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Personalizing Evaluative Priming?

Supplement 2 to Nosek and Hansen (2008a, 2008b)

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Abstract

Two studies reported in Nosek and Hansen (2008a) and Nosek and Hansen (2008b) included 'original' and 'personalized' evaluative priming procedures. This provided an opportunity to test whether attitude and cultural knowledge effects on implicit measures occurred in a measure other than the Implicit Association Test (IAT). This supplement summarizes the evaluative priming results for these two studies. Results suggest that personalizing priming measures altered attitude assessment such that personalized priming predicted racial attitude variation above and beyond that accounted for by original priming procedures, but did not do so for political attitudes. Also, while original priming showed an inconsistent relationship with racial cultural knowledge, personalized priming was not related and significantly reduced the relationship in one instance.

This supplement assumes that the reader is familiar with at least one of Nosek and Hansen (2008a) or Nosek and Hansen (2008b). We recommend reviewing those articles to extract as much useful information from this report as possible.

Nosek and Hansen (2008a, 2008b, Supplement 1) found that the original and personalized IAT designs were not related to individual differences in cultural knowledge after accounting for their shared relationship with explicit attitudes. The investigations to date have only considered the IAT among the variety of implicit measures as potentially being related to cultural knowledge, and no studies have examined the effect of analogous personalizing changes on other implicit measures. An obvious candidate for testing similar changes is evaluative priming (Blair & Banaji, 1996; Fazio, Sanbonmatsu, Powell, & Kardes, 1986; Fazio et al., 1995; Wittenbrink, Judd, & Park, 2001), a method that shares some procedural features with the original IAT. Most notably target evaluative stimuli are judged as 'Good' or 'Bad' rather than the personalizing approach of making "I like" or "I don't like" evaluative judgments. The studies reported below included a standard evaluative priming measure and a personalized evaluative priming measure. One important difference in the procedural changes between the IAT and priming is that the standard evaluative priming task does not include error feedback. So, the only procedural change with evaluative priming made the category labels "I Like" and "I Don't Like" versus "Good" and "Bad" in the two versions of the task.

Following the approach in the original articles, we investigated (a) the relationship between self-reported attitudes and evaluative priming, (b) whether the priming measures related to perceived cultural knowledge, (c) whether original and personalized priming each tapped unique attitude-relevant variation, and (d) whether all four implicit measures (original IAT, modified IAT, original priming, personalized priming) contained unique attitude-relevant variation when considered simultaneously. Key tests were conducted with correlation comparisons and multiple regression.

Study 1: Nosek and Hansen (2008a); Study 6: Nosek and Hansen (2008b) – Racial Attitudes

Method

This study measured racial attitudes with self-report, original and personalized IATs, and original and personalized evaluative priming procedures. The Racial Arguments Scale (Saucier & Miller, 2003) and cultural knowledge measures were also administered. Except for the priming procedures, the methods and results are reported in the original articles, especially Nosek and Hansen (2008a) for everything but the

personalized IAT, and Nosek and Hansen (2008b) for the personalized IAT.

Measures

Evaluative Priming. Two measures of evaluative priming – an original and a personalized version – were included. Personalizing the evaluative priming procedure involved a single alteration to the procedure described below. Instead of categorizing the target words as 'Good' or 'Bad', participants categorized the items as "I like" or "I don't like". No error feedback was provided for either version of the evaluative priming task. Reminder labels 'Good' and 'Bad' (or "I like" and "I don't like") appeared at the top left and right parts of the screen and remained there throughout the task.

Participants completed two blocks of trials. The first was a practice block of 20 trials (one presentation of each of the 10 good and 10 bad stimulus items) to familiarize participants with the task and to provide baseline data for the subsequent critical block of trials. A practice trial consisted of an orienting stimulus '+' that remained on the screen for 1000 milliseconds, immediately followed by a row of asterisks '********' that remained on the screen for 315 milliseconds. Then that part of the screen was blank for 135 milliseconds, followed by a good or bad stimulus item that remained on the screen until the participant categorized it as Good [I like] or Bad [I don't like] with two response keys, or after 2000 milliseconds elapsed whichever came first. 1500 milliseconds separated the end of one trial and the start of the next. The second block consisted of 160 trials separated by a brief rest halfway through. For the second block, the asterisks were replaced by morphed Black and White faces (8 stimulus items total), which thus served as primes for the judgments of the evaluative items. Each of the 8 Black/White faces served as a prime for each of the 20 evaluative targets once. The order of prime-target pairings was randomized. Internal consistency was negligible with personalized priming showing a split-half correlation of $\underline{r}$ = .03, $\underline{p}$ = .73, and original priming showing a split-half correlation of $\underline{r}$ = -.02, $\underline{p}$ = .73.

