do you believe is the correct share for a daughter should have in inheritance compared to her brothers?	Binary: 0=Not equal, 1=Equal Share	0.016	0.204	0.201	0.042	1426 0.020
	According to Islam, do men and women count equally as witnesses?	Binary: 0=No, 1=Yes	0.003	0.920	0.474	0.340	1498 0.040

Notes: For the indices, outcome variables are expressed in terms of standard deviations, and the reported coefficient is the AES estimate. For each component question, the coding columns explains the measurement for each question. All regressions include dummies for place of departure X accomodation category X party size category.

**APPENDIX 5: WELL-BEING - INDEX COMPONENTS**

	<i>AES Index/Question</i>	<i>Coding</i>	<b>Coef.</b>	<b>P-Value</b>	<b>Comparison SD</b>	<b>Comparison Mean</b>	<b>Obs.</b>	<b>R<sup>2</sup></b>
<b>K6 Index</b>	<b>AES</b>		<b>-0.206</b>	<b>0.000</b>				
	During the past 30 days, about how often did you feel nervous?	5 point scale: 4=None of the time, 0=All of the time	-0.273	0.000	1.098	3.187	1597	0.031
	During the past 30 days, about how often did you feel hopeless?	5 point scale: 4=None of the time, 0=All of the time	-0.101	0.059	0.906	3.531	1594	0.042
	During the past 30 days, about how often did you feel restless or fidgety?	5 point scale: 4=None of the time, 0=All of the time	-0.263	0.000	1.042	3.270	1596	0.034
	During the past 30 days, about how often did you feel so depressed that nothing could cheer you up?	5 point scale: 4=None of the time, 0=All of the time	-0.127	0.013	0.843	3.586	1588	0.043
	During the past 30 days, about how often did you feel that everything was an effort?	5 point scale: 4=None of the time, 0=All of the time	-0.204	0.000	0.815	3.635	1593	0.032
	During the past 30 days, about how often did you feel feel worthless?	5 point scale: 4=None of the time, 0=All of the time	-0.157	0.001	0.703	3.761	1588	0.035
<b>Positive Feelings</b>	<b>AES</b>		<b>-0.109</b>	<b>0.016</b>				
	During the past 30 days, about how often did you feel relaxed and peaceful?	5 point scale: 4=All of the time, 0=None of the time	-0.172	0.006	1.037	3.237	1599	0.030
	During the past 30 days, about how often did you feel content?	5 point scale: 4=All of the time, 0=None of the time	-0.111	0.066	1.017	3.280	1601	0.036
	During the past 30 days, about how often did you feel joyful?	5 point scale: 4=All of the time, 0=None of the time	-0.072	0.238	1.053	3.191	1601	0.031
	How much pleasure do you take in your life?	5 point scale: 4=Very much, 0=None	-0.097	0.039	0.780	3.233	1605	0.028
	Taking all things together, would you say you are:	4 point scale: 4=Very Happy, 1=Not at all happy	-0.053	0.198	0.673	3.387	1596	0.036
<b>Index of Satisfaction with Life and Finances</b>	<b>AES</b>		<b>-0.010</b>	<b>0.808</b>				
	All things considered, how satisfied are you with your life as a whole these days?	10 point scale: 10=Satisfied, 1=Dissatisfied	-0.088	0.365	1.583	8.500	1605	0.028
	How much room for improvement is there in your quality of life?	3=Things are as good as they can/should be right now, 2=Some room for improvement, 1=A great deal of room for improvement	0.029	0.491	0.696	1.764	1601	0.033
	How satisfied are you with the financial situation of your household?	10 point scale: 10=Completely Satisfied, 1=Completely Dissatisfied	-0.026	0.801	1.694	8.469	1605	0.027
<b>Self-Rated Physical Health</b>	<b>AES</b>		<b>-0.213</b>	<b>0.000</b>				
	All in all, how would you describe your state of physical health these days? Would you say it is?	4 point scale: 1=Poor, 4=Very Good	-0.205	0.000	0.840	3.100	1601	0.024
	Over the past year were you unable to perform normal activities for at least 7 days due to an illness/injury?	Binary: 0=Yes, 1=No	-0.043	0.007	0.235	0.941	1605	0.031

Notes: For the indices, outcome variables are expressed in terms of standard deviations, and the reported coefficient is the AES estimate. For each component question, the coding columns explains the measurement for each question. All regressions include dummies for place of departure X accomodation category X party size category.

