

Implicit Attitudes Toward Arab-Muslims and the Moderating Effects of Social Information

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Three studies examined the relative valence and strength of implicit attitudes toward Arab-Muslims using the Implicit Association Test (IAT) while exploring the moderation of such implicit effects. Studies have suggested that repeated exposure to information associating members of a social group (e.g., Arab-Muslims) with evaluative attributes (e.g., terrorism) might create automatic attitudes toward them. Consistent with this notion, the IAT results indicated strong implicit preference for White over Arab-Muslim, whereas the magnitude of such a bias was substantially diminished when assessed by explicit measures (Study 1). It is also interesting to note that participants exhibited implicit preference for Black over Arab-Muslim when measured by the IAT, whereas no difference was found between the 2 groups in stimulus familiarity and in explicit attitudes (Studies 2 and 3). However, such implicit effects were moderated when participants were exposed to positive information about Arab-Muslims (Study 3). Theoretical and practical implications of these findings are further discussed.

Research on intergroup relations has made significant contributions to understanding social judgment and behavior in intergroup contexts. A recent theoretical advance in this research field is the recognition of an implicit or unconscious manner in which attitudes or beliefs about a social group are produced and influence judgment and behavior (Bargh, 1994; Greenwald & Banaji, 1995). Greenwald and Banaji suggested that past experiences might influence social judgments and behavior without being introspectively identified (often falsely identified). Furthermore, they argued that traditional explicit measures might not always be able to assess them adequately. In addition to the conceptual identification of implicit social cognition, Greenwald, McGhee, and Schwartz (1998) introduced the Implicit Association Test (IAT). The IAT represents a simple and yet powerful method used to measure implicit attitudes by examining relative automatic associations between attitude objects (e.g., Blacks and Whites) and evaluative attributes (e.g., pleasant and unpleasant words). Since its introduction to the literature, the IAT has been known to measure implicit attitudes without be-

ing affected by perceivers' awareness, intention, and conscious control (Greenwald, Nosek, & Banaji, 2003). In all studies reported in this article, the IAT was used to measure implicit attitudes toward members of a realistic social group.

Since the tragic events of September 11, 2001, members of a specific ethno-religious group (i.e., Arab-Muslims) have been brought to the public's attention in the United States. These astonishing incidents, caused by 19 men bearing distinctive Muslim names, followed by a series of events including the war on Iraq, have had a huge impact on the ways in which Americans live their daily lives. During the past few years, Americans have been repeatedly exposed to information associating Arab-Muslims or individuals of Arabic origins with life-threatening or fear-inducing events (e.g., murdering Americans, car bombings, terror threats, etc.). Although the impact of such incidents on social environments has been profound, very few empirical studies have been conducted by social psychologists to examine attitudes toward or beliefs about members of this ethno-religious group. A recent review study (Sheridan & North, 2004) examined 1,354 abstracts in the PsycINFO database containing the terms *Islam*, *Muslim*, or *Moslem* and indicated the general lack of empirical studies toward Muslim populations. Sheridan and North also mentioned that the number of pub-

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lished studies that have specifically investigated attitudes toward Muslim populations has been minimal. Therefore, this study was designed to rigorously measure and examine implicit attitudes toward Arab-Muslims, using the IAT, with reference to two social groups (i.e., Blacks and Whites).

The primary purpose of this study is to investigate how social information about a realistic target group (i.e., Arab-Muslims) is represented and processed to form implicit attitudes in intergroup contexts. To do this, the relative valence and strength of implicit attitudes toward Arab-Muslims were assessed by the IAT and other explicit measures. In addition, this study is designed to test whether such implicit attitudes can be modified by exposure to valenced social information. Recently, many researchers have reported that automatic attitudes or stereotypes are malleable (see Blair, 2002, for a review). We explore whether implicit attitudes toward this particular ethno-religious group can be moderated, as exhibited in other studies.

As previously mentioned, the literature on attitudes toward or beliefs about Arab-Muslims is sparse. Johnson (1992) explored anti-Arabic prejudice through telephone interviews. He reported that low education, high authoritarianism, and religious fundamentalism (mostly for Catholics and Protestants) were correlated with the prejudice against Arabs, although the participants' responses to the crucial item measuring anti-Arabic prejudice did not clearly show such prejudice (39.8% responded negatively and 40.9% positively toward Arabs overall). It should be noted, however, that because this study used explicit measures to assess attitudes toward Arab-Muslims, the validity of such measures might be diminished by social desirability tendency pressures (Crosby, Bromley, & Saxe, 1980). More recently, Rowatt, Franklin, and Cotton (2005) measured implicit prejudice toward Muslims using Muslim and Judeo-Christian names as stimuli for the IAT. They observed implicit prejudice against Muslims among their participants who were largely White Christians.

Despite the scant empirical findings about attitudes toward Arab-Muslims, it is not difficult to make reasonable predictions about implicit attitudes toward Arab-Muslims. For example, Devine (1989) suggested that repeated exposure to information that associates members of a social group with evaluative attributes might form automatic attitudes and beliefs toward them. In this respect, exposure to information regarding Arab-Muslims, such as their deep religiosity or the acts of terrorism by those with identifiable Arab-Muslim names, may influence automatic attitudes toward Arab-Muslims. In addition, recent studies using the IAT have demonstrated that automatic attitudes and stereotypes toward social groups are likely to be influenced by many factors, including the valence of stereotypes salient in a given situation (Wittenbrink, Judd, & Park, 2001), information in immediate environments (Dasgupta & Asgari, 2004), and social influence (Lowery, Hardin, & Sinclair, 2001). For example, Wittenbrink et al. (Study 1) showed that exposure to a positive stereotypic situation about Blacks (e.g., a family barbe-

cue) significantly reduced the magnitude of the IAT effect (i.e., faster responses for the White + pleasant combination than the Black + pleasant combination), whereas exposure to a negative stereotypic situation (e.g., a gang incident) did not. These findings suggest that the valence of information about a social group made salient in a given situation might be important in determining the direction of automatic attitudes toward its members as measured by the IAT. To the extent that this is true, it is likely that recent exposure to information about Arab-Muslims associating them with negative events (e.g., terrorist attacks) would influence automatic attitudes toward them.

