

The Role of Self-Involvement in Shifting IAT Effects

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Abstract. Explicit measures can be affected by self-involvement in processing of a message (Johnson & Eagly, 1989). Here, we show that self-involvement in a counter-stereotypical message also influences implicit measures such as the Implicit Association Test (Greenwald, McGhee, & Schwartz, 1998). In our study, racial attitudes changed only after reading a counter-stereotypical scenario in which participants were asked to imagine themselves as victims of an assault as opposed to simply imagine an assault to a person. This shift did not depend on evaluative instructions and it was transient as it was no longer present after 1 week. These results suggest that the self-involvement might be an important factor in shifting implicit measures.

Keywords: implicit measures, malleability, Implicit Association Test, self-involvement, racial attitudes

In the research on social attitudes, a distinction between measures has emerged: One type of measure assesses attitudes using self-reports that reflect conscious and controllable evaluations. Another type of measure tries to infer the attitudes with behavior measures that are thought to assess associations that exist in memory (Greenwald, McGhee, & Schwartz, 1998). The former are often called explicit, while the latter implicit.

An example of implicit measures is the Implicit Association Test (IAT; Greenwald et al., 1998; Nosek, Greenwald, & Banaji, 2007; Nosek et al., 2009). In a standard IAT, participants are asked to classify four types of stimuli – belonging to two target categories (e.g., Black and White faces) or belonging to two evaluative dimensions (e.g., good and bad words) – by pressing one of two keys. There are two response conditions: a congruent and an incongruent condition. In the congruent condition, the interest category shares the same motor response with the stereotypic evaluative dimension (e.g., White faces and good words are associated to one key and Black faces and bad words to the other). In the incongruent condition the interest category shares the same motor response with the non-stereotypic evaluative dimension (e.g., White faces and bad words are associated with one key and Black faces and good words with the other). The difference in average categorization latency between the two conditions is an indicator of association strengths between the interest category and the evaluative dimensions.

Originally, implicit measures were assumed to be inflexible and resistant to change (Bargh, 1989; Dovidio & Fazio, 1992; Fazio, Jackson, Dunton, & Williams, 1995). In contrast to this assumption, more recent research has shown that implicit attitudes can be shifted using multiple interventions (for reviews, see Blair, 2002; Fazio & Olson, 2003; see also

Fazio, 2007). For example, shifts of implicit attitudes can be observed by exposing individuals repeatedly to either positive or negative examples of outgroup members (Dasgupta & Greenwald, 2001; Joy-Gaba & Nosek, 2010), by asking participants to create specific mental images (Blair, Ma, & Lenton, 2001; Hugenberg, Blusiewicz, & Sacco, 2010), or by eliciting social roles through specific contexts (Barden, Maddux, Petty, & Brewer, 2004).

Interestingly, recent studies have shown that implicit measures can also be influenced by reading persuasive messages such as a story (Correll, Park, Judd, & Wittenbrink, 2007; Foroni & Mayr, 2005; Horcajo, Briñol, & Petty, 2010; Marini, Rubichi, & Sartori, 2011). For example, Foroni and Mayr (2005) asked participants to imagine a fictional postapocalyptic world in which, due to radiation effects, flowers have become highly noxious, whereas insects serve as a crucial, indirect food resource for human beings. Following this experimental manipulation they reported a reduction of IAT effects indicating a preference for flowers compared to insects. In a similar vein, Horcajo and colleagues (2010) found that the attitudes toward vegetables as measured by IAT changed after reading a message in favor of consuming vegetables.

Persuasion research has demonstrated that several factors can affect the processing of a message (for a review, see Petty, Ostrom, & Brock, 1981). One of the most important factors is the self-involvement or degree of personal relevance of the message. Several studies have demonstrated that whenever a message can be related to the message recipient's "self," it becomes more personally relevant and more likely to be processed (e.g., Blankenship & Wegener, 2008; Fleming & Petty, 2000; Petty & Cacioppo, 1990). However, the importance of self-involvement has been so far assessed only on explicit measures (e.g., Bizer & Krosnick, 2001; Burnkrant &

Table 1. Scheme of the experimental paradigm: Session (pre-scenario, post-scenario, follow-up) was a within-subjects factor, while Scenario (1, 2, 3, 4) and Condition (pro-Black, pro-White) were between-subjects factors

