

Review

Are “implicit” attitudes unconscious? ☆

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**Abstract**

A widespread assumption in recent research on attitudes is that self-reported (explicit) evaluations reflect conscious attitudes, whereas indirectly assessed (implicit) evaluations reflect unconscious attitudes. The present article reviews the available evidence regarding unconscious features of indirectly assessed “implicit” attitudes. Distinguishing between three different aspects of attitudes, we conclude that (a) people sometimes lack conscious awareness of the origin of their attitudes, but that lack of source awareness is not a distinguishing feature of indirectly assessed versus self-reported attitudes, (b) there is no evidence that people lack conscious awareness of indirectly assessed attitudes per se, and (c) there is evidence showing that, under some conditions, indirectly assessed (but not self-reported) attitudes influence other psychological processes outside of conscious awareness. Implications for the concept of “implicit attitudes” are discussed.

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**1. Introduction**

Over the last decade, a new class of indirect attitude measures has become increasingly popular in many areas of psychological research (for reviews, see Fazio & Olson, 2003; Petty, Fazio, & Briñol, *in press*; Wittenbrink & Schwarz, *in press*). In contrast to the direct assessment of evaluations with standard self-report measures,<sup>1</sup> evaluations with indirect measures are inferred from performance on paradigms adapted from cognitive psychology, such as sequential priming (see Neely, 1977) and response compatibility tasks

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<sup>1</sup> Following the standard terminology in research contrasting “explicit” and “implicit” attitudes, we use the term “self-report” to refer to measures that imply an evaluative judgment of the target object (e.g., likeability ratings, semantic differentials, feeling thermometers, and standardized attitude questionnaires).

(see Kornblum, Hasbroucq, & Osman, 1990). The most well-known examples of these measures are the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998) and the affective priming task (Fazio, Sanbonmatsu, Powell, & Kardes, 1986). Other examples include semantic priming tasks (Wittenbrink, Judd, & Park, 1997), the Go/No-Go Association Task (GNAT; Nosek & Banaji, 2001), and the Extrinsic Affective Simon Task (EAST; De Houwer, 2003). To date, these measures have been applied in virtually every area of psychological research, including social psychology (e.g., Hugenberg & Bodenhausen, 2003), clinical psychology (e.g., Teachman, Gregg, & Woody, 2001), consumer psychology (e.g., Maison, Greenwald, & Bruin, 2004), health psychology (e.g., Wiers, Van Woerden, Smulders, & De Jong, 2002), life-span psychology (e.g., Hummert, Gartska, O'Brien, Greenwald, & Mellott, 2002), personality psychology (e.g., Asendorpf, Banse, & Mücke, 2002), developmental psychology (e.g., Baron & Banaji, *in press*), and neuropsychology (e.g., Phelps et al., 2000).

A widespread assumption underlying the application of indirect measures is that they provide access to unconscious mental associations that are difficult to assess with standard self-report measures (e.g., Bacchus, Baldwin, & Packer, 2004; Banaji, 2001; Bosson, Swann, & Pennebaker, 2000; Brunstein & Schmitt, 2004; Cunningham, Nezlek, & Banaji, 2004; Greenwald & Banaji, 1995; Jost, Pelham, & Carvallo, 2002; Phelps et al., 2000; Rudman, Greenwald, Mellott, & Schwartz, 1999; Spalding & Hardin, 1999; Teachman et al., 2001; Wilson, 2002). Specifically, it is often argued that self-reported (explicit) evaluations reflect conscious attitudes, whereas indirectly assessed (implicit) evaluations reflect unconscious attitudes. This notion is widely shared now, such that it is rarely subjected to empirical scrutiny.

In the present article, we propose that whether the new class of indirect measures reflects unconscious attitudes should be treated as an empirical question, rather than as a methodological dictum. In addition, we argue that, in the context of attitudes, the term “unconscious” can refer to at least three different aspects of an attitude (see Bargh, 1994). Specifically, the term “unconscious” can refer to (a) people’s awareness of the origin of a particular attitude (*source awareness*), (b) to people’s awareness of the attitude itself (*content awareness*), or (c) to the influence this attitude has on other psychological processes (*impact awareness*). Thus, before using the term “unconscious” when discussing the nature of indirectly assessed attitudes, it is important to state (a) which particular aspect of an attitude is claimed to be unconscious, and (b) whether there is empirical evidence that confirms (or disconfirms) this claim.

The main goal of the present article was to review the available evidence as to whether the aforementioned characteristics of indirectly assessed attitudes are indeed unconscious. For this purpose, we first specify to which different aspects the term “unconscious” can refer, and then review the available evidence that speaks to the present question.

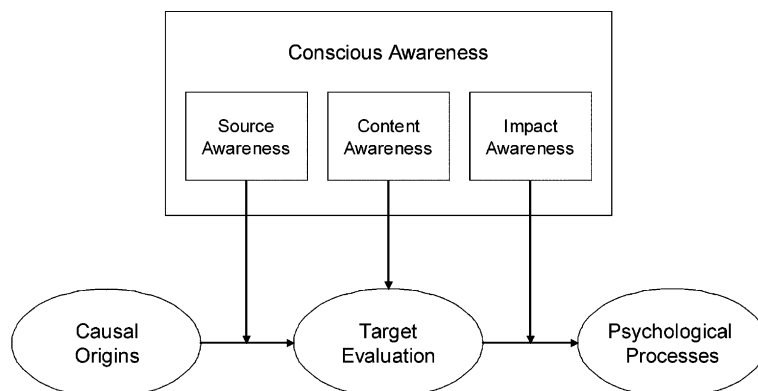


Fig. 1. Three potentially unconscious aspects of indirectly assessed attitudes.

