

## **Pervasiveness and correlates of implicit attitudes and stereotypes**

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<http://implicit.harvard.edu/> was created to provide experience with the Implicit Association Test (IAT), a procedure designed to measure social knowledge that may operate outside awareness or control. Significant

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by-products of the website's existence are large datasets contributed to by the site's many visitors. This article summarises data from more than 2.5 million completed IATs and self-reports across 17 topics obtained between July 2000 and May 2006. In addition to reinforcing several published findings with a heterogeneous sample, the data help to establish that: (a) implicit preferences and stereotypes are pervasive across demographic groups and topics, (b) as with self-report, there is substantial inter-individual variability in implicit attitudes and stereotypes, (c) variations in gender, ethnicity, age, and political orientation predict variation in implicit and explicit measures, and (d) implicit and explicit attitudes and stereotypes are related, but distinct.

In September 1998, three of the present authors launched a website with a mission to blend basic research and educational outreach in a virtual laboratory. Since then, <http://implicit.harvard.edu> (and its previous incarnation at Yale University) has functioned as a hands-on science museum exhibit, featuring self-administered Implicit Association Tests (IAT; Greenwald, McGhee, & Schwartz, 1998) to provide a glimpse of implicit social cognition—thoughts and feelings of which the respondent may be unaware or unable to control. The initial goal in launching the site was a modest one: Visitors, especially non-psychologists, might discover the sometimes surprising associative knowledge about racial, ethnic, gender, and other social group categories that exists in their own minds. From its initial launch the website caught the attention of ordinary people who have visited and completed one or more tests, and by 2007, more than 5 million study sessions were completed. In this time, the number of attitude and stereotype topics available has expanded to more than a dozen stable tests, an accessory research site was added with additional studies that are short-lived, a virtual laboratory was created for study creation and management (Nosek et al., 2006b), and parallel demonstration sites were launched for 22 other countries and in 16 languages.

This article presents a review of the data provided by those who completed IATs and self-report measures on the main demonstration sites between July 2000 and May 2006 for 17 topics, along with correlations of these implicit and explicit measures with several demographic variables. A summary of the topics and how they were operationalised in the IAT is presented in Table 1. The main new information reported in this paper concerns the patterns that can be observed, across topics, in relations between implicit and explicit measures and in relations of both measures with demographic variables. This adds to existing theoretical understanding of implicit and explicit attitude and stereotype measurement.

TABLE 1  
Description of IAT design for 17 topics that appeared at project websites

<i>Topic</i>	<i>Target concepts</i>	<i>Attribute concepts</i>	<i>Interpretation</i>
<i>Social group attitudes</i>			
Age	Young people – Old people	Good – Bad	Positive values indicate: a preference for young people compared to old people
Race	African Americans – European Americans <sup>1</sup>	Good – Bad	a preference for Whites compared to Blacks
Skin-tone	Dark-skin – Light-skin <sup>2</sup>	Good – Bad	a preference for Light-skin compared to Dark-skin
Child-race	Black Children – White Children	Good – Bad	a preference for White children compared to Black Children
Arab-Muslim	Other people – Arab Muslims	Good – Bad	a preference for other people compared to Arab-Muslims
Judaism	Other religions – Judaism	Good – Bad	a preference for other religions compared to Judaism
Disability	Abled people – Disabled people	Good – Bad	a preference for abled people compared to disabled people
Sexuality	Straight people – Gay people	Good – Bad	a preference for straight people compared to gay people
Weight	Thin people – Fat people	Good – Bad	a preference for thin people compared to fat people
<i>Social group stereotypes</i>			
Race-weapons	Black people – White people	Weapons – Harmless objects	stronger Black = Weapons, White = Harmless objects associations than the reverse
American-Native	White American – Native American	American – Foreign	stronger White American = American, Native American = Foreign associations than the reverse
American-Asian	European American – Asian American	American – Foreign	stronger European American = American, Asian American = Foreign associations than the reverse

TABLE 1  
(Continued)

<i>Topic</i>	<i>Target concepts</i>	<i>Attribute concepts</i>	<i>Interpretation</i>
Gender-Science	Male – Female	Science – Humanities	stronger Male = Science, Female = Humanities associations than the reverse
Gender-Career	Male – Female	Career – Family	stronger Male = Career, Female = Family associations than the reverse
<i>Political attitudes</i>			
Presidential Election 2004	Bush – Other presidents <sup>3</sup>	Good – Bad	a preference for Bush compared to other US presidents
Election 2000	George Bush – John Kerry	Good – Bad	a preference for Bush compared to Kerry
	George Bush – Al Gore <sup>4</sup>	Good – Bad	a preference for Bush compared to Gore

<sup>1</sup>Concept labels for the race attitude task were manipulated (African Americans – European Americans, African Americans – White Americans, Black Americans – White Americans, and Black people – White people).

<sup>2</sup>Concept labels were cartoon faces—one light-skinned, one dark-skinned—not the words “dark-skin” and “light-skin”. Exemplars for the categories were similar faces varying in skin-tone.

<sup>3</sup>The comparison president to Bush was randomly varied between subjects (Clinton, Reagan, Nixon, Kennedy, FDR, Lincoln, Jefferson, or a collection of recent presidents).

<sup>4</sup>For both the Election 2000 and Election 2004 tasks, vice presidential and other candidates were also included and participants could choose any contrast. The sample *N* counts all contrasts, but the reported data include only the primary presidential candidate contrast. Stimulus items representing each category are available in Appendix B.

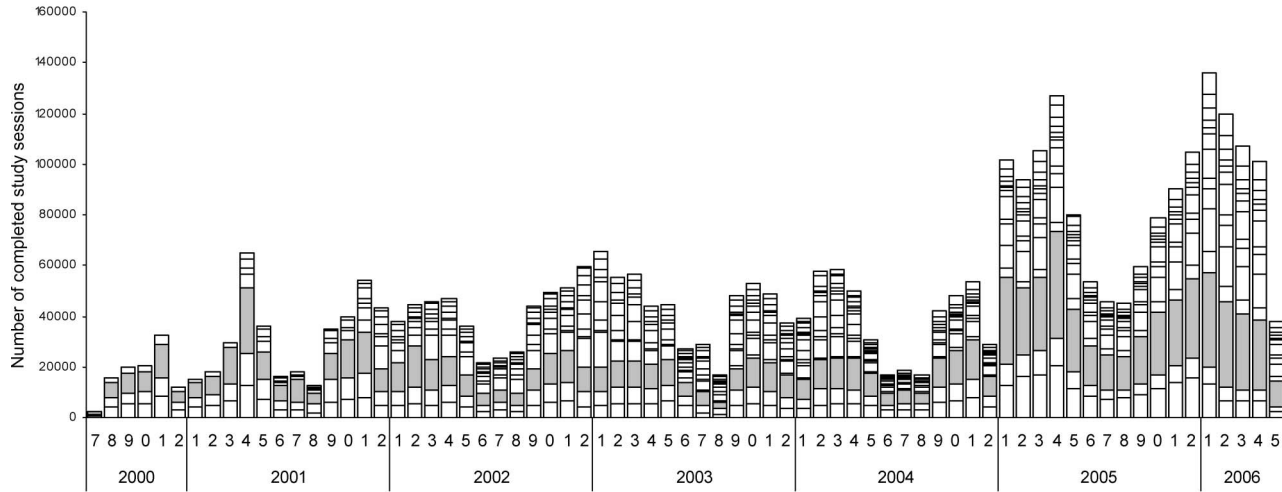
## OVERVIEW

This review summarises datasets accumulated from three publicly available websites between 12 July 2000 and 12 May 2006.<sup>1</sup> The topics were (a) social group attitudes: age (young–old), race (Black people–White people), skin-tone (dark skin–light skin), child-race (Black children–White children), Arab-Muslim (Arab Muslims–other people), Judaism (Judaism–other religions), sexuality (gay people–straight people), disability (disabled people–abled people), and weight (fat people–thin people); (b) social group stereotypes: race–weapons, gender–science/humanities, gender–career/family, American–foreign (Asian–European), and American–foreign (Native–White); and (c) US political attitudes: president (Bush–other presidents), Election 2004 (Bush–Kerry), and Election 2000 (Bush–Gore). See Table 1.

Across the 17 topics and almost 6 years of data collection, there were 2,575,535 completed IATs. Participation rates varied during the data collection period, with particularly heavy traffic following major media exposure, such as a story on the BBC News website in April 2005 (see Figure 1). Popularity of the websites has increased over time—the earliest 16 months of this dataset accounted for about 15% of the total data, and the latest 16 months accounted for about 44%.

The goal of this article is to emphasise aggregate conclusions and summarise comparative analysis rather than to detail results for any single topic or theoretical issue. The reporting strategy reflects these goals and the size of the datasets. First, significance tests are not reported. The samples are so large that power is virtually 100% and even trivial effects are reliable. Instead, comparison of group means and effect sizes are the primary methods for communicating findings, especially Cohen's  $d$  and  $\eta_p^2$ . Effect magnitudes are sensitive to the heterogeneity of the sample and to the fact that sample sizes in some comparisons are quite imbalanced. For example, effect sizes for regional comparisons are quite small because 85% of the data are from the US sample, so even substantial differences across regions are dominated by the oversampling from a single region (similarly for race comparisons). Second, we make no effort to comment on every interesting, novel, or theoretically relevant finding. The reporting is constrained to the pervasiveness of preferences and stereotypes across topics, variations in those biases by gender, race/ethnicity, age, and political orientation, and the relationship between implicit and explicit effects. Other topics such as methodological and psychometric investigations of the IAT appear

<sup>1</sup>DEMO (Demonstration site): <http://implicit.harvard.edu/> (moved from <http://www.yale.edu/implicit/> in January, 2003), SPLC (Southern Poverty Law Center site): <http://tolerance.org/>, and UP (Understanding Prejudice site): <http://understandingprejudice.org/>



**Figure 1.** Number of study sessions per month. Black lines separate the number of sessions for each topic. The shaded portion is the number of study sessions for the most popular topic overall (Race attitudes).

elsewhere (e.g., Greenwald, Nosek, & Banaji, 2003; Nosek, Greenwald, & Banaji, 2005). Third, this article is the aggregate summary of an intensive analysis project. More details of the results are available at: <http://briannosek.com/papers/pcias/>

## THE BASIC PARADIGM

Participants found the websites through media coverage, blog or chatroom discussions, personal recommendation, search engines, topically relevant sites that provided a link, as a class or work recommendation or assignment, or accidentally. Visitors to the sites first examined background information about implicit attitudes and stereotypes and were invited to participate. Those who opted to participate could select from a list of 2–15 topics, most annotated with a brief description of the typical finding. Study sessions lasted about 10 minutes and consisted of a brief questionnaire of explicit attitudes, stereotypes, and related judgements about the topic, a short demographics survey, and administration of an IAT. For most sessions, the order of the questionnaire and IAT was randomised. At the end of the session, participants received debriefing feedback about their IAT performance and were encouraged to explore additional background materials such as frequently asked questions and answers.

## SAMPLE

Of sessions with demographic reports, representation for the total sample was as follows: 62% female, 38% male; 1.0% American Indian, 6.4% Asian or Asian American, 6.7% Black (not of Hispanic origin), 5.2% Hispanic or Hispanic American, 72% White (not of Hispanic origin), 4.7% multi-racial, and 3.7% other;<sup>2</sup> 85% reported US citizenship and 15% were citizens of other nations; the mean age was 26 ( $SD = 12$ ); and 61% of the participants aged 25 or older had a bachelor's degree or more education. There was some variation in demographic representation across topics; a comprehensive demographics table is available at <http://briannosek.com/papers/pcias/>

While very large, these datasets should not be mistaken as being representative of a definable population. There are selection influences in learning about the site, choosing to visit, choice of tasks, and completing the measures. Nonetheless, because of their substantial size and much greater diversity than is available in most laboratory studies, the datasets are useful

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<sup>2</sup>This demographics scheme does not follow 2000 US Census norms that distinguish between ethnicity (Hispanic, non-Hispanic) and race. More recent data collected at these websites follows this practice. Initial analysis of that data finds more than 9% of the web sample report Hispanic ethnicity when it is distinct from reporting race.

for examining psychometric properties of the measures, illustrating that the findings generalise across populations not typically included in research on these topics, replicating and extending findings from laboratory research, and comparing sub-samples within the total sample as is normative for any selected sample such as comparing men and women from a single university with the attendant university selection influences. Given its size, the set characterises a considerable population in its own right.

### IMPLICIT ASSOCIATION TEST (IAT)

The IAT (Greenwald et al., 1998) is a popular measure of associations in part because of its ease of administration, adaptability to a variety of topics, large effect sizes, and good reliability compared to other implicit measures. Because of its popularity, understanding of the IAT has progressed rapidly since its introduction in 1998. The accumulated literature finds that (a) the IAT is both related to and distinct from self-report measures of similar constructs (Nosek & Smyth, 2007); (b) the relationship between the IAT and self-report, at least for attitudes, is moderated by multiple factors (Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005a; Nosek, 2005); (c) the IAT is influenced by extraneous factors such as the order of the response blocks, cognitive fluency, and experience with the task (McFarland & Crouch, 2002; Mierke & Klauer, 2003; Nosek et al., 2005), (d) the *D* scoring algorithm, an effect size measure, mitigates some of the extraneous influences (Cai, Sriram, Greenwald, & McFarland, 2004; Greenwald et al., 2003; Mierke & Klauer, 2003); and (e) the IAT has predictive validity that in some cases exceeds that of self-report and in other cases is weaker than self-report (Poehlman, Uhlmann, Greenwald, & Banaji, 2007). There is also progress in identifying the cognitive processes underlying IAT effects (e.g., Conrey, Sherman, Gawronski, Hugenberg, & Groom, 2005; Greenwald, Nosek, Banaji, & Klauer, 2005; Roethmund & Wentura, 2004). This report does not review the already large literature on IAT psychometrics and validity (see instead Nosek, Greenwald, & Banaji, 2006a).

