



Implicit attitudes and road safety behaviors. The helmet-use case



Rubén D. Ledesma^{a,*}, Jeremías Tosi^b, Fernando M. Poó^a, Silvana A. Montes^a,
Soledad S. López^a

^a Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET) and Universidad Nacional de Mar del Plata, Funes 3350, Mar del Plata 7600, Argentina

^b Universidad Nacional de Mar del Plata, Funes 3350, Mar del Plata 7600, Argentina

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ABSTRACT

We studied the role of implicit attitudes on road safety behaviors. We also explored the methodological benefits of using implicit measures to complement conventional self-reporting instruments. The results suggest that: (a) implicit attitudes are capable of predicting observed differences in the use of protective devices (helmet use); (b) implicit attitudes correlate with the emotional component of the explicit attitudes (e.g., perception of comfort–discomfort), but appear to be independent of the more cognitive components (e.g., perceived benefits); (c) the emotional component of the explicit attitudes appears to be the major predictor of behavior; and (d) implicit measures seem to be more robust against social desirability biases, while explicit measures are more sensitive to such bias. We conclude that indirect and automatic measures serve as an important complement to conventional direct measures (self-reports) because they provide information on psychological processes that are qualitatively different (implicit) and can also be more robust when it comes to response bias.

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1. Introduction

Research on risk behaviors have increasingly included automatic tasks to measure implicit attitudes and to complement conventional methods assessing explicit attitudes (e.g., questionnaires and attitude scales) (Fernandes et al., 2006; Houben et al., 2010; Glock et al., 2014). There are two important reasons for this. First, implicit and explicit attitudes represent differential psychological processes (Gawronski and Bodenhausen, 2011), each one of which may contribute to explain risky and/or protective behaviors. Second, while explicit measures are sensitive to response bias (Briñol et al., 2001), implicit measures provide more robust estimations because subjects are unable to manipulate or voluntarily adjust their responses. Thus, implicit measures may be able to overcome some of the intrinsic problems of traditional explicit techniques that have been the object of criticism in the field of road safety (e.g., af Whalberg, 2010).

This paper focuses on implicit attitudes toward road-safety measures, particularly helmet use. It seeks to show the methodological possibilities of a particular automatic measure, the Implicit Association Test (IAT, Greenwald et al., 1998), and contribute to a

better understanding of the role of implicit and explicit processes on road behavior. This first section is organized as follows. First, we will provide a brief theoretical framework on implicit attitudes. Second, we will describe the IAT as a paradigmatic case of an implicit attitudes measure, and discuss its use in a number of traffic psychology studies. Lastly, we will provide a justification for the present study and state its hypothesis and objectives.

1.1. Distinction between explicit and implicit systems

Studies establishing the distinction between explicit and implicit attitudes are based on concepts and methods derived from dual-process models (Gawronski and Bodenhausen, 2011). These models share the idea that human behavior is determined by two cognitive systems that are qualitatively different but capable of interacting (Strack and Deutsch, 2004; Fazio, 2007). On the one hand, there exists an explicit system based on processes that are controllable, rational and based on rules. And on the other, an implicit system that operates through processes that are more automatized and speedier, and that can occur without conscious awareness. From this perspective, two types of attitudes can be distinguished. On the one hand, we have explicit attitudes that are associated with propositional processes that allow for the construction of deliberate and conscious evaluative judgments on a given object (Gawronski and Bodenhausen, 2006). These types of attitudes can be measured with conventional self-reporting

* Corresponding author.

E-mail addresses: rdledesma@conicet.gov.ar (R.D. Ledesma), jeremiasnosi@gmail.com (J. Tosi).

techniques, such as questionnaires and Likert scales. On the other hand, we have implicit attitudes that are based more on associative processes and that imply the automatic and spontaneous activation of evaluations that are not necessarily conscious for the subject (Gawronski and Bodenhausen, 2011). Measuring implicit attitudes requires special instruments that automatically activate such “associations” while not permitting the subject to control his or her performance on the task. The IAT is one such implicit attitude measure (Greenwald et al., 1998), and there are others as well, such as semantic priming, evaluative priming, go–no-go association task, affect misattribution procedure and the Stroop task (Blair et al., 2015).

It is important to note that on occasion the two types of attitudes can enter into conflict, each pushing the subject to take a different course of action. In such circumstances, the subject’s behavior depends on which of the two processes is strong enough to impose itself on the other (Deutsch and Strack, 2006; Strack and Deutsch, 2004). Some theorists maintain that the implicit system tends to prevail due to its impulsivity and because it is oriented in the present (e.g., Epstein et al., 1996). Others, however, suggest that the determining factor is the opportunity to control the behavior in question (Fazio and Towles-Schwen, 1999; Strack and Deutsch, 2004). The great debate around this point has revived research on attitudes and its possible applications.