## 2. Three unconscious aspects of attitudes

As outlined above, there are at least three different aspects of an attitude that could be unconscious (see Fig. 1). First, an individual may or may not be consciously aware of the causal origin of a given attitude (*source awareness*). Second, an individual may or may not be consciously aware of the attitude itself (*content awareness*). Third, an individual may or may not be consciously aware of the influence a given attitude has on other psychological processes (*impact awareness*).<sup>2</sup>

With regard to *source awareness*, previous research has demonstrated that people often lack conscious awareness of the causes of their attitudes. Research on the mere exposure effect (Zajonc, 1968), for example, has repeatedly shown that prior exposure to an object can enhance self-reported liking of that object (for a meta-analysis, see Bornstein, 1989). Most importantly, participants in these studies were generally unaware that prior exposure influenced their attitudes (e.g., Kunst-Wilson & Zajonc, 1980). In other words, they showed increased liking for the object in question even though they did not know *why* they liked it. Other examples of lack of source awareness include studies on introspection. Wilson and colleagues argued that people often have no introspective access to the causes of their attitudes (e.g., Wilson, Dunn, Kraft, & Lisle, 1989). Thus, when people are asked to indicate why they like or dislike an object, they often come up with reasons that do not match the real causes. Interestingly, if this happens before people are required to make a decision between two or more objects, these decisions often differ from those without prior introspection about reasons (e.g., Wilson & Schooler, 1991), and such changes in preference can reduce subsequent satisfaction with the decision (e.g., Wilson et al., 1993). The findings by Wilson and colleagues suggest that people often have no conscious access to the causes of their attitudes, and that introspection about the reasons for their attitudes can lead them to make ill-advised choices. Concerning indirectly assessed attitudes, it has been argued that these attitudes differ from self-reported attitudes primarily with regard to their source (e.g., Rudman, 2004), such that indirect attitude measures are particularly likely to reflect evaluations for which people lack source awareness.

With regard to *content awareness*, several researchers argued that people sometimes show positive or negative reactions toward an object without being consciously aware of their evaluative responses (e.g., Berridge & Winkielman, 2003; Wilson, 2002). In line with this assumption, it is often argued that indirect attitude measures reflect a particular class of attitudes of which people are generally unaware. For instance, a widespread assumption in research on racial prejudice is that indirect attitude measures assess unconscious negative evaluations of racial minority groups, and that these evaluations are generally inaccessible to introspection (e.g., Banaji, 2001; Cunningham et al., 2004; Jost et al., 2002; Phelps et al., 2000; Rudman et al., 1999). This conclusion is based on the finding that indirect attitude measures typically show low correlations with standard self-report measures. Hence, applied to the present analysis, one could argue that indirect measures primarily capture attitudes of which people are not consciously aware per se, which in turn should undermine people's ability to report these attitudes on standard self-report measures (Greenwald & Banaji, 1995).

With regard to *impact awareness*, several researchers have argued that people are often unaware of the influence a given attitude has on other psychological processes. Nisbett and Wilson (1977), for example, claimed that people generally lack introspective access to higher-order mental processes. Hence, if people suspect a biasing influence on their judgments or behavior, they have to rely on naive causal theories in order to correct for this influence (Strack, 1992; Wegener & Petty, 1997; Wilson & Brekke, 1994). Consistent with this assumption, Wegener and Petty showed that processes of judgmental correction often depend on the specific theory people hold about how a given factor influences their judgments (e.g., Petty & Wegener, 1993; Wegener & Petty, 1995; see also Gawronski, 2004). If this theory is accurate, judgmental correction usually reduces bias. However, if this theory is inaccurate, judgmental correction can even exacerbate bias (e.g., overcorrection, correction in the wrong direction). Finally, if people have no theory about the influence of a given factor (i.e.,

<sup>2</sup> Another possible interpretation of the term “unconscious” refers to the process of measuring an attitude (i.e., do attitudes influence performance on indirect attitude measure outside of conscious awareness?). Note, however, that this interpretation differs from the other three by referring to procedural aspects of the employed task, rather than to the construct assessed by the task (see Fazio & Olson, 2003). As such, this interpretation is not relevant for the present question of whether different aspects related to the attitude per se are unconscious.

when they are not aware that a given factor influences their judgments), there will be no judgmental correction at all. Thus, applied to the present analysis, one could argue that indirectly assessed attitudes influence other psychological processes outside of conscious awareness, thus leading to biased judgments or behavior even when people are highly motivated to control for the biasing influence of their attitudes.