If repeated exposure to information associating Arab-Muslims with negative attributes serves as the basis for forming automatic attitudes toward them, the next theoretical question would concern the relative strength of such associations. If automatic prejudice against Arab-Muslims is strong, will it override the automatic prejudice against a historically stigmatized group (e.g., Blacks)?

Recent studies have shown that the IAT may be sensitive to changes in the situational context (Dasgupta & Asgari, 2004; Lowery et al., 2001; Wittenbrink et al., 2001). Furthermore, Ashburn-Nardo, Voils, & Monteith (2001) have demonstrated that the automatic intergroup bias can occur even in the minimal group situation (Tajfel, Billig, Bundy, & Flament, 1971), in which no history of conflict exists between in-group and out-group members. If the IAT is sensitive enough to reflect social information available in the situational context, the strength of associations between Arab-Muslims and recent negative events is expected to be very strong, or relatively stronger than the robust associations reflected in cultural stereotypes about Blacks, considering the salience of recent events of terrorism. This study addresses this issue by exploring the relative strength of automatic associations between different target groups and particular attributes.

Three studies were conducted (a) to investigate the relative valence and strength of implicit attitudes toward and beliefs about Arab-Muslims and (b) to test whether the implicit attitudes can be moderated by valenced social knowledge. Studies 1 and 2 concerned implicit attitudes and beliefs about Arab-Muslims with reference to Whites (Study 1) and Blacks (Study 2), controlling for the familiarity and typicality of the stimulus names used in the studies. Study 3 was designed to more directly test the hypothesis proposed in Study 2 by manipulating the valence of social information to which participants were exposed. In addition, Study 3 was expected to show moderating effects of valenced social information on implicit attitudes toward Arab-Muslims.

STUDY 1

Study 1 was designed to explore implicit attitudes and beliefs toward Arab-Muslims in relation to Whites using the IAT and explicit attitude measures. If participants had been exposed

to information relating Arab-Muslims to negative incidents (e.g., terrorist attacks), they were expected to show anti-Arabic prejudice relative to Whites. Rowatt et al. (2005) reported that their participants (mostly White Christians) exhibited an implicit preference for Judeo-Christian over Muslim names as shown by the IAT effects. Considering the differences in participants' ethnic backgrounds and in the stimulus names used in Study 1 (not necessarily Jewish or Christian names), Study 1 may represent a conceptual replication of the findings in Rowatt et al. Thus, it was predicted that we would observe an implicit preference of White over Arab-Muslim names in Study 1. To preclude an alternative explanation, familiarity of the stimulus names was controlled.

Method

Participants. Participants were 26 female and 17 male undergraduates (11 Asian Americans, 8 Blacks, 12 Hispanics, and 12 Whites) from introductory psychology courses at a northeastern university in the United States. The mean age of the participants was 23.55 ($SD = 4.56$). Participants received a partial course credit in return for participation.

Materials and procedure. Ten Arab-Muslim and 10 White male first names (e.g., *Hassan* and *Zahir* for Arab-Muslims, *Adam* and *Justin* for Whites) were selected from the pretest¹ and from Greenwald et al. (1998), respectively. In addition, 10 pleasant and 10 unpleasant words (e.g., *honor* and *rainbow* for pleasant and *cancer* and *abuse* for unpleasant words, respectively) were selected from Greenwald et al. (See Appendix A for all the stimuli used in this experiment.)

Participants were informed that this study was designed to examine general knowledge about people from different social groups including ethnic groups. They were instructed that they would engage in categorization tasks and that the study might eventually reveal their attitudes toward ethnic

¹A pretest was conducted to obtain a stimulus set of Muslim names to be used in subsequent studies. First, we used several Web sites (e.g., aaail.org/text/muslimnames/) to select 30 names composed of one word (no more than eight letters) without a hyphen. Then, 10 participants were asked to rate on a 5-point scale the degree to which each name was perceived as a Muslim name. Finally, 10 names with the highest mean ratings were selected to be used in this research (e.g., *Hassan* and *Zahir*). Black and White names used in this study were chosen from Greenwald et al. (1998). A complete list of stimulus names used in this study is presented in Appendix A. A separate pretest was conducted to examine whether all the stimulus names used in this study were actually perceived as intended. Admittedly, because some Black names might be falsely perceived as Muslim names, the pretest was aimed to measure and control the typicality of stimulus names. We asked 38 participants to judge whether each of the 30 names (10 for each of the Blacks, Muslims, and Whites) was likely to be the name of Blacks, Muslims, or Whites by choosing one of the three ethnic groups. The results showed that, on average, 78.94% of participants perceived Black names to be Blacks, 89.47% perceived Muslim names as Muslims, and 84.21% perceived White names as Whites, suggesting the names we selected were actually perceived as intended without creating confusion between ethnic categories.

groups in the United States. Participants were reminded that they were free to withdraw at any time.

The IAT experiment was conducted using an IBM-compatible desktop computer. Participants were asked to categorize a series of stimuli into two groups by pressing two response keys with left and right index fingers. The IAT task was composed of five blocks. After the two blocks of practice in which participants had to categorize Arab-Muslim or White names and pleasant or unpleasant words using left or right response keys, names of two racial groups were combined with pleasant or unpleasant words to be classified by sharing the same response keys (e.g., Arab-Muslim + pleasant, White + unpleasant). The response latency was measured for each trial to be used as the major dependent variable. After another block of practice, these associations were reversed (e.g., Arab-Muslim + unpleasant, White + pleasant). Each of the two critical blocks was composed of 80 trials by repeating each name and word twice in a random order. The order in which these critical blocks were administered was counterbalanced between participants.

