Running Head: MINIMAL GROUP PROCEDURES

An Improved (and Deception-Free) Minimal Group Induction Procedure

Brad Pinter

The Pennsylvania State University, Altoona

Anthony G. Greenwald

University of Washington

Word Count: 7,165 words
Keywords: ingroup-outgroup, minimal group paradigm, implicit partisanship, measurement

Address Correspondence to:
Brad Pinter, Ph.D.
Penn State Altoona
Department of Psychology
3000 Ivyside Dr.
Altoona, PA 16601

Voice: (814) 949-5507
Fax: (814) 949-5011
Email: tbp1@psu.edu

Abstract

Two experiments compared alternative minimal group induction procedures involving (a) memorization of novel in-group names or (b) random categorization to (c) the traditional procedure based on ostensibly meaningful but deception-based categorization. Experiment 1 revealed comparable in-group attitude and identification effects across the three procedures on explicit measures, but significantly greater effects for the memorization procedure on implicit measures. Experiment 2 incorporated aspects of procedure (a) into (b) and (c). The modified procedures, while improved, were no more effective than the memorization procedure alone in creating novel in-group attitude and identification. In both experiments, implicit-explicit correlations were largest with the memorization procedure, which suggests greater validity. Conclusion: The memorization procedure can be used as a deception-free alternative to the traditional deception-based minimal group induction procedure. (124 words/854 characters)

An Improved (and Deception-Free) Minimal Group Induction Procedure

Many years ago, a laboratory experiment produced curious findings: subjects who had been arbitrarily categorized into two novel groups subsequently displayed prejudicial attitudes and discriminatory behavior toward out-group members. Those initial findings from the *minimal group paradigm* (MGP; Tajfel, Billig, Bundy, & Flament, 1971; Rabbie & Horwitz, 1969) led to numerous theoretical advances in the study of groups, including social identity theory (Tajfel & Turner, 1986) and self-categorization theory (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987). Reports of MGP effects no longer provoke surprise. What perhaps should be surprising, however, is that more than 30 years since the creation of the MGP very little work has focused on refining the methods used to study intergroup bias and discrimination.

Contemporary researchers use minimal group induction procedures that are remarkably unchanged from the procedure developed in the late 1960s. In its typical administration, subjects complete one of a number of tasks (e.g., estimating the number of dots briefly displayed on a screen or rating a series of paintings) and are subsequently informed that they responded to the initial task like one kind of person (e.g., a dot *over*estimator or the kind of person who prefers Klee paintings) and not another kind of person (e.g., a dot *under*estimator or the kind of person who prefers Kandinski paintings). Despite what subjects are led to believe, of course, the experimenter determines their assignment to the group. Later, subjects evaluate or allocate money to in-group and out-group members, with the typical result being that subjects significantly favor members of the groups to which they have been assigned.

MGP Controversies, Revisions, and a Lingering Concern

Tajfel and Turner (1986) viewed MGP effects as due to attempts to bolster one's social identity. This perspective, central to Social Identity Theory, has remained an important explanation for MGP effects (Hewstone, Rubin, & Willis, 2002). Alternative

perspectives have emphasized explanations for why subjects discriminate that have little to do with image-bolstering, including expectations of reciprocity (e.g., Gaertner & Insko, 2000; Rabbie, Schot, & Visser, 1989) and the influence of norms (Hertel & Kerr, 2001). Researchers have also questioned the interpretation of intergroup *bias* effects shown in MGP studies, proposing alternative explanations that reflect cognitive consistency (Gramzow & Gaertner, 2005; Greenwald et al., 2002) rather than the motivational account of Social Identity Theory. These perspectives offer alternative explanations for MGP effects, but do not suggest alternative methods to produce those effects.

One aspect of the MGP that has received challenge is the traditional assessment of intergroup discrimination, the Tajfel matrices. For this assessment, subjects must choose how to distribute money to in-group and out-group members from a set of allocation strategies. The choices vary in the absolute amount given to each group as well as the relative advantage given to one group over the other. The Tajfel matrices have been criticized for confounding the various allocation strategies (Brewer, 1979) and for providing limited or ambiguous response options (Bornstein et al., 1983a; 1983b). Bornstein and colleagues developed the Multiple Alternative Matrices (MAMs) to address these shortcomings. The MAMs provide a set of clear, unconfounded response options, including separate options that favor the in-group over the out-group ("max rel") and maximize the absolute value for the in-group ("max own"). Bornstein et al. (1983a) did not find consistent evidence of in-group favoring allocations using the MAMs and so concluded that the typical MGP discrimination findings were produced by one or more artifacts in the Tajfel matrices. Gaertner & Insko (2001) subsequently showed that the MAMs do reliably measure intergroup discrimination provided that the allocation task does not invoke normative prohibitions against discrimination, as when the allocation task is framed as providing "payment," rather than a "bonus."

One methodological concern that has not yet been formally addressed is the MGP's use of deception. Historically, across domains within social psychology, the use of deception appears regrettably common (Adair, Dushenko, & Lindsay, 1985). It is encouraging, however, that recent surveys of the literature suggest that the field's use of deception is waning, particularly in the last few decades (Kimmel, 2001). In contrast to this trend, groups researchers continue to use the traditional MGP procedure for which subjects are misled regarding the true basis for their assignment to groups. This practice is all the more disconcerting considering that it is not intuitively obvious or, more importantly, empirically substantiated that use of deception is necessary to produce MGP effects. The present research directly examines this question in comparing traditional and novel, deception-free MGP procedures.

Alternative Minimal Group Procedures

A traditional alternative to the MGP deception-based procedure is a random categorization procedure, for which subjects are instructed that their assignment to groups is determined randomly. Does it make a difference which procedure is used? Although many studies have used the random categorization procedure, very few have directly compared both procedures. For example, Brewer and Silver (1978) had subjects complete the standard painting preference task and, in a *similar* condition, led subjects to believe that they had been assigned a group based on their similarities with others, whereas in an *arbitrary* condition, told subjects that their scores "were too similar to provide a basis for grouping, so they would have to be split into two groups randomly" (pp. 395-396). Note that deception was used in both conditions, but was arguably less central in the *arbitrary* condition. Brewer and Silver found that discriminatory allocations were similar in both conditions (see also Allen & Wilder, 1975). In contrast, Gaertner and Insko (2000) found that discrimination was reduced using a random procedure compared to a deception procedure. This result suggests that random

categorization may be less effective in instilling in subjects a meaningful self-group representation, which is characteristic of MGP effects.