The IAT (Greenwald et al., 1998) assesses associations between two concepts (e.g., *Black people* and *White people*) and two attributes (e.g., *good* and *bad*). Exemplars representing each of the categories appear in the centre of the computer screen and participants categorise them into one of the four superordinate categories as quickly as possible using two computer keys. There are seven blocks of response trials with the following categorisation rules: (B1) 20 trials sorting the concept exemplars (e.g., *e* key for *Black people*, *i* key for *White people*); (B2) 20 trials sorting *good* and *bad* words (e.g., *e* key for *good* words, *i* key for *bad* words); (B3) 20 trials sorting all four exemplar types, with one concept category and one attribute category



sharing a response key, and the other attribute category and concept category sharing the other response key (e.g., *e* key for *good* and *Black people*, *i* key for *bad* and *White people*); (B4) 40 trials using the same sorting rules as B3; (B5) 40 trials sorting the concept exemplars as in B1, but with the key mappings reversed (e.g., *e* key for *White people*, *i* key for *Black people*);<sup>3</sup> (B6) 20 trials sorting all four exemplar types, but reflecting the change in key mapping in B5 (e.g., *e* key for *good* and *White people*, *i* key for *bad* and *Black people*); (B7) 40 trials using the same sorting rules as B6. Blocks B3, B4, B6, and B7 comprise the primary data for analysis. Categorising the exemplars more quickly when *Black people* and *bad* (and *White people* and *good*) share a response key compared to when *Black people* and *good* (and *White people* and *bad*) share a response key is taken to indicate an implicit preference for White people compared to Black people.<sup>4</sup>

<sup>3</sup>The fifth block was 20, 25, 30, or 35 trials. This manipulation was reported by Nosek and colleagues (2005), who found that 40 trials in this reverse practice condition reduce an extraneous influence of task order in which the first combined pairing (B3, B4) interfered with performance of the second combined pairing (B6, B7).

<sup>4</sup>The seven blocks were presented in the order shown above, or with the sorting combinations of B1, B3, and B4 exchanged with B5, B6, and B7. Attribute labels and exemplars were presented in white font and concepts in green, all on a black background, to emphasise that concept items were to be categorised by their category membership, not whether they were liked or disliked. If a participant made an error in sorting during any of the response trials, a red “X” appeared just below the exemplar and remained there until they corrected the error. IATs were scored with the *D* effect size algorithm proposed by Greenwald and colleagues (2003). The difference between a person’s mean response latencies in the two stimulus-pairing conditions (i.e., blocks B3/B4 versus B6/B7) is scaled by the standard deviation of his or her latencies pooled across the two conditions. This algorithm results in *D* scores with a possible range from  $-2.0$  to  $2.0$ , with zero representing no difference in response latency between the conditions. Standard deviations included both correct and incorrect response latencies. Effect size *d* and  $\eta_p^2$  reports are based on the *D* and its variability across individuals. Because there was a period during the 6-year study span in which errant response latencies were misrecorded, all error latencies were replaced with the mean of the correct response latencies in its response block plus a 600-ms penalty prior to calculating the SD (see Nosek et al., 2006b). For about 6% of participants, valid scores could not be calculated because of missing data—stemming either from technical data-transfer problems or participant dropout. Among the remaining 94%, scores were not calculated if any of several speed and accuracy thresholds were exceeded, thus signalling careless performance: these criteria were (1) going too fast ( $< 300$  ms) on more than 10% of responses across all critical blocks, (2) 25% of responses too fast in any one of the critical blocks, (3) 35% too fast in any one of the practice blocks, (4) making more than 30% erroneous responses across the critical blocks, (5) 40% errors in any one of the critical blocks, (6) 40% errors across all of the practice blocks, or (7) 50% errors in any one of the practice blocks. Together, across all 17 tasks, these criteria resulted in a median disqualification rate of 7%, with a range of 5–15%. Beyond these disqualification criteria, individual trial response latencies were not included in the calculation if they were too fast to be authentic ( $< 400$  ms) or so slow as to indicate interrupted attention ( $> 10,000$  ms).

## SELF-REPORTED ATTITUDES AND STEREOTYPES

Because the IAT measures implicit attitudes towards one attitude object relative to another, explicit items paralleled the relative nature of the IAT. Explicit attitudes in the social group and political attitudes domains were measured with a relative preference item with the general form  $-2 = I$  strongly prefer A to B,  $-1 = I$  moderately prefer A to B,  $0 = I$  like A and B equally,  $1 = I$  moderately prefer B to A,  $2 = I$  strongly prefer B to A where A is one attitude object and B is the other (see Appendix A for full list of items).

The explicit stereotyping items either followed this format or were a combination of two items. For example, in the Gender–Career task, participants rated the extent to which they associated *career* with male or female (from Strongly Female to Strongly Male) and then used the same scale to rate the extent to which they associated *family* with male or female. Relative explicit stereotyping was then calculated as the difference in responses to the family and career items.

On all items, a positive score indicates a preference in the direction of the implicit preference, so a positive correlation between the two always indicates that stronger explicit liking for an attitude object is associated with a stronger implicit preference for that same object.

## A REVIEW OF FINDINGS FOR INDIVIDUAL TOPICS

Mean IAT effects, mean effects for a conceptually related explicit assessment, and the correlation between implicit and explicit measures for each of the 17 topics appear in Table 2. This section provides a brief summary of each topic. These are considered in aggregate or comparatively for the remainder of the report. For exposition purposes, IAT scores exceeding  $|D| = .15$  were counted as showing an evaluation in one direction or the other. This does not imply that there is something psychologically distinct about this break point in the continuous distribution of scores.

### Age attitudes

Across tasks, the strongest IAT effect magnitude was observed in the greater difficulty of pairing *old people* with *good* and *young people* with *bad* compared to pairing *old people* with *bad* and *young people* with *good*. In fact, 80% of participants showed this effect, and only 6% showed the reverse. Participants also reported an explicit preference for young people, and this was only weakly positively related with the IAT effect. Implicit age biases are notable for their strength across genders (Table 3), ethnicities (Table 4),

TABLE 2  
Summary of implicit and explicit attitudes and stereotypes for 17 topics

<i>Task</i>	<i>Dates Administered</i>		<i>N</i>	<i>IAT</i>			<i>alpha r</i>	<i>Self-report</i>			<i>I-E r</i>
	<i>Begin</i>	<i>End</i>		<i>M</i>	<i>SD</i>	<i>d</i>		<i>M</i>	<i>SD</i>	<i>d</i>	
Age attitude	27 Jul 00	12 May 06	351204	.49	.39	1.23	.72	.39	.78	.51	.13
Race attitude	27 Jul 00	12 May 06	732881	.37	.43	.86	.75	.26	.73	.36	.31
Skin-tone attitude	28 Mar 01	12 May 06	122988	.30	.41	.73	.71	.17	.67	.25	.22
Child-race attitude	1 Nov 01	1 May 04	28816	.33	.45	.73	.76	.19	1.30	.15	.29
Arab-Muslim attitude	16 Nov 01	12 May 06	77254	.14	.42	.33	.74	.45	.77	.58	.34
Judaism attitude	1 Aug 03	12 May 06	66092	-.15	.44	-.34	.76	.14	1.05	.13	.38
Disability attitude	1 Jun 03	12 May 06	38544	.45	.43	1.05	.77	.38	.67	.57	.14
Sexuality attitude	1 Feb 02	12 May 06	269683	.35	.47	.74	.79	.49	.91	.54	.43
Weight attitude	29 Mar 01	12 May 06	199329	.35	.42	.83	.74	.64	.73	.88	.20
Race-Weapons stereotype	1 Nov 01	12 May 06	85742	.37	.37	1.00	.67	.34	1.10	.31	.15
American-Native stereotype	11 May 02	12 May 06	44878	.23	.50	.46	.82	-.76	1.79	-.42	.18
American-Asian stereotype	22 Mar 01	12 May 06	57569	.26	.41	.62	.78	.57	1.27	.45	.17
Gender-Science stereotype	27 Jul 00	12 May 06	299298	.37	.40	.93	.73	.52	.66	.79	.22
Gender-Career stereotype	1 Oct 02	12 May 06	83084	.39	.36	1.10	.63	.54	.60	.89	.16
Presidential attitude	30 May 03	12 May 06	68123	-.07	.45	-.15	.77	-.94	1.28	-.73	.54
Election 2004 attitude	16 Oct 03	3 May 05	22904	-.14	.51	-.27	.81	-.69	1.64	-.42	.71
Election 2000 attitude	14 Aug 00	1 Feb 03	27146	-.09	.56	-.16	.87	-.32	1.60	-.20	.75
Unweighted means											
Social group attitudes				.29	.43	.69	.75	.35	.85	.44	.27
Social group stereotypes				.32	.41	.82	.73	.24	1.08	.40	.18
Political attitudes				-.10	.51	-.19	.82	-.65	1.51	-.45	.67

*N* indicates number of completed IATs for that topic. IAT means are *D* scores (Greenwald et al., 2003), and positive values indicate the preference or stereotype described in Table 1. Internal reliability for the IAT was calculated as a Cronbach's alpha on *D*s calculated from four IAT parcels (trials 1–15, 16–30, 31–45, 46–60 combining the two 2-stimulus pairing response blocks). A variety of conceptually parallel self-report items appeared on the site at different times during data collection. The reported mean is for a selected item or comparison of items (see Appendix B).

TABLE 3  
 Implicit and explicit attitudes and stereotypes by gender for 17 topics

Task	IAT				Self-report			
	Women	Men	$\eta_p^2$	(sim) $\eta_p^2$	Women	Men	$\eta_p^2$	(sim) $\eta_p^2$
Age attitude	1.17	1.40	.014	.014	.43	.63	.012	.014
Race attitude	.79	.93	.007	.004	.26	.48	.015	.009
Skin-tone attitude	.71	.80	.002	.001	.18	.43	.012	.009
Child-race attitude	.69	.80	.002	.001	.12	.60	.015	.015
Arab-Muslim attitude	.24	.48	.013	.011	.51	.70	.009	.005
Judaism attitude	-.36	-.34	.000	.000	.12	.14	.001	.001
Disability attitude	.98	1.28	.018	.017	.47	.76	.017	.016
Sexuality attitude	.68	.94	.014	.010	.38	.87	.035	.028
Weight attitude	.81	.93	.002	.002	.77	1.18	.033	.032
Race-Weapons stereotype	.97	1.03	.002	.001	.31	.31	.000	.001
American-Native stereotype	.46	.48	.001	.000	-.49	-.34	.005	.003
American-Asian stereotype	.61	.68	.002	.001	.43	.50	.000	.000
Gender-Science stereotype	.98	.93	-.002	-.002	.73	.91	.003	.002
Gender-Career stereotype	1.19	.94	-.008	-.010	.87	.95	.002	.001
Presidential attitude	-.20	-.13	.002	.000	-.75	-.72	.001	.003
Election 2004 attitude	-.37	-.20	.007	.000	-.49	-.32	.006	.000
Election 2000 attitude	-.20	-.07	.004	.000	-.27	-.09	.007	.000
Unweighted Means								
Social group attitudes	.63	.80	.008	.007	.36	.64	.017	.014
Social group stereotypes	.84	.81	-.001	-.002	.37	.47	.002	.001
Political attitudes	-.26	-.13	.004	.000	-.50	-.38	.005	.001

IAT and self-report values are Cohen's *d*s with positive scores indicating the preference or stereotype described in Table 1.  $\eta_p^2$  is the effect magnitude in a univariate regression with gender as the single predictor, positive values indicate a stronger effect for men than women; (sim)  $\eta_p^2$  is the effect magnitude for gender in a simultaneous regression that included three other demographic variables as predictors (ethnicity, age, political orientation). For self-report,  $\eta_p^2$  values are weight averages of effect sizes when variations of the self-report item were used in different parts of the dataset (e.g., a 5-point preference rating versus a 9-point preference rating).

age (Table 5), political orientation (Table 6), and region (Table 7). Most dramatically, adults aged 60 and older showed a pro-young effect of similar magnitude to adults in their twenties, despite dramatic changes in explicit age preferences (see also Nosek, Banaji, & Greenwald, 2002). Ingroup preference, a key component of social identity theory (Abrams & Hogg, 1990; Tajfel, 1978; Tajfel & Turner, 1986), is not evident in the pro-youth implicit age attitude of the older adults, contrary to their explicit reports and to the patterns of implicit ingroup preferences for most social groups. The factors contributing to this persistent effect are not yet understood.

