

Media, Education, and Anti-Americanism in the Muslim World

Matthew Gentzkow
Harvard University

Jesse M. Shapiro*
Harvard University

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Abstract

Recent surveys in the United States and the Muslim world show widespread misinformation about the events of September 11, 2001. Using data from 9 predominantly Muslim countries, we study how such beliefs depend on exposure to news media and levels of education. Standard economic theory would predict that increased access to information should cause beliefs to converge. More recent models of biased belief formation suggest that this result might hinge critically on who is providing the information. Consistent with the latter, we find that overall intensity of media use and level of education have at best a weak correlation with beliefs, while particular information sources have strong and divergent effects. Compared to those with little media exposure or schooling, individuals watching Arab news channels or educated in schools with little Western influence are less likely to agree that the September 11 attacks were carried out by Arab terrorists. Those exposed to media or education from Western sources are more likely to agree. Belief that the attacks were morally justified and general attitudes toward the US are also strongly correlated with source of information. These findings survive controls for demographic characteristics and are robust to identifying media effects using cross-country variation in language.

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1 Introduction

America has an image problem. Only 1 percent of people surveyed in June 2003 in Jordan or the Palestinian Authority expressed a favorable opinion of the United States. Favorability ratings elsewhere in the Middle East were almost all below 30 percent. Osama bin Laden was among the top three leaders most often trusted to “do the right thing” by survey respondents in Indonesia, Jordan, Morocco, Pakistan, and the Palestinian Authority (Pew Research Center, 2003). Responses to similar questions by Americans reveal that the feeling is mutual: Only 24 percent of Americans expressed favorable views of Muslim countries overall, and 58 percent said the number of immigrants from these countries allowed into the US should be reduced (*USA Today* 2002).

One view is that this mutual antagonism stems from deep-rooted cultural and religious differences. This thesis has been advanced most famously by Huntington (1993), and suggests that a combination of conflicting interests and conflicting values makes conflict virtually inevitable.¹ Survey responses reveal, however, that people in these two parts of the world do not just perceive their interests to be opposed, or disagree about the moral or ethical meaning of the events that have transpired. Rather, they have radically different, and distorted, perceptions of the facts themselves.

The disagreement is revealed most starkly in questions about the September 11 attacks on the World Trade Center. In survey results we report below, 78 percent of respondents in seven Muslim countries said that they do not believe that a group of Arabs carried out the attacks. Likewise, according to the Washington Post (2003), 69 percent of Americans believe it is “somewhat” or “very” likely that Saddam Hussein was personally involved in the attacks, despite the absence of any evidence to that effect.²

This picture bears a striking resemblance to a dynamic highlighted eighty years ago by Walter Lippmann (1922):

[W]hen full allowance has been made for deliberate fraud, political science has still to

¹Such a pessimistic outlook is reflected in public opinion in both the Islamic countries and the United States: in both, roughly a quarter of people respond to the question of when a “better understanding” will be achieved between the two sides by saying “never” (*USA Today* 2002).

²Another striking observation concerns the 2003 war in Iraq. In September, 2003, 20 percent of Americans said that Iraq had used chemical or biological weapons against American troops, again clearly contradicting the available evidence (Kull et al, 2003).

account for such facts as two nations attacking one another, each convinced that it is acting in self-defense... They live, we are likely to say, in different worlds. More accurately, they live in the same world, but they think and feel in different ones.

The challenge Lippmann makes to political science applies equally well to modern economics.

A simple model based on standard theory would say that individuals in America and the Islamic countries simply have different information. Thus, any changes that decrease the cost of obtaining information—in particular an expanded supply of news or increased education—should gradually cause these misperceptions to disappear. Importantly, this should be true regardless of the biases or viewpoints of the information sources.³ Compared to an inevitable “clash of civilizations,” this picture is a sanguine one. It suggests that the natural process of economic development and media expansion may eliminate much of the existing hostility.⁴

An array of evidence, however, calls into question the assumptions of this model, and suggests that the outlook it implies may be overly optimistic. Glaeser (2003), for example, notes numerous examples of beliefs that are sharply and persistently different across countries. The confirmatory bias literature in psychology—most notably Lord, Ross and Lepper’s (1979) study of views on the death penalty—shows that giving additional information to subjects with different prior opinions can lead to *divergence* rather than convergence of beliefs. Lippmann himself discusses a vast body of anecdotal evidence pointing to the ease with which beliefs can be manipulated, as well as the prevalence of bias in individuals’ assimilation of new information.

These observations point to a model in which *persuasion* is possible. In the model of Mulainathan and Shleifer (2003), for example, individuals account imperfectly for bias introduced by particular information sources. Control over the supply of information thus provides an opportunity

³In the short-run, of course, a particular information draw could cause an individual’s belief to deviate farther from the truth. Similarly, if information sources are expected to be unbiased, introducing a biased source could temporarily deceive people. But *in expectation*, it must be the case that decreasing the cost of information causes beliefs to converge to the truth.

⁴This optimistic view is echoed by policy makers. George Bush attributes negative attitudes like those cited above to America’s failure to adequately convey “the compassionate side of the American story,” pointing to the example of North Korean citizens who are kept unaware of the American food aid supplied to their country (State Department, 2002). Al Gore sees the roots of violence toward the West in “another axis of evil,” one of whose key elements is “ignorance” (Martinovich, 2002). World Bank President James Wolfensohn highlights “education and knowledge exchange” as a key to fighting terrorism, and Nobel Peace Prize winner Elie Wiesel says: “The roots of terrorism nest in... the will to live in ignorance... Education is the way to eliminate terrorism” (World Bank 2003; Jai, 2001).

to manipulate beliefs. Other recent models that explicitly incorporate persuasion include Becker (2001) and Glaeser (2002). In all of these settings, simply increasing the supply of information no longer has clear effects on beliefs. Rather, the incentives of those providing the information become key.

In this paper, we investigate how beliefs and attitudes in the Muslim world depend on the quantity and source of information. We use a unique survey dataset on over 10,000 respondents in 9 predominantly Muslim countries to explore the effects of media and education on the accuracy of beliefs and attitudes toward the West. Though we do not directly examine American beliefs and attitudes, we cite evidence suggesting that the same patterns we see in the Muslim countries may hold in the United States as well.