After completing the computer-administered IAT tasks, participants were asked to answer several questions designed to measure explicit race-related attitudes and beliefs. These questions included the following: (a) the feeling thermometer ranging from 0 to 99; 0 (*cold or unfavorable*) to 99 (*warm and favorable*); (b) five semantic differential items for each target group asking how beautiful–ugly, good–bad, pleasant–unpleasant, honest–dishonest, and nice–awful the members are on a 7-point bipolar scale ranging from –3 (*negative*) to 3 (*positive*); (c) familiarity measures asking participants to rate the degree of familiarity for every stimulus name used in Study 1 on a 5-point scale ranging from 1 (*not at all familiar*) to 5 (*very familiar*); (d) the anti-Muslim prejudice scale (Ernst, Bornstein, & Venable, 2003), composed of 20 statements about Muslims, each of which participants rated on a 9-point agreement scale ranging from –4 (*very strongly disagree*) to +4 (*very strongly agree*); half the items were reverse-coded;² (e) an open-ended question asking participants to generate what they knew or heard about Arab-Muslims through the mass media or other people (regardless of whether they endorsed the information). In addition, participants were asked to provide their demographic information including sex, ethnicity, and socioeconomic status. Lastly, participants were fully debriefed about the purpose of the study.

Results and Discussion

The response latencies from the two data-collection blocks of the IAT were analyzed and the data in practice blocks³ were

²See Appendix B for a complete list of the statements of the scale.

³Test-retest reliability was assessed by computing the correlation between the IAT effects in the practice and test blocks in all the studies. Considering the magnitude of the correlations for Studies 1, 2 and 3 ($r_s = .49, .42, \text{ and } .35$, respectively), the IAT results appeared to be reliable.

discarded. As suggested by Greenwald et al. (1998), extreme response latency values (below 300 msec and above 3000 msec) were recoded as 300 msec or 3000 msec, respectively. Then, the response latency measures were log-transformed for better approximation to a normal distribution. Subsequent analyses were conducted using log-transformed data, although the descriptive statistics represent raw data. Because the error rates were low (under 5%), all the responses were used to compute the mean response latencies. Eliminating the error responses did not change the results.

A 4 (Ethnicity of Participants:⁴ Asian, Black, Hispanic, and White) \times 2 (IAT Block: Arab-Muslim + Pleasant vs. White + Pleasant) analysis of variance (ANOVA) was conducted on the log-transformed response latency. The results showed an implicit attitudinal preference of White over Arab-Muslim names (IAT effect = 393 msec, Cohen's $d = 1.56$), $F(1, 39) = 97.17$, $p = 10^{-13}$, as indicated by faster responses for the White + pleasant combination than for the Arab-Muslim + pleasant combination. No other effect was significant. The absence of the interaction suggested that this IAT effect was observed across different ethnic groups of participants⁵ including Asians (IAT effect = 385 msec, Cohen's $d = 1.47$), Blacks (IAT effect = 362 msec, Cohen's $d = 1.35$), Hispanics (IAT effect = 368 msec, Cohen's $d = 1.12$), and Whites (IAT effect = 426 msec, Cohen's $d = 1.96$).

Why did the participants show a strong pro-White attitude over Arab-Muslim as indicated by the IAT? An analysis of the open-ended question that asked participants to provide what they knew or heard about Arab-Muslims may offer the answer. There were 75 responses to this question. Two independent raters grouped the responses into categories that were developed a priori. The interrater reliability was .92. It is not surprising that the most common responses involved terrorism or related characteristics (e.g., violent or destructive), which constituted about 27% of the responses. In addition, their deep religiosity (23%); issues about women, such as discrimination against women, polygamy, etc. (13%); personality traits not directly related to terrorism such as smart, hard-working, untrustworthy, or close-minded (12%); and physical features or outfits (9%) were reported. The results suggested that the most representative and salient attribute about Arab-Muslims con-

cerned terrorism, and this association might have influenced the IAT results observed in Study 1.

To test whether the association between Arab-Muslims and terrorism was actually related to the implicit attitudes toward them, an additional analysis was conducted by comparing the mean IAT effects between those who reported terrorism-related responses and those who did not. The results indicated that participants who yielded responses that were relevant to terrorism demonstrated greater IAT effects than those who did not ($M_s = 505$ msec and 296 msec, $SD_s = 285$ msec and 217 msec, respectively), $t(41) = 2.50$, $p < .05$. These findings provided indirect support⁶ for the interpretation that the overall IAT effects observed in Study 1 might be attributable to participants' exposure to information associating Arab-Muslims with terrorism.

An alternative explanation has to do with familiarity of the names used in Study 1 (Greenwald et al., 1998). Analysis of familiarity with the stimulus names revealed that participants felt more familiar with White than with Arab-Muslim names ($M_s = 4.33$ and 3.12, $SD_s = .78$ and 1.11, respectively), $t(41) = 7.32$, $p < .001$. To test a possibility that the IAT effects were attributable to different levels of familiarity, more analyses were performed. If different levels of familiarity with stimulus names were responsible for the IAT effects, we should observe positive correlations (a) between the IAT measures and familiarity with White names and (b) between the IAT measures and relative familiarity with White to Arab-Muslim names (familiarity of White–familiarity of Arab-Muslim). In addition, a negative correlation would be expected between the IAT measures and familiarity with Arab-Muslim names. However, analyses of correlations indicated that none of the three correlations was significant (.153, .069, and .011, respectively). This indicated that familiarity was probably not responsible for the IAT effects observed in Study 1. Thus, it appeared that the IAT effects found in Study 1 represented valid implicit attitudes toward Arab-Muslims, not an experimental artifact resulting from greater familiarity (absolute and relative) with White names.⁷

In Study 1, explicit measures for attitudes toward Arab-Muslims and Whites were also obtained, such as the feeling thermometer and semantic differential items. In addition, we administered the anti-Muslim prejudice scale (Ernst et al., 2003). Participants' responses on these items were coded in such a way that a negative number represents a negative attitude and a positive number represents a positive attitude toward Arab-Muslims, whereas a zero refers to a neutral attitude. Ernst and colleagues reported that their scale was highly reliable ($\alpha = .92$), and the results in Study 1 also dem-

⁴Ethnicity of participants was taken as an independent variable in three studies because, given that ethnic backgrounds of participants were diverse, it was expected that the results might be moderated by ethnicity of participants, as the stimuli included names that were specific to certain ethnic groups.