It is important to note that the three dimensions of (un)awareness are to some degree logically intertwined. For example, if an individual is unaware of his or her attitude toward a given object (i.e., lack of content awareness), awareness of the origin of the attitude should be absent as well (i.e., lack of source awareness). In a similar vein, if an individual is unaware of his or her attitude toward a given object (i.e., lack of content awareness), this individual should also lack knowledge of how this attitude influences other psychological processes (i.e., lack of impact awareness). In other words, both awareness of the source and awareness of the impact of an attitude logically depend on people's awareness of the attitude itself (i.e., one cannot be aware of the source or the impact of an attitude of which one is unaware). However, the three dimensions of (un)awareness can also be independent of one another. For instance, an individual may be consciously aware of his or her positive attitude toward a Chinese ideograph, but he or she may be unaware that this attitude results from prior exposure (Zajonc, 1968). In a similar vein, an individual may be consciously aware of his or her attitude toward Black people, but he or she may be unaware of how these reactions influence the interpretation of ambiguous behavior (Gawronski, Geschke, & Banse, 2003). Thus, awareness of the attitude itself does not necessarily imply awareness of the source of this attitude, nor does awareness of the attitude itself imply awareness of the impact this attitude has on other psychological processes. In other words, even though content awareness is necessary for both source and impact awareness, it is not sufficient. Accordingly, the available evidence for unconscious aspects of indirectly assessed attitudes needs to be considered separately for each of the three different aspects (unless there is strong evidence for a lack of content awareness).

### 3. Unconscious aspects of “implicit” attitudes

As outlined above, there are three different aspects of attitudes that could be unconscious (see Fig. 1). First, an individual may or may not be consciously aware of the causal origin of a given attitude (*source awareness*). Second, an individual may or may not be consciously aware of the attitude itself (*content awareness*). Third, an individual may or may not be consciously aware of the influence a given attitude has on other psychological processes (*impact awareness*). In the remainder of this article, we review the available research as to whether indirectly assessed attitudes indeed can be characterized by each of the three unconscious features.

#### 3.1. Source awareness

From a general perspective, lack of source awareness would be indicated by the existence of an attitude for a given object with the respondent being unaware of the cause of this attitude. Evidence for this claim comes from a number of studies on evaluative conditioning. Olson and Fazio (2001), for example, developed an evaluative conditioning paradigm in which several hundred randomly presented words and images were interspersed with critical pairings of positive or negative unconditioned stimuli (US) and neutral conditioned stimuli (CS). Employing the IAT as an indirect measure of attitudes, results indicated that CS paired with positive US developed a more positive valence than CS paired with negative US. Most importantly, these effects emerged even though participants were not aware of the contingency implied by the CS–US pairings. This finding was replicated in a follow-up study using a subliminal affective priming task as the dependent measure (Olson & Fazio, 2002).

Additional evidence comes from a series of experiments by Dijksterhuis (2004). In these studies, participants were subliminally presented with the word “I” on a computer screen. Immediately after the presentation, participants were shown either a meaningful or a meaningless word, and their task was to indicate whether the word was meaningful or meaningless. For some participants, all meaningful words were positive trait words (e.g., smart, nice). In a control condition, all meaningful words referred to mundane, evaluatively neutral objects (e.g., chair). Afterwards, all participants completed an IAT designed to assess implicit self-evaluations (Greenwald & Farnham, 2000). Consistent with Olson and Fazio's (2001, 2002) findings, participants

showed more positive self-evaluations when the word “I” was repeatedly paired with positive trait words, than when it was paired with neutral words. Most importantly, this effect emerged even though the conditioning manipulation involved subliminal presentations of the word “I.” Thus, changes in participants’ self-evaluations occurred even though participants were unaware of the cause of this change.

Based on these findings, one might be tempted to conclude that people are often unaware of the causes of their attitudes, and that such kinds of attitudes can be tapped by the new class of indirect attitude measures. It is important to note, however, that lack of source awareness has also been demonstrated for self-reported (explicit) attitudes. The aforementioned research on mere exposure (Bornstein, 1989) and introspection (Wilson et al., 1989), for example, generally employed self-report measures to assess participants’ attitudes. Similarly, Lieberman, Ochsner, Gilbert, and Schacter (2001) found that choosing between two equally attractive objects can influence post-decisional attitudes toward these objects (see Brehm, 1956) even when participants have no explicit memory for their choice. Again, these findings were obtained with standard self-report measures, rather than with indirect measures. A similar conclusion can be drawn from research on the sleeper effect (Hovland, Lumsdaine, & Sheffield, 1949), showing that discrediting information about the source of a persuasive message often does not qualify the impact of this message on self-reported attitudes (for a meta-analysis, see Kumkale & Albarracín, 2004). Taken together, these results indicate that people are often unaware of the source of self-reported (explicit) attitudes.

In addition to these findings, several studies have shown that both conscious and unconscious factors can lead to corresponding effects on self-reported and indirectly assessed attitudes. Olson and Fazio (2001), for example, found corresponding effects of their evaluative conditioning manipulation on self-reported and indirectly assessed evaluations. As outlined above, participants in these studies were generally unaware of the contingency implied by US–CS pairings. In a similar vein, Gawronski, Walther, and Blank (2005) demonstrated that self-reported and indirectly assessed attitudes toward unfamiliar individuals were equally affected by verbal information about these individuals. In contrast to Olson and Fazio’s (2001) study, participants in Gawronski et al.’s (2005) study were generally aware of the source of their newly formed attitudes. Applied to the present question, these results suggest that lack of source awareness is *not* a discriminating feature of indirectly assessed in contrast to self-reported attitudes. Both self-reported and indirectly assessed attitudes may be characterized by a lack of source awareness (e.g., Olson & Fazio, 2001). In addition, awareness of the source is not limited to self-reported attitudes, but can also characterize indirectly assessed attitudes (e.g., Gawronski et al., 2005).