Research on the *implicit partisanship* effect (IP; Greenwald, Pickrell, & Farnham, 2002; Pinter & Greenwald, 2004) suggests a new alternative MGP method. Greenwald et al. had subjects study the names of four members of a novel group for 45 seconds. Their subjects subsequently completed assessments of implicit attitude and identification toward the studied group relative to an unstudied group using the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998). They found that subjects (implicitly) significantly preferred and identified more with the studied group. Pinter and Greenwald (2004) conducted a series of studies to improve understanding of the IP effect. They found evidence for strong implicit preference of the studied group regardless of the type of relationship shared by the groups (i.e., competitive or cooperative) or the type of group itself (i.e., human or non-human). Further, Pinter and Greenwald discovered a condition in which the IP effect was limited: When subjects studied names of a novel group linked to a rival university, the effect of name-study was reduced.

Might the procedure used to produce IP effects be used more generally as a MGP procedure? The IP and MGP procedures differ in a number of aspects. For one, MGP effects result from explicit categorization, whereas the IP effect presumably is a product of implicit categorization. For another, in contrast to the work on IP, MGP effects have been demonstrated with self-report measures, although increasingly researchers are using implicit measures in this domain as well (e.g., Ashburn-Nardo, Voils, and Monteith, 2001). Despite these differences, the important similarity between the MGP and IP effects is that they both demonstrate minimal group effects. This link suggests that a deception-free variant of the IP procedure might be adapted to study explicit categorization.

In the two experiments described here, we tested the traditional MGP induction procedure against a series of modified procedures, including ones that incorporated IP's name memorization procedure and ones based on random categorization, with the goal of developing an effective and deception-free procedure for producing minimal group effects.

Experiment 1

Experiment 1 compared a standard MGP induction procedure—one that ostensibly categorizes subjects into groups on a meaningful basis (*deception condition*)—with alternative procedures for which subjects are categorized on a random basis (*random condition*) or for which subjects briefly study the names of members of one group (*memorization condition*).

Method

Subjects

Ninety-one (33 men, 57 women, 1 not sex-identified) undergraduate students at the University of Washington participated for partial credit towards their introductory psychology course requirements. The sample sizes for the three conditions were 29 (*deception*), 32 (*random*), and 30 (*memorization*).

Conditions and Procedures

Subjects were seated in separate cubicles and completed the experimental tasks (including informed consent and debriefing) on computers. Subjects were randomly assigned to one of three conditions, which are summarized in Table 1 and described below.

Deception. This condition was modeled after the MGP induction procedure developed by Tajfel et al. (1971). Subjects were led to believe that the purpose of the study was to examine people's artistic preferences ("Art plays such an important role in our lives, yet artistic preference is virtually ignored by psychologists," etc.). Subjects' first

task was to rate a series of 20 paintings by artists who collectively would be identified by the arbitrary names, *Quan* and *Xanthie* (Ashburn-Nardo et al., 2001). Paintings were displayed singly and subjects rated each painting on a 6 point scale (1=*dislike very much;* 6=*like very much*). Immediately following the task, the computer paused briefly and then randomly displayed one of the group names in large block letters for approximately 3 seconds. Subsequent instructions, borrowed from Ashburn-Nardo et al., reinforced the idea that subjects' assignment to a group was based on their artistic preferences and presented additional information about the supposed differences between the two groups (e.g., "Previous research has shown that people who prefer such paintings tend to process perceptual information in a bottom-up fashion. That is, you tend to examine the finer details of new stimuli, and then form an overall impression.").

Random. This condition used a deception-free scenario based on the standard MGP painting preference task. Subjects first imagined that a small number of students on campus had been divided into two groups based on their preferences regarding two art styles. They were instructed to imagine that "half the students were put into the *Quan* group based on their liking of an artist named QUAN. Similarly, half of the students were put into the *Xanthie* group based on their liking of XANTHIE." Subjects were then instructed to imagine that they had been randomly assigned to one of the two groups and to memorize the name of their assigned group (which was, of course, randomly determined). To help them think of themselves as members of the group, subjects next completed a self-group association task for which they practiced classifying the names of the members of both groups along with words representing *self* (*I, me, myself*) or *other* (*other*, *them*, *they*). Because subjects had not been exposed to any names of the group members in a previous task, it was necessary to give them a heuristic for correctly classifying the names into the two groups. Following Ashburn-Nardo et al., we used names that were easily distinguishable by the presence of the letter *Q* (for *Quan*) or the

letter *X* (for *Xanthie*). The complete set of names was: Bixten, Volx, Nardoxa, Xerdo, Xercerla, Qutar, Aloqu, Boqer, Linquos, and Qesh. Subjects were told to imagine that these were pseudonyms of real people who preferred either *Quan* or *Xanthie*. For 2 blocks of 48 trials, subjects classified singly presented names and words from the two categories, using left-side ('d') and right-side ('k') computer keys. For *Quan* subjects, the pairings were *Quan+self* and *Xanthie+others*, whereas for *Xanthie* subjects, the pairings were *Xanthie+self* and Q*uan+others*. Category-pairing labels remained on the display for the entire task and their leftside-rightside position switched on the second block of trials to disrupt consistent associations of response keys with the categories. The name presentation was designed so that no more than three player names of the same group could occur in sequence and that each name from each group would be displayed at least 6 times and each item from the additional two categories (i.e., *self* and *other*) would be displayed at least 5 times. Subjects were instructed to respond quickly, but to avoid errors. Response errors required correction for the program to continue.

Memorization. Subjects in this condition were introduced to a task modeled after procedures used by Pinter and Greenwald (2004). Subjects first imagined that there were two groups of students competing to solve a campus-wide scavenger hunt. Next, subjects read the following instruction: "In order to help you learn the names of the scavenger hunt group members, we will ask you to memorize the names of the players of one group. The names of the Xanthie [Quan] group will be presented on the following page for 45 seconds. Please try to memorize the names of the members of the XANTHIE [QUAN] group…." The next page presented five names (either *Quan*: Lisa, Daniel, Christina, Ryan, and Pat; or *Xanthie*: Erin, Jeremy, Kimberly, Adam, and Kris) in a horizontal block centered on the screen, below the instruction: "These are the members of the Quan [Xanthie] group." The group member's names were chosen to be common, familiar names for our subjects. Further, we matched the total length of the names in

both groups (*Quan*: 26 letters; *Xanthie*: 26 letters). Subjects were next asked to imagine that they had joined the group whose members' names they had just memorized, and to help them think of themselves as members of the group, they completed the same self-group association task used in the *random condition*.[1]