⁵The mean response latencies for pleasant + White and pleasant + Arab-Muslim across ethnic groups were as follows: Asians (1,014 msec, $SD = 196$ msec, and 1,399 msec, $SD = 244$ msec), Blacks (978 msec, $SD = 221$ msec, and 1,340 msec, $SD = 297$ msec), Hispanics (1,130 msec, $SD = 273$ msec, and 1,498 msec, $SD = 301$ msec), and Whites (933 msec, $SD = 242$ msec, and 1,359 msec, $SD = 226$ msec). In addition, D scores were computed for each ethnic group using the new scoring algorithm (Greenwald, Nosek, & Banaji, 2003): Asians (0.96, $SD = 0.66$), $t(10) = 4.86$, $p < .001$; Blacks (0.91, $SD = 0.67$), $t(7) = 3.82$, $p < .01$; Hispanics (0.89, $SD = 0.75$), $t(11) = 4.17$, $p < .01$; and Whites (1.07, $SD = 0.55$), $t(11) = 6.79$, $p < .001$.

⁶Because some of the participants who generated terrorism-related responses also mentioned positive characteristics about Arab-Muslims, the results of this analysis can provide only indirect support for the interpretation.

⁷The issue of familiarity with stimulus items was more extensively addressed in previous studies (e.g., Dasgupta, Greenwald, & Banaji, 2003; Dasgupta, McGhee, Greenwald, & Banaji, 2000).

onstrated its reliability ($\alpha = .87$). A composite score was computed by averaging the ratings for the 20 items.

Results of a *t* test showed that participants expressed preference for White over Arab-Muslim on the feeling thermometer ($M_s = 76.19$ and 58.35 , $SD_s = 30.69$ and 23.63 , respectively), $t(41) = 3.99, p < .001$, Cohen's $d = .61$. Furthermore, participants exhibited a similar bias on the semantic differential ($M_s = 0.76$ and 0.19 , $SD_s = 1.13$ and $.89$, respectively), $t(41) = 3.82, p < .001$, Cohen's $d = .57$. However, participants did not show such a bias on the anti-Muslim prejudice scale⁸ ($M = .014$, $SD = 1.469$, Cohen's $d = .10$).

The IAT measures demonstrated substantially stronger preference for White than did the feeling thermometer and the semantic differential, although all three measures exhibited statistically significant relative preference for White. The magnitude of effect size for this bias, indexed by Cohen's d , was over twice as great for the IAT measures as for the two explicit measures. It is interesting to note that although participants indicated a pro-White bias on these variables, they did not show any bias toward Arab-Muslims on the anti-Muslim prejudice scale (the mean was close to zero).

Table 1 presents the correlations among the aforementioned measures. Explicit measures (except for the feeling thermometer) were significantly correlated with the IAT measures in Study 1. An interesting feature of Table 1 is that, although participants did not show any sign of prejudice against Arab-Muslims as indicated in the mean (.014) of the anti-Muslim prejudice scale, scores on this scale were highly correlated with the implicit measure as well as with the other explicit measures. This is evidence for construct validity of the scale. In fact, correlations among the three explicit measures were very high (see Table 1). If the anti-Muslim prejudice scale measured the same construct but did not reflect any attitudinal bias, unlike other measures, it is likely that participants attempted to respond in a socially desirable manner because the statements used were directly and specifically expressing stereotypical beliefs about Arab-Muslims.

Taken together, the results of Study 1 clearly indicate that participants preferred White to Arab-Muslim names on both implicit and explicit measures. The pro-White preference was more strongly demonstrated on the IAT measures than on two explicit measures (i.e., the feeling thermometer and semantic differential). When more specifically asked about Arab-Muslims on stereotypical dimensions, participants did not exhibit any prejudice against them, leaving suspicions of a social desirability response to this scale.

TABLE 1
Correlations Among Implicit and Explicit Measures of Attitudes Toward Arab-Muslims (Study 1)

Measures	1	2	3	4
1. IAT effects	—			
2. Feeling thermometer	.085	—		
3. Semantic differential	.323*	.753*	—	
4. Anti-Muslim prejudice	.318*	.699**	.768**	—

Note. $N = 43$ for all correlations.
* $p < .05$. ** $p < .001$.

STUDY 2

Study 2 was designed to examine the relative strength of automatic associations between Arab-Muslims and relevant attributes. The findings in Study 1 showed strong implicit pro-White preference over Arab-Muslim. There was evidence that this effect was related to the salience of information associating Arab-Muslims with recent negative events. Given these results, the next theoretical question might concern the relative strength of such attitudes: How strong are the automatic associations between Arab-Muslims and negative attributes? Can recent exposure to such social information create automatic associations that are stronger than associations between negative attributes and historically stigmatized groups (e.g., Blacks)? Empirical studies have shown that it is difficult to remove implicit prejudice or stereotypes about Blacks even in the presence of a clear instruction to do so (Walsh, Banaji, & Greenwald, 1995). Although the magnitude of such an anti-Black bias could be substantially reduced by exposing participants to admired Black and disliked White exemplars (Dasgupta & Greenwald, 2001), the bias was not completely eliminated. In Study 2, we tested a hypothesis that participants would be more negative (or less positive) toward Arab-Muslim names as compared with African American names, at least in part, due to their recent exposure to information associating Arab-Muslims with terrorism. If the IAT is able to reflect social information available in the environment (e.g., terrorist attacks), it was expected to observe implicit pro-Black preference over Arab-Muslim in Study 2.

Method

Participants. Participants were 30 female and 26 male undergraduates (13 Asian Americans, 10 Blacks, 12 Hispanics, and 21 Whites) from introductory psychology courses at a northeastern university in the United States. The mean age of the participants was 22.75 ($SD = 4.11$). Participants received a partial course credit in return for participation.

Materials and procedure. The materials used in Study 2 were identical to those in Study 1 except for the stimulus names used. Ten Black names from Greenwald et al.

⁸A *z* test was conducted on the mean anti-Muslim scale score for each study. It was not significant in Studies 1 and 2 ($z_s = .06$ and $.17$). In Study 3, results showed that whereas the means were not different from zero for negative and neutral conditions ($z_s = .37$ and $.48$), the mean differed significantly from zero in the positive condition ($z = 4.81$). In addition, the anti-Muslim prejudice scale was found to be reliable in Studies 2 ($\alpha = .89$) and 3 ($\alpha = .81$).