		Session	
Pre-scenario		Post-scenario	Follow-up
• Performance of the IAT		• Reading a scenario • Performance of the IAT	• Performance of the IAT

		Condition	
		Pro-Black	Pro-White
Scenario	Scenario 1	+ Self-involvement + Evaluative instructions	+ Self-involvement + Evaluative instructions
	Scenario 2	+ Self-involvement – Evaluative instructions	+ Self-involvement – Evaluative instructions
	Scenario 3	– Self-involvement + Evaluative instructions	– Self-involvement + Evaluative instructions
	Scenario 4	+ Self-involvement – Evaluative instructions	+ Self-involvement – Evaluative instructions

Unnava, 1989; Petty & Cacioppo, 1979; for a review and meta-analysis, see Johnson & Eagly, 1989).

The main goal of the present study was to investigate whether the self-involvement in processing a counter-stereotypical message influences implicit measures. In particular, drawing from findings in persuasion research, we hypothesized that the self-involvement in a counter-stereotypical message can shift IAT effects potentially by influencing the sensitivity in perceiving and integrating it. To test our hypothesis, we ran an experiment using various racial counter-stereotypical scenarios in which the self-involvement was manipulated. In addition to that, we also manipulated the instructions given to the participants to see whether explicitly cueing their attention to a specific association between the two racial categories and evaluative dimensions could also affect the IAT. Both before and after reading the scenario, participants completed an IAT to assess the racial associations. We repeated the IAT after 1 week to test whether the potential shifts of the IAT effects were stable or transient.

Methods

Participants

Eighty-four white participants (age 18–40 years; mean = 22.69; 61 women) were recruited for the experiment.

Experimental Paradigm, Stimuli, and Procedure

The experimental paradigm is schematically shown in Table 1. It consisted of three sessions: pre-scenario, post-scenario, and a follow-up session. In the pre-scenario and

follow-up session participants performed only the IAT, while in the post-scenario session they read a scenario and then performed the IAT. The pre-scenario and the post-scenario session took place the same day, while the follow-up session took place 1 week later.

Participants were randomly assigned to one of two conditions (pro-Black, pro-White) and to one of four scenarios (Scenario 1, 2, 3, 4) describing an assault.

In the pro-Black condition, the aggressor was a White individual and a Black individual played the role of the rescuer. Conversely, in the pro-White condition, that was introduced for control purposes, the aggressor was a Black individual and a White individual played the role of the rescuer.

The four scenarios were designed to assess the effect of the self-involvement of participants and of evaluative instructions. In Scenario 1, participants were asked to imagine themselves as victims of an assault and evaluative instructions were given. The evaluative instructions consisted in a piece of text in which participants were explicitly required to imagine that the IAT was a tutoring program designed to establish firmly in people's minds specific associations. In the pro-Black condition, these associations were “White = Bad, Black = Good,” while the opposite associations (i.e., “Black = Bad, White = Good”) were proposed in the pro-White condition. Scenario 2 was like Scenario 1 with the only exception that evaluative instructions were not included. In Scenario 3 there was no self-involvement as participants were asked to imagine an assault to a person and evaluative instructions were given. Scenario 4 was like Scenario 3 with the only exception that evaluative instructions were not given. An exemplary scenario is reported in Appendix A.

Twenty participants were assigned to Scenario 1,¹ twenty-four to Scenario 2, twenty to Scenario 3, and twenty to Scenario 4. In each scenario half of the participants were assigned to the pro-Black condition, while the other half to the pro-White condition.

¹ One out of 10 participants assigned to the pro-Black condition did not return for the follow-up session.

Similar to Greenwald et al. (1998) the IAT consisted of a total of five blocks: (1) good/bad discrimination (32 trials); (2) White/Black discrimination (32 trials); (3) combined, congruent block to racial stereotype (64 trials): White faces and good words were categorized with the same response key, while Black faces and bad words were categorized with a second response key; (4) practice of reversed White/Black discrimination (32 trials); and (5) combined, incongruent block to racial stereotype (64 trials): White faces and bad words were categorized with one key, and Black faces and good words with the other key. The stimuli consisted of 16 words (eight good words and eight bad words) and 12 pictures (six White individuals and six Black individuals). They were the same as those used in the IAT to assess the racial attitudes on the website <https://implicit.harvard.edu/implicit/italy/>. Participants were asked to respond as quickly and accurately as possible to the stimuli, by pressing one of two keys on a keyboard.