Another point of debate revolves around the nature and degree of relationship between explicit and implicit measures. Although early research indicated low to non-existent correlations between the two types of measures, later studies demonstrated that high correlations could be attained (Hofmann et al., 2005), suggesting that there might exist factors that act as moderators in this relationship (Nosek, 2007). Some theorists have proposed interesting explanations as to how explicit and implicit processes might interact (Whitfield and Jordan, 2009), but additional empirical research is still needed.

1.2. The Implicit Association Test (IAT)

The IAT (Greenwald et al., 1998) is the most widely used measure in the evaluation of implicit attitudes. This instrument was initially developed to evaluate social prejudice, but it has been adapted to measure other constructs (self-concept, attitudes, etc.) and areas of behavior (Greenwald et al., 2009). In the IAT, stimuli representing four categories (e.g., helmet use, helmet non-use, good and bad) must be sorted as quickly as possible under two sets of instructions. Under the first set of instructions, items identified as “helmet use” and “good” are to be categorized through a predetermined response (e.g., typing “E” on a computer keyboard) and items identified as “helmet non-use” and “bad” are to be categorized through an alternative response (e.g., typing “I” on a computer keyboard). Under the second set of instructions, items identified as “helmet non-use” and “good” are to be categorized through the predetermined response (e.g., typing “E” on a computer keyboard) and items identified as “helmet use” and “bad” are to be categorized through the alternative response (e.g., typing “I” on a computer keyboard). The difference in response time under one set of instructions and the other is considered indicative of the associative strength between the objects and the evaluations. A quicker response time when “helmet-use” is paired with “good” and “helmet non-use” is paired with “bad” is considered indicative of a preference for helmet use (or of a “positive implicit attitude” toward this safety device).

Previous studies provide evidence in support of this simple procedure as a means of evaluating implicit attitudes. The IAT has shown adequate levels of internal consistency (from .70 to .90, Nosek et al., 2007), and in general it is more reliable than other measures of this type (Bar-Anan and Nosek, 2014). This is

important considering that response-time-based measures tend to be less reliable when compared to other psychometric measures. In terms of evidence of the IAT’s validity, a meta-analysis by Greenwald et al. (2009) revealed several interesting points. According to the authors, IAT scores are able to predict social behavior in various areas, from political preference to attitudes on drug use. They also suggest that the IAT tends to show better predictive validity than self-reporting instruments in areas considered socially “sensitive” (e.g., racial prejudice). In these cases, both methods tend to be poorly related. On the other hand, in areas less sensitive (e.g., consumer preferences), the IAT and self-reporting techniques seem to generate more convergent results, and explicit measures tend to show greater predictive validity.

If we consider the IAT’s convergent validity with other implicit measures, the evidence is not as clear because significant correlations between the IAT and other tasks have not been found (Olson and Fazio, 2003). This is typically attributed to measures reliability problems, which attenuates the correlation between the different techniques (Nosek et al., 2007). It has also been said that the low correlations may be due to differences in the cognitive processes involved by the various measures, and consequently in the constructs they measure. Certainly, some authors point out the need to not only improve the reliability of implicit measures, but also to clarify their conceptual basis (Spence, 2005). What is clear is that of all these measures, the IAT has generated the greatest volume of research in terms of its internal validity. Among other things, researchers have looked at the possible effect of familiarity of stimulus items, order of combined tasks, previous experience with the IAT, intertrial interval duration, fakeability, etc. (Nosek et al., 2007). Variations of the IAT have also been suggested to overcome some of its possible limitations. For instance, some consider it is too long, and a shorter version has been proposed. Additionally, there has been debate on whether the IAT really measures personal evaluations rather than extrapersonal associations, and this has led to a proposed variant called the personalized IAT. However, there is less evidence of validity for these proposed variants and, in the majority of cases, less reliability (Teige-Mocigemba et al., 2010). To sum up, the IAT is the most widely used measure of implicit attitudes, and its measurement properties have been the most studied.

1.3. The Implicit Association Test in road safety research

Previous studies have used the IAT to explore attitudes toward risky driving behaviors. Fernandes et al. (2006) evaluated implicit attitudes toward several behaviors (i.e., speeding, drunk driving, driving while fatigued and driving while not wearing a seat belt) and their relationship with explicit measures based on the Health Belief Model (e.g., severity and perceived susceptibility, barriers and perceived benefits). The results varied substantially by the type of behavior analyzed, but low to null correlations between the IAT and the explicit measures were generally observed. A problem we observed in this study is the manner in which the researchers defined the verbal stimuli used in the IAT to refer to risk behaviors. For example, when evaluating “drunk driving” behavior, the stimuli used included “irresponsible” and “dangerous.” Not only are these stimuli not specific to the behavior being evaluated (object of the attitude), they also have a negative connotation in and of themselves. The authors themselves admit this is an issue; in our opinion, it poses a significant construct validity problem.

Another important study involving the IAT was undertaken by Hatfield et al. (2008). They used the IAT to evaluate attitudes toward speeding, together with self-reporting measures (attitudes and behaviors related to speeding) and performance measures using a driving simulator. The IAT was positively correlated with a “Feeling thermometer” and with semantic differential item

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