(1998) and 10 Arab-Muslim names employed in Study 1 were used as stimuli. Otherwise, Study 2 used the same materials and procedure as in Study 1.

Results and Discussion

The response latencies from the two critical blocks³ were analyzed after the same data-reduction process as in Study 1. Again, statistical analyses were conducted using the log-transformed data, although descriptive statistics are presented in raw data.

A 4 (Ethnicity of Participants: Asian, Black, Hispanic, and White) \times 2 (IAT Block: Arab-Muslim + Pleasant vs. Black + Pleasant) ANOVA was conducted on the log-transformed response latency. The results exhibited an implicit attitudinal preference of Black over Arab-Muslim names (IAT effect = 223 msec, Cohen's $d = .58$, $F(1, 52) = 24.17$, $p = 10^{-4}$, as indicated by faster responses for the Black + pleasant combination than for the Arab-Muslim + pleasant combination. No other effect was significant. Again, the absence of an interaction indicated that the IAT effect was consistent across different ethnic groups of participants⁹ including Asians (IAT effect = 284 msec, Cohen's $d = .83$), Blacks (IAT effect = 386 msec, Cohen's $d = .91$), Hispanics (IAT effect = 183 msec, Cohen's $d = .54$), and Whites (IAT effect = 130 msec, Cohen's $d = .30$).

As in Study 1, we asked participants to provide what they knew or heard about Blacks and Arab-Muslims in open-ended questions. One hundred five responses were obtained about Blacks and 84 responses about Arab-Muslims. Two independent raters grouped the responses into categories, as in Study 1. The interrater reliability was .86. For Blacks, the responses were about great athleticism (22%), criminality (17%), musical (dancing) talent (12%), negative personality traits (e.g., lazy, annoying, etc.; 9%), poverty (8%), and family orientedness (7%), etc. For Arab-Muslims, the responses had to do with terrorism (31%), deep religiosity (22%), personality traits (14%), discrimination against women (11%), and physical features or outfits (10%). Apparently, the most distinct attribute associated with Arab-Muslims concerned terrorism, which has significant implications for participants' safety.

As in Study 1, an additional analysis was conducted to compare the mean IAT effects between those who reported terrorism-related responses and those who did not. It was found that participants who provided responses that were rel-

evant to terrorism demonstrated greater IAT effects than those who did not ($M_s = 363$ msec and 152 msec, $SD_s = 251$ msec and 263 msec, respectively), $t(54) = 2.78$, $p < .01$. Again, these findings provided only indirect support⁶ for the interpretation that the IAT effects observed in Study 2 resulted from participants' exposure to information associating Arab-Muslims with terrorism.

Participants' familiarity with the stimulus names was also analyzed, and there was no significant difference in familiarity between Black and Arab-Muslim names ($M_s = 2.92$ and 2.79, $SD_s = 1.02$ and 1.19, respectively, $t < 1$). In addition, correlations between the IAT effects and familiarity with Black and Arab-Muslim names, as well as a correlation between the IAT effects and relative familiarity with Black to Arab-Muslim names (Black–Arab-Muslim), were calculated and none was significant (.103, $-.083$, and $.142$, respectively). It indicated that the IAT effects in Study 2 were not attributable to greater familiarity with stimulus names representing one group over the other.

As in Study 1, we obtained explicit measures for Blacks and Arab-Muslims in Study 2. Analyses of the feeling thermometer and semantic differential showed no difference between Blacks and Arab-Muslims ($M_s = 65.11$ and 61.93, $SD_s = 25.01$ and 22.40, respectively; $M_s = .67$ and $.75$, $SD_s = 1.52$ and 1.31, respectively; $t_s < 1$). Again, participants did not show any prejudice against Arab-Muslim as measured by the anti-Muslim prejudice scale⁸ ($M = .029$, $SD = 1.25$).

To examine the relationship between the implicit and explicit measures, correlations between the IAT effects and other explicit measures (i.e., the feeling thermometer, the semantic differential, and the anti-Muslim prejudice scale) were calculated. No correlation was significant (.115, $.089$, and $.103$).

Taken together, results of Study 2 demonstrated implicit preference of Black over Arab-Muslim names as measured by the IAT, whereas all other explicit measures failed to show any relative preference. Some of this intriguing effect seemed to be attributable to exposure to information associating Arab-Muslims with recent negative incidents. This information was shown to be available and salient to participants in their social environments. Exposure to such information might have produced automatic associations that were stronger than the associations underlying cultural stereotypes about a stigmatized group.

STUDY 3

Study 3 was designed to directly test the hypothesis from Study 2 while exploring whether implicit preference of Black over Arab-Muslim could be moderated. In Study 2, we reasoned that the observed effects were attributable, in part, to recent exposure to information relating Arab-Muslims with terrorism based on participants' responses to the open-ended question. In fact, participants who generated terrorism-

⁹The mean response latencies for pleasant + Black and pleasant + Arab-Muslim across ethnic groups were as follows: Asians (1,033 msec, $SD = 284$ msec, and 1,317 msec, $SD = 241$ msec), Blacks (1,134 msec, $SD = 224$ msec, and 1,520 msec, $SD = 285$ msec), Hispanics (1,204 msec, $SD = 280$ msec, and 1,387 msec, $SD = 261$ msec), and Whites (1,250 msec, $SD = 228$ msec, and 1,380 msec, $SD = 309$ msec). As in Study 1, D scores were computed for each ethnic group: Asians (0.64, $SD = 0.59$), $t(12) = 3.84$, $p < .01$; Blacks (0.87, $SD = 0.66$), $t(9) = 4.11$, $p < .01$; Hispanics (0.41, $SD = 0.60$), $t(11) = 2.35$, $p < .05$; and Whites (0.39, $SD = 0.83$), $t(20) = 2.15$, $p < .05$.

related responses did show greater pro-Black prejudice over Arab-Muslims. In spite of the high plausibility of such interpretation, one might still argue that the causal relationship is not warranted based on the results in Study 2, because exposure to such information was not manipulated. To test this possibility, participants in Study 3 were randomly assigned to social information conditions. Specifically, participants were asked to read one of three one-page texts: (a) a newspaper article on September 12, 2001 (negative information); (b) a health report on drinking water and daily health (neutral information); (c) and an introduction to Arab-Muslim culture (positive information). Although participants in the neutral condition were expected to show a similar bias replicating the results of Study 2, it was expected that participants exposed to negative information about Arab-Muslims would exhibit greater implicit anti-Arab attitudes than would those exposed to neutral information, because direct and immediate exposure to such negative information would strengthen the association between Arab-Muslims and terrorism. In addition, as other studies have shown the moderation of implicit stereotypes against a target group (Dasgupta & Asgari, 2004; Lowery et al., 2001; Wittenbrink et al., 2001), participants presented with positive information about Arab-Muslims would show a smaller anti-Arab bias than those in other conditions.