The first question we address is how individuals' overall quantity of media use and education relate to the accuracy of their beliefs, and to their attitudes toward the West. Consistent with a model in which persuasion is important, we find that this relationship is very weak. Although individuals with more exposure to the news media are more likely to be informed with respect to politically neutral information, they are not significantly more likely to have accurate beliefs about the September 11 attacks. More educated individuals do tend to have more accurate beliefs about the attacks, but the effect is much smaller than for politically neutral information measures. Neither overall media use nor education is consistently related to attitudes toward the US.

The second question is how beliefs and attitudes depend on the source of information. We find strong and consistent effects that point to the importance of persuasion. Viewers of the Arabic-language satellite station Al Jazeera, for example, are *less* likely to attribute the September 11 attacks to Arab terrorists than those who watch no media at all, and also more likely to express anti-American sentiment. Viewers of CNN, on the other hand, have slightly more accurate beliefs about the attacks and express more pro-US views. These results remain when we use linguistic differences among countries as a source of exogenous variation in access to different media sources. Turning to education, we develop a proxy for the degree of western contact and influence in the education system based on the percentage of university instruction offered in English. We find that education correlates positively with both accurate beliefs about the attacks and pro-US views when the English share is large, and has zero or negative correlation where the share is small.

Given the complexity of the setting and the limitations of a single cross-sectional data set, it is not possible to definitively separate the possible causal relationships among these variables, and the findings should be interpreted with caution. Nevertheless, results from a range of different measures and specifications paint a surprisingly consistent picture that we believe sheds light on the role of information in shaping attitudes and beliefs.

Overall, our findings suggest that increasing access to information in a broad sense will not necessarily improve relations between the Muslim world and the West. In fact, if market forces bring forth media sources that tend to reinforce existing biases (as in Mullainathan and Shleifer 2003) or promote the views of the respective governments, media growth could actually deepen hostilities.⁵ On the other hand, policies specifically targeted at increasing the variety of viewpoints available could have a positive effect. From the US perspective, this would suggest that steps like subsidizing the translation or subtitling of Western news sources in local languages could be an effective intervention.

The rest of the paper is organized as follows. Section 1 describes the 2002 Gallup Poll of the Islamic World. Section 2 presents our results on the news media, and section 3 presents findings on education. Section 4 concludes.

2 Data

Our data come from the 2002 Gallup Poll of the Islamic World (The Gallup Organization, 2002). The survey consists of 10,004 responses from nine predominantly Muslim countries: Pakistan (2,043), Iran (1,501), Indonesia (1,050), Turkey (1,019), Lebanon (1,050), Morocco (1,000), Kuwait (790), Jordan (797), and Saudi Arabia (754). Other than a slight oversampling of urban households, the samples are designed to be representative of the adult (18 and over) population in each country.⁶

⁵A *New York Times* editorial speculates: “If a free, uncensored press ever arrives in the Arab world, many Americans will be shocked by what it says. Then, the energetic... broadcasts of Al Jazeera will seem, in comparison, like the nuanced objectivity of the BBC” (2003).

⁶Further details on sample selection and survey methodology are available at <http://www.gallup.com/poll/summits/islam.asp>.

To construct each national sample, official statistics were used to stratify locations by demographic characteristics. Primary sampling units (PSUs) were then selected from each stratum, and households were selected in each PSU according to a pre-specified plan. Within a household, respondents were chosen according to the Kish Grid system to prevent selection bias.

Interviews were conducted in person in the respondent’s home, and each 120-question interview typically took about one hour to complete. The survey questions cover a number of areas, including basic demographics, frequency of media use, media choice, personal and religious values, attitudes toward the West, attitudes toward contemporary and historical figures, and attitudes toward particular countries. Appendix Table 1 summarizes the demographic characteristics of the sample, which is well dispersed across different cohorts and socioeconomic groups.

Our measures of knowledge cover two types of information: politically neutral and politically loaded. Our measure of politically neutral information is drawn from a question asking respondents’ knowledge and opinion of various world leaders: Kofi Annan, Mahatma Ghandi, Nelson Mandela, Salahddine Al Ayyoubi, Tony Blair, George Bush, Amro Mousa, and Kamal Attaturk. Many of these leaders are either strongly associated with the history of particular countries in our sample (i.e. Ghandi for Pakistan and Attaturk for Turkey) or are strongly associated with the US (i.e. Bush and Blair). To develop as neutral a measure as possible, we therefore focus on knowledge of Kofi Annan: we code a binary variable equal to 1 if the respondent expresses an opinion about Kofi Annan and 0 if she indicates that she is “not aware of” him. All the results reported below are qualitatively unchanged if we replace the Kofi Annan variable with the total number of leaders of whom the respondent is aware.

Our measure of politically loaded information comes from the following question:

According to news reports groups of Arabs carried out attacks against USA [*sic*] on September 11th. Do you think that this is true or not?

We code a binary variable equal to 1 if the respondent believes the news reports.⁷

⁷The share of respondents answering “yes” to this question correlates almost perfectly across countries with the share of respondents indicating that Al Qaeda was behind the attacks in an open-ended question on the same topic. This suggests that answers to this question can be interpreted as reflecting the extent of belief in news stories about September 11.

Our primary measure of attitudes toward anti-American terrorism comes from the following question:

There are many acts some people may do in life. I will read out to you number of these acts I would like you to indicate to which extent it can be morally justified?... Events of September 11 in USA, that is, the attack on the World Trade Center and the Pentagon.

Respondents report an answer from 1, cannot be justified at all, to 5, completely justifiable. For ease of interpretation, we will generally code this question as a binary variable equal to 1 if the respondent feels that the September 11 attacks cannot be justified at all, and 0 otherwise.⁸ This question was not asked in Jordan and Saudi Arabia, so those countries will be omitted when our statistical analysis uses this variable.

We will also make some use of a question about general attitudes toward the US:

In general, what opinion do you have of the following nations?...The United States.

Respondents answer from 1, very unfavorable, to 5, very favorable. We recode the response to vary from 0 to 1.⁹ Though general opinions about the US are of less obvious policy relevance than feelings about terrorism, this question was asked in all 9 countries, thus allowing us to make more complete use of the available data.