Dependent Measures

Implicit Attitude and Identification Measures. Immediately following the minimal group induction procedure, subjects in all conditions completed two seven-block IATs designed to measure novel group implicit attitude and implicit identification. The IAT target categories and stimuli were represented by the group names, *Quan* and *Xanthie*, and the ten names of the group members (10 actual names in the *memorization condition*; the 10 pseudonyms in the *random* and *deception conditions*).[2] The attribute categories and stimuli for the attitude IAT were *pleasant* (*good*, *win*, *palace*, *rich*, *miracle*) and *unpleasant* (*bad*, *lose*, *slum*, *poor*, *disaster*) and for the identification IAT, *self* (*I*, *me*, *mine*, *my*, *self*) and *other* (*other*, *their*, *theirs*, *them*, *they*). IAT response latencies were transformed into the standard *D* metric (Greenwald, Nosek, & Banaji, 2003) prior to analysis. Positive values reflect greater association of *self* and *pleasant* (versus *other* and *unpleasant*) with the assigned group than with the unassigned group [IAT practice and test block αs = .88 (attitude) and .77 (identification)].

Explicit Attitude and Identification Measures. Following the implicit measures, subjects completed several items that assessed explicit attitude and identification. Using a 7-item scale (*strongly disagree-strongly agree*), subjects responded to 4 items measuring attitude ("I like the Quan group," "I like the Xanthie group," "The Quan group is good," and "The Xanthie group is good") and identification ("I feel attached to the Quan group," "I feel attached to the Xanthie group," "I identify with the Quan group," and "I identify with the Xanthie group"). The four items of each type were combined to create difference scores (paralleling the IAT) for which positive values indicate

preference for and identification with the assigned group relative to the unassigned group [αs = .84 (attitude) and .91 (identification)].

Manipulation Checks. Finally, subjects responded to two questions intended to validate the manipulation. The first item was "I was a member of the…." Subjects had three response options, 1=*Xanthie group*, 2=*can't remember*, and 3=*Quan group*. The second item was "The way I became a member of one group was…," which also had three response options, 1=*on the basis of my test performance*, 2=*don't remember which*, and 3=*I was assigned to the group*. These items were transformed by subtracting 2 from each item, so that the zero point of each measure would indicate uncertainty.

Initial examination of the manipulation check results showed error rates of 23% and 15%, respectively, on the knowledge of group membership and basis for group assignment questions. Nevertheless, analyses with and without data from subjects who answered one or both manipulation check questions incorrectly did not differ for any of the dependent measures. Results are therefore reported including all observations.[3]

For the assessment of subjects' knowledge of their group membership, results showed that *Quan* members (M=.62, SD=.78) and *Xanthie* members (M=-.58, SD = .75) knew their group membership, F (1, 84) = 53.12, $p = 10^{-11}$. For the assessment of subjects' knowledge of the basis of their group membership, results showed expected differences among conditions for what subjects believed was the basis for their group membership, F (2, 84) = 54.29, $p = 10^{-17}$. Subjects in the *deception condition* believed their assignment was based on their artistic preferences (M=-.62, SD = .78), whereas subjects in the *random condition* (M=.84, SD = .52) and in the *memorization condition* (M=.83, SD = .53) correctly believed they had been randomly assigned to groups, F (1, 87) = 109.33, $p = 10^{-18}$. The *random* and *memorization conditions* did not differ, F (1, 87) = .00, p = .98.

Results

IAT Attitude and Identification

The attitude IAT involved subjects sorting names referring to the *Quan* and *Xanthie* groups and words referring to the categories, *pleasant* and *unpleasant*. Figure 1, Panel A displays the relevant standardized means. The exclusively positive values shown are indicative of stronger associations of the assigned group relative to the unassigned group with *pleasant* words than with *unpleasant* words, F (1, 85) = 105.34, $p = 10^{-17}$. However, a significant interaction effect shows that the degree of assigned group implicit preference varied with the experimental condition, F (2, 85) = 38.56, $p = 10^{-13}$. Post-hoc analyses (Bonferroni) revealed that attitude effects were significantly larger in the *memorization condition* than in the *random condition* [t (60) = 7.32, $p = 10^{-10}$] or the *deception condition* [t (57) = 7.87, $p = 10^{-10}$]. The latter two conditions did not differ, t (59) = .73, p = .75.

The identification IAT involved subjects sorting names referring to the *Quan* and *Xanthie* groups and words referring to the categories, *self* and *other*. Figure 1, Panel B displays standardized means for the measure. As shown, across conditions subjects showed stronger associations of the assigned group versus the unassigned group with *self* than with *other*, F (1, 85) = 99.68, $p = 10^{-17}$. The degree of assigned group implicit identification also varied with the experimental condition, F (2, 85) = 15.03, $p = 10^{-7}$. Post-hoc analyses revealed that identification effects were significantly larger in the *memorization condition* than in the *random condition* [t (60) = 4.67, $p = 10^{-6}$] or in the *deception condition* [t (57) = 4.85, $p = 10^{-6}$]. The latter two conditions did not differ, t (59) = .30, p = .95.

Explicit Attitude and Identification

Subjects completed four items designed to assess explicit preference for the assigned and unassigned groups. Figure 1, Panel A displays the relevant standardized means. Analyses revealed only one significant effect—a one-sample test for difference from zero indicating that, across conditions, subjects favored the assigned group to the

unassigned group (M= .74, SD = 1.21), F (1, 85) = 32.65, p = 10^{-8}. Explicit preference for the assigned group did not vary by condition, F (2, 85) = .90, p = .41.

Subjects also completed four items meant to assess explicit identification with the assigned and unassigned groups. Figure 1, Panel B displays the standardized means. Analyses revealed only that across conditions subjects identified more with the assigned group (M= 1.60, SD = 1.95), F (1, 85) = 59.64, p = 10^{-12}. Explicit identification with the assigned group did not vary by condition, F (2, 85) = .38, p = .69.

Effect Size Comparisons

To test for differences in the magnitude of the relative strengths of effects obtained with implicit and explicit measures we conducted Repeated Measures ANOVAs that included the standardized implicit and explicit attitude (or identification) measures as the within-subjects variables and experimental condition as the between-subjects variable. For the attitude measures, results showed a significant Implicit Versus Explicit X Condition interaction, F (2, 85) = 20.24, p = 10^{-8}. Examining the implicit-explicit difference at different levels of the Condition variable revealed only a significant difference favoring the implicit (IAT) measure for the *memorization condition*, F (1, 28) = 58.00, p = 10^{-9} [*deception condition*: F (1, 27) = 3.51, p = .07; *random condition*: F (1, 30) = 3.28, p = .08]. Similarly, for the identification measures, results showed a significant Implicit Versus Explicit X Condition interaction, F (2, 85) = 5.83, p = .004. Examining the implicit-explicit difference at different levels of the Condition variable revealed only a significant difference favoring the IAT for the *memorization condition*, F (1, 28) = 9.16, p = .005 [*deception condition*: F (1, 27) = 2.36, p = .14; *random condition*: F (1, 30) = .63, p = .43]. Repeated Measures ANOVAs focusing on differences between attitude and identification measures within measure type (i.e., IAT or explicit) revealed no significant effects (all Fs < 2.23).