Method

Participants. Participants were 37 female and 35 male undergraduates (19 Asian Americans, 12 Blacks, 17 Hispanics, and 24 Whites) from introductory psychology courses at a northeastern university in the United States. The mean age of the participants was 21.39 (*SD* = 5.37). Participants received a partial course credit in return for participation.

Materials and procedure. The materials and procedure used in Study 3 were identical to those in Study 2 except that participants were presented with a one-page text to read before the IAT task. Participants were told that they would participate in two ostensibly independent studies. The first study was introduced as a text comprehension study in which participants would read a one-page text from diverse sources and be asked about the contents of the text at the very end of the study. About one third of the participants were presented with a newspaper article issued on September 12, 2001, about the terrorist attack that occurred on the previous day (negative information condition). No specific Arab-Muslim name was mentioned in the article, and we did not adapt the original newspaper article by including such names, because it seemed sufficient to activate an automatic association between Arab-Muslims and terrorism without leading participants to make unnecessary guesses about the hypotheses of the study. Another third of the participants read a health report on why drinking a sufficient amount of water is important in maintaining daily health (neutral information condi-

tion). The other third of the participants read an essay on multiculturalism in which Arab-Muslim culture was introduced as an example (positive information condition). In this text, many positive aspects of Arab-Muslim culture were mentioned (e.g., abstinence, sharing wealth with the poor, strong neighborhood, and contribution to the world in mathematics, physics, and architecture, etc.). The second study, which included the IAT task, was introduced in the same way as in Studies 1 and 2. Otherwise, Study 3 used the same materials and procedure as in Study 2.

Results and Discussion

The response latencies from the two critical blocks³ of the IAT were analyzed by social information conditions, after the same data-reduction process as in Studies 1 and 2. Again, statistical analyses were conducted using the log-transformed data, although raw data were presented in Figure 1 (see Figure 1). Because no effect of participant ethnicity was obtained in Studies 1 and 2, this variable was dropped from the reported analyses in Study 3.

A 3 (Valence of Information: negative, neutral, and positive) × 2 (IAT Block: Arab-Muslim + Pleasant vs. Black + Pleasant) ANOVA was conducted on the log-transformed response latency. Similar to the findings in Study 2, the results indicated an implicit attitudinal preference of Black over Arab-Muslim names (IAT effect = 209 msec, Cohen's *d* = .61), $F(1, 69) = 37.32, p = 10^{-6}$, as indicated by faster responses for the Black + pleasant combination than the Arab-Muslim + pleasant combination. However, this main effect was qualified by a valence of information by IAT block interaction, $F(2, 69) = 9.50, p = .0001, \eta^2 = .216$. Analyses of simple effects (*t* tests) revealed that the interaction was driven by different amount of IAT effects for the conditions of information valence. Significant IAT effects were observed in negative (IAT effect = 397 msec, *SD* = 247 msec, $p < .001$) and neutral (IAT effect = 218 msec, *SD* = 271 msec, p

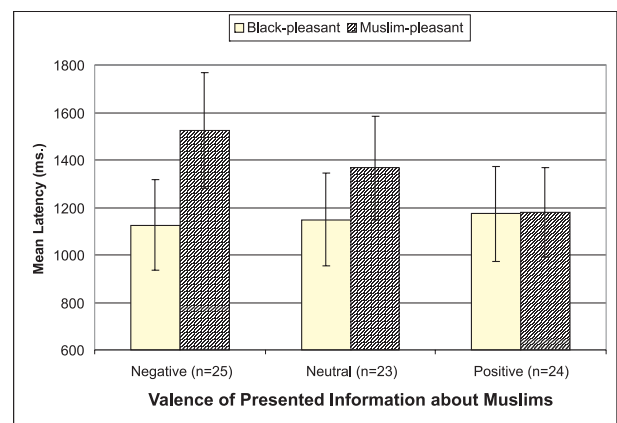


FIGURE 1 Mean response latency results for the two critical blocks of the Implicit Association Test as a function of valence of information presented to participants (Study 3, *N* = 72).

< .01) conditions, whereas the effect was not reliably different from zero in the positive condition (IAT effect = 5 msec, $SD = 319$ msec, *ns*).¹⁰ The main effect of information valence was not significant.

To more adequately examine whether the IAT effects were significantly different among the conditions of valence of information, a one-way ANOVA was conducted on the IAT effects taking information valence as the independent variable.¹¹ The results showed overall mean differences in IAT effects among conditions of valence of information, $F(2, 69) = 10.22, p = .0001, \eta^2 = .229$. Analyses of simple effects (*t* tests) indicated that the IAT effects in the negative condition were significantly greater than those in the neutral condition ($p < .05$), suggesting that immediate exposure to negative information about Arab-Muslims did strengthen the association between Arab-Muslims and negative attributes (e.g., terrorism). Additionally, the IAT effects in the positive condition were substantially reduced compared with those in the negative and neutral condition ($p < .001$ and $p < .05$, respectively), demonstrating that exposure to positive information about Arab-Muslims could remarkably reduce the anti-Arabic bias.

As in Study 2, participants' familiarity with the stimulus names was analyzed. Again, no significant difference was found overall between Black and Arab-Muslim names ($M_s = 2.98$ and $2.91, SD_s = 1.16$ and $1.25, t < 1$) and the same pattern was observed across the three social information conditions. Additionally, correlations between the IAT effects and familiarity with Black and Arab-Muslim names, along with a correlation between the IAT effects and relative familiarity with Black to Arab-Muslim names (Black–Arab-Muslim), were computed. None of the three correlations was significant (.116, $-.107$, and $.049$, respectively). Familiarity did not seem to be responsible for the IAT effects in Study 3.

