

Explicit and Implicit Beliefs, Attitudes, and Intentions

*The Role of Conscious and Unconscious Processes
in Human Behavior*

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Willful acts are familiar experiences in daily life. Having pancakes for breakfast, making a doctor's appointment, and watching the evening news on television are perceived as volitional behaviors, the result of deliberate decisions or intentions. Consistent with this intuition, many contemporary models in social psychology incorporate the assumption that intentions are the proximal antecedent of human social behavior. In the present chapter we consider the nature and origins of behavioral intentions, the explicit and implicit beliefs and attitudes on which they are based, as well as their causal effects on behavior.

REASONED ACTION

It is well recognized that people can be fully aware of only a small fraction of the many stimuli vying for attention at any given moment and of the vast amount of information stored in memory. However, attention can shift, and information can be recalled as needed to deal with the task at hand. The mechanisms underlying these processes lie largely outside conscious awareness; we only become aware of the resulting mental contents and states. When weighing whether to go on a diet, for example, dormant beliefs and feelings associated with dieting can become accessible to conscious awareness, prompt deliberation, and influence the decision. Description of the ways in which

explicit beliefs and attitudes influence intentions and actions is the domain of “reasoned action” models (see Fishbein & Ajzen, 2010); among them are social cognitive theory (Bandura, 1986, 1997), the theory of subjective culture and interpersonal relations (Triandis, 1972), the health belief model (Rosenstock, Strecher, & Becker, 1994), goal-setting theory (Locke & Latham, 1994), the information-motivation-behavioral skills model (Fisher & Fisher, 1992), and the technology acceptance model (Davis, 1989). Prominent among these models is the theory of planned behavior (Ajzen, 1991, 2012), which is discussed in some detail later in the chapter.

As the term implies, the hallmark of reasoned action models is their reliance on explicit beliefs and attitudes as the basis of behavioral intentions leading to action. These models emphasize the controlled aspects of human information processing and decision-making. Their concern is primarily with behaviors that are goal-directed and steered by conscious self-regulatory processes. In reasoned action models, behavioral intention is conceptualized as a *predictive process* that precedes reasoned action, rather than a *post-dictive inference* that occurs after an action has already occurred. In this regard, behavioral intention is better aligned with the Comparator Model (Blakemore & Frith, 2003; Blakemore, Wolpert, & Frith, 2002) than Wegner and colleagues’ (e.g., Wegner & Wheatley, 1999) post hoc inference account of mental causation and behavior. According to the Comparator Model, the experience of agency over one’s action (intention to act) arises from internal motor representations that *precede* the action. A mental representation of the sensory consequences of one’s action is generated prior to the action, which is compared with the actual sensory state after the action has been initiated. If the actual sensory state matches the predicted one, it is understood to be self-caused. If there is a mismatch, the action is understood to be externally caused.

Complementing the reasoned action approach, a great deal of research in recent years has focused on implicit cognitions and their effects on behavior. The general theorizing behind this line of work is the proposition that dormant beliefs, attitudes, intentions, and other constructs of this kind can be activated while still remaining below conscious awareness, and that these implicit reactions can have observable effects on judgments and actions. Consistent with this idea, research has shown that behavioral intentions measured indirectly, using physiological measures, occur well before individuals become consciously aware of their intentions and are able to self-report the desire to act (e.g., Libet, Gleason, Wright, & Pearl, 1983). We consider this type of evidence and its implications after discussing the role of conscious intentions as determinants of behavior.

THEORY OF PLANNED BEHAVIOR

In this chapter, we are primarily concerned with volitional, goal-directed behaviors. Physical activity to improve health and fitness, recycling to protect the environment, wearing a seatbelt for increased safety, using condoms to prevent sexually transmitted diseases, and so forth, are voluntary in nature, involving a measure of deliberation and planning—at least when first contemplated. Neither inborn reflexes nor unattended aspects of behavior (e.g., facial expressions, hand gestures, seating distance, speed of walking) are, in this sense, goal-directed or volitional and are therefore of secondary interest for our purposes. Like other reasoned action models, the theory of planned behavior (TPB) (Ajzen, 1991, 2012) posits that the *intention* to engage in a certain behavior is the proximal antecedent of voluntary action. It can be defined as a behavioral disposition (Campbell, 1963), or a readiness to act in a certain way under appropriate circumstances. Intentions vary in their degree of generality or specificity. At the lowest level of generality are intentions to engage in a particular action in a given context and time frame. The intention to get a flu shot at the local pharmacy next Tuesday on the way home from work is an example of a very specific intention. Much less detailed in terms of context and time is the general intention to get a flu shot. Whether general or specific, once formed, the intention can be automatically activated by internal or external cues and thus prompt performance of the relevant behavior (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Troetschel, 2001; Gollwitzer, 1993). When applying the theory of planned behavior, it is assumed that implicit or dormant intentions are accessible in memory, can be brought into conscious awareness, and thus can be measured by means of self-reports.

As we discuss later in this chapter, many factors can influence the predictive validity of measured intentions. One of these factors is incorporated in the TPB in that the causal effect of intention is said to depend on the degree to which an individual has control over performance of the behavior. Given sufficient control, people are expected to carry out their intentions as the opportunity presents itself. When measures of actual control are unavailable, perceived behavioral control can serve as a proxy to the extent that perceptions of control accurately reflect actual control.