Table 1 summarizes the variation in the attitude and information measures across the countries in the sample. About 70 percent of respondents claim to be aware of Kofi Annan, and roughly 80 percent don't believe that Arabs committed the September 11 attacks. Only about half of respondents consider the September 11 attacks completely unjustifiable, and in Kuwait only about one-fourth of the population feels that way.

⁸Given the range of beliefs in our sample about the facts surrounding the September 11 attacks, it is not entirely obvious how responses about their moral justifiability should be interpreted. Saying the attacks are justifiable correlates strongly with other measures of anti-US attitudes, however, consistent with the interpretation that most respondents expressed their general opinion about terrorist attacks on the US.

⁹That is, we subtract 1 from the response code and divide the result by 4.

3 News Media

3.1 Frequency of Media Use

One natural approach to measuring the effects of information on attitudes is to exploit variation in overall exposure to news media. Survey respondents were asked three questions of the form:

How frequently do you {read daily newspapers/watch TV/listen to the radio} these days regardless of how much time you spent listening to the radio in an average day?

Possible responses were 7 days a week, 6 days a week, ..., 1 day a week, less often than one day a week, or do not read/watch/listen. We have coded measures of media use to indicate the number of days a week the medium is used, with “less often” coded as .5 and “do not use” coded as 0.

Table 2 shows the results of regressions of our key knowledge and attitude measures on these three measures of media use frequency. Each cell presents the coefficient and standard error from a regression of the form:

$$\text{Dependent variable} = \alpha + \beta (\text{number of days a week read/watch/listen}) + X\gamma + \varepsilon$$

where X is a set of controls including country dummies and dummies for the demographic characteristics described in Appendix Table 1. In columns (1), (2), and (3), the dependent variable is binary, so the coefficients represent marginal effects from probit regressions of the probability that the dependent variable is equal to 1 on the right-hand-side variables. In column (4), the coefficients reported are from ordinary least squares (OLS) regressions.

So, for example, the coefficient in the first row of column (3) can be interpreted as the effect of reading a daily newspaper one more day per week on the probability that a respondent considers the September 11 attacks unjustified, holding fixed the respondent’s observable demographic characteristics. The coefficient indicates that reading the newspaper one more day per week increases the probability of considering the attacks unjustified by .005.

The results in column (1) show that all three media types have large and statistically significant effects on the likelihood of knowing who Kofi Annan is. For example, reading a daily newspaper

one more day per week is associated with a 2.8 percent greater chance of knowing who Kofi Annan is, and this effect is statistically significant at the .1 percent level. This is consistent with our expectations: respondents who make greater use of news media are better informed about world events. This is true despite the fact that many of these countries have tight restrictions on media ownership (Djankov, McLiesh, Nenova and Shleifer, 2003) that have only recently been eroded by the rise of satellite television (Alterman, 1998).

In contrast, column (2) shows that the probability of believing US claims about September 11 is only weakly increasing in the use of newspaper, television, and radio. The point estimates are small, and only the effect of television is statistically significant (at the 10 percent level). These striking findings suggest that increased use of news media may not substantially reduce misinformation about politically charged events.

Overall, the results in columns (3) and (4) suggest little or no effect of media use on attitudes. Within each attitude measure, effects vary greatly in sign and magnitude. For example, newspaper readership has a marginally statistically significant positive effect on the probability of thinking the September 11 attacks unjustified, television viewership has a statistically insignificant positive effect, and listening to the radio has an insignificant negative effect. None of the media use measures has a statistically significant effect in the same direction on both opinions about September 11 and general attitudes toward the US.

Thus the evidence indicates that increased use of news media is associated with more politically neutral knowledge, but neither less misinformation nor more pro-US attitudes. The contrast between politically neutral and politically loaded beliefs suggests the possibility that media “spin” might make the source of information received just as important as its quantity. In the next subsection, we investigate this issue using data on the choice of television news outlet.

3.2 Source of News

To study the role of the source of information in determining attitudes, we focus on two international news networks popular in our sample countries: CNN International and Al Jazeera. CNN International, a twenty-four-hour English-language news broadcast, is by far the most popular

Western news network broadcasting in the countries in our sample. A subsidiary of AOL Time-Warner, it claims to reach more than 10 million households and hotel rooms in the Middle East. Programming in the region originates from London, and is almost entirely in English.¹⁰

Al Jazeera, a twenty-four-hour Arabic language network broadcasting out of Qatar, is the most popular satellite news network in our sample countries, and claims to reach 35 million viewers as of 2001.¹¹ Broadcasting since 1996, Al Jazeera has been widely hailed for combining serious, high-quality reporting with a willingness to present alternative viewpoints on contentious issues.¹² It is, for example, one of the only Arab stations to have aired interviews with Israeli officials. With most of its senior staff having lived or been educated in the West (Alterman 1998), Al Jazeera is probably the closest thing to independent television journalism currently available in Arabic.

While Al Jazeera and CNN are similar in many respects, and are both generally thought to adhere to high journalistic standards, the viewpoints implicit in their coverage are very different. Al Jazeera has been criticized in the West for taking an anti-American and even a pro-terrorist stance in its reporting. Its coverage of the Palestinian conflict and the wars in Afghanistan and Iraq are said to have strongly emphasized the suffering of civilians with limited coverage of the American or Israeli points of view.¹³ With regard to the events of September 11, Al Jazeera has frequently replayed taped messages of Osama bin Laden, reported the charge that Jews were warned in advance of September 11 not to go to work in the World Trade Center, and broadcast an interview with a French author who claims the towers were destroyed by US missiles (Campagna, 2001; United Press International, 2002).¹⁴ A *New York Times* critic, after an extended study of the station's coverage, wrote: "Al Jazeera... may not officially be the Osama bin Laden Channel—but

¹⁰This information was obtained from http://cnmasiapacific.com/cnni/cnni_corpinfo/cnn/index.asp. September, 2003.

¹¹The viewership figure is cited in Campagna (2001).