Implicit-Explicit Measure Correlations

For the IAT and explicit attitudes, research has shown the average correlation to be small to moderate (.24; Hofmann, Gawronski, Gschwendner, Le, and Schmitt, in press; .36, Nosek, 2005). Research has also suggested that the relationship is nuanced, with some studies showing latent variable correlations as low as .23 for age attitudes and as high as .86 in the domain of political attitudes (Greenwald et al., 2003). Convergence between implicit and explicit attitudes should be expected in cases in which normative pressures to respond are low, evaluative strengths of the attitudes in question are strong, attitudes are simple in structure, and subjects are able to correctly introspect about their attitudes (Nosek, 2005). In many instances one or more of these factors is lacking and so the resultant correlation is low, as is the case in comparisons of implicit and explicit prejudice. In the domain of minimal groups it is not apparent that any of described factors *a priori* should attenuate the relationship between implicit and explicit attitudes. For this reason, one can consider variations in the strength of the correlations to reflect the relative validity of the procedures. In other words, stronger correlations are suggestive of greater validity.

The implicit-explicit correlations for the full sample (N=91) were moderate-to-large in magnitude according to conventional standards (Cohen, 1977): $r = .36$, $p = 10^{-4}$. (attitude) and $r = .38$, $p = 10^{-4}$. (identification). Examining each condition separately suggested stronger evidence of convergent validity for the *memorization* procedure [$r = .54$, $p = 10^{-3}$ (attitude); $r = .55$, $p = 10^{-3}$ (identification)] than for the *random* procedure [$r = .38$, $p = 10^{-2}$ (attitude); $r = .25$, $p = .17$ (identification)] or the *deception* procedure [$r = .36$, $p = .05$ (attitude); $r = .28$, $p = .14$ (identification)]. However, *z*-tests revealed that none of the correlations differed significantly (all $z_{diff} < 1.33$). Overall attitude-identification correlations were large for both the IAT ($r = .71$, $p = 10^{-15}$) and explicit measures ($r = .69$, $p = 10^{-14}$).

Discussion

Experiment 1 provided an initial comparison of three MGP induction procedures. In the *deception condition*, subjects were falsely informed that they had been assigned to one of the two groups, *Quan* or *Xanthie*, based on their preferences on a painting judgment task—a traditional MGP procedure. In the *random condition*, subjects simply imagined they had been randomly assigned to one of the groups. In the *memorization condition*, subjects studied the four names of members of one of the novel groups and were asked to imagine that they had joined that group. These latter two conditions included a self-group association task to aid establishing the association of self to the novel group.

The results for the IAT attitude and identification measures revealed that, across conditions, subjects showed greater implicit preference for and identification to the group to which they were assigned than to the unassigned group. Further, these effects were significantly greater for subjects in the *memorization condition* than for subjects in the other two conditions. Results for the explicit measures of attitude and identification, by contrast, did not show differences among the conditions, only a consistent, moderate preference for the assigned group. This latter finding establishes continuity with the large body of existing MGP findings that use explicit ratings as dependent measures. Finally, analyses of effect sizes and implicit-explicit correlations showed that effect sizes were larger for implicit measures than explicit measures only in the *memorization condition* and that the implicit-explicit correlations were descriptively largest for subjects in the *memorization condition*. Taken together, the results from this initial comparison of traditional and alternative procedures suggest that the *memorization* procedure produces the MGP effect more readily than do the *random* and *deception* procedures.

This conclusion is perhaps premature due to two methodological differences among conditions. First, the *memorization condition* used relatively familiar names,

whereas the other conditions used novel names that could not have been familiar to subjects (cf. Footnote 2). It is possible then that subjects had difficulty implicitly linking *self* to such unfamiliar names. Second, subjects in the *memorization condition* completed the self-group association practice, whereas subjects in the *deception condition* did not. It is possible that this difference made it more difficult for subjects to implicitly "join the group." However, this possibility seems less likely given the significant difference between the *memorization* and *random conditions*, both of which included self-group association practice. Regardless, the purpose of Experiment 1 was not to equalize differences in the conditions, but rather to compare new procedures with the traditional method. The *memorization* procedure appeared to be strongest. Experiment 2 sought additional evidence to evaluate alternative MGP induction procedures.

Experiment 2

Experiment 2 was designed with two goals in mind. First, we sought to improve the potency of the *deception* and *random* MGP inductions. To do this, we incorporated into both conditions a *modified name memorization* task for which subjects simultaneously learned the names of two in-group and two out-group members. Second, we attempted to increase the similarity of other procedural details across the conditions. To this end we used familiar names and self-group association practice in all conditions.

Method

Subjects

Sixty (22 men, 35 women, 3 not sex-identified) undergraduate students at the University of Washington participated for partial credit towards their introductory psychology course requirements. Sample sizes were equal for all conditions: 20 (*modified deception*), 20 (*modified random*), and 20 (*memorization*).

Conditions and Procedures

Procedures were similar to those in Experiment 1. Two changes applied to all conditions. First, we replaced the pseudonyms used in two of the conditions in Experiment 1 with the more familiar names taken from previous research (Pinter & Greenwald, 2004). In all conditions the group names were *Purple* and *Gold* (University of Washington school colors) and the group members' names were: *Purple*: Christina, Daniel, Lisa, Ryan; and *Gold*: Adam, Erin, Jeremy, Kimberly. Second, subjects in all conditions completed the self-group association task, as described in Experiment 1. These changes increased comparability across conditions. Some remaining condition-specific changes are described below (see Table 1 for summary).

Modified deception. The lone additional change in this condition was the inclusion of a modified version of the memorization task used in the first experiment's *memorization condition*. The modified task had subjects memorize two names from both groups during the 45 second study period. The four names, along with *Purple* and *Gold*, were presented in a centered block with the assigned group's names on top of one another on the left and the unassigned group's names on top of one another on the right. Subjects studied the names for 45 seconds. Use of this task minimized differences among conditions.