Analysis

Data analysis of evaluative priming followed procedures established by Fazio and colleagues (Fazio et al., 1995). Error responses were removed before proceeding with analysis (1144 of 29,880 trials; 3.8%). Response latencies under 300 milliseconds were recoded to be 300 milliseconds (38 of 28,736 trials, .13%). All latencies were log-transformed. The response to each evaluative item in the critical block was subtracted from the response to that evaluative item in the practice block (with no prime) to create a facilitation score. Mean facilitation scores across trials were calculated for four conditions – White prime, Good target; White prime, Bad target; Black prime, Good target; Black prime, Bad target. Evaluative priming scores were calculated for White [and similarly for Black] by subtracting the White prime/Bad target trials from the White prime/Good target trials. Relative preference for White compared to Black was calculated by taking the difference between the White effect and the Black effect. The evaluative priming score was coded such that positive values indicated liking for Whites relative to Blacks.

Results and Discussion

The relationship between self-reported attitudes and evaluative priming. We examined the correlation between self-reported attitudes and the two priming measures. Correlations for the IATs are also presented for comparison purposes. The IAT data were presented previously in structural equation models in Nosek and Hansen (2008a) and Supplement 1. Structural models were not used in this report because models that included evaluative priming measures regularly failed to converge perhaps because of the near zero internal consistency.

Table 1. Product-moment correlations between implicit measures and self-reported racial attitudes and cultural knowledge. All measures coded such that positive values indicate favorability toward Whites relative to Blacks.

Measure	original IAT	personalized IAT	Z-bar	p	original priming	personalized priming	Z-bar	p
Self-reported attitudes								
Favorability	.29*	.33*	.46	.65	.18*	.23*	.47	.64
Liking	.30*	.22*	-.90	.37	.17*	.24*	.66	.51
Composite	.32*	.30*	-.23	.82	.19*	.25*	.57	.57
Unobtrusive attitude measure								
Racial Arguments Scale	.03	.14	1.19	.23	.04	.02	-.18	.86
Cultural Knowledge								
Historical	-.11	-.04	-.73	.47	.01	.01	.00	1.00
Favorability	.01	.04	-.31	.76	.24*	-.01	2.22	.03
Portrayals	.12	-.04	1.65	.10	.12	.00	1.05	.29
Composite	-.01	-.03	.21	.84	.15	.00	1.32	.19

Note: N = 142, except for cultural knowledge items N = 131; * p < .05.

The top right quadrant of Table 1 presents the correlational data for racial attitudes with evaluative priming. In all cases, self-reported attitudes were positively related to evaluative priming. Directionally, personalized priming elicited stronger correspondence with self-reported attitudes, but the differences were very small and non-significant ($\underline{p}$'s = .51, .57, .64).

The relationship between cultural knowledge and modified and original evaluative priming. This study measured perceived cultural associations about evaluations of Black Americans compared to White Americans. Of the four cultural association items, one (favorability) showed a significant positive relationship with priming effects (Table 1). Variation in the extent to which participants reported observing that American society portrays Blacks more negatively than Whites was correlated with greater negative evaluations of Black relative to White people on the original priming task. None of the other three cultural association correlations with original priming reached significance (r's = .15, .12, .01; p's = .09, .16, .95). Personalized priming showed a significantly weaker relationship with the cultural favorability item than did original priming (Z-bar = 2.22, p = .03). However, none of the other three cultural association items showed significantly weaker relationships with personalized priming compared to original priming (Z-bar's = 1.32, 1.05, .00; p's = .19, .29, 1.00).

In sum, one of four cultural knowledge items correlated with original priming and showed a weaker relationship with personalized priming. The most interesting feature of this finding is that these effects with evaluative priming is the pattern predicted by Olson and Fazio (2004) with regard to the IAT, but did not occur (Nosek & Hansen, 2008a, 2008b). Its occurrence, however, should not be overinterpreted. It occurred just once. Replication is essential.

Table 2. Hierarchical linear regressions predicting self-reported racial attitudes with implicit measures.