¹²One author calls the station "a startling new experiment... [that] trumpets its bold independence and provides a forum for criticisms that otherwise [would] have difficulty finding an outlet" (Alterman 1998). Another writes: "Al Jazeera has quickly become the most watched—and most controversial—news channel in the region, winning over viewers with its bold, uncensored news coverage, its unbridled political debates, and its call-in-show formats that tackle a range of sensitive social, political, and cultural issues" (Campagna 2001).

¹³See Ajami (2001), Campagna (2001), and Waxman (2001).

¹⁴With regard to the claim that Jews were warned not to go to work, a *New York Times* editorial claims this was "reported" on Al Jazeera. A station spokesman said a talk show host cited the charge and asked guests to respond (Campagna 2001).

he is clearly its star... The channel's graphics assign him a lead role... A huge, glamorous poster of bin Laden's silhouette hangs in the background of the main studio set" (Ajami 2001). At least one prominent Al Jazeera reporter has been arrested on suspicion of connections to Al Qaeda (Reuters, 2003).

CNN, on the other hand, is frequently seen as giving a pro-Western slant to the news. Like many US networks, CNN prominently displayed an American flag on its screen for more than a year after the September 11 attacks. In sharp contrast to the attention given to civilian casualties on Al Jazeera during the Afghanistan war, a widely cited memo from the chairman of CNN to his staff suggested that it "seems perverse to focus too much on the casualties or hardship in Afghanistan" (Kurtz 2001). In terms of the war Iraq, a study of CNN's coverage found that only three percent of US guests interviewed expressed opposition to the war, compared to 27 percent opposition in the American public as a whole (Rendall and Broughel 2003). The coverage of this war on CNN and Al Jazeera was analyzed by a *Wall Street Journal* media critic, who concludes, "It's the same conflict seen through two different lenses. CNN plays up technology and strategy and 3-D maps analyzed by retired generals. There are few civilians other than embedded reporters. On Al Jazeera... the conflict is messy, bloody and chaotic. Soldiers fire from dusty trenches; injured children fill hospitals" (Nelson 2003).¹⁵

Both networks are freely available to any household with access to a satellite in all sample countries except Iran, in which satellite television is illegal, and Indonesia, in which the networks are available only through paid subscription services. The cost of a satellite dish is less than \$100, and dishes are "as common in Cairo slums as they are in Dubai mansions" (Ajami 2001). Many people who do not have dishes at home watch the channels in public places such as cafes and restaurants.

Our study of these news networks takes advantage of two questions asked in the Gallup poll:

Which TV channel would you tune first nowadays to catch up on current world affairs?

Which other TV channels did you watch at anytime in the past seven days?

¹⁵These quotes refer to the domestic broadcast of CNN, and our statistical results pertain to CNN International. Although the programming and coverage on the two networks are quite similar, they may not be identical in all the respects mentioned here.

Respondents were permitted to give any answer they liked; the surveyor did not prompt with a list of networks. From these two questions we divided respondents into four categories: those who watched neither CNN nor Al Jazeera in the past seven days, those who watched CNN only, those who watched Al Jazeera only, and those who watched both CNN and Al Jazeera.

Table 3 shows breakdowns of these four categories by country. The low viewership numbers in Turkey, Pakistan, Iran and Indonesia are as expected, and those countries are consequently dropped in this section of the analysis. Overall, both networks are fairly popular, with 7 percent of all respondents watching both Al Jazeera and CNN in the last seven days, and 62 percent watching neither network. Dropping Turkey, Pakistan, Iran and Indonesia, these numbers change to 14 percent watching both and less than 35 percent watching neither network.

Table 4 shows the results of regressions of our knowledge and attitude measures on dummy variables representing three of our four viewership categories. All specifications include dummies for education, gender, age, urban/rural status, marital status, and country of residence, using the categories shown in Appendix Table 1. The dummy for the “neither” category has been omitted from the models, so coefficients in these regressions can be interpreted as measuring the attitudes or knowledge of a particular category *relative* to respondents who watched neither CNN nor Al Jazeera in the past seven days. To avoid a confound with total amount of TV watched, we included only those respondents who indicated that they watch television seven days a week, or about 88 percent of the sample in the included countries.

Turning first to our measure of politically neutral knowledge, whether the respondent knows who Kofi Annan is, column (1) shows that those respondents who watch either or both networks are more likely to know his identity than those who watch neither. The effect of “Al Jazeera only” is strongly statistically significant. Additionally, there is no statistically significant difference in this measure of knowledge between those watching CNN only and those watching Al Jazeera only, and those watching both are better informed than those watching either one alone. This finding is consistent with the view that, while these two networks spin the news very differently, they both provide similar amounts of basic information.

In the case of more politically charged beliefs—the propensity to believe stories that Arabs carried out the September 11 attacks—the picture is quite different. Column (2) shows that watchers

of CNN only are more likely to believe these reports (though the difference is not statistically significant) and Al Jazeera watchers are significantly less likely to believe them, relative to those who watch neither network. Respondents who report watching both networks are slightly less likely to believe that a group of Arabs carried out the attacks than respondents who watched neither network.

The difference between those who watch both networks and those who watch Al Jazeera only is statistically significant, illustrating that the observed relationships are not driven by differences between households with and without satellite television. Any household with access to Al Jazeera also has access to CNN and vice versa, so there is no difference in satellite access between the “Al Jazeera only” and “both” categories. Nevertheless, there is a sizable difference in attitudes.

The contrast between columns (1) and (2) tends to refute the view that exposure to richer sources of information will lead to a convergence of beliefs. Although watching CNN and watching Al Jazeera are both associated with a greater likelihood of knowing who Kofi Annan is, the two networks have very different associations with beliefs about the perpetrators of the September 11 attacks.

Column (3) shows that there is also a relationship between news network viewership and attitudes about September 11. Respondents who watched CNN only were insignificantly less likely to say that the attacks on September 11 were completely unjustifiable. Al Jazeera watchers were significantly less likely to consider the attacks unjustifiable, as were respondents who report having watched both CNN and Al Jazeera.

The relationship between news network viewing and overall favorability towards the United States, presented in column (4) of Table 4, reveals that CNN watchers are more favorable toward the US than Al Jazeera watchers, with watchers of both networks closer to the Al Jazeera only category than to the CNN only category. (All coefficients are statistically significant.)