TABLE 4  
Implicit and explicit attitudes and stereotypes by ethnicity for 17 topics

Task	IAT								Self-report									
	<i>AmIn</i>	<i>Asn</i>	<i>Blk</i>	<i>Hisp</i>	<i>Wht</i>	<i>Multi</i>	<i>Other</i>	$\eta_p^2$	( <i>sim</i> ) $\eta_p^2$	<i>AmIn</i>	<i>Asn</i>	<i>Blk</i>	<i>Hisp</i>	<i>Wht</i>	<i>Multi</i>	<i>Other</i>	$\eta_p^2$	( <i>sim</i> ) $\eta_p^2$
Age attitude	1.22	1.22	1.40	1.23	1.25	1.17	1.25	.001	.002	.46	.63	.31	.49	.51	.48	.50	.004	.003
Race attitude	.79	.88	-.05	.79	1.00	.56	.70	.087	.084	.30	.44	-.93	.22	.55	.07	.16	.177	.174
Skin-tone attitude	.59	.76	.22	.68	.88	.49	.66	.056	.054	.13	.42	-.13	.21	.37	.10	.15	.025	.023
Child-race attitude	.53	.76	-.16	.67	.87	.40	.64	.099	.100	.18	.38	-1.17	.25	.51	-.13	.19	.100	.104
Arab-Muslim attitude	.29	.17	.19	.36	.40	.19	.00	.015	.012	.74	.29	.34	.65	.70	.30	.10	.026	.022
Judaism attitude	-.20	-.14	-.18	-.20	-.39	-.30	-.36	.005	.005	.28	.43	.68	.39	.08	.18	.05	.012	.012
Disability attitude	.98	1.09	1.14	1.02	1.07	.98	.93	.001	.001	.63	.78	.60	.53	.54	.53	.54	.003	.002
Sexuality attitude	.83	.91	1.11	.87	.74	.66	.70	.008	.009	.66	.77	.85	.62	.54	.47	.55	.005	.006
Weight attitude	.81	.76	.74	.81	.88	.76	.79	.003	.003	.82	1.04	.59	.78	.90	.82	.75	.006	.005
Race-Weapons stereotype	.84	.92	.59	.92	1.05	.86	.89	.012	.011	.31	.44	.21	.33	.33	.15	.15	.005	.005
American-Native stereotype	-.24	.48	.44	.46	.56	.16	.30	.039	.040	-.79	-.34	-.73	-.54	-.38	-.59	-.41	.012	.012
American-Asian stereotype	.59	.29	.83	.68	.85	.51	.61	.060	.058	.34	.50	.46	.47	.47	.34	.29	.027	.022
Gender-Science stereotype	.90	.88	.85	.85	.98	.88	.93	.002	.002	.68	.86	.77	.74	.80	.67	.70	.001	.001
Gender-Career stereotype	1.06	.97	1.19	1.06	1.14	1.06	1.03	.002	.001	.76	.88	.87	.84	.91	.80	.78	.001	.001
Presidential attitude	-.18	-.24	-.33	-.20	-.16	-.27	-.24	.002	.002	-.06	-.58	-.86	-.93	-.71	-.86	-.82	.003	.003
Election 2004 attitude	-.25	-.37	-.61	-.31	-.27	-.37	-.39	.003	.003	-.31	-.63	-.82	-.46	-.39	-.52	-.48	.008	.011
Election 2000 attitude	-.11	-.32	-.70	-.23	-.11	-.25	-.25	.020	.002	-.16	-.43	-.80	-.28	-.13	-.38	-.25	.026	.003
Unweighted Means																		
Social group attitudes	.65	.71	.49	.69	.75	.55	.59	.031	.030	.47	.57	.13	.46	.52	.31	.33	.040	.039
Social group stereotypes	.63	.71	.78	.79	.92	.69	.75	.023	.022	.26	.47	.32	.37	.43	.27	.30	.009	.008
Political attitudes	-.18	-.31	-.55	-.25	-.18	-.30	-.30	.008	.002	-.18	-.54	-.83	-.56	-.41	-.59	-.52	.012	.006

IAT and self-report values are Cohen's *d*s with positive scores indicating the preference or stereotype described in Table 1.  $\eta_p^2$  is effect magnitude for an omnibus test of differences among the ethnicities; (*sim*)  $\eta_p^2$  is effect magnitude for ethnicity in a simultaneous regression that included three additional demographic variables as predictors (gender, age, political orientation). For self-report,  $\eta_p^2$  values are weight averages of effect sizes when variations of the self-report item were used in different parts of the dataset (e.g., a 5-point preference rating versus a 9-point preference rating). AmIn = American Indian, Asn = Asian or Asian American, Blk = Black (not of hispanic origin), Hisp = Hispanic, Wht = White (not of Hispanic origin), Multi = Multi-racial, Other = Other.

TABLE 5  
Implicit and explicit attitudes and stereotypes by age decade for 17 topics

Task	IAT								Self-report							
	10	20	30	40	50	60+	$\eta_p^2$	(sim) $\eta_p^2$	10	20	30	40	50	60+	$\eta_p^2$	(sim) $\eta_p^2$
Age attitude	1.19	1.30	1.27	1.23	1.21	1.25	.000	.000	.73	.57	.32	.16	.12	.08	-.047	-.050
Race attitude	.86	.88	.79	.79	.84	.98	.000	.000	.36	.34	.32	.37	.42	.60	.000	.001
Skin-tone attitude	.66	.73	.78	.80	.90	.90	.004	.005	.28	.25	.22	.21	.21	.31	-.001	-.001
Child-race attitude	.76	.71	.67	.67	.73	.71	.001	.000	.36	.17	.10	.22	.23	.57	.001	.000
Arab-Muslim attitude	.24	.31	.40	.45	.48	.57	.009	.008	.55	.52	.64	.73	.78	.92	.005	.004
Judaism attitude	-.34	-.36	-.32	-.32	-.39	-.32	.000	.000	.17	.13	.12	.12	-.01	.06	-.003	-.002
Disability attitude	.98	1.05	1.09	1.16	1.21	1.35	.007	.007	.71	.50	.46	.43	.47	.59	-.003	-.003
Sexuality attitude	.85	.77	.66	.62	.70	.87	-.006	-.004	.68	.52	.45	.49	.57	.70	-.006	-.005
Weight attitude	.79	.88	.86	.79	.81	.88	.000	.000	.88	.90	.88	.82	.82	1.01	.001	.001
Race-Weapons stereotype	.92	1.03	1.03	1.08	1.11	1.22	.004	.004	.41	.31	.21	.17	.15	.19	-.008	-.007
American-Native stereotype	.44	.44	.44	.42	.46	.56	.002	.002	-.27	-.42	-.51	-.54	-.51	-.40	-.007	-.007
American-Asian stereotype	.61	.59	.61	.73	.90	.95	.002	.000	.53	.47	.36	.35	.33	.34	-.013	-.008
Gender-Science stereotype	.88	.95	.98	1.08	1.18	1.30	.008	.008	.77	.79	.82	.82	.85	.92	.001	.001
Gender-Career stereotype	1.00	1.14	1.17	1.22	1.28	1.36	.008	.009	.81	.93	.96	.93	.87	.79	.000	.000
Presidential attitude	-.04	-.13	-.24	-.27	-.36	-.33	-.010	-.010	-.68	-.74	-.76	-.73	-.82	-.78	-.001	-.001
Election 2004 attitude	-.20	-.29	-.39	-.35	-.45	-.31	-.005	-.004	-.32	-.46	-.45	-.40	-.52	-.54	-.002	-.001
Election 2000 attitude	-.07	-.14	-.27	-.29	-.36	-.30	-.007	-.005	-.14	-.21	-.25	-.24	-.32	-.25	-.002	.000
Unweighted Means																
Social group attitudes	.66	.70	.69	.69	.72	.80	.002	.002	.52	.43	.39	.39	.40	.54	-.006	-.006
Social group stereotypes	.77	.83	.84	.91	.98	1.08	.005	.005	.45	.42	.37	.35	.34	.37	-.005	-.004
Political attitudes	-.10	-.19	-.30	-.30	-.39	-.32	-.007	-.006	-.38	-.47	-.48	-.46	-.55	-.52	-.002	-.001

IAT and self-report values are Cohen's  $d$ s with positive scores indicating the preference or stereotype described in Table 1. Ages are grouped by decade (all participants 60 and over are one group) for ease of presentation.  $\eta_p^2$  is effect magnitude for a univariate linear regression with age as the single predictor; (sim)  $\eta_p^2$  is effect magnitude for age in a simultaneous regression that included three additional demographic variables as predictors (gender, ethnicity, political orientation). For self-report,  $\eta_p^2$  values are weight averages of effect sizes when variations of the self-report item were used in different parts of the dataset (e.g., a 5-point preference rating versus a 9-point preference rating).

TABLE 6  
Implicit and explicit attitudes and stereotypes by political orientation for 17 topics

Task	IAT liberal			IAT conservative			$\eta_p^2$	(sim) $\eta_p^2$	Self-report liberal			Self-report conservative			$\eta_p^2$	(sim) $\eta_p^2$
	strong	mod	slight	slight	mod	strong			strong	mod	slight	slight	mod	strong		
Age attitude	1.12	1.19	1.19	1.21	1.24	1.19	.001	.001	.46	.54	.50	.45	.45	.33	-.001	-.002
Race attitude	.63	.74	.79	.88	1.05	.98	.011	.009	.08	.23	.27	.40	.70	.74	.031	.029
Skin-tone attitude	.63	.68	.73	.80	.90	.85	.007	.006	.07	.18	.24	.31	.49	.51	.015	.013
Child-race attitude	-	-	-	-	-	-	.013	.013	-	-	-	-	-	-	.024	.023
Arab-Muslim attitude	.07	.14	.19	.29	.43	.45	.015	.012	.34	.42	.53	.70	1.03	1.13	.044	.039
Judaism attitude	-.48	-.50	-.39	-.25	-.30	-.27	.008	.008	-.08	-.10	.09	.34	.45	.67	.037	.035
Disability attitude	.91	.91	.98	1.05	1.09	1.02	.006	.005	.46	.50	.57	.60	.65	.62	.002	.001
Sexuality attitude	.30	.49	.77	1.00	1.15	1.28	.098	.091	.02	.21	.53	.90	1.25	1.51	.172	.162
Weight attitude	.64	.74	.76	.83	.88	.83	.005	.005	.86	.93	.89	.85	.96	.89	.002	.001
Race-Weapons stereotype	.84	.92	.95	1.00	1.05	.92	.002	.001	.13	.25	.34	.44	.49	.63	.019	.019
American-Native stereotype	.22	.26	.48	.70	.72	.80	.032	.032	-.20	-.08	-.06	.02	.08	.15	.016	.015
American-Asian stereotype	.56	.56	.59	.66	.78	.80	.006	.006	.72	.85	1.00	1.06	1.08	1.20	.012	.011
Gender-Science stereotype	.88	.90	.88	.88	.95	.93	.000	.000	.76	.82	.88	.86	1.03	.92	.008	.007
Gender-Career stereotype	.97	1.05	1.09	1.13	1.17	1.19	.003	.005	.73	.86	.92	.96	1.15	1.22	.014	.013
Presidential attitude	-.60	-.51	-.29	.20	.64	.73	.192	.179	-1.25	-1.22	-1.00	-.29	.46	.64	.346	.347
Election 2004 attitude	-.92	-.78	-.39	.29	.73	.82	.367	.357	-1.13	-1.07	-.62	.32	.96	1.04	.598	.589
Election 2000 attitude	-	-	-	-	-	-	.460	.432	-	-	-	-	-	-	.645	.611
<b>Unweighted Means</b>																
Social group attitudes	.48	.55	.63	.73	.81	.79	.018	.017	.28	.36	.45	.57	.75	.80	.036	.033
Social group stereotypes	.69	.74	.79	.87	.93	.93	.009	.009	.43	.54	.61	.67	.77	.82	.014	.013
Political attitudes	-.76	-.65	-.34	.25	.68	.78	.340	.323	-1.19	-1.14	-.81	.02	.71	.84	.530	.516

IAT and self-report effects are shown as Cohen's *d*s for each level of a 6-point political orientation scale with positive scores indicating the preference or stereotype described in Table 1. Some portions of the dataset included a 5-point or 7-point scale with *moderate* or *neutral* as a mid-point. Two domains (Child-race, Election 2000) contained no data with the 6-point scale, but did use 7-point (Child-race) or 5-point (Election 2000) scales. The  $\eta_p^2$  is a weighted average (across the political orientation item variations) of  $\eta_p^2$ s for univariate linear regressions with political orientation as the single predictor; (sim)  $\eta_p^2$  is a weighted average of the effect magnitudes for political orientation in simultaneous regressions that included three additional demographic variables as predictors (gender, ethnicity, age). For self-report,  $\eta_p^2$  values are weight averages of effect sizes when variations of the self-report item were used in different parts of the dataset (e.g., a 5-point preference rating versus a 9-point preference rating).

TABLE 7  
Implicit and explicit attitudes and stereotypes by region for 17 topics

Topic	IAT							Self-report						
	Asia	Australia	Canada	Europe	UK	USA	Other	Asia	Australia	Canada	Europe	UK	USA	Other
Age attitude	1.18	1.22	1.24	1.38	1.27	1.24	1.29	.56	.60	.51	.62	.54	.49	.49
Race attitude	.93	.81	.86	.84	.79	.86	.68	.51	.30	.32	.40	.30	.36	.13
Skin-tone attitude	.85	.76	.78	.78	.68	.73	.69	.52	.21	.25	.33	.25	.24	.26
Child-race attitude	.69	.56	.58	.60	.69	.73	.61	.19	.06	.11	.08	.12	.16	.16
Arab-Muslim attitude	.26	.60	.38	.48	.31	.33	.05	.52	.66	.44	.69	.52	.61	.32
Judaism attitude	-.07	-.27	-.29	-.29	-.34	-.36	-.37	.39	.12	.05	.19	.17	.12	.15
Disability attitude	1.07	1.02	1.02	1.09	1.02	1.07	1.02	.78	.57	.63	.69	.43	.55	.57
Sexuality attitude	1.21	.83	.87	.89	.84	1.01	1.22	1.58	.71	.79	.74	.63	1.01	1.47
Weight attitude	.60	.81	.81	.88	.74	.86	.71	.95	.92	.93	1.05	.86	.88	.86
Race-Weapons stereotype	.84	1.05	.95	1.00	1.00	.97	.81	.40	.03	.28	.01	.16	.33	.42
American-Native stereotype	.47	-.02	.37	-.02	.00	.47	.39	-.08	-.51	-.37	-.69	-.57	-.42	-.58
American-Asian stereotype	.38	.40	.55	.36	.29	.67	.60	.48	.46	.40	.46	.30	.46	.33
Gender-Science stereotype	.95	1.08	.95	1.05	1.03	.95	.87	.85	.80	.68	.82	.75	.82	.77
Gender-Career stereotype	1.09	1.10	1.09	1.17	1.19	1.13	1.10	.87	.83	.84	.95	.89	.90	.84
Presidential attitude	-.24	-.31	-.31	-.36	-.33	-.16	-.24	-.77	-.98	-1.00	-1.03	-1.02	-.72	-.86
Election 2004 attitude	-.24	-.29	-.51	-.57	-.47	-.29	-.39	-.51	-.55	-.79	-.89	-.85	-.40	-.62
Election 2000 attitude	-.16	-.57	-.45	-.54	-.54	-.09	-.49	-.30	-.62	-.58	-.71	-.61	-.13	-.33
<b>Unweighted Means</b>	.58	.52	.52	.51	.48	.60	.50	.41	.21	.20	.22	.17	.31	.26
Social group attitudes	.75	.70	.69	.74	.67	.72	.66	.67	.46	.45	.53	.43	.49	.49
Social group stereotypes	.75	.72	.78	.71	.70	.84	.75	.50	.32	.36	.31	.31	.42	.36
Political attitudes	-.21	-.39	-.42	-.49	-.45	-.18	-.38	-.53	-.72	-.79	-.88	-.82	-.42	-.60

IAT and self-report effects are shown as Cohen's *ds* for each level of a 6-point political orientation scale with positive scores indicating the preference or stereotype described in Table 1. The overall percent of sample and median sample size per topic by region were Asia (2.0%,  $n = 1187$ ), Australia (1.4%,  $n = 744$ ), Canada (3.1%,  $n = 1834$ ), Europe (4.1%,  $n = 2969$ ), U.K. (2.3%,  $n = 1390$ ), USA (85.0%,  $n = 50517$ ), and other (2.0%,  $n = 1199$ ).