	Step 1				Step 2						
	personalized priming				personalized priming			original priming			
Explicit Measure	B	SD B	Beta	R-sq	B	SD B	Beta	B	SD B	Beta	R-sq
Favorability	1.93	.71	.23*	5%	1.73	.71	.20*	1.26	.71	.15+	7%
Liking	2.09	.70	.24*	6%	1.91	.71	.22*	1.19	.71	.14	8%
Composite	2.01	.65	.25*	6%	1.82	.65	.23*	1.22	.65	.15+	9%

Note: N = 142; * p < .05, + p < .08

Unique contributions of personalized and original evaluative priming in predicting self-reported attitudes. Following the approach described in Nosek and Hansen (2008b), we examined whether original priming carried unique attitude-relevant variance beyond the personalized priming task for racial attitudes. We conducted a series of hierarchical linear regressions predicting self-reported attitudes in which the first step introduced personalized priming and the second step introduced original priming. The three hierarchical regressions in Table 2 show that personalized priming significantly predicted self-reported attitudes, and original priming was a marginally significant predictor when entered in the second step of the model (β's = .15, .15, .14; p's = .06, .08, .10). Consistent with the observations with the IAT, both versions of evaluative priming appeared to contain unique attitude-relevant variance, and personalized priming somewhat more so.

Evaluative priming and IAT simultaneously predicting self-reported attitudes. It is unlikely that the mind's complex associative network of evaluative associations could be sufficiently characterized by a single numerical index with a single measure. For racial attitudes, correlations among the four implicit measures averaged r = .27 and ranged from r = .16 to r = .40 (all p's < .07). While the IAT and evaluative priming are both are 'implicit' by name, they may capture unique aspects of the attitude construct (Bosson, Swann, & Pennebaker, 2000). We tested this question by submitting all four implicit measures – personalized IAT, original IAT, personalized priming, original priming – as simultaneous predictors into three regressions predicting self-reported racial attitudes. If each of these tasks captures unique aspects of the attitude construct, then each may show some unique predictive utility even after controlling for variance shared with the other implicit measures. The simultaneous regressions are summarized in Table 3 with the presentation of β weights for each implicit measure predictor and an R^2 value for the overall model. Significant predictors are denoted with an asterisk. In each model except for one (Racial attitudes – favorability) more than one implicit measure showed significant predictive utility.

Table 3. Beta weights for simultaneous linear regressions predicting self-reported attitudes and behavioral intentions with four implicit measures.

Explicit Measure	original IAT	personalized IAT	original priming	personalized priming	R-sq
Study 1 - Racial Attitudes					
Favorability	.15	.23*	.04	.13	16%
Liking	.21*	.08	.07	.17*	13%
Composite	.19*	.17	.06	.16*	16%
Study 2 - Political Attitudes					
Semantic Differential	.11	.40*	.32*	.08	53%
Direct Comparison	.21*	.39*	.30*	.06	58%
Liking	.28*	.38*	.22*	.00	50%
Feeling Thermometer	.21*	.38*	.30*	.04	54%
Election (Vote Today)	.20*	.43*	.23*	-.04	47%
Composite Preference	.21*	.42*	.29*	.03	58%
Party Affiliation	.27*	.34*	.05	.08	34%

Note: Study 1 N = 142, Study 2 N = 82, except for party affiliation N = 81; * p < .05

In summary, personalizing had similar effects on evaluative priming as it had on the IAT. We did not test here whether personalizing similarly encouraged explicit evaluation of primes as it does for target

concepts in the IAT (Nosek & Hansen, 2008b). We did, however, see some evidence that both versions of priming predicting unique attitude variation, and that both the IAT and priming predict explicit racial attitudes when considered simultaneously. Finally, and most intriguingly, the original evaluative priming procedure was significantly related to one cultural knowledge measure, and the personalized evaluative priming procedure was not.

"Study 2"; Study 5: Nosek and Hansen (2008b) – Political Attitudes

Method

This Study measuring attitudes toward George Bush compared to Al Gore was not reported in Nosek and Hansen (2008a). It included original and personalized IATs, original and personalized evaluative priming, and self-reported attitude measures administered within-subjects. It did not include cultural knowledge measures. The study was described very briefly in Nosek and Hansen (2008b) and Supplement 1, so a relatively complete method section appears here.

Participants

Ninety-six University of Virginia undergraduates (ages 17-22) participated in the study for partial course credit. Prior to analysis, three participants were removed because one did not complete all of the measures and two were not fluent English speakers. Initial analysis removed two participants for high error rates (>20%) in the standard evaluative priming task, and nine participants who did not follow task instructions in performance of the modified IAT. Of the remaining 82 participants, 58 were female and 24 were male; 65 were White, 8 were Asian, 5 were Black, 2 were Hispanic, and 2 were a different ethnicity.

Materials

Stimulus items. Ten exemplars representing the evaluative categories directly replicated the normative items used by Olson and Fazio (2004). Four stimulus items (two head shots, last name, first and last name) represented the categories 'George Bush' and 'Al Gore' for all of the implicit measures. The items were the same as ones used for the 2000 Presidential Election task at the Implicit Association Test Web site (https://implicit.harvard.edu/; Nosek, Banaji, & Greenwald, 2002).