Overall, the evidence in Table 4 suggests that, although CNN and Al Jazeera convey similar amounts of basic information, information from the two stations has very different effects on attitudes. Moreover, the propensity to believe that a group of Arabs carried out the September 11 attacks is strongly associated with the news network(s) watched.

3.3 Language and current events interest

Despite our use of demographic controls, the results in the previous subsection raise concerns about causality. Most obviously, the relationship between media and attitudes may simply reflect the fact that those with relatively pro-US attitudes are more likely to watch CNN, and those with relatively anti-US attitudes tend to watch Al Jazeera. Reverse causality is less obviously a problem in regressions with factual beliefs on the left-hand side, but it is possible that some omitted variables influence both media choices and beliefs.

We address these concerns by using cross-country variation in the ability to access the two networks. The ideal way to deal with the reverse causality issue would be to have a source of exogenous variation in access at the *individual* level. However, the ubiquity of satellite access, combined with the particular limitations of our data set, mean we do not have any instruments that could function in this way. Using cross-country differences is a coarser approach, and the results will be subject to the criticism that they pick up the effect of other country-level differences unrelated to media. Keeping these limitations in mind, however, this will be a good check on whether the effects documented in the media regressions are spurious, or capture a causal relationship.

The specific country-level difference we exploit is the extent to which people are able to understand English and Arabic. Since CNN broadcasts only in English (or Turkish in the case of CNN Turkey), and Al Jazeera only in Arabic, language is a strong constraint on an individual's ability to access the networks. Our basic approach is to compare knowledge and attitudes for individuals categorized along two dimensions: propensity to watch television news (captured by reported attention to current events), and the extent to which English and/or Arabic are widely understood in the individual's country. If current events junkies in Arabic-speaking countries differ in knowledge or attitudes, compared to both those less interested in current events and those following current events in non-Arabic-speaking countries, we interpret this as an effect of the Arabic-language media (including Al Jazeera). Similarly, we interpret the interaction between current events interest and living in a country where English is widely spoken as the effect of access to English-language news, for which CNN is by far the most important source.

The measure of attention to current affairs comes directly from the survey. Respondents were

asked:

With respect to how much attention you pay to current affairs, would you say that you do not pay much attention (code 1),..., pay a lot of attention (code 5).

For ease of interpretation, we have recoded the response to this question to vary from 0 to 1.

The extent to which Arabic is widely understood is also relatively easy to code. In five of our countries—Lebanon, Kuwait, Saudi Arabia, Jordan and Morocco—Arabic is the first language and is spoken by virtually everyone. In the remaining four countries—Turkey, Pakistan, Iran and Indonesia—Arabic is not the first language. While it is used to some extent, especially for religious purposes, the majority of people could not understand a news broadcast in Arabic. We therefore code the former countries as Arabic-speaking and the latter as not.

Measuring the number of people who understand English is more difficult. English is not the first language in any of the sample countries, and we are unaware of any accurate data on the fraction of people fluent in it as a second language. Nevertheless, two sources of information suggest strong differences among our countries. First, data to be discussed in section 3 show that English is a common language of university instruction in Saudi Arabia, Lebanon, Kuwait, Jordan, and Pakistan. Second, the Linguasphere Register, a classification of “the world’s languages and speech communities,” lists Kuwait, Jordan and Pakistan as countries where English is widely spoken (Dalby et al. 1999). The latter is consistent with the fact that Kuwait, Jordan, and Pakistan are the only countries in our sample that were previously under some form of British rule. Since colonial history seems the clearest way to separate the sample, we will categorize these three as countries where English is common. However, none of the qualitative results below change if we include Saudi Arabia and Lebanon as well. Finally, we add Turkey to the “English” category, not because English is widely spoken but because individuals there have access to broadcasts from CNN Turkey in their native language.

As a first step, we verify that the language categories relate in the predicted way to viewership of CNN and Al Jazeera. Table 3 shows that the fraction watching Al Jazeera in the Arabic-language countries is high, whereas it is essentially zero in the non-Arabic countries. CNN viewership is high in Kuwait, Turkey, and Pakistan, significant in Jordan, Lebanon and Saudi Arabia, and

negligible in the remaining countries, roughly consistent with our categorization. A more accurate way to test the relationship is to run a regression of viewership on the interaction between the language variables and attention to current events. Focusing on the interaction removes any effect of differences between the country groups in average viewership, such as might be caused by differences in education or income. The results of this exercise go in the predicted direction: the interaction between English and current events has a significant positive effect on CNN viewership, but no effect on Al Jazeera viewership; the interaction with Arabic has exactly the reverse pattern.

We will estimate models of the form:

$$\begin{aligned} \text{Dependent variable} &= \alpha + \beta (\text{current events interest}) + \gamma (\text{country}) \\ &+ \lambda (\text{Arabic} \times \text{current events interest}) \\ &+ \rho (\text{English} \times \text{current events interest}) + \varepsilon \end{aligned}$$

and test the hypothesis that $\lambda < 0$ and $\rho > 0$ for attitudes, but $\lambda > 0$ and $\rho > 0$ for knowledge. This approach has the disadvantage relative to the regressions in Table 4 that we will not be able to identify the precise networks or publications responsible for the effects, but has the advantage that it will not be contaminated by reverse causality.

The results of this test are shown in Table 5. In general, they validate our hypotheses. Column (1) demonstrates that both being in an Arabic-speaking country and being in an English-speaking country make respondents interested in current events relatively more likely to have heard of Kofi Annan. The coefficients on the two key interaction terms are of similar magnitude and are statistically indistinguishable. This is consistent with the finding in Table 4 that both CNN and Al Jazeera provide comparable amounts of information.

As column (2) shows, effects on believing that a group of Arabs carried out the September 11 attacks go in the expected direction, although they are not statistically significant. Greater interest in current events is associated with a lower likelihood of believing that a group of Arabs carried out the attacks in Arabic-speaking countries (relative to the baseline); the opposite holds for the interaction with English language.

Column (3) shows that the probability that a respondent believes the September 11 attacks are

unjustifiable rises more rapidly with current events interest in English-language countries, and rises less rapidly in Arabic-language countries. The former effect is statistically significant. Column (4) repeats this specification using general favorability toward the US as a dependent variable, and finds similar results. In this case, it is the effect of Arabic-language interacted with current events interest that is statistically significant; the English-language effect is wrong-signed and statistically insignificant.