Explicit attitudes toward Blacks and Arab-Muslims were also measured in Study 3. A 2 (Target Ethnicity: Black vs. Arab-Muslim) \times 3 (Valence of Information: negative, neutral, and positive) ANOVA was conducted on the feeling thermometer. However, no effect was found significant.¹² An

¹⁰Again, *D* scores were calculated for each condition of information valence: Negative information condition ($0.96, SD = 0.60, t(24) = 7.97, p < .001$; neutral information condition ($0.53, SD = 0.71, t(22) = 3.55, p < .01$; and positive information condition ($0.02, SD = 0.87, t(23) = 0.08, ns$).

¹¹Although the main effect of valence of information was not significant, a more effective way to test the moderation seemed to use the IAT effects (the difference scores between the two test blocks) as a dependent variable. The main effect of valence of information merely tells that participants in the three conditions differed in response time, which is not very informative. Because we were concerned with the amount of bias created as a function of information valence, an analysis of the difference score (IAT effects) was expected to reveal the moderating effects of information valence on implicit attitudes toward Arab-Muslims. In addition, the same one-way ANOVA was conducted on *D* scores, but the results did not change.

¹²The mean ratings for Blacks and Muslims were $67.96 (SD = 20.19)$ and $61.80 (SD = 25.61)$ for the negative condition, $69.35 (SD = 24.51)$ and $64 (SD = 28.30)$ for the neutral condition, and $59.46 (SD = 23.63)$ and $61.50 (SD = 23.95)$ for the positive condition.

identical ANOVA was also conducted on the semantic differential. The results showed a significant interaction of target ethnicity and valence of information, $F(2, 69) = 5.01, p = .01$. Analyses of simple effects (*t* tests) indicated that the semantic differential for Blacks was marginally higher than that for Arab-Muslims in the negative condition ($M_s = .69$ and $.32, SD_s = 1.15$ and 1.23 , respectively), $t(24) = 1.86, p < .08$, but it was reversed in the positive condition ($M_s = .70$ and $1.15, SD_s = 1.27$ and 1.24 , respectively), $t(23) = 2.31, p < .05$. No significant difference was found between Blacks and Arab-Muslims in the neutral condition ($M_s = .83$ and $.72, SD_s = 1.09$ and 1.22 , respectively, *ns*). Additionally, we conducted a one-way ANOVA on the Anti-Muslim prejudice scale score, taking valence of information as an independent variable.⁸ Results showed overall mean rating differences across conditions, $F(2, 69) = 6.14, p = .004$. Inspection of simple effects by *t* tests revealed that the overall effect was primarily driven by a relatively higher mean rating in the positive condition ($M = 1.17, SD = 1.14$) compared with mean ratings in the negative and neutral conditions ($M_s = -.09$ and $.13, SD_s = 1.19$ and 1.33 , respectively).

Again, correlations between the IAT effects and other explicit measures were calculated as in Study 2. Correlations between the IAT effects and two explicit measures (i.e., the semantic differential and the anti-Muslim prejudice scale) were significant ($r_s = .26$ and $.31$, respectively, $p_s < .05$). By contrast, the correlation between the IAT and the feeling thermometer was not significant ($r = .13$). These results indicated that implicit and explicit measures were related at least to some degree in Study 3.

GENERAL DISCUSSION

The purpose of this study was to examine the relative valence and strength of implicit attitudes toward Arab-Muslims while exploring the moderation of such implicit effects. The IAT results in Study 1 showed strong implicit preference for White over Arab-Muslim names, whereas the magnitude of such a bias was substantially reduced when assessed by explicit measures. It is interesting to note that the results of Studies 2 and 3 demonstrated implicit preference for Black over Arab-Muslim names as indicated by the IAT measures, whereas no significant difference was found between the two groups in familiarity with the stimulus names and in explicit attitude measures. Furthermore, the results of Study 3 indicated that such implicit and explicit anti-Arabic prejudice could be moderated when participants were exposed to positive and negative information about Arab-Muslims prior to the IAT task.

Why should we observe automatic anti-Arabic prejudice? Other studies (e.g., Devine, 1989) proposed that repeated exposure to information associating members of a target group with evaluative attributes might lead to form automatic attitudes toward them. Furthermore, as Wittenbrink et al. (2001)

reported, the valence of social information made salient in a situational context may be crucial in determining the nature of automatic attitudes toward them. In this study, analyses of open-ended questions suggested that the most distinct information about Arab-Muslims, to which participants had likely been exposed, had to do with recent incidents of terrorism. In addition, participants who generated such responses showed greater anti-Arab prejudice than those who did not. Considering the implications of such incidents, it appeared reasonable to attribute the IAT effects observed in Studies 1 and 2 to exposure to information associating Arab-Muslims with recent events of terrorism. Results of Study 3 provided a more direct evidence for this explanation. Participants exposed to information describing the terrorist attack on September 11, 2001 (negative information condition), showed a greater anti-Arab bias than did those in the neutral information condition. Although participants in the neutral information condition in Study 3 also exhibited implicit preference of Black over Arab-Muslim, replicating the results of Study 2, immediate exposure to an incident of terrorism (negative information condition) led to an even stronger automatic prejudice against Arab-Muslims. Although no specific Arab-Muslim name was mentioned in the text presented in the negative information condition, reading the terrorist incident seemed to be sufficient to strengthen the automatic associations between Arab-Muslims and terrorism. These results suggested that exposure to social information relating Arab-Muslims to negative events (e.g., terrorism) was responsible for implicit anti-Arab prejudice.¹³ An alternative explanation of the IAT effects in terms of familiarity with stimulus names was not supported.