Modified random. As in the *modified deception condition*, subjects completed a modified memorization task to help them learn two names from each group.

Memorization. In this condition, *prior* to the name memorization task, subjects were instructed to imagine that they were members of one of two groups, *Purple* or *Gold*. In contrast, in Experiment 1 subjects received this instruction *after* the name memorization procedure. Like the changes in the other two conditions, this change increased similarity of procedures across conditions.

Dependent Measures

Implicit Attitude and Identification Measures. The only change to the IATs was the inclusion of the more familiar group and group members' names that were now identical in all conditions. Positive scores on both IAT measures reflect greater association (*pleasant* or *self)* with the assigned group than with the unassigned group [IAT practice and test block αs = .85 (attitude) and .82 (identification)].

Explicit Attitude, Identification, and Manipulation Checks. The explicit measures were identical to those used in Experiment 1, except for replacing the group names with *Purple* and *Gold*. Positive values on the measure reflect stronger preference or identification with the assigned group than with the unassigned group [αs = .93 (attitude) and .91 (identification)].

Examination of the manipulation check results showed error rates of 3% and 10%, respectively, on the knowledge of group membership and basis for group assignment questions. Analyses with and without data from subjects who answered one or both manipulation check questions incorrectly did not differ for any of the dependent measures. Results are therefore reported including all observations.

For the assessment of subjects' knowledge of their group membership, results showed that *Purple* members (M=1.00, SD=0) and *Gold* members (M=-.93, SD = .26) knew their group membership, F (1, 54) = 1676.36, $p = 10^{-43}$. For the assessment of subjects' knowledge of the basis of their group membership, results showed expected differences among conditions for what subjects believed was the basis for their group membership, F (2, 54) = 81.84, $p = 10^{-18}$. Specifically, subjects in the *modified deception condition* correctly believed their assignment was based on their artistic preferences (M=-.60, SD = .75), whereas subjects in the *memorization condition* (M=1.00, SD = 0) and in the *modified random condition* (M=.95, SD = .22) correctly believed they had been randomly assigned to groups, F (1, 58) = 162.92, $p = 10^{-19}$. The latter two conditions did not differ significantly, F (1, 57) = .12, p = .73.

Results

IAT Attitude and Identification

The attitude IAT involved subjects sorting names referring to the *Purple* and *Gold* groups and words referring to the categories, *pleasant* and *unpleasant*. Figure 2, Panel A displays standardized means for the measure. As shown, across conditions subjects showed stronger associations of the assigned group relative to the unassigned group with *pleasant* than with *unpleasant*, F (1, 54) = 59.89, $p = 10^{-11}$. Unlike Experiment 1, this effect did not reliably differ across conditions, F (2, 54) = 2.15, p = .13.

The identification IAT involved subjects sorting names referring to the *Purple* and *Gold* groups and words referring to the categories, *self* and *other*. Figure 2, Panel B displays standardized means for this measure. As shown, across conditions subjects showed stronger associations of assigned group relative to the unassigned group with *self* than with *other*, F (1, 54) = 86.50, $p = 10^{-14}$. Unlike Experiment 1, and similar to the results for attitude IAT in the current experiment, this effect did not reliably differ across conditions, F (2, 54) = 0.59, p = .56.

Explicit Attitude and Identification

Subjects completed four items to assess explicit preference for the assigned and unassigned groups. Results revealed only a significant tendency for subjects to favor the assigned group relative to the unassigned group, (M= 1.06, SD = 1.83), F (1, 54) = 18.94, $p = 10^{-5}$. Explicit preference for the assigned group did not vary by condition, F (2, 54) = .20, p = .82.

Subjects also completed four items to assess explicit identification with the assigned and unassigned groups. Results revealed only a tendency to identify with the assigned group relative to the unassigned group, (M= 2.02, SD = 2.20), F (1, 54) = 47.42, $p = 10^{-9}$. Explicit preference for the assigned group did not vary by condition, F (2, 54) = .33, p = .72.

Effect Size Comparisons

As in Experiment 1, we conducted Repeated Measures ANOVAs that included implicit and explicit attitude (or identification) as the within-subjects variables and experimental condition as the between-subjects variable. Results showed no reliable differences in magnitudes of attitude or identification effects (Fs < 2.96). Similarly, there were no reliable differences in magnitudes of implicit or explicit measures (Fs < 1.23).

Implicit and Explicit Measure Correlations

The implicit-explicit correlations for the full sample (N=60) were large, according to conventional standards (Cohen, 1977): r = .55, $p = 10^{-7}$ (attitude) and r = .64, $p = 10^{-9}$ (identification). Examining each procedure separately suggested stronger evidence of convergent validity for the *memorization* procedure [r = .68, $p = 10^{-4}$ (attitude); r = .74, $p = 10^{-4}$ (identification)] than for the *modified random* procedure [r = .43, p = .06 (attitude); r = .57, $p = 10^{-3}$ (identification)] or the *modified deception* procedure [r = .62, $p = 10^{-3}$ (attitude); r = .59, $p = 10^{-3}$ (identification)]. However, z-tests revealed that none of the correlations differed significantly (all $z_{diff} < 1.08$). Overall attitude-identification correlations were large for the IAT (r = .70, $p = 10^{-10}$) and explicit measures (r = .81, $p = 10^{-15}$).

Discussion

To strengthen manipulations and to improve comparability across conditions, Experiment 2 featured a number of changes, including the incorporation of a modified name memorization procedure into the Experiment 1's *random* and *deception conditions*. The modified name memorization procedure required subjects to initially study two names of *both* groups. In this way subjects could derive whatever benefits would come from learning the names, but subjects would not be led to differentiate the groups during the memorization task.

Replicating Experiment 1 findings, results from the implicit measures revealed that subjects showed stronger implicit preference for and identification to the assigned group than the unassigned group. However, unlike Experiment 1, this basic tendency was not more pronounced in the *memorization* condition. Results from the explicit measures also replicated Experiment 1 findings: Subjects in all conditions showed a consistent explicit preference for the assigned group relative to the unassigned group. Finally, as in Experiment 1, implicit-explicit correlations tended to be larger in the *memorization condition* than in the *modified deception* or *modified random conditions*.