Results

Following Greenwald, Nosek, and Banaji (2003), we computed the D index for each participant by dividing the difference in mean response latency between the two IAT combined blocks by the participant's latency standard deviation inclusive of the two combined blocks. A positive D index indicated a pro-White attitude (i.e., a stronger association of *White* people with *good* and *Black* people with *bad*) and a negative D index indicated a pro-Black attitude (i.e., a stronger association of *White* people with *bad* and *Black* people with *good*). The following data cleaning procedures were employed: responses faster than 300 ms, or slower than 10,000 ms, were removed, and errors were replaced with the mean of the correct responses in that response block plus 600 ms of penalty.

We submitted the D index to an analysis of variance (ANOVA) with Scenario (1, 2, 3, 4) and Condition (pro-Black, pro-White) as between-subjects factors and Session (pre-scenario, post-scenario, follow-up) as a within-subjects factor. Figure 1 presents in graphical form the averages and standard deviations of the D index as a function of the three factors considered in our experiment.

Crucially for the hypothesis that we intended to test, we found a significant three-way interaction between the factors Session, Condition, and Scenario $F(6, 150) = 6.08, p < .001, \eta_p^2 = .19$. To study this effect, we conducted separate ANOVAs for each scenario. We found that the interaction between the factors session and condition was significant only for the scenarios with self-involvement (Scenario 1: $F(2, 34) = 21.03, p < .001, \eta_p^2 = .55$; Scenario 2: $F(2, 44) = 10.76, p < .001, \eta_p^2 = .33$). The two-way interaction was not significant for the scenarios without self-involvement (Scenario 3: $F(2, 36) = 1.09, p = .35, \eta_p^2 = .06$; Scenario 4: $F(2, 36) = 0.02, p = .98, \eta_p^2 = .001$). A closer inspection at the scenarios with self-involvement (Scenario 1 and Scenario 2) revealed that the average D index differed in the three sessions only for the pro-Black condition (Scenario 1: $F(2, 16) = 23.22, p < .001, \eta_p^2 = .74$; Scenario 2: $F(2, 22) = 18.21, p < .001, \eta_p^2 = .62$), while no significant difference was obtained for the pro-White condition (Scenario 1: $F(2, 18) = 0.47, p = .63, \eta_p^2 = .05$; Scenario 2: $F(2, 22) = 1.29, p = .30, \eta_p^2 = .11$). In the pro-Black condition, the D index after reading the scenario was significantly smaller compared to the pre-scenario (Scenario 1: -0.14 vs. $1.09, MD = -1.23, SE = .24, p < .01, CI = [-1.94, -0.52]$; Scenario 2: 0.13 vs. $0.82, MD = -0.68, SE = .14, p < .001, CI = [-1.07, -0.30]$) and to the follow-up session after 1 week (Scenario 1: -0.14 vs. $0.77, MD = -0.92, SE = .17, p < .01, CI = [-1.43, -0.40]$; Scenario 2: 0.13 vs. $0.73, MD = -0.60, SE = .12, p < .001, CI = [-0.93, -0.26]$), while no difference was observed between