**APPENDIX 6: ENGAGEMENT AND EXPOSURE - INDEX COMPONENTS**

<i>AES Index/Question</i>	<i>Coding</i>	<i>Coef.</i>	<i>P-Value</i>	<i>Comparison SD</i>	<i>Comparison Mean</i>	<i>Obs.</i>	<i>R<sup>2</sup></i>
<b>Socioeconomic Engagement</b>							
<b>AES</b>		<b>-0.002</b>	<b>0.922</b>				
How frequently do you visit people outside your home (neighbors, relatives, etc) in the town/village where you live	6 point scale: 1=Seldom, 6=Everyday	0.033	0.718	1.596	4.780	1605	0.043
How frequently do other people (neighbors, relatives, etc) who live in the same town/village as you, visit you at your home	6 point scale: 1=Seldom, 6=Everyday	-0.010	0.920	1.612	4.627	1605	0.038
How frequently do you visit people outside your home (relatives, friends etc) outside the town/village where you live	6 point scale: 1=Seldom, 6=Once per week or more	0.054	0.531	1.441	2.423	1605	0.075
How frequently do other people (relatives, friends, etc) from out of your town/village come to visit you?	6 point scale: 1=Seldom, 6=Once per week or more	0.120	0.138	1.392	2.300	1605	0.082
During the past year, how many times have close friends and family sought your advice on a family matter?	Numeric	-0.520	0.375	11.862	1.624	1605	0.022
During the past year, how many times have close friends and family sought your advice on a religious matter?	Numeric	-0.217	0.665	9.942	1.445	1605	0.023
During the past year, how many times have close friends and family sought your advice on a business matter?	Numeric	-0.060	0.876	7.569	0.795	1605	0.037
During the past year, how many times have more distant friends and family sought your advice on a family matter?	Numeric	-0.267	0.242	4.648	0.773	1605	0.021
During the past year, how many times have more distant friends and family sought your advice on a religious matter?	Numeric	-0.264	0.523	7.992	0.904	1605	0.012
During the past year, how many times have more distant friends and family sought your advice on a business matter?	Numeric	-0.010	0.939	2.332	0.392	1605	0.013
Are you a member of a religious organization (e.g. local zakaat committee, masjid committee)	Binary: 0=No, 1=Yes	0.005	0.716	0.238	0.060	1605	0.014
Are you a member of a professional organization (e.g. labor union, business association, trade association)	Binary: 0=No, 1=Yes	-0.007	0.259	0.120	0.015	1605	0.019
Are you a member of a school organization (e.g. school or madrassah advisory board)	Binary: 0=No, 1=Yes	-0.001	0.894	0.126	0.016	1605	0.037
Do you work as an employee for any other person?	Binary: 0=No, 1=Yes	-0.012	0.532	0.324	0.119	1605	0.034
Are you self-employed in any kind of business, even if it only takes up part of your working time?	Binary: 0=No, 1=Yes	0.032	0.143	0.405	0.207	1605	0.020
<b>Engagement in Politics</b>	<b>AES</b>	<b>-0.011</b>	<b>0.704</b>				
Did you vote in the most recent local body elections?	Binary: 0=No, 1=Yes	-0.020	0.444	0.430	0.756	1605	0.024
How interested would you say you are in national affairs?	Binary: 0=Not interested, 1=Interested	0.018	0.560	0.492	0.406	1517	0.037
Are you a member of any political party?	Binary: 0=No, 1=Yes	0.000	0.956	0.140	0.020	1605	0.022
Are you a member of a political organization (not just political party but any politically based org such as student wing of political parties, etc.)	Binary: 0=No, 1=Yes	0.002	0.692	0.089	0.008	1605	0.027
Are you a member of a social/welfare/civic organization (e.g. social club, neighbourhood or police station committee, service for elderly, handicapped or poor)	Binary: 0=No, 1=Yes	0.004	0.539	0.120	0.015	1605	0.063
How often do you follow national affairs in the news on television or on the radio or in the daily papers?	Binary: 0=Twice a week or less, 1=Several times a week or more	-0.051	0.110	0.499	0.540	1439	0.053
How satisfied are you with the way the people now in national assembly are handling the country's affairs?	Binary: 0=Had no Opinion, 1=Had an Opinion	-0.013	0.639	0.464	0.688	1605	0.028

Notes: For the indices, outcome variables are expressed in terms of standard deviations, and the reported coefficient is the AES estimate. For each component question, the coding columns explains the measurement for each question. All regressions include dummies for place of departure X accomodation category X party size category.