### 3.2. *Content awareness*

From a general perspective, lack of content awareness would be indicated by the existence of an attitude toward a given object with the respondent being unaware of the attitude itself. In the context of indirectly assessed attitudes, lack of content awareness could be inferred if participants are generally unable to report their attitudes, as assessed by indirect measures (see Greenwald, 1992; Kihlstrom, 2004). Indeed, low correlations between self-reported and indirectly assessed attitudes are often interpreted as empirical evidence for this assumption (e.g., Banaji, 2001; Cunningham et al., 2004; Jost et al., 2002; Phelps et al., 2000; Rudman et al., 1999). In contrast to this conclusion, however, there is now accumulating evidence that self-reported attitudes are systematically related to indirectly assessed attitudes (e.g., Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005; Nosek, 2005). Moreover, the relative size of the correlation between self-reported and indirectly assessed attitudes seems to depend on a variety of different variables related to basic psychological as well as methodological factors.

First, self-report measures are sometimes influenced by motivational factors that leave indirect attitude measures unaffected. As such, correlations between the two kinds of measures are often higher when the impact of motivational factors is controlled. Consistent with this assumption, several studies have shown that self-reported and indirectly assessed attitudes toward racial minority groups are positively correlated for individuals with a low motivation to control prejudiced reactions. In contrast, individuals with a high motivation to control prejudice usually show no (or negative) correlations between self-reported and indirectly assessed attitudes (e.g., Akrami & Ekehammar, 2005; Banse & Gawronski, 2003; Dunton & Fazio, 1997; Fazio, Jackson, Dunton, & Williams, 1995; Gawronski et al., 2003; Hofmann, Gschwendner, & Schmitt, 2005; Payne,



2001). In a similar vein, correlations between self-reported and indirectly assessed attitudes have been shown to increase as a function of bogus pipeline manipulations (see Jones & Sigall, 1971). In a study by Nier (2005), for example, correlations between self-reported and indirectly assessed attitudes toward African-Americans were significantly higher when participants believed that inaccurate self-reports could be detected by the experimenter. These results indicate that people are consciously aware of their attitudes as they are reflected in indirect measures, but that motivational factors can sometimes undermine the influence of these attitudes on self-report measures. If people were generally unaware of their indirectly assessed attitudes, bogus pipeline manipulations may lead to simple shifts in the *mean values* of self-reported attitudes. However, they should be unable to increase the *correlation* between self-reported and indirectly assessed attitudes.

Second, correlations between self-reported and indirectly assessed attitudes have been shown to depend on the degree of cognitive deliberation. Specifically, it seems that enhanced deliberation in the course of reporting one's attitudes can reduce the relation between self-reported and indirectly assessed evaluations. Consistent with this assumption, a meta-analysis by Hofmann, Gawronski, et al. (2005) found that correlations between self-reported and indirectly assessed attitudes generally increase as a function of the spontaneity of self-reports (see also Koole, Dijksterhuis, & van Knippenberg, 2001). In a similar vein, Florack, Scarabis, and Bless (2001) demonstrated that individuals with a strong dispositional tendency to engage in cognitive deliberation (i.e., high need for cognition; see Cacioppo, Petty, Feinstein, & Jarvis, 1996) showed lower correlations between self-reported and indirectly assessed evaluations than individuals with a low tendency to engage in deliberation. Drawing on similar effects resulting from cognitive dissonance processes (e.g., Gawronski & Strack, 2004), Gawronski and Bodenhausen (2005) argued that enhanced deliberation increases the amount of additional information individuals consider for their self-reported evaluations. Hence, if this additionally considered information is inconsistent with the evaluative implication of indirectly assessed evaluations, these evaluations are sometimes rejected in order to achieve cognitive consistency, thus reducing the relation between self-reported and indirectly assessed attitudes.

Third, self-report measures may or may not correspond to indirect measures with regard to their underlying constructs. As such, correlations between the two are sometimes reduced because of mere conceptual differences. Banse, Seise, and Zerbes (2001), for example, demonstrated that indirectly assessed attitudes toward homosexuals show higher correlations with self-reported attitudes when the latter involve self-reports on affective reactions (e.g., "I feel uncomfortable nearby two men kissing each other.") than when they involve self-reports on personal opinions (e.g., "Gay men should not work with children or adolescents."). These results were corroborated in a meta-analysis by Hofmann, Gawronski, et al. (2005) showing that attitudes assessed with the IAT generally show higher correlations with affective as compared to cognitive self-report measures. In addition, Hofmann, Gawronski, et al. found that low correlations can also be due to mismatches in dimensionality. The IAT, for example, generally involves a comparison between two attitude objects, thus representing relative rather than absolute evaluations. Consequently, it is not very surprising that correlations between the IAT and explicit self-reports are generally higher when the latter involve relative rather than absolute evaluations.

Finally, indirect attitude measures often exhibit low internal consistencies (e.g., Banse, 1999; Bosson et al., 2000). Thus, their correlations to self-report measures are often attenuated by measurement error. Consistent with this assumption, several studies found that correlations between self-reported and indirectly assessed attitudes substantially increased when the impact of measurement error was controlled with latent variable analyses (e.g., Cunningham, Preacher, & Banaji, 2001; Gawronski, 2002; see also Hofmann, Gawronski, et al., 2005).