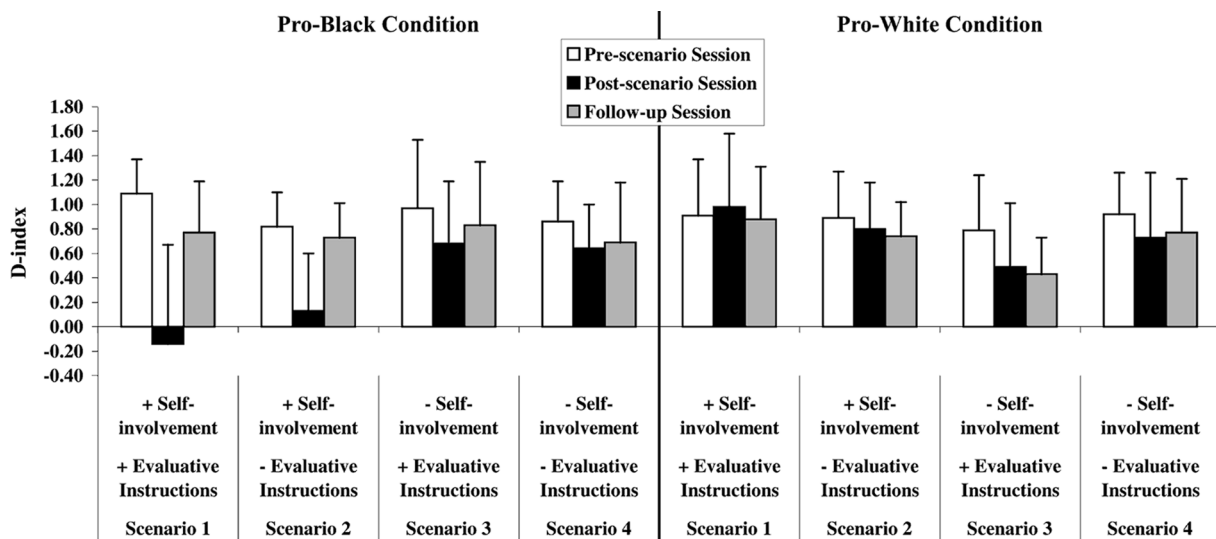


Figure 1. Mean D index as a function of factors Session (pre-scenario, post-scenario, follow-up), Scenario (1, 2, 3, 4), and Condition (pro-Black and pro-White). Vertical bars indicate standard errors.

pre-scenario and follow-up session (Scenario 1: 1.09 vs. 0.77, $MD = 0.32$, $SE = .15$, $p = .19$, $CI = [-0.13, 0.76]$; Scenario 2: 0.82 vs. 0.73, $MD = 0.08$, $SE = .11$, $p = 1.00$, $CI = [-0.24, 0.40]$). This pattern of results indicated that self-involvement in a counter-stereotypical message was critical in shifting implicit measures. Indeed, the racial attitudes, as measured by IAT, shifted only after reading a pro-Black scenario with self-involvement in which participants were asked to imagine themselves as victims (Scenario 1 and Scenario 2). This shift was transient as shown by the fact that the IAT effects evaluated after 1 week in the follow-up session were significantly different from those measured in the post-scenario session. Evaluative instructions were not critical to produce a shift of implicit measures. We observed a shift of IAT effects also when evaluative instructions were not included in the scenario (Scenario 2).

The ANOVA revealed other effects that we report without further discussion in Appendix B, because they are not relevant to the hypothesis.

Discussion

The main purpose of the present research was to test whether the self-involvement in a counter-stereotypical message could influence the shift of implicit measures. To this aim, we conducted an experiment in which participants completed an IAT to assess racial attitudes both before and after reading racial counter-stereotypical scenarios in which the self-involvement was manipulated. Results showed that the pro-White attitudes shifted after reading a counter-stereotypical scenario in which participants were asked to imagine themselves as victims of an assault as opposed to simply imagine an assault to a person. This shift was not determined by evaluative instructions and it was transient as it was no longer present after 1 week.

To the best of our knowledge this is the first study showing that, similar to the case of explicit measures (e.g., Bizer & Krosnick, 2001; Burnkrant & Unnava, 1989; Petty & Cacioppo, 1979; for a review and meta-analysis, see Johnson & Eagly, 1989), also shifts in implicit measures, such as the IAT, are influenced by self-involvement. What are the mechanisms underlying this shift? Although, the present study was not specifically designed to address this point, we can offer some speculations. Previous results (Briñol, Petty, & McCaslin, 2009; Horcajo et al., 2010) showed that the amount of processing of a message has a strong influence on implicit measures. Studies in persuasion research have shown that the self-involvement is a motivational factor that instigates more thorough processing of persuasive messages (e.g., Chaiken, 1980; Johnson & Eagly, 1989; Petty & Cacioppo, 1979, 1981). Thus, one possible explanation for the results of the present study is that self-involvement induced in the participants a more thorough processing of the scenario which, in turn, determined a shift in IAT effects only in scenarios with self-involvement.

An additional outcome of the present study concerns the role of evaluative instructions. We found that evaluative instructions were not critical in determining a shift of implicit measures. Indeed, we observed a significant shift

of the IAT effects also in a scenario (Scenario 2) that included self-involvement *but not* evaluative instructions. This result further suggests that self-involvement, instead of a more salient association between racial categories and evaluative dimensions, is the critical factor in producing a shift of IAT effects. This conclusion is also in line with the lack of shift of IAT effects in a scenario (Scenario 3) containing evaluative instruction but not self-involvement.