**APPENDIX 6 CONTINUED: ENGAGEMENT AND EXPOSURE - INDEX COMPONENTS**

<i>AES Index/Question</i>	<i>Coding</i>	<i>Coef.</i>	<i>P-Value</i>	<i>Comparison SD</i>	<i>Comparison Mean</i>	<i>Obs.</i>	<i>R<sup>2</sup></i>
<b>Formal Knowledge of Islam</b>							
<b>AES</b>		<b>0.004</b>	<b>0.916</b>				
Name as many of the five pillars of Islam as you can	Binary: 1=could name all 5 (mistakes allowed), 0 = fewer than 5	0.006	0.828	0.484	0.627	1605	0.039
How many siparas (chapters) are there in the Qu'ran?	Binary: 1= 30, 0 = anything else	0.002	0.762	0.140	0.980	1605	0.019
Can you recite your favorite verse of the Qu'ran?	Binary: 0=Unable to recite verse, 1=Able to recite verse	-0.002	0.934	0.462	0.692	1604	0.057
What is the shortest sura of the Qu'ran?	Binary: 0=Incorrect answer, 1=Correct answer	0.000	0.998	0.496	0.564	1605	0.050
What is the longest sura of the Qu'ran?	Binary: 0=Incorrect answer, 1=Correct answer	0.019	0.552	0.498	0.453	1605	0.053
What is the first revealed verse in the Qu'ran?	Binary: 0=Incorrect answer, 1=Correct answer	0.032	0.289	0.482	0.366	1604	0.062
How many suras are there in the Qu'ran?	Binary: 0=Incorrect answer, 1=Correct answer	-0.018	0.569	0.478	0.353	1605	0.049
Is the way in which Muslims should pray Namaz (Salat) described in the Qu'ran?	Binary: 0=Yes, 1=No	0.001	0.972	0.492	0.411	1604	0.050
What is the percentage amount required to be given as Zakat?	Binary: 0= Any other answer, 1=2.5	-0.008	0.776	0.495	0.575	1605	0.045
How many months do you have to hold wealth for Zakat to be due on it?	Binary: 0= Any other answer, 1=12	-0.017	0.527	0.442	0.735	1605	0.051
<b>Diversity Knowledge</b>	<b>AES</b>	<b>0.146</b>	<b>0.001</b>				
How many accepted schools of thought (maz'habs/maslaks) are there within Sunni Islam and what are their names?	Binary: 0=Incorrect Answer, 1=Correct Number/Correct Number and Names	0.058	0.012	0.354	0.147	1604	0.061
Is it required that a cap be worn when praying Salat?	Binary: 0=Yes, always, 1=No/Depends on Islamic school of thought	0.039	0.166	0.448	0.278	1474	0.037
Is it sufficient for a man to say "talak, talak, talak" in one breath to perform a divorce that is legal according to Islam?	Binary: 0=Yes/No, 1=Depends on school of thought/"maslak"	0.021	0.015	0.115	0.013	1604	0.024
<b>Gender Knowledge</b>	<b>AES</b>	<b>0.125</b>	<b>0.001</b>				
What was the full name of the Prophet Muhammad's (PBUH) first wife?	Binary: 0=Incorrect Answer, 1=Correct Full or First Name	0.043	0.182	0.500	0.501	1604	0.065
According to Islam, how many wives is a man allowed to have at a given time?	Binary: 0=Neither four nor one, 1=Four or one [Note: either four or one may be considered correct]	0.022	0.435	0.466	0.682	1604	0.062
According to Islam, can a Muslim man marry a Jewish or Christian woman?	Binary: 0=No, 1=Yes	0.035	0.248	0.497	0.442	1604	0.023
Is dowry (jehej) mandatory according to Islam?	Binary: 0=Yes, 1=No	0.049	0.119	0.495	0.429	1604	0.040
Have you heard about the Hudood ordinance, which is the Islamic law relating to adultery?	Binary: 0=No, 1=Yes	0.045	0.088	0.414	0.219	1605	0.038
What is your opinion about the quality of women's lives in Saudi Arabia	Binary: 0=Expressed no opinion, 1=Expressed an opinion	0.111	0.000	0.465	0.684	1605	0.036
What is your opinion about the quality of women's lives in Indonesia/Malaysia	Binary: 0=Expressed no opinion, 1=Expressed an opinion	0.097	0.001	0.459	0.300	1605	0.042
What is your opinion about the quality of women's lives in the West?	Binary: 0=Expressed no opinion, 1=Expressed an opinion	0.067	0.030	0.484	0.373	1605	0.052
<b>Global Knowledge</b>	<b>AES</b>	<b>0.083</b>	<b>0.047</b>				
List all countries that share a border with Pakistan? (List up to 5 names of countries)	Numeric: 0=No correct country given, 4>All four correct countries given (India, Afghanistan, Iran, China).	0.137	0.154	1.701	1.975	1605	0.046
What country has the largest number of Muslims as its citizens?	Binary: 0=Incorrect answer, 1=Correct answer	0.036	0.063	0.311	0.108	1605	0.032
What percentage of Nigerians are Muslims?	Binary: 0=<40% or >70%, 1=40%-70%	0.033	0.046	0.238	0.060	1605	0.021
What two countries have the greatest population in the world?	Binary: 0=Named none, 1=Named one, 2=Named both (India and China)	0.041	0.159	0.493	0.412	1605	0.045
Who is currently Prime Minister of India?	Binary: 0=Incorrect answer, 1=Correct answer	0.018	0.537	0.477	0.351	1605	0.039
Which country is further away from Pakistan, England or the USA?	Binary: 0=Incorrect answer, 1=Correct answer	0.022	0.470	0.499	0.541	1605	0.033

Notes: For the indices, outcome variables are expressed in terms of standard deviations, and the reported coefficient is the AES estimate. For each component question, the coding columns explains the measurement for each question. All regressions include dummies for place of departure X accomodation category X party size category.