Taken together, the available evidence indicates that self-reported and indirectly assessed attitudes are systematically related. Moreover, the relative size of the correlations seems to depend on a variety of different variables, such as motivational factors, the degree of deliberation during self-report, conceptual correspondence between measures, and measurement error. These findings are in contrast to the widespread assumption that people generally have no conscious access to indirectly assessed attitudes. Rather, it seems that people are consciously aware of the attitudes assessed by indirect measures. However, whether or not these attitudes are reflected in self-report measures depends on a variety of factors pertaining to cognitive, motivational, and methodological variables.

From a critical perspective, one could argue that correlations between self-reported and indirectly assessed evaluations do not necessarily imply that people have introspective access to their attitudes. Rather, these correlations could also be due to self-perception processes that do not require any kind of introspective access (Nosek, 2005). For example, if someone was asked to estimate the attitudes of his or her best friend, it seems plausible that these estimates would be highly correlated with self-reported evaluations provided by the best friend. Such correlations, however, do not indicate that good friends have introspective access to each other's attitudes (unless one believes in the existence of ESP phenomena). Instead, these correlations are obviously due to inferences based on behavioral observations (e.g., my friend usually orders Shiraz for dinner, therefore he must like Shiraz). In the same manner, one could argue that people generally have no introspective access to their own attitudes, but infer their attitudes from observations of their personal behavior (Bem, 1967). More precisely, evaluations reflected in indirect measures may directly influence behavior, and self-reported attitudes may be based on post hoc observations of typical behavior patterns. In this case, the relation between indirectly assessed and self-reported attitudes should be indirect rather than direct, such that the impact of indirectly assessed attitudes on self-reported evaluations is mediated by observations of one's own behavior (see Baron & Kenny, 1986). Note, however, that even though this assumption can fully explain the relation between self-reported and indirectly assessed attitudes for long-standing attitudes, it is unable to explain significant correlations for newly acquired attitudes, particularly when people lack awareness of their origin. In Olson and Fazio's (2001) evaluative conditioning studies, for example, participants had no opportunity to observe their behavior before they reported their attitudes toward the conditioned stimuli. Nevertheless, self-reported and indirectly assessed attitudes showed corresponding effects with the two measures being highly correlated. Importantly, participants were generally unaware of the contingency implied by CS-US pairings, thus ruling out demand characteristics as an alternative explanation for the effects on self-reported attitudes. Thus, it seems that people do indeed have introspective access to their attitudes, as they are reflected in indirect attitude measures. However, these attitudes may not be reflected in self-reported evaluations when cognitive, motivational, or methodological factors undermine their impact on explicit self-reports.

### 3.3. *Impact awareness*

From a general perspective, lack of impact awareness would be indicated by the existence of an attitude to a given object with the respondent being unaware of how this attitude influences other psychological processes. Drawing on previous research on bias correction in social judgment (e.g., Strack & Hannover, 1996; Wegener & Petty, 1997; Wilson & Brekke, 1994), lack of impact awareness could be inferred if indirectly assessed attitudes affect a given process even when participants are both motivated and able to control this influence. This conclusion is based on the assumption that successful attempts to control a biasing influence depend on at least three necessary factors: (a) awareness of a biasing influence, (b) motivation to control for the biasing influence, and (c) sufficient cognitive capacity to control for the biasing influence. Thus, if people are unaware of a biasing influence, their judgments and behavior should be biased even when the latter two conditions are met.

Evidence for such cases comes from a study by Gawronski et al. (2003). Specifically, Gawronski et al.'s results indicate that people may be unaware of how their attitudes reflected in indirect measures can influence the interpretation of ambiguous information. In this study, German participants were asked to form an impression of either a German or a Turkish individual on the basis of evaluatively ambiguous behavior. Consistent with previous research (e.g., Darley & Gross, 1983; Duncan, 1976; Dunning & Sherman, 1997; Kunda & Sherman-Williams, 1993; Sagar & Schofield, 1980), participants evaluated the behavior more negatively when the target was Turkish than when he was German. However, this effect was moderated by indirectly assessed attitudes towards Turks as compared to Germans, such that the target's category membership influenced the interpretation of ambiguous behavior only for participants with negative attitudes toward Turkish people but not for those with neutral attitudes (see also Hugenberg & Bodenhausen, 2003). Most importantly, the influence of indirectly assessed attitudes was *not* moderated by participants' motivation to control prejudiced reactions. Instead, motivation to control prejudice affected only the relation between self-reported and

indirectly assessed attitudes toward Turkish people in general, such that self-reported and indirectly assessed attitudes were highly correlated for participants low but not for those high in motivation to control prejudice (see also Akrami & Ekehammar, 2005; Banse & Gawronski, 2003; Dunton & Fazio, 1997; Fazio et al., 1995; Hofmann, Gschwendner, et al., 2005; Payne, 2001). Self-reported attitudes had no impact on the interpretation of ambiguous behavior. Thus, given that participants were generally able to control the influence of indirectly assessed attitudes on their interpretation of ambiguous behavior (i.e., participants were not under time pressure or otherwise cognitively depleted), these results suggest that participants were unaware of the impact of indirectly assessed attitudes on their interpretation of ambiguous behavior. Hence, these attitudes influenced their behavioral interpretations irrespective of their motivation and their ability to control for this influence.