## Race-related attitudes

Three different tasks investigated race/ethnicity-related evaluations—attitudes towards Blacks versus Whites (race), attitudes towards dark-skin versus light-skin individuals (skin-tone), and attitudes towards Black children compared to White children (child-race). In all three, responses were faster on the IAT when *Black/dark-skin* was paired with *Bad* and *White/light-skin* was paired with *Good* compared to the reversed pairings (average  $d=0.77$ ).<sup>5</sup> Approximately 68% of participants showed this pattern, and 14% showed the reverse. Participants also reported an explicit preference for White/light-skin compared to Black/dark-skin though the effect magnitude was weaker (average  $d=0.25$ ). Implicit and explicit responses were moderately positively related (average  $r=.27$ ). Notably, Black participants were the only racial group that did not show an implicit pro-White preference on average (average  $d=0.01$ ; see Table 4). Among racial groups, White participants showed a strong implicit pro-White preference (average  $d=0.91$ ), but so did American Indians ( $d=0.64$ ), Asians ( $d=0.80$ ), Hispanics ( $d=0.71$ ), Multi-racials ( $d=0.48$ ), and “others” ( $d=0.67$ ) making clear that the result is more than an own-group preference effect.

## Arab-Muslim attitudes

Prior to 11 September 2001, attitudes towards Arabs in general and Arab-Muslims in particular were rarely studied in psychology outside Israel (Bar-Tal, 1996). Since then, interest in this group has increased dramatically. Our Arab-Muslim task was introduced in November 2001. To create a conservative test for observing relative negativity towards Arab-Muslims, *other people* was selected as the contrast category. Exemplars for *other people* were foreign names that would be unfamiliar to a US audience (85% of the participants) and unlikely to be perceived as an ingroup. Nonetheless, on average, other people’s names were implicitly preferred over Arab-Muslim names ( $d=0.33$ ): 50% showed the dominant pattern, while 25% showed a preference for Arab-Muslim names relative to those of other unfamiliar people. Contrasted against age and race attitudes, this attitude domain elicited a stronger explicit effect favouring other people ( $d=0.58$ ) than was observed implicitly. This provides an interesting counterexample to the norm in which implicit social group effects tend to exceed explicit ones. As a new target of intense interest amid concerns about terrorism, this

<sup>5</sup>A variety of category labels were used for the categories “Black People” and “White People” including: Black Americans/White Americans, Black People/White People, African Americans/White Americans, and African Americans/European Americans. Variation of these labels had minimal effects on IAT performance.

finding suggests that explicit self-regulation may not always seek to suppress automatic responses and, in some cases, might even strengthen them.<sup>6</sup> Conspicuously, these attitudes consistently elicited some of the largest group differences, both implicitly and explicitly, such that greater anti-Arab attitudes were observed among men compared to women (Table 3), older people compared to younger people (Table 5), and conservatives compared to liberals (Table 6).

### Judaism attitudes

A similarly conservative test was designed for measuring attitudes toward *Judaism* by contrasting it with *other religions*. In this circumstance, Judaism was implicitly preferred on average, but explicitly other religions were preferred slightly: 50% of the sample implicitly preferred Judaism and 26% showed the opposing preference. Among the social group attitudes tested, this domain elicited relatively strong implicit–explicit correspondence ( $r = .38$ ; Table 2). These attitudes were unique in that members of every ethnic group implicitly preferred Judaism to other religions on average (Table 4). And, at the same time, members of every ethnic group explicitly preferred other religions to Judaism on average. While *other religions* represented a diverse set of religions on the implicit measure, explicitly a particular religion might have been especially salient and influential in generating an explicit preference for the “other religions” category (e.g., Christianity for Christians). Also, people who reported being White, multiracial, or another ethnicity were the most positive towards Judaism. This occurred because approximately 7% of respondents in those categories were Jewish. With Jews removed, there were minimal differences among the racial groups (Jews showed strong pro-Judaism effects, e.g., implicit  $d > 1.3$ ).

### Disability attitudes

Attitudes towards people with disabilities receive little attention in psychology compared to the dominant interest in race and gender attitudes. The few attitude-relevant studies available reflect a general negativity towards people with disabilities (Nabor & Larson, 2002; Nowicki, 2006; Pruett & Chan, 2006; Saetermoe, Scattone, & Kim, 2001; Sheldon & Strohmer, 1983; Weisel & Florian, 1990; Young & Masoodi, 1977).

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<sup>6</sup>An alternative explanation is that the ambiguous “other people” category may be especially sensitive to other influences compared to coherent, specific contrast categories. However, this alternative does not explain the stronger explicit preference for fat people compared to thin people for the weight task.

Preference for people without disabilities compared to people with disabilities was among the strongest implicit and explicit effects across the social group domains: 76% of the sample showed a pro-abled implicit preference, while 9% showed a pro-disabled preference. Implicit and explicit responses were weakly positively related. The relative negativity towards disabled people was evident across genders, ethnicities, age groups, and political orientations (see Tables 3–6). Further, more than 3000 of the participants reported having a disability and they too showed an implicit preference for abled people over disabled people ( $d=0.85$ ), although it was weaker than for participants without disabilities ( $d=1.12$ ). A similar pattern was observed in self-report. People with ( $d=0.26$ ) and without ( $d=0.62$ ) disabilities explicitly preferred abled people. The weaker pro-abled preferences among people with disabilities suggest some degree of ingroup influence, but like age attitudes, the overall effect is an outgroup preference.

### Sexuality attitudes

With many calling for greater rights and access for gay men and lesbians, sexual orientation is probably the most prominent civil rights issue in the early twenty-first century. It is also still relatively acceptable to express negativity towards gay people in many societies and subcultures. Both implicitly and explicitly, participants showed a preference for straight people relative to gay people, and 68% showed this effect implicitly while 15% showed an implicit pro-gay effect. Perhaps reflecting the social acceptance of expressing negative opinions about sexual orientation, implicit–explicit correspondence was the strongest observed among social group attitudes ( $r=.43$ ). Paralleling the political climate, there is substantial variation in implicit and explicit sexuality attitudes across the political spectrum, from strong liberals on the low end showing a modest implicit straight preference ( $d=0.30$ ) and no explicit preference ( $d=0.01$ ), to strong conservatives showing substantial implicit ( $d=1.28$ ) and explicit ( $d=1.51$ ) straight preferences (see Table 6). In this case, explicit effect magnitudes were weaker than implicit effects among liberals, but stronger than implicit effects among conservatives. This underscores the rich complexity of incidence, magnitude, and relations between implicit and explicit evaluations.

### Weight attitudes

As with sexual orientation, expressing negativity towards fat people is not socially sanctioned to the same extent as it is for other social groups. Thin people were strongly preferred to fat people both implicitly and explicitly: 69% of the sample implicitly preferred thin people, and 12% implicitly preferred fat people. Pro-thin preferences are prevalent across all of the

social groups examined, but are comparatively lower among Black people compared to other racial groups (see Table 4). This could indicate some influence of ingroup preferences, as African Americans are more likely to be obese than are members of other groups in the US. In a more in-depth analysis of these data, Smith, Nosek, and Banaji (2007) found that both the respondent's own ethnicity and body mass index (BMI) predicted implicit weight attitudes, simultaneously suggesting that there is both a race-cultural difference and an ingroup effect based on the respondent's own weight status. However, while obese people show less implicit and explicit negativity towards fat people than thin people do, they do not show an ingroup preference for fat over thin (Smith et al., 2007). Like the elderly with age attitudes, and the disabled with disability attitudes, fat people on average showed an outgroup preference for thin people.

### Race–weapons stereotypes

The previous summaries concerned social group attitudes. The websites also featured social group stereotypes such as associating Blacks and Whites with weapons and harmless objects. On the IAT, most participants showed stronger associations of *Blacks* with *weapons* and *Whites* with *harmless objects* compared to the reverse pairing of *Blacks* with *harmless objects* and *Whites* with *weapons*: 72% of the sample showed the dominant effect, and 9% showed the reverse association. Participants also self-reported associating weapons with Blacks more than with Whites, and this was modestly positively related with the implicit stereotype. The implicit race–weapons stereotype was weaker among Black participants compared to other racial groups, but still relatively strong ( $d=0.59$ ). This contrasts with implicit racial attitudes in which Black participants showed no implicit preference on average between Blacks and Whites.

### American stereotypes

Two tasks measured associations of ethnic-national groups—*Asian Americans* or *Native Americans* versus *European* (or *White*) *Americans*—with the attributes *American* versus *Foreign*. In both IATs, participants more easily associated *European American* faces with *American*, and *Asian or Native American* faces with *Foreign*, than the reverse (Asian stereotype 61% of sample; Native stereotype 57% of sample). For the Asian–European contrast, self-report showed a parallel main effect, but for the Native–European contrast, participants reported the opposing stereotype, explicitly associating American with Native Americans more strongly than with European Americans. This held for both American and European respondents (Table 7; see also Devos, Nosek, & Banaji, 2007). Interestingly,

implicitly Australians and Europeans showed no stereotype of Whites or Natives as more American, whereas citizens of Asia, Canada, and other parts of the world showed implicit stereotypes in line with Americans. This implies that Europeans and Australians have relatively strong counter-associations of Whites not being American, though not strong enough to reverse the implicit stereotype completely.

The dramatic dissociation between implicit and explicit stereotypes might reflect participants' intentional reasoning that, logically, they should associate American more with Native Americans despite the pervasive societal and historical images of America as White. While such an explicit association might suddenly make sense when a person is confronted with a question like "Who is more American: White Americans or Native Americans?", the associative representation of American = White is not subject to such reasoning (Gawronski & Bodenhausen, 2006; Nosek & Hansen, in press). Everyday images of prominent Americans—all the US presidents, most political and social leaders, celebrities, and a majority of the population—reinforce associations of America as White (Devos & Banaji, 2005).

### Gender–science/humanities stereotypes

Prominent stereotypes characterise some academic domains—especially maths and science—as being gendered. On the gender–science/humanities IAT, participants showed stronger associations of *science* with *male* and *humanities* with *female* than the reverse academic–gender pairing (72% of the sample), and also reported associating science with male more than with female. Implicit and explicit stereotypes were positively related. Notably, this effect was observed for men and women, both implicitly and explicitly. Social stereotyping is not solely the belief system of a dominant group imposing its views on others. Many stereotypes are socially shared and reinforced, even by the targets of such stereotypes (Jost & Banaji, 1994). An interesting dissociation between implicit and explicit stereotyping was observed by age. While older participants did not report stronger explicit stereotypes than younger participants, implicit stereotypes increased monotonically across the life span from the teens to people aged 60 and older (see Table 5).

### Gender–career/family stereotypes

Another prominent gender stereotype concerns the association of gender with career and family. Participants' IAT performance suggested a stronger association of *males* with *career* and *females* with *family* compared to the reverse (76% of the sample). Similar effects were observed with self-reported

stereotypes, and these effects were modestly positively related. Essentially the same pattern of increasing implicit, but not explicit, bias with age was observed for career/family stereotypes as for science/humanities stereotypes (see Table 5).

### Political attitudes

Three tasks measured attitudes towards George W. Bush compared to previous US presidents (President), John Kerry (2004 Election), or Al Gore (2000 Election). Across the three domains, participants showed a modest implicit (average  $d = -0.19$ ) and a moderate explicit (average  $d = -0.45$ ) preference for the political figure opposing Bush. This reflects the fact that the sample was, on average, more liberal than conservative. The most noteworthy result from the politics tasks is the strong convergence between implicit and explicit attitudes (average  $r = .67$ ). Here, and in other investigations, political attitudes consistently elicit the strongest implicit–explicit correspondence. This may be because political attitudes are often expressed openly, are well elaborated, tend to be polarised, and people know where they stand compared to others (Nosek, 2005).

## A REVIEW OF FINDINGS ACROSS TOPICS

### Effect magnitudes

One of the factors generating interest in implicit and indirect measurement of attitudes and stereotypes is the belief that people might possess social preferences that they do not report. The under-reporting is presumed to occur for two reasons. For one, people might be *unwilling* to report some of their attitudes or stereotypes because they do not like having them or because they do not want others to know about them. Alternatively, people might be *unable* to report some of their attitude or stereotypes because they do not even realise that they exist (Greenwald & Banaji, 1995). In any case, a variety of perspectives converge on the notion that because of egalitarian norms, people's reports of social preferences will be weaker than what is revealed by implicit measures like the IAT (Devine, 1989; Fazio, Jackson, Dunton, & Williams, 1995; Greenwald & Banaji, 1995).

This general expectation was supported with this large, relatively heterogeneous dataset. Across social group attitudes and stereotypes, the IAT generally elicited a stronger effect than the corresponding self-report measure (Table 2). The direction of implicit and explicit effects was the same in 12 of the 14 social attitudes and stereotypes, and for 10 of those 12 the implicit effect magnitude was larger than the explicit effect magnitude. The two exceptions were that explicit preferences for thin people compared

to fat people slightly exceeded implicit thin preferences, and explicit preferences for other people compared to Arab-Muslims exceeded implicit preferences. The most dramatic dissociations occurred on the Judaism and American-Native stereotype tasks, which yielded implicit and explicit effects in opposite directions. Most notably, participants reported that they associated *Native Americans* more than *European Americans* with *American* ( $d = -0.42$ ), but implicitly the opposite was observed ( $d = 0.46$ ).