In sum, the results of Experiment 2 clearly showed increased similarity across conditions, which is consistent with both of our stated goals. However, the basis for that change is unclear, given that we made multiple changes in the procedures. It is possible that the inclusion of the modified memorization procedure, which in its original form produced large effects in Experiment 1 and in previous IP research, improved the *modified deception* and *random conditions*, but it is also quite likely that our inclusion of more familiar names in all conditions produced the improvements. The effect of the memorization condition was smaller than in Experiment 1. This result is possibly due to the one change made in that condition, which was assigning subjects to groups prior to the name memorization task. Regardless, actually determining the cause or causes of the increased similarity among conditions is not paramount, rather what is important is to note is that the improvement of the *modified deception* and *modified random* procedures did not do more than bring them close to the effectiveness of the *memorization* procedure; it did not surpass the *memorization* procedure on any of the indices. This confirms Experiment 1's conclusion that the use of deception is a non-essential ingredient of MGP effects.

General Discussion

We began by noting that for more than 30 years groups researchers have predominantly employed a deception-based MGP induction procedure. This practice is curious because it was never established that use of deception is necessary for producing MGP effects. Legitimate questions can be raised about the morality of using deception whether or not it turns out to be a necessary condition, but if it can be shown to be irrelevant, sound ethical practice obliges discontinuing its use.

Experiment 1 contrasted the long-used deception-based procedure, for which subjects are led to believe their assignment to a group is based on some important personal attribute, with two deception-free procedures that emphasized, respectively, random assignment and name memorization. Results showed an advantage for the *memorization* procedure. Experiment 2 incorporated a modified name memorization task into the *deception* and *random conditions*. Results indicated that this change strengthened the two conditions, but not beyond the strength of the *memorization condition*. These findings establish that deception is not a necessary component of effective MGP inductions. We recommend the *memorization* procedure as an effective and deception-free alternative to the traditional MGP induction procedure.

Two additional comments bear mentioning. First, in the Introduction we noted that the use of a random induction procedure has produced mixed findings (cf. Brewer & Silver, 1978; Gaetner & Insko, 2000). The strategy we adopted was to attempt to increase the potency of the manipulation by adding a self-group association task. Results are consistent with the success of this strategy in that the *random* procedure consistently produced MGP effects in both experiments. It seems advisable then to use such a strategy when using a *random* procedure. Second, the clear finding of MGP effects (with or without deception) on the IAT reinforces the interpretation that MGP effects are not an artifact of properties of the dependent measures used to assess the effects. The IAT

reveals MGP effects and does so without the complexities of the various matrix measures. For this reason, the IAT can be used as an effective measure of MGP effects.

References

Adair, J. G., Dushenko, T. W., & Lindsay, R. C. L. (1985). Ethical regulations and their impact on research practice. *American Psychologist, 40,* 59-72.

Allen, V. L., & Wilder, D. A. (1975). Categorization, belief similarity, and group discrimination. *Journal of Personality and Social Psychology, 32*, 971-977.

Ashburn-Nardo, L., Voils, C. I., & Monteith, M. J. (2001). Implicit associations as the seeds of intergroup bias: How easily do they take root? *Journal of Personality and Social Psychology, 81*, 789-799.

Bornstein, G., Crum, L., Wittenbraker, J., Harring, K., Insko, C. A., & Thibaut, J. (1983a). On the measurement of social orientations in the minimal group paradigm. *European Journal of Social Psychology, 13,* 321-350.

Bornstein, G., Crum, L., Wittenbraker, J., Harring, K., Insko, C. A., & Thibaut, J. (1983b). Reply to Turner's comments. *European Journal of Social Psychology, 13,* 369-381.

Brewer, M. B. (1979). In-group bias in the minimal intergroup situation: A cognitive-motivational analysis. *Psychological Bulletin, 86,* 307-324.

Brewer, M. B., & Silver, M. (1978). Ingroup bias as a function of task characteristics. *European Journal of Social Psychology, 8,* 393-400.

Cohen, J. (1977). *Statistical power analysis for the behavioral sciences.* Academic Press: New York.

Gaertner, L., & Insko, C. A. (2000). Intergroup discrimination in the minimal group paradigm: Categorization, reciprocation, or fear? *Journal of Personality and Social Psychology, 79*, 77-94.

Gaertner, L., & Insko, C. A. (2001). On the measurement of social orientations in the minimal group paradigm: Norms as moderators of the expression of intergroup bias. *European Journal of Social Psychology, 31,* 143-154.

Gramzow, R. H., & Gaertner, L. (2005). Self-esteem and favoritism toward novel in-groups: The self as an evaluative base. *Journal of Personality and Social Psychology, 88*, 801-815.

Greenwald, A. G., Banaji, M. R., Rudman, L. A., Farnham, S. D., Nosek, B. A., & Mellott, D. S. (2002). A unified theory of attitudes, stereotypes, self-esteem, and self-concept. *Psychological Review, 109,* 3-25.

Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: The Implicit Association Test. *Journal of Personality and Social Psychology, 74*, 1464-1480.

Greenwald, A. G., Nosek, B., Banaji, M. R. (2003). Understanding and using the implicit association test: I. An improved scoring algorithm. *Journal of Personality and Social Psychology, 85,* 197-216.

Greenwald, A. G., Pickrell, J. E., & Farnham, S. D. (2002). Implicit partisanship: Taking sides for no reason. *Journal of Personality and Social Psychology, 83*, 367-379.

Hertel, G., & Kerr, N. L. (2001). Priming in-group favoritism: The impact of normative scripts in the minimal group paradigm. *Journal of Experimental Social Psychology, 37,* 316-324.

Hewstone, M., Rubin, M., & Willis, H. (2002). Intergroup bias. *Annual Review of Psychology, 53,* 575-604.

Hofmann, W., Gawronski, B., Gschwendner, T., Le, H., & Schmitt, M. (in press). A meta-analysis on the correlation between the Implicit Association Test and explicit self-report measures. *Personality and Social Psychology Bulletin.*

Kimmel, A. J. (2001). Ethical trends in marketing and psychological research. *Ethics and Behavior, 11,* 131-149.

Nosek, B. A. (2005). *Moderators of the relationship between implicit and explicit attitudes*. Manuscript submitted for publication.

Pinter, B., & Greenwald, A. G. (2004). Exploring implicit partisanship: Enigmatic (but genuine) group identification and attraction. *Group Processes and Intergroup Relations, 7,* 283-296.

Poehlman, T. A., Uhlmann, E., Greenwald, A. G., & Banaji, M. R. (2005). *Understanding and using the Implicit Association Test: III. Meta-analysis of predictive validity*. Manuscript submitted for publication.

Rabbie, J. M., Schot, J. C., & Visser, L. (1989). Social identity theory: A conceptual and empirical critique from the perspective of a behavioral interaction model. *European Journal of Social Psychology, 19,* 171-202.