As an additional robustness check, we have run all of the same regressions including interactions between the language variables and our standard set of demographics. This verifies that the effects we are picking up are not driven by demographic differences across countries that happen to be correlated with language. The results are not shown in Table 5, but the sign and statistical significance of the coefficients remain the same.

On the whole, then, our hypotheses are confirmed: those interested in current events and living in Arabic-speaking countries are less likely to attribute the September 11 attacks to Arab terrorists and tend to be less pro-US in their attitudes; those who follow current affairs and live in relatively more English-speaking countries are both better informed and more pro-US. The evidence in Table 5 thus serves to strengthen the case made by Table 4 that it is the source of information, not information itself, which affects misperceptions and attitudes.

3.4 Comparisons with the United States

While recent events have made knowledge, perceptions and attitudes in the Muslim world especially relevant, some evidence exists to suggest that the patterns we have described in this section may apply equally well to Americans. A recent poll collected evidence on media use and several misperceptions from a sample of Americans (Kull et al, 2003). Misperceptions studied related to evidence of an Iraqi-Al Qaeda link, whether weapons of mass destruction have been found in Iraq, and whether Iraq used chemical or biological weapons in the recent war. Tabulations of the survey data show no consistent relationship between overall attention to the news and the frequency of misperceptions, but a strong effects when the specific source of news is taken into account. While these results are not conclusive, they suggest that the patterns we observe in Islamic countries may

apply equally to beliefs in the United States.

4 Education

Even more than media, perhaps, the education system plays a critical role in determining the information available to individuals. We therefore study the effects of educational attainment on knowledge measures and attitudes toward the US as a second test of our key hypotheses. We predict that more educated individuals will always be better informed on politically neutral measures, but will not necessarily have more accurate perceptions of September 11 or be more pro-US in their attitudes. Moreover, we expect that the heterogeneity in the effects of education on attitudes will be related to the extent of western influence in the school system.

The Gallup dataset codes educational attainment into 7 categories, described in Appendix Table 2. We convert these into approximate years of completed schooling, and estimate models of the form:

$$\text{Dependent variable} = \alpha + \beta (\text{years of schooling} \times \text{country}) + X\lambda + \varepsilon$$

where X is a set of controls including country dummies and dummies for the demographic characteristics described in Appendix Table 1. Table 6 reports the country-specific education coefficients that result from this exercise. Each column reports the estimated marginal effect of education on the corresponding dependent variable for residents of each country. To improve statistical precision, we assume that control variables have identical effects in all countries.

By far the most consistent relationship is between schooling and the probability of knowing who Kofi Annan is: this relationship, shown in column (1), is positive and statistically significant in all 8 countries for which data are available. In all countries, more schooling is strongly associated with more politically neutral knowledge.

The effect of education on the propensity to believe that a group of Arabs carried out the September 11 attacks is generally small and positive, although the point estimate is insignificantly negative in Indonesia. The coefficients in column (2) are generally much smaller than the corresponding estimates in column (1), indicating that schooling has a much stronger associating with

knowing who Kofi Annan is than with believing that a group of Arabs perpetrated the September 11 attacks. Once again, knowledge about September 11 does not behave like politically neutral information.

Column (3) reveals significant cross-country variation in the relationship between schooling and attitudes about September 11. Out of the seven countries for which data are available, two (Kuwait and Pakistan) show a statistically significant positive relationship between schooling and the probability of believing that the September 11 attacks are unjustifiable, three (Turkey, Iran, and Indonesia) show a statistically insignificant positive effect, one (Lebanon) shows a statistically insignificant negative effect, and one (Morocco) a statistically significant negative effect.¹⁶ There is similar variability in the relationship between education and general attitudes toward the US, as shown in column (4).

What accounts for the differences in the education effect across countries? One candidate explanation is that some countries' education systems place relatively more emphasis on Western information sources. To explore this hypothesis, we have collected data on the share of universities conducting regular instruction in English and Arabic for our nine sample countries. These data, compiled from Awais (1987) and summarized in Table 7, provide a proxy for the extent to which Western sources of knowledge are used in instruction. An individual residing in a country whose universities use English as a primary or secondary language ought to have more access to English-language sources, especially if that individual is herself a university graduate.

This language measure is also broadly correlated with the extent of British or American influence in the structure of the education system. In the four countries that have the highest percentage of instruction in English—Pakistan, Lebanon, Kuwait, and Jordan—the major universities were all either founded directly by the British or American governments, or designed with extensive participation by British or American consultants.¹⁷ In the countries with the lowest Eng-

¹⁶In light of these cross-country differences, it does not seem surprising that Krueger and Maleckova (2003) find no consistent relationship between socioeconomic status and support for terrorism in Palestine.

¹⁷The University of Punjab, which controls higher education standards throughout Pakistan, was founded by the British and modeled on the University of London. Two of the leading Lebanese universities, the American University of Beirut and Beirut University College, were chartered by the Board of Regents of the State of New York. Kuwait University was founded following a report by consultants from Cambridge, England, and American University of Beirut (Altbach 1991). The structure of the University of Jordan was based on a report by a British delegation from Oxford,

lish percentages—Turkey, Indonesia, Iran, and Morocco—the models were either French, Dutch, or independently developed.¹⁸

Table 8 tests formally whether the effects of university education differ systematically depending on the country’s typical languages of instruction. Here we parallel Table 5 and estimate models of the form

$$\begin{aligned} \text{Dependent variable} &= \alpha + \beta (\text{university education}) + \gamma X \\ &+ \lambda (\text{share teaching in English} \times \text{university education}) \\ &+ \rho (\text{share teaching in Arabic} \times \text{university education}) + \varepsilon \end{aligned}$$

where X is a set of controls including country dummies and dummies for the demographic characteristics described in Appendix Table 1.

Column (1) shows that there are no significant interactions between language of instruction and university education using as a dependent variable whether the respondent knows who Kofi Annan is. Politically neutral information appears equally sensitive to university education in all countries.