For the 10 topics that showed the dominant pattern of implicit social biases exceeding parallel explicit social biases, the difference between Cohen's  $d$  values ranged from roughly comparable (gender–science: implicit  $d = 0.93$ ; explicit  $d = 0.79$ ) to widely discrepant (age: implicit  $d = 1.23$ ; explicit  $d = 0.51$ ). Comparing effect magnitudes across measures should be done with caution because they are influenced by reliability, sensitivity, and construct-irrelevant factors. The IAT is known to be relatively reliable among implicit measures, but it may achieve weaker reliability levels compared to some varieties of self-report measures (Bosson, Swann, & Pennebaker, 2000; Nosek et al., 2006a). In this review, the median alpha was .76 across topics. This is relatively good for implicit measures, but perhaps somewhat lower than the reliability of the thermometer and preference ratings that comprise the self-report measures (Nosek & Smyth, 2007). On its own, this would suggest that the IAT should elicit weaker effect magnitudes on average than self-report, the opposite of what was observed. This suggests that implicit effects measured by the IAT tend to exceed parallel self-report effects for social group attitudes and stereotypes.

An important qualification to this conclusion is that it does not hold across all domains—most notably the weight and Arab-Muslim tasks discussed earlier. Also, in these relatively liberal samples, across the political attitude tasks (President, Election 2004, Election 2000), explicit preferences for presidents or candidates other than George Bush (unweighted average  $d = -0.45$ ) consistently exceeded implicit preferences (unweighted average  $d = -0.19$ ). Other investigations have identified a variety of circumstances in which self-reported preferences are stronger than parallel implicit preferences measured with IATs (Nosek, 2005). So the expectation that implicit social attitudes and stereotypes will exceed explicit biases was observed in general for the topics and measures we studied, but this effect is not a universal feature of implicit and explicit measurement, or of the IAT in particular.

One should be attentive to all features of measurement when interpreting differences in effect magnitudes across domains, even within a measurement type. For example, among social group attitudes, the Arab-Muslim and Judaism tasks elicited the weakest implicit effects. This is likely due to the selection of a relatively negative contrast category (“other people” using unfamiliar names, and undifferentiated “other religions”, respectively)

compared to the domains that contrasted one group against a specific, high-status category (e.g., Black–White, Fat–Thin). This influence is clearly evident in the President task in which George Bush was randomly contrasted against either Clinton, Reagan, Kennedy, Nixon, FDR, Lincoln, Jefferson, or a group of recent presidents. Bush was implicitly preferred when contrasted against Nixon ( $d=0.48$ ), but was relatively disliked when contrasted against Clinton ( $d=-0.51$ ) or Jefferson ( $d=-0.22$ ) among others. Similar variations were observed in self-reported preferences (aggregation of these contrasts is presented in Table 2; a detailed breakdown is available in supplementary materials). This emphasises that interpretation of IAT effects must consider the relative nature of the assessment (Nosek et al., 2005).

With few exceptions, across domains and demographic categories, participants showed implicit and explicit social preferences and stereotypes. Men and women, young and old, conservative and liberal, Black, White, Asian, and Hispanic—all groups have social preferences for some groups over others, and hold stereotypic associations or beliefs. Social preferences are not possessed exclusively by a privileged few—they are a general characteristic of human social cognition.

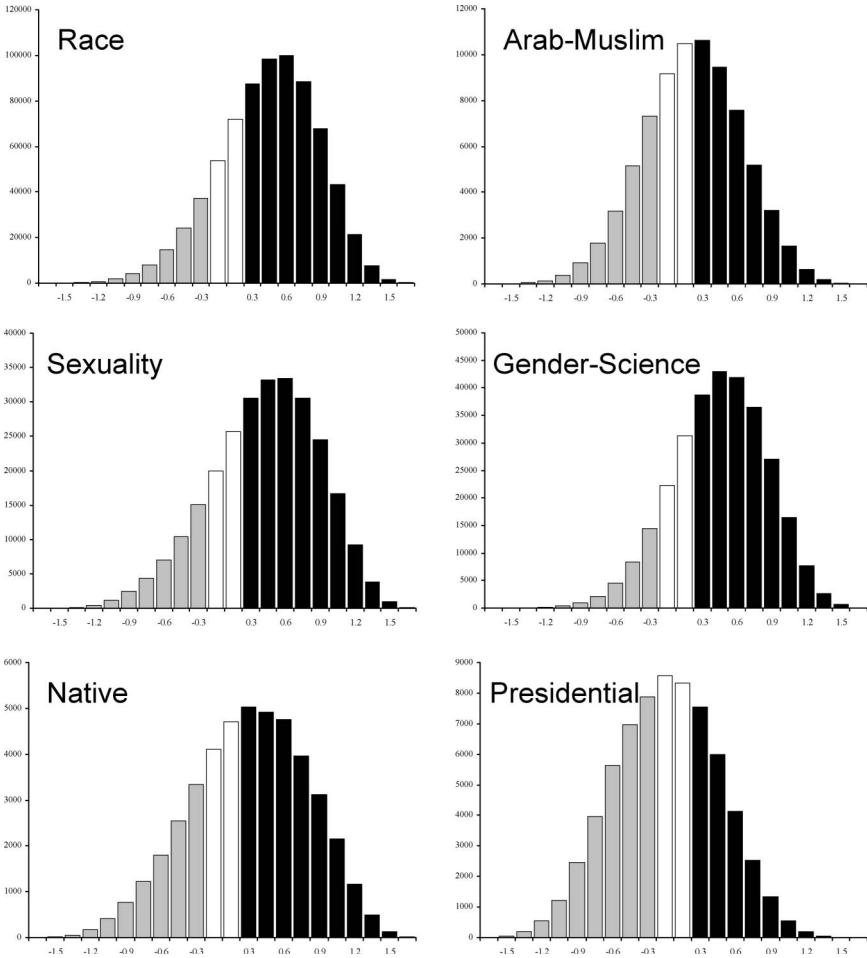
### Inter-individual variability

Variation in effect magnitudes across topics suggests that, like self-report, the IAT is sensitive to variations in the social content of assessment. This does not address whether the IAT is sensitive to individual differences. If the IAT does not show meaningful inter-individual variability, then it might not be interpreted properly as an individual difference measure, and it, or implicit attitudes and stereotypes more generally, might not provide information about the person, but rather might, for example, reflect *shared* cultural knowledge (Arkes & Tetlock, 2004; Karpinski & Hilton, 2001). Of course, showing inter-individual variability does not itself guarantee that the associations are not “cultural” in that individuals have unique experiences of their cultural context (Nosek & Hansen, in press; Uhlmann, Poehlman, & Nosek, 2007).

For each topic, there was substantial inter-individual implicit and explicit variability. Histograms of IAT effects for six of the topics are presented in Figure 2. Among the topics examined, the three political attitude tasks should elicit the greatest variability in implicit evaluations because presidential candidate attitudes tend to be polarised. The IAT standard deviations presented in Table 1 confirm this expectation, as the Election tasks yielded the greatest inter-individual variability.

Correlations between the IAT and self-reports are one means of assessing the meaningfulness of inter-individual variability. The unweighted average correlation between implicit and explicit effects was  $r=.31$ . All correlations





**Figure 2.** Histogram plots of IAT scores for 6 of the 17 domains. Black shading indicates a preference or stereotype described in Table 1, grey shading indicates the opposing preference or stereotype. White bars indicate  $|D| < .15$ .

were positive and there was substantial variability in the correlation magnitudes (Hofmann et al., 2005a; Nosek, 2005). As a group, the social stereotypes elicited the weakest implicit–explicit correspondence ( $r = .18$ ), social group attitudes showed moderate correspondence on average ( $r = .27$ ), and political attitudes showed strong implicit–explicit correspondence ( $r = .67$ ). Within social group attitudes, implicit–explicit correlations varied from weak (age  $r = .13$ , disability  $r = .14$ ) to moderate (sexual orientation  $r = .43$ , Judaism  $r = .38$ ).

These results are consistent with meta-analytic findings based largely on laboratory research with small samples (Hofmann et al., 2005a). In a multitrait–multimethod investigation, IAT and self-report measures showed convergent validity with implicit and explicit measures of the same topic being correlated positively, and discriminant validity with (a) implicit measures of different topics showing weak relations, and (b) implicit and explicit measures of different topics showing weak relations (Nosek & Smyth, 2007). Also, while the IAT and self-reports were related, a structural model representing them as measuring related but distinct constructs fit much better than representing the IAT and self-reports as measuring a single construct (Nosek & Smyth, 2007; Ranganath, Smith, & Nosek, in press). Further, here and in other reports (Nosek, 2005; Nosek & Hansen, in press) the strength of correspondence varies substantially across topics from weakly to strongly positive, suggesting that there are one or more moderators of the relationship between the IAT and self-report. Nosek (2005) found evidence that a variety of personal features of the evaluation—such as self-presentation concern, attitude strength, attitude dimensionality, and attitude distinctiveness—moderated the relationship between implicit and explicit attitudes. Finally, a meta-analysis of predictive validity studies found that the IAT showed predictive validity across a variety of topics; that explicit measures outperformed the IAT for some topics (e.g., consumer attitudes); and that the IAT outperformed explicit measures for some topics (e.g., stereotyping and prejudice; Poehlman et al., 2007). Together, the present data and accumulated research suggest that the IAT is sensitive to individual differences with substantial inter-individual variability that is related to, but distinct from, explicit attitude measures and predicts individual behaviour (Cunningham, Nezlek, & Banaji, 2004; Cunningham, Preacher, & Banaji, 2001; Greenwald & Farnham, 2000; Hofmann et al., 2005a; Hofmann, Gschwendner, Nosek, & Schmitt, 2005b; Nosek, 2005; Nosek & Smyth, 2007; Poehlman et al., 2007).

## SOURCES OF INTER-INDIVIDUAL VARIABILITY

What are the factors that are associated with variability in implicit and explicit attitudes and stereotypes? This question is at the core of many important social psychological theories including social identity theory (Tajfel & Turner, 1986), social dominance theory (Pratto, Sidanius, Stallworth, & Malle, 1994; Sidanius & Pratto, 1999), and system justification theory (Jost & Banaji, 1994; Jost, Banaji, & Nosek, 2004). In terms of intergroup attitudes, social identity theory emphasises the psychological factors that lead to favouring one's own group over others. Social dominance and system justification theories put a greater emphasis on

favouring higher-status groups over lower-status groups in order to maintain and justify the status quo.

In our aggregate and comparative analysis, we examine four characteristics that are thought to predict variation in attitudes and stereotypes: gender, ethnicity, age, and political orientation. Also we include a brief section comparing implicit and explicit attitudes and stereotypes across a selection of nations. These variables emphasise demographic rather than psychological characteristics and do not imply that they are the sole sources of variability in attitudes and stereotypes, nor that they are the causal factors influencing implicit cognitions. Rather, these are individual differences of common interest and what can be summarised effectively in a single review. Where possible, we connect the discussion to existing psychological theories that may help explain these variations.

## Gender

*Social group attitudes.* Social dominance theory postulates that men have greater desire to dominate others than women do, and that this may translate to group attitudes such that men will exhibit stronger social group preferences for ingroups or high-status groups than women will (Sidanius & Pratto, 1999). Likewise, research on system justification theory finds that men tend to have stronger system-justifying tendencies than women (Jost & Kay, 2005), suggesting that they might also show stronger preferences for higher- over lower-status groups. This expectation is supported in research on explicit attitudes towards gay people (Anderssen, 2002; Davies, 2004; Negy & Eisenman, 2005), and may also hold for implicit sexuality attitudes (Dasgupta & Rivera, 2006; Steffens, 2005). Investigations of racial attitudes find that female children (Moore, Hauck, & Denne, 1984), adolescents (Johnson & Marini, 1998), and college students (Qualls, Cox, & Schehr, 1992) demonstrate less racial prejudice than their male peers. However, a broad review of adults' racial attitudes revealed that gender differences in racial attitudes were small and inconsistent (Hughes & Tuch, 2003). While one study found that women demonstrated higher implicit prejudice than men (Ekehammar, Akrami, & Araya, 2003), another large review of more than 220,000 race IATs found men's implicit preference for White over Black exceeded women's (Nosek et al., 2002).

Less research comparing effects by gender is available for other social topics. Within the existing literature, inconsistent or limited differences have been reported, such as no gender difference in explicit Arab-Muslim attitudes (Bushman & Bonacci, 2004; Echebarria-Echabe & Fernandez-Guede, 2006), nor in implicit or explicit disability attitudes (Pruett & Chan, 2006). Weight attitudes are mixed with gender differences occurring in both directions or no differences at all (Aruguete, Yates, & Edman, 2006;

Crandall, 1994; Crandall & Biernat, 1990; Crandall & Martinez, 1996; Grover, Keel, & Mitchell, 2003; Morrison & O'Connor, 1999; Perez-Lopez, Lewis, & Cash, 2001). A meta-analysis of age attitudes found that the gender composition of study samples was not related to overall evaluations of older adults (Kite, Stockdale, Whitley, & Johnson, 2005). The mix of findings within and across domains is likely influenced by relatively small and distinct samples. The present datasets offered an opportunity to conduct extremely high-powered tests, with a heterogeneous sample, across a variety of social topics to evaluate the expectation that men will have stronger social preferences than women for higher- over lower-status groups.