Tajfel, H., Billig, M. G., Bundy, R. P., & Flament, C. (1971). Social categorization and intergroup behavior. *European Journal of Social Psychology, 1,* 149-178.

Tajfel, H., & Turner, J. C. (1986). An integrative theory of intergroup relation. In S. Worchel & W. G. Austin (Eds.), *Psychology of intergroup relations* (pp. 7-24). Chicago: Nelson-Hall.

Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D., & Wetherell, M. S. (1987). *Rediscovering the social group: A self-categorization theory*. New York: Blackwell.

Author Note

Brad Pinter, Department of Psychology, The Pennsylvania State University, Altoona and Anthony G. Greenwald, Department of Psychology, University of Washington.

Thanks to Leslie Ashburn-Nardo for providing the painting task stimuli.

Correspondence concerning this article should be addressed to Brad Pinter, Department of Psychology, Penn State Altoona, 3000 Ivyside Dr., Altoona, PA 16601, email: tbp1@psu.edu

Footnotes

[1] To eliminate possible confusion, it is important to note that the current memorization procedure differs from the original procedure used by Greenwald et al. (2002) and Pinter and Greenwald (2004), which did not explicitly assign subjects to groups or have subjects practice associating the category *self* with a group. It is clear from those studies that neither aspect of the current procedure is necessary to produce implicit attitude and identification effects, but it is unknown whether the addition of those changes may strengthen effects.

[2] At the time of the administration of the dependent measures, subjects in the *deception* condition had not previously studied any of the *Q* or *X* letter-based names nor had they been instructed on how to distinguish the names of the two groups (recall that they did not complete the self-group association task as did subjects in the *random* condition). For this reason it was necessary to give subjects instructions for distinguishing the names of the two unfamiliar groups immediately before the administration of the dependent variables. Note that the use of different sets of names provides a possible source of confounding that is avoided in Experiment 2.

[3] Degrees of freedom are reduced for manipulation check analyses because one subject did not answer those questions.

Table 1. Summary of minimal group induction procedures in Experiments 1 and 2.

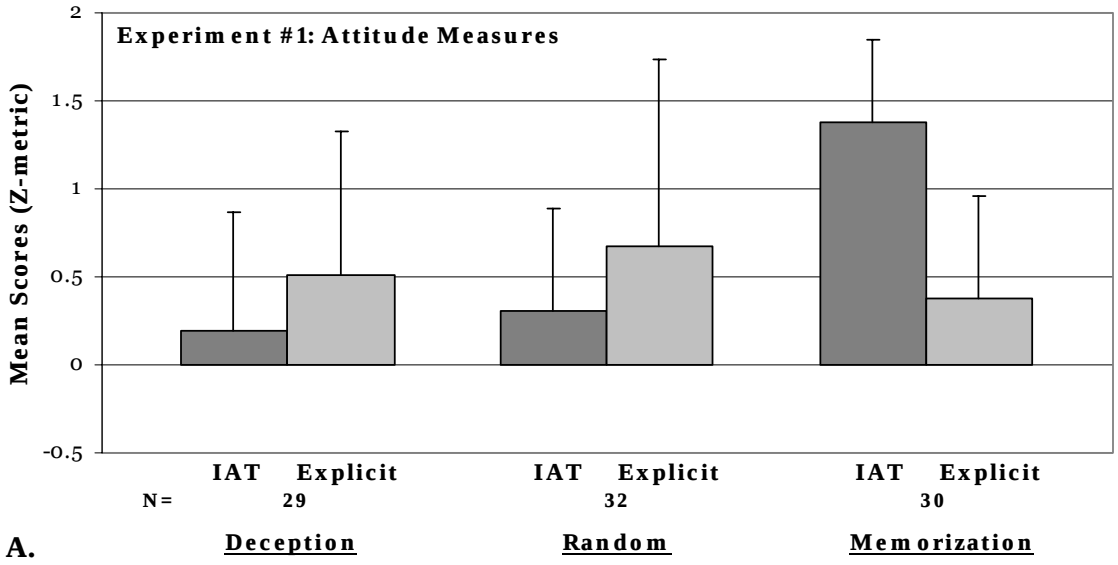
Condition	Scenario	Induction	Sample Names	Self-Group Association Task
Experiment 1				
Deception	Paintings	Test	Qutar, Xerdo	None
Random	Paintings	Assigned	Qutar, Xerdo	*Quan+self*, *Xanthie+self*
Memorization	Scavenger Hunt	Memorization, Assigned	Lisa, Erin	*Quan+self*, *Xanthie+self*
Experiment 2				
Deception	Paintings	Test, M-Memorization	Lisa, Erin	*Purple+self*, *Gold+self*
Random	Paintings	Assigned, M-Memorization	Lisa, Erin	*Purple+self*, *Gold+self*
Memorization	Scavenger Hunt	Assigned, Memorization	Lisa, Erin	*Purple+self*, *Gold+self*

Notes. Memorization=Task for which subjects studied 5 names of members of one group. M-Memorization=Modified memorization task for which subjects studied two names of each group for 45 seconds.

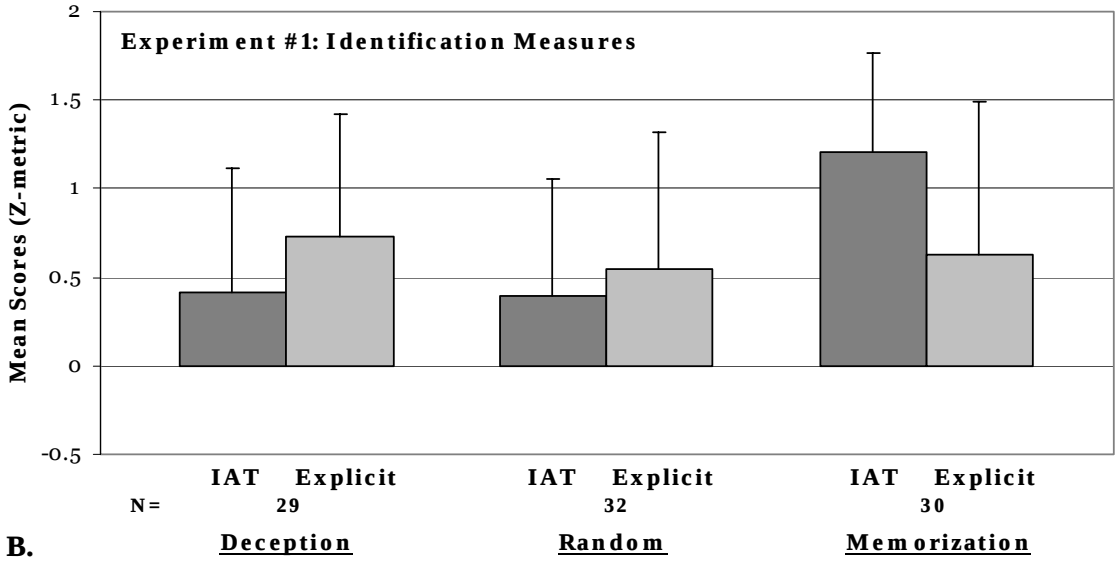
Figure Captions

Figure 1. Attitude and identification effects (Experiment 1). For the IAT, subjects more easily associated *pleasant* and *self* with the assigned group than the unassigned group, particularly in the *memorization condition*. On explicit measures, subjects showed a consistent preference for and identification with the assigned group. Bar values represent standardized *D*-transformed response latencies (Greenwald et al., 2003) and standardized explicit relative preference measures. Error bars represent standard deviations.