A different picture emerges in column (2), which shows that the effect of education on the probability of believing that a group of Arabs carried out the September 11 attacks decreases significantly with the share of universities instructing in Arabic. The university effect increases with the share instructing in English, but this interaction is not statistically significant. Taken together, the columns (1) and (2) suggests that the specific characteristics of the education system captured by the language variable change the information provided about politically charged events, but do not affect the provision of politically neutral information.

Column (3) shows that the effect of having a university education on the probability of believing the September 11 attacks are unjustifiable is higher in countries with more English-language instruction, and lower in countries with more Arabic-language instruction. These differences are statistically significant and large: a change from 0 universities teaching in English to all universities teaching in English raises the university effect by 20 percentage points.

Cambridge, and the University of London (University of Jordan 2003).

¹⁸See Altbach (1991) for Turkey and Indonesia. See Clark and Neave (1992) for Iran and Morocco.

With respect to general attitudes toward the US, as column (4) shows there is no significant interaction between English instruction and university education, and a marginally significant negative interaction between Arabic instruction and university education.

The pattern of the coefficients remains the same when we add interactions between the language of instruction variables and our usual set of demographics, though the results are not shown in the table. This provides some evidence that the effects are not driven by observable differences correlated with language that also change the effect of university education on pro-US views.

5 Conclusion

Our findings regarding both media and education suggest that increased access to information does not necessarily lead beliefs to converge to the truth. Instead, particular news outlets and education systems appear able to manipulate politically charged beliefs, and may actually exacerbate misinformation. Different information sources are also closely tied to both expressed support for terrorist activities and general attitudes toward the West.

People in the United States and the Islamic world are clearly, to use Lippmann's (1922) formulation, thinking and feeling in different worlds. The severe consequences of such divergent perceptions seem clear. More than anything else, the results above point to the crucial role of information providers in shaping these perceptions, and suggest that understanding better the constraints and incentives that govern the market for politically relevant information—news, persuasion, propaganda—is a crucial task for future research. We are optimistic based on recent advances in the literature that economics is now well positioned to make progress on this front.

In terms of more immediate policy issues, the results suggest that exposure to a broader range of information sources could reduce hostility on both sides of the current conflict. From the US perspective, a simple intervention would be to encourage the growth of Western media in Muslim countries. This could include subsidizing broadcasts of Western news sources in Arabic, and other local languages of the Muslim world. Such efforts could be applied to CNN, as well as other networks such as the BBC or FOX that are not freely available in the Middle East at the present

time.¹⁹ This proposal has been advanced, for example, in a recent *Washington Post* opinion piece (Satloff, 2003). A more controversial approach is for the government to sponsor the production and broadcast of original programming with a pro-American message. For example, government officials have recently called for the establishment of a “Middle East Television Network,” broadcast in Arabic throughout the Middle East, that would replicate the popularity of the recently launched Radio Sawa (Shelby, 2003). How the effects of such explicitly persuasive messages would differ from the subtler “spin” introduced by newscasts is a question outside the scope of this study, and an important topic for further research.

¹⁹As pointed out by Mullainathan and Shleifer (2003), the equilibrium effect of increasing the supply of Western news would depend on the existing news sources reposition their coverage in response. For example, if Al Jazeera were to adopt a more anti-US stance in order to further differentiate itself from new Western sources, introducing more such sources could actually increase the degree of anti-US sentiment.

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Table 1: Summary of key variables

	Know who Kofi Annan is (%)	Believe stories about 9/11 (%)	9/11 attacks unjustifiable (%)	General attitude toward US (Avg.)
Lebanon	96.0	42.4	62.4	0.474
Kuwait	96.5	11.1	25.7	0.438
Saudi Arabia	NA	NA	NA	0.275
Jordan	94.6	NA	NA	0.295
Turkey	37.8	51.5	55.6	0.492
Pakistan	53.0	4.1	40.9	0.202
Iran	60.4	20.3	55.8	0.224
Morocco	63.5	12.8	54.5	0.398
Indonesia	88.9	21.6	74.3	0.491
Total	69.9	21.5	52.3	0.346

Notes:

Individuals with missing data have been omitted from the table. Results are weighted as recommended by the data providers.

Table 2: Effects of media use

	(1)	(2)	(3)	(4)
	Know who Kofi Annan is	Believe stories about 9/11	9/11 attacks unjustifiable	General attitude toward US
Model	Probit	Probit	Probit	OLS
Newspaper	0.0275 (0.0026)	0.0017 (0.0023)	0.0053 (0.0031)	-0.0007 (0.0015)
Television	0.0190 (0.0029)	0.0056 (0.0033)	0.0041 (0.0037)	-0.0038 (0.0019)
Radio	0.0098 (0.0020)	0.0018 (0.0019)	-0.0035 (0.0025)	0.0021 (0.0013)
N	9203	7583	8102	9607

Notes:

Individuals with missing data on dependent variable or key independent variable have been omitted from the table. Results are weighted as recommended by the data providers. All specifications include dummies for education, gender, age, urban/rural status, marital status, and country of residence, using the categories shown in Appendix Table 1. In probit specifications, coefficients reported reflect marginal effects.

Table 3: News network viewership by country

	Neither (%)	CNN Only (%)	Al Jazeera Only (%)	Both (%)
Lebanon	36.88	5.1	46.25	11.77
Kuwait	7.87	2.58	46.49	43.06
Saudi Arabia	18.08	1.16	68.82	11.94
Jordan	39.38	1.08	52.69	6.85
Turkey	77.97	22.03	0	0
Pakistan	78.04	21.96	0	0
Iran	99.01	0	0.99	0
Morocco	61.56	0.24	36.57	1.63
Indonesia	99.39	0.61	0	0
Total	61.94	6.52	24.45	7.09

Notes:

Individuals with missing data have been omitted from the table. Results are weighted as recommended by the data providers.