The present study also extends previous research on the persistence over time of shifting of IAT effects by Dasgupta and Greenwald (2001), which reported that shift in attitudes still persisted in a follow-up session 24 hr after the intervention. Here, no shift in attitudes was found in a follow-up session that took place 7 days after intervention. Taken together, these results suggest that shifts in IAT effects are transient. They might be still found after 1 day but they tend to vanish with a time course of few days.

Even if it goes beyond the goal of this study, an interesting point is whether the shift in IAT effects found here is indicative of a real change of attitudes or not (Han, Czellar, Olson, & Fazio, 2010). It is in itself difficult to understand, because previous studies have also reported cases in which implicit measures are modulated by attitudes-independent influences (e.g., Blanton, Jaccard, Gonzales, & Christie, 2006; Bluemke & Fiedler, 2009; Czellar & Fazio, 2008; Deutsch & Gawronski, 2009; Fiedler, Messner, & Bluemke, 2006; Gonsalkorale, Allen, Sherman, & Klauer, 2010; Rothenmund & Wentura, 2004). For these reasons, no definitive conclusion can be drawn on whether present experimental results indicate a mere change of the measure itself or a real change of attitudes.

In summary, the present study shows that self-involvement is a critical factor in shifting implicit measures such as the IAT. Similar influences of the self-involvement had been previously reported in the case of explicit measures. Thus an interesting line of research could be to test how shifts produced by self-involvement in the two types of measures are related to each other. In particular, from the perspective of the associative-propositional evaluation model (APE model; Gawronski & Bodenhausen, 2006, 2007; Sritharan & Gawronski, 2010), shifts of implicit measures by processing a counter-stereotypical message with self-involvement may be mediated by shifts in explicit measures. Further studies, that include both explicit and implicit measures, are needed to address this point.

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Appendix A

Exemplary Scenario (English Translation)²

Imagine that **you are (a boy/girl is)** in Milan. It is 3 in the morning, **you have (he/she has)** just spent the evening in various bars and nightclubs downtown, and **you are (he/she is)** on your way home. All of a sudden, a car approaches menacingly.

You realize (The boy/girl realizes) that the driver, a White/Black man in his forties, means **you (he/she)** harm, so **you start (he/she starts)** running to get away.

It is useless – the car runs into **you (him/her)**.

The White/Black man gets out, puts **you (the boy/girl)** into the car, and takes **you (him/her)** to a secluded area.

You are (The boy/girl is) terrified. Alone in the hands of **your (his/her)** attacker, **you try (he/she tries)** to escape. **You open (He/She opens)** the door of the car and start(s) to run through the isolated countryside, yelling for help. The White/Black man, armed with a baseball bat, follows **you (him/her)**. When he catches up with **you (him/her)**, he hits **you (him/her)** brutally. **You lose (He/She loses)** consciousness.

A Black/White man who lives nearby and is on his way home fortunately realizes that **you are (the boy/girl is)** in danger and immediately calls the police. He gets out of his car and yells at the White/Black man to let you go. The attacker then lifts **you (the boy/girl)** off the ground, trying to drag **you (him/her)** back into the car. The Black/White man decides to confront the White/Black man and runs into him. A violent fight breaks out, in which the

Black/White man manages to get the upper hand and keeps the White/Black man trapped until the police arrive to put an end to **your (the boy/girl's)** nightmare.

The policemen handcuff the White/Black man, who has previous charges, and take him into the station. **You are (The boy/girl is)** accompanied to the hospital where the doctors repair three broken vertebrae and a broken pelvis.

Imagine that the following task is a tutoring program that is supposed to establish firmly in people's minds these associations: White = Bad, Black = Good /Black = Bad, White = Good.

When performing the task, please try to keep this scenario in mind.

Appendix B

Supplementary Results

The factor session was significant, $F(2, 150) = 33.05$, $p < .001$, $\eta_p^2 = .31$. More specifically the D index in the post-scenario session was smaller than in both the pre-scenario (0.54 vs. 0.90; $MD = -0.37$, $SE = .05$, $p < .001$, $CI = [-0.49, -0.25]$) and follow-up session (0.54 vs. 0.73; $MD = -0.19$, $SE = .50$, $p < .001$, $CI = [-0.30, -0.08]$). In addition, the D index in the pre-scenario session differed from the follow-up (0.90 vs. 0.73; $MD = 0.18$, $SE = .04$, $p < .001$, $CI = [0.08, 0.27]$). The factor condition, $F(1, 75) = 1.60$, $p = .21$, $\eta_p^2 = .02$ and scenario, $F(3, 75) = 0.24$, $p = .87$, $\eta_p^2 = .01$, did not reach significance.