Evaluative Priming. The evaluative priming measure followed procedures described in the previous study. The Black and White primes were replaced with the 'Gore' and 'Bush' exemplars described above. Internal consistency was weak with personalized priming showing a split-half correlation of $\underline{r} = .19$, $\underline{p} = .08$, and original priming showing a split-half correlation of $\underline{r} = .18$, $\underline{p} = .10$.

Implicit Association Test. The procedure for the IAT (both original and personalized) replicated the versions used by Olson and Fazio (2004) described in their fourth study. The original and personalized IATs were the same except for two procedural differences. One difference involves changing the evaluative category labels from ones thought to emphasize normative judgments in the original IAT (Good/Bad, Pleasant/Unpleasant) to ones that emphasize idiosyncratic judgments in the modified IAT (I Like/I Dislike). The other change eliminated error feedback for incorrect responses for the personalized IAT with the assumption that such feedback reinforces making normative judgments rather than idiosyncratic evaluations of each evaluative exemplar. All other procedural details were identical and are described below.

Participants completed seven blocks of response trials for each of the two IATs. First, participants sorted evaluative words for 20 trials into categories (Pleasant/Unpleasant for the original IAT; I like/I dislike for the modified IAT) using two response keys on a standard keyboard. Second, using the same response keys participants sorted faces and words associated with Bush and Gore for 20 trials into categories (Bush/Gore). Third, participants sorted items for all four categories (Bush, Gore, Pleasant [I like], Unpleasant [I dislike]) for 20 trials using the two response keys. One key was used to categorize Gore and Pleasant [I like] items; the other key was used to categorize Bush and Unpleasant [I dislike] items. Fourth, the same key mapping was repeated for 40 more trials. Fifth, like the 2nd block, participants sorted Bush and Gore items again for 20 trials except that the response mapping was reversed (i.e., if Gore items were categorized with the left key before, they were now categorized with the right key). Sixth, again participants sorted items from all four categories for 20 trials except that the response mappings for the category exemplars (Bush/Gore) were opposite of the 3rd and 4th blocks. So, in this example, Gore and Unpleasant [I dislike] were sorted with one key and Bush and Pleasant [I like] were sorted with the other. And, seventh, participants repeated the sorting conditions in the 6th block for 40 more trials.

In blocks with four categories, trials alternated between presenting category (Gore, Bush) and attribute

(Pleasant [I like], Unpleasant [I dislike]) items. Also, reminder labels appeared at the top of the screen for all blocks reminding participants of the current sorting task. Further, to emphasize the distinction between the category and attribute dimensions, "Gore/Bush" labels and items appeared in black, and "I like/I dislike" labels and items appeared in green. For the original IAT only, categorization errors were identified with a red 'X' below the stimulus item and participants had to correct the response before continuing to the next trial. An interstimulus delay of 150 milliseconds separated each trial. Finally, the order of the category mapping conditions (Gore with Unpleasant [I dislike] before or after Gore with Pleasant [I like]) was counterbalanced between-subjects.

IAT analysis followed recommendations of Greenwald, Nosek, and Banaji (2003). The IAT scores were coded such that positive values indicated liking for Gore relative to Bush.

Explicit measures. Explicit evaluations of Al Gore and George Bush were measured with five different explicit attitude measures (adapted from Olson and Fazio, 2004). All explicit measures were coded such that positive values indicated a preference for Gore over Bush.

Procedure

Participants completed four implicit measures and a set of explicit measures assessing evaluations of Al Gore and George Bush. Presentation of measures were counterbalanced as follows: half of the participants completed the explicit measures before the implicit measures and the other half completed them in the opposite order; within implicit measures, half of the participants completed the modified tasks before the original tasks and the other half completed them in the opposite order; within task type, half of the participants completed the IAT before priming and the other half completed them the in opposite order; and within IATs, participants performed the category pairings in a between-subjects counterbalanced order.

Analysis

Analysis of evaluative priming data followed the procedures described in the previous study. Error responses were removed before proceeding with analysis (1030 of 26,964 trials; 3.8%) and response latencies under 300 milliseconds were recoded to be 300 milliseconds (109 of 26,964 trials, .40%). The evaluative priming score was coded such that positive values indicated liking for Gore relative to Bush. Evaluative priming results are discussed in the Additional Analyses section.

Results and Discussion

The relationship between self-reported attitudes and evaluative priming. For political attitudes (Table 4), original priming elicited significantly stronger relationships with self-reported attitudes than did personalized priming.