Table 4: Effects of news source

	(1)	(2)	(3)	(4)
	Know who Kofi Annan is	Believe stories about 9/11	9/11 attacks unjustifiable	General attitude toward US
Model	Probit	Probit	Probit	OLS
CNN only	0.0296 (0.0200)	0.0653 (0.0567)	-0.0142 (0.0679)	0.0827 (0.0365)
Al Jazeera only	0.0390 (0.0098)	-0.0822 (0.0206)	-0.0935 (0.0271)	-0.0449 (0.0136)
Both CNN & Al Jazeera	0.0544 (0.0090)	-0.0172 (0.0290)	-0.1729 (0.0355)	-0.0802 (0.0197)
N	3269	2457	2450	3769

Notes:

Individuals with missing data on dependent variable or key independent variables have been omitted from the table. Results are weighted as recommended by the data providers. Results exclude respondents living in Turkey, Pakistan, Indonesia or Iran and watching television fewer than seven days a week. All specifications include dummies for education, gender, age, urban/rural status, marital status, and country of residence, using the categories shown in Appendix Table 1. In probit specifications, coefficients reported reflect marginal effects.

Table 5: Language, knowledge and attitudes

	(1)	(2)	(3)	(4)
	Know who Kofi Annan is	Believe stories about 9/11	9/11 attacks unjustifiable	General attitude toward US
Model	Probit	Probit	Probit	OLS
English × Current events	0.3175 (0.1759)	0.0040 (0.0222)	0.1741 (0.0695)	-0.0531 (0.0508)
Arabic × Current events	0.3822 (0.1044)	-0.0814 (0.0518)	-0.0330 (0.0818)	-0.1450 (0.0523)
Current events	-0.1012 (0.0888)	0.0515 (0.0139)	-0.0477 (0.0571)	0.0034 (0.0313)
N	7873	6362	6821	8338

Notes:

Individuals with missing data on dependent variable or key independent variable have been omitted from the table. Results are weighted as recommended by the data providers. Standard errors in parentheses are clustered by country to correct for intercorrelation among the error terms. All specifications include controls for country of residence. In probit specifications, coefficients reported reflect marginal effects.

Table 6: Education effects by country

	(1)	(2)	(3)	(4)
	Know who Kofi Annan is	Believe stories about 9/11	9/11 attacks unjustifiable	General attitude toward US
Model	Probit	Probit	Probit	OLS
Lebanon	0.0772 (0.0199)	0.0353 (0.0098)	-0.0050 (0.0098)	0.0072 (0.0027)
Kuwait	0.0499 (0.0209)	0.0295 (0.0192)	0.0434 (0.0148)	0.0163 (0.0030)
Saudi Arabia	NA	NA	NA	-0.0003 (0.0035)
Jordan	0.0954 (0.0181)	NA	NA	0.0100 (0.0028)
Turkey	0.1190 (0.0137)	0.0125 (0.0109)	0.0101 (0.0102)	0.0042 (0.0021)
Pakistan	0.1262 (0.0113)	0.0337 (0.0177)	0.0499 (0.0086)	-0.0039 (0.0017)
Iran	0.1506 (0.0085)	0.0271 (0.0100)	0.0020 (0.0072)	0.0174 (0.0016)
Morocco	0.1961 (0.0182)	0.0289 (0.0115)	-0.0356 (0.0096)	-0.0030 (0.0022)
Indonesia	0.1473 (0.0220)	-0.0165 (0.0231)	0.0115 (0.0211)	-0.0060 (0.0039)
N	9203	7583	8102	9607

Notes:

Individuals with missing data on dependent variables or education have been omitted from the table. Results are weighted as recommended by the data providers. All specifications include dummies for gender, age, urban/rural status, marital status, and country of residence, using the categories shown in Appendix Table 1. Coefficients on controls are restricted to be identical across countries. In probit specifications, coefficients reported reflect marginal effects.

Table 7: Share of universities instructing in English

Country	No. of Universities Reporting Language	Pct. Instructing in English	Arabic
Lebanon	5	80	80
Kuwait	1	100	100
Saudi Arabia	8	75	100
Jordan	3	100	100
Turkey	18	11	0
Pakistan	18	100	0
Iran	14	21	0
Morocco	3	33	100
Indonesia	29	17	3
Total	99	43	20

Notes:

Table is based on authors' calculations from Awais (1987).

Table 8: Language and university education

	(1)	(2)	(3)	(4)
	Know who Kofi Annan is	Believe stories about 9/11	9/11 attacks unjustifiable	General attitude toward US
Model	Probit	Probit	Probit	OLS
English share × University	0.0174 (0.0860)	0.0542 (0.0477)	0.2152 (0.0288)	-0.0252 (0.0769)
Arabic share × University	-0.0438 (0.1075)	-0.0820 (0.0392)	-0.1467 (0.0238)	-0.1022 (0.0551)
University education	0.1767 (0.0182)	0.0578 (0.0306)	0.0074 (0.0313)	0.1178 (0.0555)
N	9203	7583	8102	9607

Notes:

Individuals with missing data on dependent variable or key independent variable have been omitted from the table. Results are weighted as recommended by the data providers. Standard errors in parentheses are clustered by country to correct for intercorrelation among the error terms. All specifications include dummies for gender, age, urban/rural status, marital status, and country of residence, using the categories shown in Appendix Table 1. In probit specifications, coefficients reported reflect marginal effects.

Appendix Table 1: Demographic characteristics

	Share (%)		Share (%)
<i>Age (years)</i>		<i>Urban/rural status</i>	
Missing	0.1	Missing	0.3
18-19	9.3	Urban	53.4
20-24	17.3	Suburban	18.2
25-29	15.4	Rural	28.2
30-34	14.5		
35-39	12.6	<i>Gender</i>	
40-44	9.7	Male	50.4
45-49	7.3	Female	49.6
50-54	5.2		
55-59	3.4	<i>Marital status</i>	
60+	5.4	Single	32.3
		Married with children	59.8
<i>Schooling</i>		Married w/o children	6.4
Less than primary	19.8	Other	1.6
Completed primary	35.0		
Completed secondary	34.5		
Completed university	10.7		

Notes:

Shares may not add to 100% due to rounding. Results are weighted as recommended by the data providers.

Appendix Table 2: Education codes

Survey question: Could you please tell me the highest level you have reached?

Survey responses:

Category	Description	Approximate completed years
1	Do not have any formal education	0
2	Some elementary education/can read and write	3
3	Finished elementary ed. less than intermediate	6
4	Finished intermediate less than secondary	9
5	Finished secondary	12
6	College some university	14
7	University and above	16