Further evidence for a lack of impact awareness comes from studies that investigated the relation between self-reported and indirectly assessed attitudes on spontaneous versus deliberate behavior (e.g., Dovidio, Kawakami, Johnson, Johnson, & Howard, 1997; Dovidio, Kawakami, & Gaertner, 2002; Fazio et al., 1995; McConnell & Leibold, 2001). From a general perspective, these studies have shown that spontaneous behavior is uniquely predicted by indirectly assessed (but not self-reported) attitudes, whereas deliberate behavior is uniquely predicted by self-reported (but not indirectly assessed) attitudes. A common explanation for these findings is that the spontaneous behavior assessed in these studies is difficult to control, and thus more likely to be influenced by automatic evaluations, such as they are reflected in indirect attitude measures. Alternatively, however, one could argue that participants are able to control at least some of these behaviors, but that they are unaware of how their indirectly assessed evaluations affect these behaviors. For example, speaking time (McConnell & Leibold, 2001) or spatial distance (Fazio et al., 1995) in interactions with Black people seem quite easy to control. However, people may be unaware of how these behaviors are affected by their indirectly assessed attitudes toward Blacks. Thus, they may not attempt to control these behaviors irrespective of their motivation and ability to do so. Moreover, these behaviors were generally unaffected by self-reported attitudes, suggesting that such unconscious influences are unique to indirectly assessed attitudes. Drawing on these findings, it seems that indirectly assessed attitudes can indeed affect other psychological processes outside of conscious awareness, and that for some processes such influences are unique to indirectly assessed attitudes.

#### 4. Discussion

The major goal of the present article was to review the available evidence pertaining to whether certain aspects of indirectly assessed “implicit” attitudes are unconscious, as is often claimed in research using indirect attitude measures (e.g., Bacchus et al., 2004; Banaji, 2001; Bosson et al., 2000; Brunstein & Schmitt, 2004; Cunningham et al., 2004; Greenwald & Banaji, 1995; Jost et al., 2002; Phelps et al., 2000; Rudman et al., 1999; Spalding & Hardin, 1999; Teachman et al., 2001; Wilson, 2002). Namely, we argued that, in the context of attitudes, the term “unconscious” can refer to at least three different aspects (see Bargh, 1994). Thus, before labeling indirectly assessed attitudes as “unconscious,” it is important to state (a) which particular aspect of attitudes is claimed to be unconscious, and (b) whether there is empirical evidence that confirms (or disconfirms) this claim. The conclusion that can be drawn from the present review is that there is indeed evidence for unconscious features of indirectly assessed attitudes. However, this evidence is equivocal, such that each of the three features has not received equal support. Specifically, our review suggests the three following conclusions:

- (1) People often lack awareness of the causal origin of their attitudes (*source awareness*). However, this seems to be true for both self-reported and indirectly assessed attitudes. Hence, lack of source awareness does not seem to be a unique feature of indirectly assessed attitudes.
- (2) It seems that people are consciously aware of their attitudes, as they are reflected in indirect attitude measures (*content awareness*). However, these attitudes are often not reflected in self-reported evaluations when cognitive, motivational, or methodological factors undermine their impact on self-report measures.



- (3) There is evidence showing that indirectly assessed attitudes can influence other psychological processes outside of conscious awareness (*implicit awareness*), and that for some processes, such influences can be unique to indirectly assessed attitudes. This conclusion can be drawn from studies showing that indirectly assessed attitudes, but not self-reported attitudes, affect a given process irrespective of participants' motivation and ability to control this influence.

These conclusions have important consequences for the interpretation of data obtained with indirect attitude measures. Specifically, we propose that researchers should be cautious in using the term “unconscious” without further differentiating which particular aspect of attitudes they consider to be unconscious. Moreover, if researchers claim that indirectly assessed attitudes indeed have unconscious features in one of the three possible meanings, it would be prudent to provide independent evidence for this claim. As outlined in the context of content awareness, null effects or low correlations are generally insufficient, because null effects can result from multiple factors. Finally, in cases where no empirical evidence can be provided, we propose that parsimony should be the prevailing principle. In such cases, it might be useful to discuss different possible interpretations of a given finding. However, restrictive discussions in terms of unconscious features should be avoided in order to circumvent misleading interpretations of the obtained results.

#### 4.1. *Are implicit attitudes repressed attitudes?*

Some researchers have argued that indirectly assessed attitudes can reflect attitudes that have been repressed into the unconscious (e.g., Wilson, Lindsey, & Schooler, 2000). For example, heterosexuals may repress erotic attraction to members of the same sex into the unconscious because of the anxiety-provoking nature of these feelings (Wilson, 2002). Even though we do not rule out the actual existence of repression phenomena, we believe that an interpretation of indirectly assessed attitudes as repressed attitudes is problematic for several reasons.

First, repressed attitudes are often considered to be unconscious in the sense that people are generally unaware of the existence of these attitudes. In terms of the present terminology, such cases would reflect a general lack of content awareness. However, the evidence reviewed in the present article suggests that such an interpretation of indirectly assessed attitudes is not supported by the available data. Rather, it seems that people are generally able to report attitudes as they are reflected in indirect measures, but that these attitudes are not reflected in self-reported evaluations when cognitive, motivational, or methodological factors undermine their impact on self-report measures.