² The bold text indicates the different alternatives used to manipulate the self-involvement. The bold text outside parentheses was used in the scenarios with self-involvement (Scenario 1 and 2), while the bold text inside parentheses was used in the scenarios without self-involvement (Scenario 3 and 4). Italic text denotes the evaluative instructions that were present only in Scenario 1 and 3. Underlined text indicates the two alternatives used in the pro-Black and pro-White condition, respectively. More precisely, the text on the left of the “/” was used in the pro-Black condition, while the text on the right of the “/” was used in the pro-White condition.

The interaction between session and condition was significant, $F(2, 150) = 18.85, p < .001, \eta_p^2 = .20$. The average D index differed in the three sessions for both conditions (pro-Black: $F(2, 80) = 28.73, p < .001, \eta_p^2 = .42$; pro-White: $F(2, 82) = 4.72, p < .05, \eta_p^2 = .10$). In the pro-Black condition, the D index in the post-scenario session was smaller than in both the pre-scenario (0.33 vs. 0.92; $MD = -0.60, SE = .10, p < .001, CI = [-0.84, -0.35]$) and follow-up session (0.33 vs. 0.76; $MD = -0.43, SE = .08, p < .001, CI = [-0.63, -0.22]$). In addition, the D index in the pre-scenario session differed from the follow-up (0.92 vs. 0.76; $MD = 0.17, SE = .06, p < .05, CI = [0.02, 0.31]$). By contrast in the pro-white condition, the D index differed only between the pre-scenario and follow-up session (0.88 vs. 0.70; $MD = 0.18, SE = .05, p < .01, CI = [0.04, 0.31]$). The D index in the post-scenario was not significantly different than in the pre-scenario (0.75 vs. 0.88; $MD = -0.13, SE = .06, p = .13, CI = [-0.28, 0.03]$) and follow-up session (0.75 vs. 0.70; $MD = 0.05, SE = .06, p = 1.00, CI = [-0.11, 0.21]$).

We also found a significant interaction between session and scenario, $F(6, 150) = 2.41, p < .05, \eta_p^2 = .09$. To study this effect we conducted four one-way ANOVAs, one for each level of the factor scenario. This analysis revealed a main effect of the factor session in Scenario 1: $F(2, 36) = 6.68, p < .01, \eta_p^2 = .27$; Scenario 2: $F(2, 46) = 8.99, p < .001, \eta_p^2 = .28$; and Scenario 3:

$F(2, 38) = 6.41, p < .01, \eta_p^2 = .25$. We found no effect of the factor session in Scenario 4: $F(2, 38) = 3.02, p = .06, \eta_p^2 = .14$. Post hoc analyses revealed that in Scenario 1 the D index in the post-scenario session was significantly different than in the pre-scenario (0.45 vs. 1.00; $MD = -0.55, SE = .19, p < .05, CI = [-1.05, -0.04]$) but not in the follow-up session (0.45 vs. 0.83; $MD = -0.38, SE = .16, p = .09, CI = [-0.80, 0.04]$). No significant difference between pre-scenario and follow-up session was found (1.00 vs. 0.83; $MD = 0.17, SE = .09, p = .27, CI = [-0.08, 0.41]$). In Scenario 2 the D index in the post-scenario session was significantly smaller than in the pre-scenario (0.47 vs. 0.85; $MD = -0.39, SE = .11, p < .01, CI = [-0.66, -0.12]$) and follow-up session (0.47 vs. 0.73; $MD = -0.27, SE = .10, p < .05, CI = [-0.53, -0.01]$). No significant difference between pre-scenario and follow-up session was found (0.85 vs. 0.73; $MD = 0.12, SE = .07, p = .33, CI = [-0.06, 0.31]$). In Scenario 3 the D index in the pre-scenario session was significantly different than in the post-scenario (0.88 vs. 0.58; $MD = 0.30, SE = .08, p < .01, CI = [0.08, 0.51]$) and follow-up session (0.88 vs. 0.63; $MD = 0.25, SE = .08, p < .05, CI = [0.04, 0.46]$). We found no significant difference between the post-scenario and follow-up session (0.58 vs. 0.63; $MD = -0.05, SE = .11, p = 1.00, CI = [-0.32, 0.23]$).