Implicit and explicit attitudes are listed by gender in Table 3. Across social group attitudes, men ( $d=0.80$ ) consistently demonstrated stronger implicit preferences than did women ( $d=0.63$ ; average gender difference  $\eta_p^2 = .008$ ). This pattern was observed for every domain except Judaism, in which men and women showed nearly equivalent pro-Judaism preferences. The gender difference was most pronounced for implicit disability attitudes, with women showing a strong pro-abled preference and men showing an even stronger one ( $\eta_p^2 = .018$ ). Explicitly, gender differences were even larger, with men ( $d=0.64$ ) showing stronger social group preferences than women ( $d=0.36$ ; average gender difference  $\eta_p^2 = .017$ ) across topics. Again, the only social group attitude that did not conform to this trend for explicit reports was Judaism attitudes, but the strongest explicit gender difference was on preferences for thin versus fat people. Men reported stronger preferences for thin people over fat people than women did. Notably, even overweight men reported stronger pro-thin preferences than overweight women did (Smith et al., 2007). This outgroup preference could indicate that men are more likely to resist self-identification as fat than are women. Another possibility is that when pitting *high-status* (thin) against *ingroup* (fat), overweight men are more likely to prioritise valuing status. Across topics, the pattern supports expectations that men favour higher-status groups more than women both implicitly and explicitly.

*Social group stereotypes.* Social dominance theory does not clearly predict that men would maintain stronger social stereotypes than women, perhaps with the exception of stereotypes that serve the interests of maintaining dominant status. System justification theory (Jost & Banaji, 1994; Jost et al., 2004) suggests that subordinate groups might uphold the social system as much as the superordinate groups. Likewise, this does not have obvious implications for whether gender differences in social stereotyping should be observed generally, except for the evidence that men have stronger system-justifying tendencies.

Comparisons across social group stereotypes did not reveal consistent gender differences (see Table 3). On aggregate, women and men showed

approximately the same magnitude of implicit stereotyping. Women's implicit stereotypes were noticeably stronger than men's in just one domain—gender–career stereotypes—with women associating male with career and female with family ( $d=1.19$ ) more than men did ( $d=0.94$ ;  $\eta_p^2 = -.008$ ), while their self-reported career–family stereotypes were just slightly weaker than men's.

*Political attitudes.* Across the three political attitude measures, observed effects were consistent with prior explicit research, with men being somewhat more favourable to Bush than women, whether measuring implicitly or explicitly. The column “(sim)  $\eta_p^2$ ” in Table 3 is the effect size of the gender difference in a simultaneous regression that includes the three other individual difference variables: ethnicity, age, and political orientation. The gender difference in political attitudes disappears in this regression, indicating that gender does not contribute uniquely to predicting differences in implicit or explicit attitudes towards political figures once gender differences in political orientation are taken into account.

### Race and ethnicity

Despite the intense interest in race and ethnicity in social psychology, very little of the research tests whether people of different ethnicities tend to show more or less social group preferences or stereotypes. For example, a meta-analysis of age attitudes noted a distinct lack of evidence regarding race or ethnicity differences within the US or cross-culturally (Kite et al., 2005). The existing literature features race and ethnicity in intergroup bias with an emphasis on measuring attitudes *towards* various ethnicities. When the perceiver's race or ethnicity is of interest, it is usually in the context of favouring one's own group compared to outgroups (Hewstone, Rubin, & Willis, 2002; Tajfel & Turner, 1986), such as the large literature on White and Black Americans' attitudes about themselves and each other. Judd, Park, Ryan, Brauer, and Kraus (1995) noted that “very rarely have the views of ethnic minorities been assessed or documented” (p. 461).

What literature does exist on race and ethnic differences in social preferences does not communicate a simple story. Black Americans stigmatise overweight people and disabled people less than do White Americans (Harris, Walters, & Waschull, 1991; Hebl & Heatherton, 1998; Sheldon & Strohmer, 1983), but report stronger anti-gay sentiments (Lewis, 2003; Negy & Eisenman, 2005; Schulte & Battle, 2004). Blacks report more negativity towards Whites than Whites report towards Blacks (Judd et al., 1995). Asian students report more negative attitudes towards disabled people than do members of other racial groups (Saetermoe et al., 2001), and more favourable attitudes towards traditional gender roles

(Lottes & Kuriloff, 1992). In the few studies that have examined it, no race or ethnic differences have been observed in the differential implicit or explicit perception of Asians and Whites as American (Cheryan & Monin, 2005; Devos & Banaji, 2005).

*Social group attitudes.* These datasets provide an opportunity for comparisons of racial groups in their implicit and explicit social preferences across a variety of topics. Implicit and explicit social group attitudes are presented by ethnicity in Table 4. On aggregate, it appears that Black participants showed weaker implicit preferences than other groups, especially White participants (Blacks  $d=0.49$ ; Whites  $d=0.75$ ; other groups  $ds=0.55$  to  $0.71$ ). However, this aggregation collapses over three domains that involve contrasting Black and White (or dark-skin and light-skin). For those three, Blacks show no preference between Black and White on average ( $d=0.01$ ) whereas other groups, and especially Whites, show strong pro-White preferences (Whites  $d=0.91$ ; other groups  $ds=0.48$  to  $0.80$ ).

A different pattern emerges among the social group attitudes that do not include a Black–White contrast. On these judgements, Blacks and Whites show the strongest implicit preferences (average  $ds=0.79$ ) and multi-racial or participants selecting “other” ethnicity show the weakest, although not much weaker (average  $ds=0.68, 0.67$ ). This pattern varies among content domains with, for example, Black participants showing the strongest implicit preferences in the age, disability, and sexuality tasks, but the weakest in the weight task, the latter effect in line with other findings on explicit fat–thin attitudes (Harris et al., 1991). Perhaps most interesting is the comparison with self-report for age attitudes. While showing the strongest pro-young preference implicitly, Blacks reported the weakest pro-young preference explicitly. Otherwise, Blacks’ implicit and explicit ranks were relatively consistent, evidencing the strongest anti-gay preference for both, and the weakest anti-fat preference for both. Also notable, Asian participants (mostly Asian Americans) reported the strongest pro-young preferences ( $ds=1.22, 0.63$ ) despite the common assumption that age bias is weakest among East Asian cultures because of Confucian principles of filial piety (Liu, Ng, Weatherall, & Loong, 2000; Ng, 1998).

For the three racial tasks, Black participants reported an explicit preference for Black or dark-skin compared to White or light-skin ( $d=-0.74$ ), whereas other groups reported no preference to moderate preferences for White/light-skin ( $ds=0.01$  to  $0.41$ ) and White participants reported the strongest preferences ( $d=0.48$ ). For the non-racial domains, Asians self-reported the strongest social biases on average (Asians  $d=0.66$ ; other groups  $ds=0.42$  to  $0.60$ ) even though Blacks and Whites showed stronger implicit biases on average. As was observed implicitly, participants reporting multi-racial or “other” ethnicities reported the weakest social

group preferences. And again, variation was observed across domains. For example, Asians reported the strongest weight, disability, and age preferences, but reported among the weakest preferences for other people compared to Arab-Muslims.

*Social group stereotypes.* Aggregated across the five social stereotype domains, White participants showed stronger implicit stereotypes than did other ethnic groups (Table 4). As with social group attitudes, however, there was some variability across topics. Whites consistently showed the strongest stereotypes among ethnic groups, except for gender–career stereotypes where they showed the second strongest effect. This contrasts with Whites’ self-reported stereotypes, which were not the strongest in any domain except for gender–career.

Other noteworthy variations by ethnicity include: (a) Black participants showed the weakest Black–weapons association, although it was still a robust effect; (b) Native Americans showed a reversal of the Native with Foreign and European with American stereotype and was the only group to do so implicitly, even though all groups did so explicitly; similarly (c) Asian Americans showed less tendency to associate Asian with Foreign and European with American compared to other groups, but the effect did not reverse; and (d) people reporting multi-racial and “other” ethnicities did not show systematically weaker implicit stereotypes, as they did with social group attitudes.

As with explicit attitudes, Asians reported the strongest social stereotypes aggregated across domains (Asians  $d = 0.47$ , other groups  $ds = 0.26$  to  $0.43$ ). Notably, in addition to reporting the strongest gender–science and weapons stereotypes, Asians also self-reported the *strongest* stereotypes associating American with White compared to Asian faces (Asians  $d = 0.50$ ; other groups  $ds = 0.29$  to  $0.47$ ). This runs counter to the rank order for the parallel implicit stereotypes and defies a potential ingroup effect of associating one’s own ethnic group with American. Another stereotype effect that counters a simple ingroup interpretation was Black participants’ self-reported stereotyping associating weapons more with Blacks than with Whites. While their stereotyping magnitude is weaker than that of some groups, it was not the weakest.

*Political attitudes.* Ethnic comparisons of implicit and explicit attitudes towards Bush compared to other presidents or candidates conform to observations of voting behaviour from exit polling data (CNN.com Election 2004). Across the three topics, Blacks showed the strongest negativity towards Bush compared to the alternatives, both implicitly ( $d = -0.55$ ) and explicitly ( $d = -0.83$ ; see Table 4). Whites and Native Americans showed the least negativity towards Bush implicitly ( $ds = -0.18$ ,  $-0.18$ ) and explicitly ( $ds = -0.41$ ,  $-0.18$ ).

## Age

Little psychological research has examined variation in social group attitudes by age group, nor has psychological theory commented much on the possibility of age differences. What does exist usually concerns variations very early in the lifespan. For example, negativity towards fatness appears early, even in 3-year-olds (Cramer & Steinwert, 1998). At least among younger samples, ageing is associated with less stigmatisation of obesity (Latner, Stunkard, & Wilson, 2005). Likewise, own race familiarity or preference appears to emerge early, both implicitly and explicitly (Bar-Haim, Ziv, Lamy, & Hodes, 2006; Baron & Banaji, 2006).

*Social group attitudes.* Cross-sectional data confound history and developmental stage. It is not possible in the present review to discriminate between these factors. Implicit and explicit social group attitudes by age decade are presented in Table 5. Because of relatively small numbers of older participants, adults aged 60 and older were grouped together to obtain a stable estimate.

Across topics, there is not a consistent linear effect of increasing or decreasing social group preferences by age. Instead, three patterns were observed in implicit effects across topics—no differences, positive linear, and quadratic (high for young and old compared to middle ages). Four topics showed little to no difference across decades: age, child-race, Judaism, and weight. The most surprising of these is the persistent implicit preference for young compared to old across the age span (Lindner, Nosek, & Banaji, 2006; Nosek et al., 2002). Adults aged 60 and older showed implicit preferences for young over old nearly as strongly as did adults in their twenties. This contrasts with explicit age preferences in which adults in their twenties reported strong young preferences, but adults aged 60 or older were more age-egalitarian. Notably, explicit age preference was the only example of a substantial negative slope of greater egalitarianism across the age span.

Positive linear implicit social preferences by age were evident in three domains: skin-tone, Arab-Muslim, and disability. Older adults showed stronger negativity toward dark-skin, Arab-Muslims, and disabled people than did younger adults. Two domains—race and sexuality—showed a curvilinear pattern, with the youngest and oldest decades showing stronger implicit pro-White and pro-Straight preferences than the middle age groups. Finally, among explicit biases, similar variations in patterns with ageing were observed. The age 60 and older group reported the strongest directional preferences in six of the nine domains (race, skin-tone, child-race, Arab-Muslim, sexuality, weight), were second strongest in one other (disability), and were nearly egalitarian for age and Judaism preferences.



While an interesting story could be spun for the particular pattern of age variations across topics, no developed theory predicts these comparative results. As mentioned, the most unexpected result was the comparison of implicit and explicit age attitudes (see also Nosek et al., 2002). As people age, social identity theory would predict that they will likewise develop more positive attitudes towards the group (Tajfel & Turner, 1986), a finding that is strongly supported by the accumulated research for other groups (Hewstone et al., 2002). The clarity of this prediction and evidence contrasts remarkably with the implicit age data in which no shift of ingroup preference is observed across age cohorts. This lack of ingroup effect could be a function of a resistance to identifying oneself as old and therefore avoiding making it an ingroup (Montepare & Lachman, 1989; Westerhof, Barrett, & Steverink, 2003).

Ageing is associated with declines in general processing speed and inhibitory ability (Earles et al., 1997; Salthouse, 1996). Von Hippel, Silver, and Lynch (2000) suggested that older adults may show greater social biases than younger adults, not necessarily because of holding stronger preferences, but because of a decreased capacity for inhibiting their automatic activation. They observed that decreased inhibitory ability among older adults compared to younger adults mediated age differences in explicit racial stereotyping. Using IAT data, Gonsalkorale, Sherman, Allen, Amodio, and Bartholow (2007) applied a quad-model process dissociation procedure that purports to separately estimate cognitive processes of attitude activation (AC), overcoming bias (OB), detectability of the correct response (D), and guessing (G) involved in IAT performance. Their models suggested that older adults had less capacity to overcome their automatic racial preferences than did younger adults. Although the older adults appeared to have weaker automatic attitude activations than younger adults, the behavioural IAT effect was similarly strong, perhaps because the younger adults were better able to self-regulate their stronger automatic responses, and older adults were worse at self-regulating their weaker responses. These studies suggest that older adults' implicit and explicit social group attitudes and stereotypes are linked to age-related declines in inhibition capacity. The implication is that, behaviourally, older adults will evidence stronger social preferences than will younger adults when the underlying evaluative associations are equal.<sup>7</sup> The data here were generally consistent with von Hippel and colleagues' analysis (2000), although we cannot determine whether

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<sup>7</sup>An important factor for age-related comparisons of IAT data is the potential impact of age-related slowing in average response latency. Slower responding can have an extraneous influence on IAT effects artefactually making them larger (Hummert, Garstka, O'Brien, Greenwald, & Mellott, 2002). The *D* score, an individualised effect size used here, mitigates the influence of average response latency on IAT effects (Greenwald et al., 2003).

inhibitory capacity in the present data is responsible for older adults' generally stronger self-reported preferences.

*Social group stereotypes.* While a variety of self-report patterns across age groups characterised responses in the attitude topics, age-related patterns of implicit stereotypes were more consistent (Table 5). An approximately linear positive relationship with age occurred in all five stereotype domains. Adults aged 60 or older tended to show stronger implicit stereotypes (average  $d=1.08$ ) than participants in their twenties (average  $d=0.83$ ). The shape and incline of the age differences did vary, but the general pattern was consistent. At the weak end, Native stereotypes were relatively consistent across the age span, with just slightly stronger stereotyping among the adults aged 60 and older compared to those in their twenties. At the other end, gender/science/humanities and career/family stereotypes were consistently stronger for older than younger groups.