Second, one could argue that repressed attitudes are preconscious<sup>3</sup> rather than unconscious.<sup>3</sup> That is, repressed attitudes may usually be outside of conscious awareness (i.e., the attitude is temporarily inaccessible), but under certain circumstances these attitudes may re-enter consciousness (i.e., the attitude is temporarily accessible). Moreover, indirect attitude measures may be generally affected by attitudes irrespective of whether or not these attitudes are momentarily accessible. Explicit self-report measures, in contrast, may be influenced by attitudes only when these attitudes are momentarily accessible. If this assumption is correct, repressed attitudes do not have to be conscious in order to influence performance on indirect attitude measures. However, repressed attitudes do have to be conscious in order to influence self-report measures. Even though this interpretation is consistent with the obtained variations in correlations between self-reported and indirectly assessed attitudes, an explanation in terms of preconscious (or temporarily inaccessible) attitudes remains circular unless it provides a clear specification of under which conditions repressed attitudes enter consciousness.<sup>4</sup> If such conditions cannot be specified, the proposed account is consistent with any empirical outcome, and is thus nonfalsifiable (see Popper, 1934; for a contemporary holistic definition of falsifiability,

<sup>3</sup> Our use of the terms “preconscious” and “unconscious” is based on Freud's (1953) original definitions of “unconscious” as *generally unavailable* to consciousness, and “preconscious” as *temporarily inaccessible* to consciousness.

<sup>4</sup> According to this circular explanation, low correlations between self-reported and indirectly assessed attitudes would indicate that indirectly assessed attitudes reflect repressed (or temporarily inaccessible) attitudes, and the assumption that indirectly assessed attitudes reflect repressed (or temporarily inaccessible) attitudes would be indicated by low correlations between self-reported and indirectly assessed attitudes.

see Quine & Ullian, 1978). Moreover, given that varying correlations between self-reported and indirectly assessed attitudes can be well predicted by cognitive, motivational, and methodological factors, we consider these explanations as superior compared to one in terms of preconscious or repressed attitudes.

Third, one could argue that people are consciously aware of repressed attitudes, but that these attitudes can nevertheless influence other psychological processes outside of conscious awareness. For instance, heterosexuals who experience erotic attraction to members of the same sex may generally try to suppress these feelings, but these attempts may be unsuccessful, such that they cannot change the (consciously experienced) existence of the feeling (see Strack & Deutsch, 2004; Wegner, 1994). However, their continuous attempts to suppress homosexual feelings may lead people to (incorrectly) assume that their behavior is generally unaffected by these feelings. In other words, people may be consciously aware of their suppressed homosexual feelings, but they may be unaware that these feelings influence other processes regardless of their attempts to suppress them. In the context of indirectly assessed attitudes, we believe that this interpretation is the only one that is consistent with both the available evidence and contemporary standards for scientific explanations. However, it is important to note that this interpretation strongly deviates from the original conceptualization of repressed attitudes (see Wilson & Dunn, 2004). In the original conceptualization, the term “unconscious” refers to the attitude itself (content awareness). In the present conceptualization, in contrast, the term “unconscious” refers to the processes of how an attitude influences other psychological processes (impact awareness). As such, labeling indirectly assessed attitudes as “repressed attitudes” can be misleading if researchers do not specify which particular aspect of “repressed attitudes” they consider to be unconscious.

#### 4.2. Redefining “implicit” attitudes

When specifying the constructs assessed by indirect attitude measures, many researchers refer to Greenwald and Banaji’s (1995) original definition of implicit attitudes as “introspectively unidentified (or inaccurately unidentified) traces of past experience that mediate favorable or unfavorable feeling, thought, or action toward social objects” (p. 8). This definition is often interpreted as implying lack of content awareness, such that indirectly assessed attitudes per se are unconscious. Moreover, because both source and impact awareness logically depend on content awareness (i.e., one cannot be aware of the source or impact of an attitude one is unaware of), Greenwald and Banaji’s (1995) definition includes all three aspects of unconsciousness: lack of source awareness, lack of content awareness, and lack of impact awareness. In contrast to this widespread assumption, our review suggests that the only aspect that clearly distinguishes between self-reported and indirectly assessed attitudes is lack of impact awareness.

Even though we believe that the question of what indirect attitude measures actually assess should be treated in the same empirical manner as the question of whether certain aspects of indirectly assessed attitudes are unconscious (De Houwer, *in press*), we claim that self-reported and indirectly assessed attitudes differ with regard to their underlying evaluative processes. Drawing on a central distinction in recent models of information processing (e.g., Sloman, 1996; Smith & DeCoster, 2000; Strack & Deutsch, 2004), we argue that indirectly assessed attitudes reflect associative evaluations of an attitude object, whereas self-reported attitudes reflect propositional evaluations (Gawronski & Bodenhausen, 2005; Gawronski, Strack, & Bodenhausen, *in press*). In this conceptualization, the two kinds of evaluations do not differ in terms of their (un)consciousness. Instead, associative and propositional evaluations are assumed to differ with regard to their underlying principles of information processing. Specifically, we argue that associative evaluations reflect immediate *affective reactions* to an attitude object that depend on which associations are activated spontaneously in memory. Propositional evaluations, in contrast, reflect *evaluative judgments* of an attitude object that may or may not be based on spontaneous affective reactions. Moreover, whether or not propositional evaluations are based on associative evaluations depends on (a) the evaluative implication of other information that is momentarily considered for the judgment and (b) the perceived consistency of this information with one’s spontaneous affective reaction (e.g., Gawronski & Strack, 2004). If this information is consistent with one’s spontaneous affective reaction, evaluative judgments usually reflect the evaluative quality of one’s spontaneous affective reaction. However, if this information is inconsistent with one’s spontaneous affective reaction, this reaction may be rejected as a valid basis for an evaluative judgment. For example, self-reported propositional evaluations of Coke may be based on spontaneous affective reactions to Coke, unless additional infor-