Table 4. Product-moment correlations between implicit measures and self-reported political attitudes, behavioral intentions, and party affiliation.

Explicit Measure	original IAT	personalized IAT	Z-bar	p	original priming	personalized priming	Z-bar	p
Semantic Differential	.44	.64	2.18	.03	.59	.41	-1.87	.06
Direct Comparison	.53	.67	1.64	.10	.60	.41	-1.98	.05
Liking	.54	.62	.91	.36	.50	.33	-1.65	.10
Feeling Thermometer	.50	.65	1.71	.08	.58	.38	-2.03	.04
Election (Vote Today)	.47	.63	1.76	.08	.50	.28	-2.10	.04
Composite Preference	.52	.68	1.89	.06	.59	.38	-2.15	.03
Party Affiliation	.47	.51	.41	.68	.35	.30	-.46	.65

Note: N = 82, except for party affiliation N = 81; all correlations p < .01.

Unique contributions of personalized and original evaluative priming in predicting self-reported attitudes. As before, we conducted a series of hierarchical linear regressions predicting self-reported attitudes in which the first step introduced personalized priming and the second step introduced original priming (Table 5). Personalized priming was a significant predictor of all seven self-report variables in the first step. With the addition of original priming in the second step, personalized priming was in the correct direction but not a significant predictor of any of the seven variables (β's = .06 - .18; p's range = .13 - .61), and original priming significantly and positively predicted all seven. Taken together, results from political and racial attitude measures suggest that original priming may have unique attitude-relevant variance that is not shared with the personalized version of the task.

Table 5. Hierarchical linear regressions predicting self-reported political attitudes, behavioral intentions, and party affiliation with priming measures.

	Step 1				Step 2						
	personalized priming				personalized priming			original priming			
	B	SD B	Beta	R-sq	B	SD B	Beta	B	SD B	Beta	R-sq
Semantic Differential	3.06	.77	.41*	17%	1.18	.77	.16	3.20	.63	.52*	37%
Direct Comparison	3.08	.77	.41*	17%	1.17	.76	.16	3.26	.62	.53*	38%
Liking	2.50	.79	.33*	11%	.87	.83	.12	2.76	.68	.45*	26%
Feeling Thermometer	2.87	.78	.38*	15%	.98	.78	.13	3.22	.64	.52*	35%
Election (Vote Today)	2.13	.81	.28*	8%	.43	.84	.06	2.89	.69	.47*	25%
Composite Preference	2.73	.74	.38*	15%	.93	.73	.13	3.07	.60	.52*	36%
Party Affiliation	1.78	.63	.30*	9%	1.03	.70	.18	1.27	.58	.26*	15%

Note: N = 82, except for party affiliation N = 81; * p < .05

Evaluative priming and IAT predicting self-reported attitudes. Correlations among the four implicit measures averaged $\underline{r}$ = .41 and ranged from $\underline{r}$ = .32 to $\underline{r}$ = .50 (all $\underline{p}$'s < .oo5). We submitted all four implicit measures – personalized IAT, original IAT, personalized priming, original priming – as simultaneous predictors into seven regressions predicting self-reported political attitudes. If each of these tasks captures unique aspects of the attitude construct, then each may show some unique predictive utility even after controlling for variance shared with the other implicit measures.

The simultaneous regressions are summarized in Table 3 with the presentation of $\underline{\beta}$ weights for each implicit measure predictor and an R^2 value for the overall model. In every model, more than one implicit measure showed significant predictive utility.

Conclusion

In two studies, personalizing priming measures altered attitude assessment such that personalized priming predicted racial attitude variation above and beyond that accounted for by original priming procedures, but did not do so for political attitudes. Also, original priming showed an inconsistent relationship with racial cultural knowledge, but personalized priming was not related. Considering both personalized and original version of the IAT and priming revealed evidence that each measured unique attitude-relevant variance in at least 2 of the 10 models (Table 3; original IAT – 8 models; personalized IAT – 8 models; original priming – 6 models; personalized priming 2 models). It is also interesting to note that five of the models had three implicit measures simultaneously explaining unique variance in self-reported attitudes.

Nosek and Hansen (2008b) found evidence that personalizing the IAT inadvertently increased the incidence of task recoding – explicitly evaluating target concepts (e.g., rating Black and White faces as liked or disliked rather than categorizing them by racial category). It is not clear whether personalizing priming has similar deleterious effects. However, the effects could not be identical because of the procedural dissimilarities. The most related confounding influence would be if personalizing encouraged evaluation of the prime stimulus rather than the target. Additional research is needed to determine if such confounding influences are also at the root of the personalized priming variation.

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