A similar positive relationship was found between the *explicit* gender–science stereotype and age (see Table 5), but this was the only case of a positive relationship among the five stereotype domains. Explicit stereotypes for three topics were negatively related to age. First, explicit weapons and Asian stereotypes were weaker for adults 60 and older than for adults in their twenties. Second, explicit Native stereotypes were in the opposite direction from implicit stereotypes, with Native Americans being viewed as more American than were Whites, an effect most pronounced among adults 60 and older. Third, a negative quadratic relationship was observed between age and explicit gender–career stereotypes, with middle-aged groups reporting stronger stereotypes than the youngest and oldest groups. Interestingly, the strongest explicit male = career, female = family stereotypes were evident in the age decades in which parents with children are most commonly found (twenties through forties). These decades are easy to understand as presenting the greatest challenges for balancing career and family, putting a heightened stress on social roles for mother–father couples trying to manage a household. However, implicit gender–career stereotypes followed the positive linear relationship with age.

*Political attitudes.* Across the three political tasks, older groups showed stronger preferences for other presidents or candidates compared to George Bush both implicitly and explicitly, although all age groups preferred the political figure opposing Bush on average (Table 5). The magnitude of these age differences was approximately halved when political orientation, gender, and ethnicity were included as simultaneous predictors (sim  $\eta_p^2$  in Table 5).

## Political orientation

Of gender, ethnicity, age, and political orientation, the latter has the most developed theory concerning variation in social preferences. From classic and contemporary works about the authoritarian personality (Adorno, Frenkel-Brunswik, Levinson, & Sanford, 1950; Altemeyer, 1996, 1998) to psychological perspectives on motivated social cognition (Jost, Glaser, Kruglanski, & Sulloway, 2003), a consistent expectation is that, compared to liberals, conservatives are less concerned with equality, prefer to maintain the status quo, favour dominant groups over subordinate groups, and favour ingroups to a greater extent over outgroups (Altemeyer, 1996; Jost et al., 2003; Pratto et al., 1994; Sidanius & Pratto, 1999). This hypothesis applies generally across social groups and implicit and explicit measurements (Jost et al., 2004), and also connects to the personality concept of ethnocentrism, a preference for people and groups like oneself, which is found to have a basis in explicit and implicit social cognition (Cunningham et al., 2004).

*Social group attitudes.* In Table 6, we summarise implicit and explicit social group preferences for each topic separated by political orientation reported on a 6-point scale from strongly liberal to strongly conservative. The effect size estimate,  $\eta_p^2$ , is a weighted average of political orientation effects of 5-, 6-, and 7-point scales that were used at different times throughout the data collection. Consistently, conservatives showed stronger implicit preferences for higher-status groups than did liberals. The single exception was the Judaism task in which all groups showed a preference for Judaism compared to other religions, but the effect was somewhat stronger for liberals than for conservatives.<sup>8</sup> The magnitude of this relationship varied across domains, from a nearly flat relationship between political orientation and implicit pro-young attitudes ( $\eta_p^2 = .001$ ), to a strong one for implicit sexuality attitudes in which strong liberals showed a moderate implicit preference for straight relative to gay people ( $d = 0.30$ ) and strong conservatives showed a substantial preference ( $d = 1.28$ ;  $\eta_p^2 = .098$ ).

The consistent pattern of conservatives showing stronger implicit social group preferences than liberals do was also apparent in self-reports (Table 6). In fact, the relationship between explicit attitudes and political orientation was even stronger than for implicit attitudes. Conservatives explicitly

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<sup>8</sup>None of the data collected for the Child-race task included a 6-point political orientation measure. However, for the child-race task, and the other tasks, a similar pattern was observed when a 7-point political orientation item was used. In this case, conservatives showed stronger pro-White children biases than liberals did. Data using 7-point scale results are included in the effect size estimates in Table 6. More detailed summary data with the 7-point scale appears in the supplementary materials.

reported being more anti-Black, anti-dark-skin, anti-Black-children, anti-Arab-Muslim, anti-gay-people, and weakly more anti-disabled relative to the associated contrast category than were liberals. Combined, the average effect size for explicit reports was more than double that of the implicit effects. These results are consistent with theories of motivated social cognition (Jost et al., 2003) among others, and illustrate the generality of the findings across domains and implicit–explicit measurement. Note that, directionally, liberals held the same social preferences as conservatives, just more weakly.

A couple of differences between implicit and explicit preferences across the political spectrum were observed as well. First, although conservatives showed a mild implicit preference for Judaism compared to other religions, explicitly they reported a strong preference for other religions. Again, this may be a consequence of selecting an ambiguous “other religions” as a contrast category. Second, although conservatives showed a stronger implicit preference for thin people relative to fat people than did liberals, self-report findings were inconsistent, with conservatives reporting slightly stronger pro-thin preferences overall, but the pattern was non-monotonic across the political spectrum.

*Social group stereotypes.* Similar to the effects across social group attitudes, conservatives tended to show stronger implicit ( $\eta_p^2 = .009$ ) and explicit ( $\eta_p^2 = .014$ ) stereotypes than did liberals (Table 6). Again, the relationship between political orientation and social stereotypes was stronger in self-report than on the IAT. With only a few exceptions, implicit and explicit social stereotyping increased monotonically at each step from strong liberalism to strong conservatism. The only task that did not show a consistent trend was implicit gender–science stereotyping, on which the strength of male = science, female = humanities associations did not vary meaningfully by political orientation.

*Political attitudes.* As expected, conservatives showed stronger pro-Bush preferences than did liberals, both implicitly and explicitly (Table 6). This finding demonstrates convergent validity for the measures. Both the IAT and self-report effectively distinguish conservatives’ and liberals’ support for Bush compared to other political figures.

### Unique contributions of gender, ethnicity, age, and political orientation to variation of social preferences and stereotypes

In the preceding sections, we have considered gender, ethnicity, age, and political orientation separately to identify variations in the given social category. Given intercorrelations among some of these variables,

simultaneous regressions were performed with gender, ethnicity, age, and political orientation as predictors to test whether they contribute uniquely to attitude and stereotype variation. In Tables 3–6, the effect size  $\eta_p^2$  column reflects the group difference calculated independently and (sim)  $\eta_p^2$  is the effect size of that group difference after variation from the other three social group variables was partialled from the model. If the effect size vanishes in the latter column, then the observed group difference co-occurs with one of the other variables. Each of gender, ethnicity, age, and political orientation continued to account for unique variation in implicit and explicit evaluations even when all four were considered simultaneously. There was one exception. As reported earlier, the independent effect of gender on predicting reported attitudes towards political candidates was wiped out when the other social group variables were included in the analysis (Table 3). Finally, these four variables are far from providing a full account of inter-individual variability in implicit or explicit social cognitions. Variation in attitudes is partly associated with group membership, partly with other experiences with and features of the attitude object (Eagly & Chaiken, 1998), and partly with individual difference variables such as, perhaps, the tendency to be a social dominator or system justifier.

## REGIONAL COMPARISONS

The Internet removes geography as a practical constraint for data collection. Cross-national and cross-cultural research stands to benefit substantially from the development of effective web-based research methods. The websites that generated the data for this review were developed for a US audience, but attracted interest internationally. Of the total traffic, 15% came from respondents outside the United States. This section provides a brief summary of regional comparisons across topics. The websites were presented in English, presenting strong selection influences for foreign national participation. As such, this data summary, presented in Table 7, should be considered a preliminary report of regional differences and similarities in implicit and explicit social evaluation. It emphasises regions for which English is the primary language. As such, we will point out some of the intriguing effects without additional theoretical commentary.

Perhaps the most notable finding is the consistency of implicit and explicit intergroup attitudes and stereotypes across regions. On aggregate, visitors from Asia, Australia, Canada, Europe, and the UK showed implicit and explicit effects similar to the large US sample. Some notable distinctions between regions include: (a) the US, and especially Asia and “other,” showed stronger implicit and explicit preferences for straight over gay than did Australia, Canada, Europe, and the UK; (b) of all regions, Asia showed the strongest implicit and explicit preferences for White over Black

(and light-skin over dark-skin); (c) Australians and Europeans did not self-report associating weapons more with Blacks than Whites, although their implicit stereotypes were of comparable magnitude to other regions; (d) in contrast, Australians and Europeans did not implicitly associate White Americans more strongly than Native Americans with America despite the fact that all other regions did; (e) all regions, except for Asia, were more negative towards George W. Bush relative to Gore, Kerry, and previous presidents than the US, especially explicitly; and (f) the aggregated implicit and explicit political attitudes across the seven regions were very strongly correlated,  $r = .96$ .<sup>9</sup>

In 2005, Project Implicit launched an internationalisation initiative to create nation-specific websites. As of mid-2007, there were sites representing 22 countries and 16 languages, with more in development. This will enhance the future investigation of cross-cultural and cross-national comparisons extending this preliminary report.

### IMPLICIT – EXPLICIT CORRESPONDENCE IS NOT GREATER AMONG GROUPS THAT REPORT STRONGER SOCIAL PREFERENCES

An earlier section summarised evidence that implicit and explicit effects were positively related. An important component of the construct validation of implicit social cognition is derived from understanding its relationship with explicit social cognition. In order to justify the notion of dual-constructs—such as for implicit and explicit attitude constructs—the measures should evidence convergent validity such that calling both *attitudes* is justified, and discriminant validity such that a distinction between *implicit* and *explicit* is necessary (Greenwald & Nosek, in press; Nosek, 2007; Nosek & Smyth, 2007). If they measure the same thing, then there is no reason to make a distinction between implicit and explicit constructs. If they measure and predict completely unrelated things, then it may be difficult to justify a common root construct. To the extent that they are related, identifying the factors that account for that relationship is warranted (Nosek, 2005). The present datasets are consistent with existing laboratory and web research in finding evidence for a moderate positive relationship between implicit and explicit social cognitions, and that the strength of this relationship varies across topics.

Some dual-process models conceive of implicit and explicit measures as assessing a single attitude construct (e.g., Fazio & Olson, 2003). This

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<sup>9</sup>Across the aggregated social group attitude topics, the IAT and self-report were also strongly correlated,  $r = .72$ , and across the aggregated social group stereotypes, the IAT and self-report correlation was  $r = .50$ .

perspective predicts that implicit–explicit correspondence will be stronger to the extent that social preferences are expressed freely. For example, we observed that men and conservatives reported stronger social preferences and stereotypes than women and liberals, respectively, suggesting that they are less motivated to override their automatic social responses. In comparison, dual-process models that postulate dual representations would not necessarily anticipate a difference in correspondence, except to the extent that they predict self-presentational effects as a moderating factor of implicit–explicit relations (e.g., Strack & Deutsch, 2004; Wilson, Lindsey, & Schooler, 2000).

Finding that conservatives are willing to report stronger preferences for higher-status groups than liberals do might indicate that conservatives would also show greater consistency between implicit and explicit reactions. However, implicit–explicit correspondence showed no consistent variation across the political spectrum. Averaging the implicit–explicit correlations across topics for the six levels of reported political orientation from strongly liberal to strongly conservative, there were no differences in implicit–explicit correlations for social attitudes (.27, .26, .25, .24, .24, .24) or for social stereotypes (.15, .16, .16, .14, .16, .17; see web supplements for more details). Conservatives' greater willingness to report social biases does not increase correspondence between their self-report and IAT effects relative to liberals.

Likewise, if implicit and explicit measures assess a single attitude construct, the fact that men consistently reported stronger social preferences than did women suggests that they might also show stronger implicit–explicit correspondence. Research on implicit self-esteem, however, finds that women show stronger correspondence between implicit and explicit self-esteem measures (Pelham et al., 2005). This has been interpreted as evidence that “relative to men, women are more strongly socialized to trust their feelings and intuitions” (p. 84), leading to a greater reliance on affective-based automatic cognitions among women than among men. If this is the operative mechanism, then it should generalise beyond the self-esteem construct. However, implicit–explicit correspondence was nearly identical between the sexes, for social group attitudes (men  $r = .27$ , women  $r = .26$ ), social group stereotypes (men  $r = .18$ , women  $r = .18$ ), and political attitudes (men  $r = .65$ , women  $r = .68$ ). Either neither process is operating, or both are and averaging to a null result. Finally, no systematic differences in implicit–explicit correspondence were observed between racial or age groups, although there were small differences within some specific domains.

In summary, despite substantial variation in reports of attitudes and stereotypes, the strength of implicit–explicit correlations appears to be driven by influences independent of gender, race/ethnicity, age, and political

orientation. The greater willingness to report social preferences among some groups compared to others does not translate into stronger correspondence between implicit and explicit measures inter-individually.

## SUMMARY

This review of more than 2.5 million completed IATs and associated self-report measures for 17 topics yielded the following results:

- Implicit and explicit comparative preferences and stereotypes were widespread across gender, ethnicity, age, political orientation, and region.
- Implicit and explicit attitudes and stereotypes varied substantially across individuals.
- Implicit and explicit attitudes and stereotypes were generally positively related, but the strength of this relation was itself quite variable across topics.
- Men showed stronger implicit and explicit social group preferences for higher-status groups than did women.
- Whites and Asians showed stronger social group preferences and stereotypes than did other racial groups and ethnicities, but this varied by topic.
- Adults over 60 showed the strongest social preferences and stereotypes implicitly and explicitly.
- Conservatives consistently showed stronger implicit and explicit social preferences and stereotypes for higher-status groups than did liberals, and this difference was most pronounced explicitly.

These results would be further strengthened by investigations that employed sampling methods which better approximated representative or random sampling of US or world populations, and by increased variability in the topics, measurement methods, and research designs used to investigate implicit and explicit social cognition.