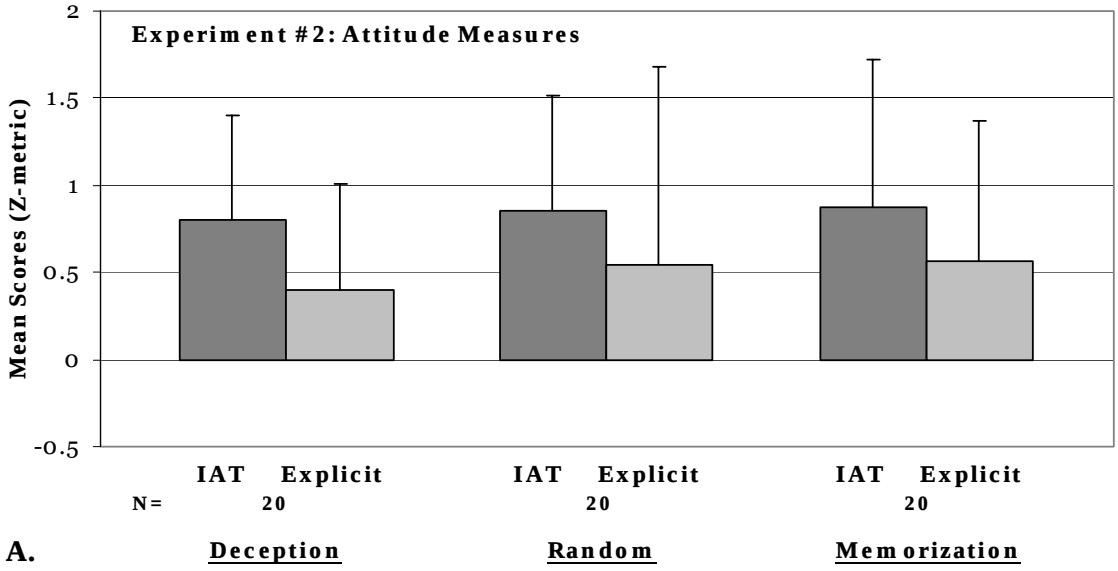
Figure 2. Attitude and identification effects (Experiment 2). For the IAT, subjects more easily associated *pleasant* and *self* with the assigned group than the unassigned group. This effect was statistically constant across conditions. On explicit measures, subjects showed a consistent preference for and identification with the assigned group. Bar values represent standardized *D*-transformed response latencies (Greenwald et al., 2003) and standardized explicit relative preference measures. Error bars represent standard deviations.


Experiment #1: Attitude Measures
Mean Scores (Z-metric)
2
1.5
1
0.5
0
-0.5
IAT Explicit
IAT Explicit
IAT Explicit
N= 29 32 30
Deception
Random
Memorization

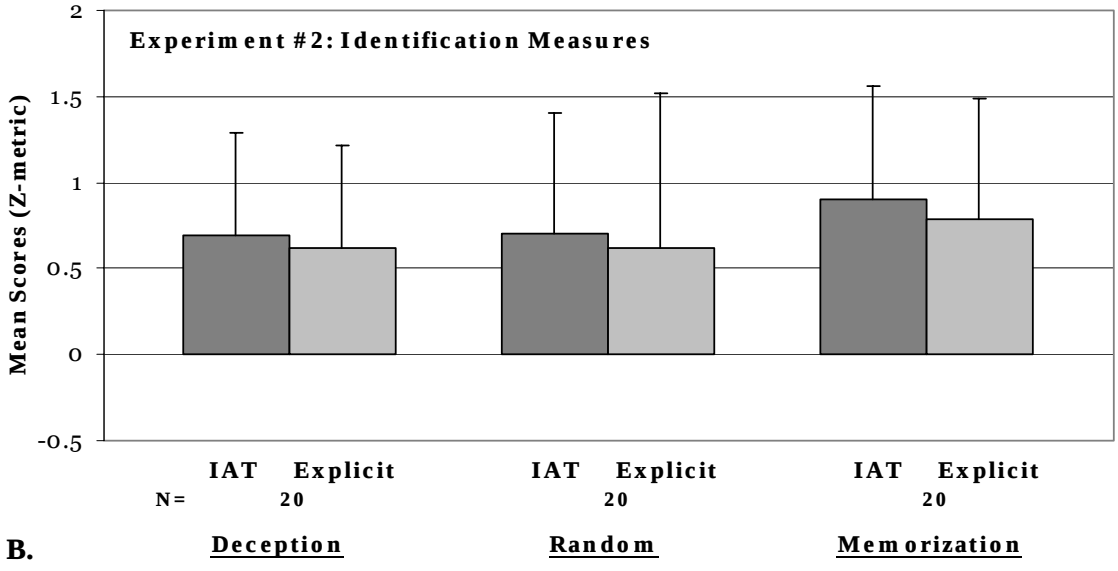
A.


Experiment #1: Identification Measures
Mean Scores (Z-metric)
2
1.5
1
0.5
0
-0.5
IAT Explicit
IAT Explicit
IAT Explicit
N= 29 32 30
Deception
Random
Memorization

B.


Experiment #2: Attitude Measures
Mean Scores (Z-metric)
2
1.5
1
0.5
0
-0.5
IAT
Explicit
IAT
Explicit
IAT
Explicit
N=
20
20
20
Deception
Random
Memorization

A.


Experiment #2: Identification Measures
Mean Scores (Z-metric)
2
1.5
1
0.5
0
-0.5
IAT
Explicit
IAT
Explicit
IAT
Explicit
N=
20
20
20
Deception
Random
Memorization

B.