mation leads to a rejection of one's affective reaction as a valid basis for an evaluative judgment (e.g., when spontaneous positive reactions collide with negative propositional knowledge about the company). This conceptualization implies that people are consciously aware of their evaluative reactions reflected in indirect attitude measures. However, these evaluations may not be reflected in explicit self-reports when they are deliberately rejected as a valid basis for an evaluative judgment. These assumptions were recently supported by LeBel and Gawronski (2006) who found that correlations between self-reported and indirectly assessed attitudes significantly increased when participants were asked to focus on their feelings toward the attitude object in the course of making an evaluative judgment (see also Banse et al., 2001; Hofmann, Gawronski, et al., 2005). However, correlations significantly decreased when participants were asked to think about reasons why they like or dislike the attitude object (see Wilson et al., 1989). Future research employing a framework in terms of associative and propositional evaluations may help to further clarify the precise nature of self-reported and indirectly assessed attitudes.

#### 4.3. Future research

The present results also have several implications for future research. First, it seems desirable to investigate further the conditions under which self-reported and indirectly assessed attitudes are related to one another. Such investigations could provide richer insights into the processes that determine whether or not people consider indirectly assessed attitudes as a valid basis for an evaluative judgment. Previous research on this question has primarily employed an individual difference approach (e.g., Banse & Gawronski, 2003; Dunton & Fazio, 1997; Fazio et al., 1995; Florack et al., 2001; Hofmann, Gschwendner, et al., 2005). However, such investigations are ambiguous with regard to *causal* mechanisms. Thus, experimental studies that systematically manipulate the proposed motivational and cognitive moderators may provide a better empirical understanding (e.g., Gawronski & Strack, 2004; LeBel & Gawronski, 2006; Nier, 2005). Most importantly, experimentally induced variations in correlations between self-reported and indirectly assessed attitudes can be expected only under the assumption that people are consciously aware of indirectly assessed attitudes. If indirectly assessed attitudes are generally unconscious, experimental manipulations of this kind should leave the relation between self-reported and indirectly assessed attitudes unaffected.

A question that speaks directly to this point concerns changes in self-reported and indirectly assessed attitudes. Originally, indirect attitude measures were assumed to tap stable evaluative representations stemming from long-term socialization experiences (e.g., Dovidio, Kawakami, & Beach, 2001; Greenwald & Banaji, 1995; Rudman, 2004; Wilson et al., 2000). Challenging this assumption, however, recent research has shown that indirect attitude measures are highly sensitive to contextual influences (for a review, Blair, 2002). Moreover, previous research on attitude change has obtained a variety of different patterns, including changes in self-reported but not indirectly assessed attitudes (e.g., Gawronski & Strack, 2004), changes in indirectly assessed but not self-reported attitudes (e.g., Karpinski & Hilton, 2001), and corresponding changes in both self-reported and indirectly assessed attitudes (e.g., Olson & Fazio, 2001). However, the specific conditions of these patterns are still not sufficiently well understood. Accordingly, studies investigating the conditions under which self-reported attitudes are based on indirectly assessed attitudes could also provide deeper insights into the conditions of different patterns of attitude change (see Gawronski & Bodenhausen, 2005).

Finally, one question that remains is whether the observed impact of indirectly assessed attitudes on non-verbal behavior (e.g., Dovidio et al., 1997, 2002; Fazio et al., 1995; McConnell & Leibold, 2001) is due to a lack of impact awareness or to a general inability to control these behaviors. For instance, some of the behaviors that have previously been labeled as uncontrollable may be affected by indirectly assessed attitudes simply because people are unaware of this influence. Thus, people may not attempt to control for the influence of indirectly assessed attitudes even when they are motivated and able to do so (Strack & Hannover, 1996; Wegener & Petty, 1997; Wilson & Brekke, 1994). Alternatively, one could argue that controlling multiple aspects of one's behavior requires more self-regulatory capacity than people usually have available. That is, people may be generally aware of the behavioral impact of their indirectly assessed attitudes and they may in principle be able to control for this influence. However, indirectly assessed attitudes may still influence certain aspects of people's behavior when their capacity is insufficient to control for multiple simultaneous influences (see also Hofmann, Rauch, & Gawronski, 2005).

## 5. Conclusion

In summary, our review suggests that (a) people may lack awareness of the origin of their attitudes, but that source awareness is not a distinguishing feature of self-reported versus indirectly assessed attitudes, (b) there is no empirical evidence that people lack conscious awareness of indirectly assessed attitudes per se, and (c) there is at least some evidence showing that indirectly assessed (but not self-reported) attitudes can influence other psychological processes outside of conscious awareness. Drawing on these findings, we argue that the term “unconscious” is adequate for indirectly assessed attitudes only with regard to one particular aspect: impact awareness. However, the term “unconscious” is inadequate when it is assumed to imply lack of source awareness or lack of content awareness.

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