Perhaps the most interesting component of this study was that the strong anti-Arab prejudice could be moderated by exposing participants to positive information about Arab-Muslims. Blair (2002) argued that automatic stereotypes and prejudice, which had been believed to be fixed and unavoidable (Bargh, 1999; Devine, 1989), could be influenced by several moderating variables. On reviewing many studies that provided evidence for the malleability of automatic prejudice, Blair (2002) proposed that automatic responses could be affected by stimulus cues in the surrounding context. Consistent with her theoretical accounts, the results of Study 3 demonstrated that implicit anti-Arab prejudice relative to Blacks was almost eliminated when positive information about Arab-Muslims was primed before the IAT task. Exposure to positive information about Arab-Muslims appeared to weaken automatic associations between Arab-Muslims and negative attributes, although it did not replace such associations. The moderation of such implicit effects has theoretical

and practical importance because it suggests that the automatic prejudice can be modified by situational factors. The results of Study 3 add evidence to the growing body of research showing the malleability of automatic stereotypes and prejudice.

Another intriguing feature of this study concerned the fact that participants showed an implicit Black preference over Arab-Muslim as measured by the IAT. This finding has important theoretical implications. Research has suggested that automatic attitudes toward members of a stigmatized group (e.g., Blacks) are robust and relatively immutable (Devine, 1989). For example, other studies were not able to completely eliminate anti-Black prejudice, although its magnitude was significantly reduced, by exposing participants to (a) positive stereotypic information about Blacks (Wittenbrink et al., 2001) or (b) admired Black and disliked White exemplars (Dasgupta & Greenwald, 2001). As shown in our study, however, when exposed to information associating another social group with negative incidents, participants could exhibit automatic preference of Black over another social group. Although some studies have reported implicit attitudes toward several minorities such as Jews and Asians in the in-group–out-group context (e.g., Rudman, Feinberg, & Fairchild, 2002), no study has reported an implicit preference of a historically stigmatized group (e.g., Blacks) over another ethnic group.

The results of this study generally demonstrate distinct patterns for implicit and explicit measures. Although responses on the IAT consistently reflected relative preference for one group over the other with medium to large effect sizes, explicit measures often did not indicate such effects (except for Study 1). However, many correlations between implicit and explicit measures were found significant (except for Study 2). These findings are consistent with the argument that implicit and explicit attitudes are distinct and separate constructs although they are still related to each other (Cunningham, Nezlek, & Banaji, 2004; Cunningham, Preacher, & Banaji, 2001).

What are the practical implications of these findings? Implicit and explicit prejudice toward Arab-Muslims revealed in this study is not limited to the laboratory but appear to be manifested in many areas of American society. For example, a newspaper article (NYT, April 25, 2002) reported that Equal Employment Opportunity Commission officials noticed a significant increase in the number of complaints from Muslims regarding discrimination in the workplace (from 171 to 427) following the terrorist attack on September 11, 2001. The unfair practice does not seem to be confined to the workplace. In such places as courtrooms, schools, or even public places, anti-Muslim prejudice is likely to affect social judgment and behavior toward them, often in an insidious fashion, raising the serious issue of social justice. If repeated exposure to the information associating Arab-Muslims with negative incidents plays a major role in creating and reinforcing such prejudice, as this study suggested, one solution

¹³One may still argue that the effects reported in this article could be attributable to a general fear–out-group association, rather than the Arab-Muslim–terrorism association. As the data in this study were not able to test the idea, a future study should explore this notion to clarify the psychological mechanisms underlying the effects.

might include exposing people to positive informational cues about Muslims (e.g., religious, good neighborhood, etc.) to unlearn or replace such associations with negative attributes. Another possible solution might be leading people to subtype or subgroup (Richards & Hewstone, 2001) in a subcategory the Arab-Muslim terrorists, who do not represent the entire Arab-Muslim populations. Future studies should address these issues more systematically using the knowledge about psychological processes underlying such prejudice.

In conclusion, this study investigated implicit attitudes toward members of a realistic target group by making use of the IAT. The IAT allowed us to examine automatic attitudes without being affected much by participants' awareness or conscious control. The findings of this study shed light on the ways in which social information about realistic group members influences automatic attitudes. Future studies should explore psychological mechanisms or processes by which dispositional and situational factors moderate or attenuate automatic stereotypes and prejudice.

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APPENDIX A
Stimulus Names and Words Used for the Implicit Association Test (IAT)

<i>Black Names</i>	<i>Muslim Names</i>	<i>White Names</i>	<i>Pleasant</i>	<i>Unpleasant</i>
Alonzo	Ammar	Adam	Diamond	Abuse
Alphonse	Jaafar	Andrew	Freedom	Cancer
Darnell	Haashim	Chip	Heaven	Evil
Jamel	Hassan	Frank	Honest	Filth
Jerome	Muhammad	Jonathan	Honor	Pollute
Lerone	Nadeem	Justin	Love	Poverty
Leroy	Rashid	Harry	Loyal	Rotten
Percell	Saad	Matthew	Lucky	Sickness
Theo	Umar	Roger	Peace	Stink
Torrance	Zahir	Stephen	Rainbow	Vomit

APPENDIX B
Anti-Muslim Prejudice Scale

1. Islam is at least as tolerant and respectful of other faiths as most major religions are.
2. Muslims, as a rule, are more devious than other people.*
3. Islam, by its nature, is contrary to the American way of life.*
4. Islam promotes kindness and love toward all people.
5. Muslims are controlled too much by their irrational emotions.*
6. Muslims are very attentive to cleanliness and good grooming.
7. One must admit the traditional cloth headdress worn by many Muslims looks ridiculous.*
8. Muslims deserve great respect for their many cultural accomplishments.
9. Sad to say, when you get right down to it, Muslims are basically troublemakers.*
10. Muslims are at least as intelligent and well educated as others are.
11. Islam has had a very positive effect on the lives of many people.
12. Muslims are often more selfish and inconsiderate than others are.*
13. Overall, Muslims have made an important positive contribution to our society.
14. The basic teachings of Islam must be condemned as evil.*
15. When conflicts arise, Muslims are cowards and do not fight honorably.*
16. Compared with other people, Muslims are uncivilized and backward.*
17. Muslims show great respect for human rights and freedom.
18. Muslims lack the ability to think independently; they follow their leaders like sheep.*
19. The understanding that Muslims have of political issues is sophisticated and advanced.
20. Muslims cherish every human life.

Note. Every item was rated on a 9-point scale ranging from -4 (*very strongly disagree*) to 4 (*very strongly agree*) with the statement. * Scores from these statements were reverse-coded in Studies 2 and 3.

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