## Theoretical implications

This review of very large web datasets of implicit and explicit measures of attitudes and stereotypes did not evaluate a particular theory. Nonetheless, the data have implications for theory, especially for the psychological factors predicting social preferences and stereotypes and for development of the nomological net—a network of relations among theoretical conceptions and empirical measurements (Cronbach & Meehl, 1955)—for implicit social cognition constructs.



*Social preferences and stereotypes.* Social identity, social dominance, and system justification theories emphasise the importance of group membership and group status as predictors of attitudes towards groups. This review provided support for these expectations in implicit and explicit measurement across a variety of topics. Both implicitly and explicitly, respondents preferred, for example, White, young, abled, straight, and thin people over their complementary categories. When variation was observed between demographic or ideological groups, it tended to correspond with theoretical expectations such as men showing stronger preferences for higher-status groups on average than women did, perhaps because of stronger social dominance or system-justifying tendencies (Jost & Kay, 2005; Sidanius & Pratto, 1999), and conservatives showing stronger preferences for higher-status groups on average than liberals did (Altemeyer, 1998; Jost et al., 2003).

Respondents showed more liking for their own group both implicitly and explicitly for racial, religion, and sexuality topics. However, there were some notable exceptions. Old people (Lindner et al., 2006), overweight people (Smith et al., 2007), and people with disabilities showed outgroup preferences for young, thin, and abled people respectively, with the outgroup preference being especially apparent on IAT measures. White respondents consistently showed implicit and explicit preferences for Whites compared to Blacks. However, Black respondents, although reporting strong average explicit ingroup preferences, showed little to no average implicit preference for their own group. For members of lower-status groups to show ingroup preference would require their overcoming the cultural representation of the group as lower status, requiring a rejection of system-justifying tendencies (Jost, Nosek, & Gosling, in press; Nosek, Jost, & Banaji, in press). This rejection may be much easier to achieve explicitly than implicitly (Jost et al., 2004).

*Implicit social cognition.* Theoretical and methodological innovation has spurred interest in implicit social cognition (Greenwald & Banaji, 1995; Wilson et al., 2000). The present review focused on the Implicit Association Test and adds to the rapidly accumulating understanding of the IAT and the construct validation of implicit attitudes and stereotypes.

Across topics, respondents tended to show stronger implicit preferences for higher-status groups than they self-reported. This could indicate that unpopular ideas are easily masked in self-report, but less easily on an implicit measure. The evidence suggests that self-presentation does play a role in the distinction between implicit and explicit responses, but it does not provide a complete account (Nosek, 2005, 2007). People can reject their implicit associations because they honestly disagree with them or because they are not even aware of possessing them (Greenwald & Banaji, 1995).

As such, it is not meaningful to ask, “Which assesses mental truth?” Both implicit and explicit responses have a claim to validity in that they predict perception, judgement, and action (Poehlman et al., 2007). Further, theoretical accounts suggest that implicit and explicit measures reflect distinct psychological processes. For example, Gawronski and Bodenhausen (2006) suggest that implicit and explicit measurement differences correspond to associative versus propositional processes (see also Strack & Deutsch, 2004). This is perhaps best reflected in the Native stereotype task in which respondents showed stronger associations of America with White Americans compared to Native Americans on the IAT. Explicitly, however, respondents reasoned that Native Americans should be considered more American, presumably because of historical precedence, and reported the opposite judgement.

This review also reinforced recent evidence that the IAT and self-report assess related but distinct psychological constructs (Nosek & Smyth, 2007). Implicit–explicit correlations varied from weakly to strongly positive across topics, with the strongest relations occurring for political attitudes. Nosek (2005) also observed strongest implicit–explicit correspondence for political topics, and found evidence for multiple personal moderators of implicit–explicit relations. A next step for this area of research will be to determine whether and how implicit–explicit correspondence is related to the predictive validity of implicit or explicit reactions or both. For example, when implicit and explicit reactions are correlated, Poehlman and colleagues (2007) found some evidence that both are more predictive of behaviour than when they are discordant.

Further, the observation of implicit–explicit relations suggests that strong claims that the IAT measures just shared cultural knowledge are untenable (Arkes & Tetlock, 2004; Karpinski & Hilton, 2001). However, it could be that the portion of variance in the IAT that is not shared with explicit attitudes is attributable to cultural knowledge. If so, it is not clear whether that cultural knowledge is (a) extrapersonal, in the sense that it is attitude irrelevant and not predictive of individual perception, judgement, or action, or (b) personal, and part of what distinguishes implicit from explicit attitudes (Banaji, 2001; Nosek & Hansen, in press; Uhlmann et al., 2007). Nosek and Hansen (in press) conducted a sizeable investigation of explicit attitudes and cultural knowledge related to IAT performance. Cultural knowledge was represented by a variety of items that measured cultural perceptions, estimates of the average person’s attitudes, and present or historical portrayals of the concepts. Across almost 100 topics and with more than 100,000 participants, the IAT was consistently and variably related to explicit attitudes, albeit showed little unique relationship with cultural knowledge. In short, the present evidence suggests that the IAT is *personal* in that it reveals something about the individual’s mind with

potential to shape behaviour, but not *endorsed* in that individuals could honestly disagree with their implicit reactions and even actively resist their influence (Banaji, Nosek, & Greenwald, 2004).

## CONCLUSION

Scientific understanding of implicit measures, and the IAT in particular, has developed at a rapid rate. In just 9 years since publication of the initial description of the IAT, hundreds of studies have been conducted identifying the psychometric properties and validity of the tool, new variants of implicit measures have been introduced that will enhance implicit assessment and measurement flexibility, and theoretical models are improving to account for the distinction between implicit and explicit social cognition. This article summarised large datasets gathered through a website at which the public can view, participate, and respond to psychological science as it occurs. Such efforts at education and dissemination serve the simultaneous purpose of making the public aware of modern research in psychology, and providing social and behavioural researchers with their most precious resource for improving our understanding of the mind—human participants.

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APPENDIX A

Description of self-report items for 17 topics that appeared at the websites

<i>Topic</i>	<i>Target concepts</i>	<i>Response options</i>
<i>Social group attitudes</i>		
Age	Young people – Old people	<i>Which statement best describes you?</i> – 2 = I strongly prefer young people to old people, – 1 = I moderately prefer young people to old people, 0 = I like young people and old people equally, 1 = I moderately prefer old people to young people, 2 = I strongly prefer old people to young people
Race	African Americans – European Americans	<i>Which statement best describes you?</i> – 2 (I strongly prefer European Americans to African Americans) to 2 (I strongly prefer African Americans to European Americans)* <i>*Other labels for this and subsequent tasks are the same as those presented in the age task (above), unless indicated otherwise.</i>
Skin-tone	Dark-skin – Light-skin	<i>Who do you prefer?</i> – 2 (I strongly prefer light skinned people to dark skinned people) to 2 (I strongly prefer dark skinned people to light skinned people)
Child-race	Black Children – White Children	<i>Who do you prefer?</i> – 2 (I strongly prefer White children to Black children) to 2 (I strongly prefer Black children to White children)
Arab-Muslim	Other people – Arab Muslims	<i>Which statement best describes you?</i> – 2 (I strongly prefer other people to Arab Muslims) to 2 (I strongly prefer Arab Muslims to other people)
Judaism	Other religions – Judaism	<i>Which statement best describes you?</i> – 2 (I strongly prefer other religions to Judaism) to 2 (I strongly prefer Judaism to other religions)
Disability	Abled people – Disabled people	<i>Which statement best describes you?</i> – 2 (I strongly prefer abled people to disabled people) to 2 (I strongly prefer Disabled people to abled people)
Sexuality	Straight people – Gay people	<i>Which statement best describes you?</i> – 2 (I strongly prefer straight people to Gay people) to 2 (I strongly prefer Gay people to straight people)
Weight	Thin people – Fat people	<i>Which statement best describes you?</i> – 2 (I strongly prefer thin people to Fat people) to 2 (I strongly prefer Fat people to thin people)

(continued)

APPENDIX A  
(Continued)

<i>Topic</i>	<i>Target concepts</i>	<i>Response options</i>
<i>Social group stereotypes</i>		
Race-weapons	Black people – White people	<i>How much do you associate the following objects with Black Americans and White Americans? (Participants respond separately to weapons and harmless objects)</i> Strongly with Black people, Moderately with Black people, Somewhat with Black people, Neither Black nor White, Somewhat with White people, Moderately with White People, Strongly with White People
American-Native	European American – Native American	<i>Which statement best describes your belief?</i> –4 = I strongly consider Americans of European descent to be more American than American Indians, –3 = I moderately consider Americans of European descent to be more American than American Indians, –2 = I somewhat consider Americans of European descent to be more American than American Indians, –1 = I slightly consider Americans of European descent to be more American than American Indians, 0 = Both are equally American, 1 = I slightly consider American Indians to be more American than Americans of European descent, 2 = I somewhat consider American Indians to be more American than Americans of European descent, 3 = I moderately consider American Indians to be more American than Americans of European descent, 4 = I strongly consider American Indians to be more American than Americans of European descent
American-Asian	European American – Asian American	<i>Which Statement best describes your belief?</i> –4 (I strongly consider Americans of European descent to be more American than Americans of Asian descent to 4 (I strongly consider Americans of Asian descent to be more American than Americans of European descent))* *Labels follow format for American-Native Task (above)

(continued)

APPENDIX A  
(Continued)

<i>Topic</i>	<i>Target concepts</i>	<i>Response options</i>
Gender – Science	Male – Female	<i>Which statement best describes you?</i> – 2 (I strongly associate liberal arts with females and science with males to 2 (I strongly associate liberal arts with males and science with females)
Gender – Career	Male – Female	<i>How strongly do you associate career and family with males and females?</i> (Participants respond separately to career and family) 1 = Strongly female, 2 = Moderately female, 3 = Slightly female, 4 = Neither female nor male, 5 = Slightly male, 6 = Moderately male, 7 = Strongly Male
<i>Political attitudes</i>		
Presidential	Bush – Other presidents <sup>1</sup>	<i>Which statement best describes you?</i> – 2 (I strongly prefer George Bush to Other presidents to 2 (I strongly prefer Other presidents to George Bush)
Election 2004	George Bush – John Kerry	<i>Which statement best describes you?</i> – 2 (I strongly prefer George Bush to John Kerry) to 2 (I strongly prefer John Kerry to George Bush)
Election 2000	George Bush – Al Gore <sup>2</sup>	<i>Which statement best describes you?</i> – 2 (I strongly prefer George Bush to Al Gore) to 2 (I strongly prefer Al Gore to George Bush)

<sup>1</sup>The comparison president to Bush was randomly varied between-subjects (Clinton, Reagan, Nixon, Kennedy, FDR, Lincoln, Jefferson, or a collection of recent presidents).

<sup>2</sup>For both the Election 2000 and Election 2004 tasks, vice presidential and other candidates were also included and participants could choose any contrast. The sample *N* counts all contrasts, but the reported data include only the primary presidential candidate contrast.

## APPENDIX B

## IAT stimulus items for 17 topics that appeared at the websites

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<i>Social group attitudes</i>		
Age	Young people – Old people	12 black and white pictures of young and old faces (half male, half female), cropped at the chin and forehead
Race	African Americans – European Americans	12 black and white pictures of African American and European American faces (half male, half female), cropped at the chin and forehead
Skin-tone	Dark-skin – Light-skin	12 cartoon dark skin and light skin faces (half male, half female)
Child-race	Black Children – White Children	16 black and white morphed photographs of Black Children and White Children (half male, half female), cropped and edited so that only the face is displayed
Arab-Muslim	Other people – Arab Muslims	10 Arab Muslim names (Hakim, Sharif, Yousef, Wahib, Akbar, Muhsin, Salim, Karim, Habib, Ashraf) and 10 names of other people (Ernesto, Matthais, Maarten, Philippe, Guillame, Benoit, Takuya, Kazuki, Chaiyo, Marcelo)
Judaism	Other religions – Judaism	10 colour symbols representing Judaism and other religions
Disability	Abled people – Disabled people	Eight colour symbols representing abled and disabled people
Sexuality	Straight people – Gay people	Four black and white symbols and four words (Straight, Heterosexual, Gay, Homosexual) representing Gay People and Straight People
Weight	Thin people – Fat people	Two sets of black and white pictures, each consisting of five identical faces, morphed to represent fat people or thin people
<i>Social group stereotypes</i>		
Race-weapons	Black people – White people	12 black and white pictures of African American and European American faces (half male, half female), cropped at the chin and forehead, and 14 black and white images representing weapons and harmless objects
American-Native	White American – Native American	16 black and white pictures of White Americans and Native Americans, cropped at the torso, and 10 images and 10 words (Ohio, Miami, Seattle, Utah, Missouri, Warsaw, Oslo, France, Moscow, Italy) representing American and foreign landmarks

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APPENDIX B  
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American-Asian	European American – Asian American	12 black and white cartoon drawings of Asian American and European American faces, and twelve images representing foreign and American landmarks
Gender-Science	Male – Female	Eight words representing Female (Mother, Wife, Aunt, Woman, Girl, Female, Grandma, Daughter), eight words representing Male (Man, Son, Father, Boy, Uncle, Grandpa, Husband, Male), eight words representing Science (Astronomy, Biochemistry, Chemistry, Physics, Biology, Neuroscience, Engineering), and eight words representing Liberal Arts (History, Arts, Humanities, English, Philosophy, Music, Latin)
Gender-Career	Male – Female	Five female names (Rebecca, Michelle, Emily, Julia, Anna), five male names (Ben, Paul, Daniel, John, Jeffrey), seven words representing Career (Career, Corporation, Salary, Office, Professional, Management, Business), and seven words representing Family (Wedding, Marriage, Parents, Relatives, Family, Home, Children)
<i>Political attitudes</i>		
Presidential	Bush – Other presidents	Each IAT contained six colour and black and white photographs of George W. Bush and six colour and black and white photographs of the comparison President
Election 2004	George Bush – John Kerry	12 colour photographs of George W. Bush and John Kerry
Election 2000	George Bush – Al Gore	12 colour photographs of George W. Bush and Al Gore

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