According to the TPB, formation of an intention to engage (or not engage) in a given behavior is said to follow from three kinds of considerations. The first are beliefs about the likely consequences of the behavior, termed “behavioral beliefs.” Depending on the subjective value of these consequences, behavioral beliefs lead to the formation of a positive or negative attitude toward performance of the behavior. The second consideration is normative in nature. Beliefs as to what important others expect us to do or

are themselves doing (normative beliefs), together with the motivation to comply with the normative referents, produce perceived social pressure, or a subjective norm, to engage or not to engage in the behavior under consideration. Finally, individuals are assumed to consider the presence of factors that can facilitate or inhibit performance of the behavior, such as needed skills and opportunities, time and money, cooperation by others, and so on. These control beliefs, together with the perceived power of the control factors to facilitate or interfere with behavioral performance, are assumed to produce an overall level of perceived control, or what Bandura (1986, 1997) has called "self-efficacy." In the TPB, attitudes, subjective norms, and perceptions of control are postulated jointly to influence intentions, their relative importance varying as a function of the behavior and the population of interest.

Empirical support for the theory of planned behavior comes from tests of the model in a great variety of behavioral domains. Meta-analyses of research findings have confirmed that indexes composed of behavioral, normative, and control beliefs correlate, as expected, with direct (e.g., semantic differential) measures of attitudes, subjective norms, and perceptions of control; and these variables account for a great deal of the variance in intentions (see Fishbein & Ajzen, 2010, for a review). Moreover, properly operationalized intentions are generally found to be good predictors of behavior (Sheeran, 2002) and, confirming their causal effects, a meta-analysis of 47 behavior-change interventions (Webb & Sheeran, 2006) showed that experimentally induced changes in intentions (mean $d = 0.66$) are followed by corresponding changes in later behavior, albeit of smaller magnitude (mean $d = 0.36$).

THE NATURE OF REASONED ACTION

The TPB's focus on controlled aspects of human behavior should not be taken to mean, however, that people are assumed to be rational. A rational decision-making process would involve careful review and unbiased evaluation of all available information relevant to the decision, and dispassionate use of this information to arrive at the best possible decision consistent with formal rules of logic. The account provided by the theory of planned behavior differs in important respects from this construal.

Information-Processing Continuum

To start, there is no assumption in the TPB that individuals systematically assemble and impartially process all relevant information whenever they are contemplating performance of a behavior. Instead, consistent with popular

dual-mode processing approaches (see Carver & Scheier, 1998; Chaiken & Trope, 1999; Petty & Cacioppo, 1986), the extent to which people process information prior to forming an intention is assumed to depend on their motivation and cognitive capacity, varying along a continuum from shallow to deep (see Ajzen & Sexton, 1999). The intention to engage in a behavior is likely to be preceded by deliberate review and consideration of available information to the extent that the behavior is of importance and has rarely been performed before. Buying a home, getting married, joining the military, and quitting one's job are examples of what are, for most people, important, infrequent decisions. For decisions of this kind, individuals will, according to the TPB, consider the likely consequences of the behavior, the normative expectations of significant others, and the availability of requisite resources, as well as possible impediments to performance of the behavior. In contrast, such everyday behaviors as brushing one's teeth, taking a shower, going to work, or reading the morning newspaper are assumed to become routine and to be performed without much prior deliberation. Attitudes, subjective norms, perceptions of control, and intentions are assumed to guide these kinds of behaviors with little awareness and deliberation; these attitudinal and normative influences on behavior are often considered implicit or automatic.

Cognitive Heuristics, Errors and Biases

In the theory of planned behavior, beliefs are the building blocks for the formation of attitudes toward a behavior, subjective norms, the perceptions of behavioral control, and ultimately behavioral intentions. They represent the information that people have in relation to the behavior under consideration. More often than not, our beliefs reflect reality reasonably well (Jussim, 2012). This could hardly be otherwise, for if they did not, we would not have survived as a species. However, people do not act like intuitive scientists in the way they arrive at their beliefs or draw inferences from them; indeed, their cognitive shortcomings are well documented. Use of cognitive heuristics can produce systematic errors of judgment, and motivational biases can lead to the formation of unrealistic or even delusional beliefs (see Fiske & Taylor, 1991; Ajzen, 1983; Nisbett & Ross, 1980; Tversky & Kahneman, 1974). A staggering number of cognitive and motivational biases have been identified over the years: acquiescence bias, false consensus, in-group bias, just world hypothesis, self-serving bias, unrealistic optimism, expectancy bias, illusory correlation, hindsight bias, and many more (see Jussim, 2012).

There is nothing in the TPB to contradict these observations. The theory makes no assumptions about the ways in which beliefs are formed, or about

the objectivity or veridicality of those beliefs. All it stipulates is that people's intentions and behaviors take account of, and are consistent with, their beliefs, no matter how the beliefs originated. It is in this sense of internal consistency, and only in this sense, that behavior is considered to be reasoned.

HABITS AND AUTOMATICITY

As noted earlier, behaviors enacted frequently in the same context can become routine and no longer require a conscious decision to be enacted. Further, after sufficient practice, some behaviors are performed automatically without much conscious awareness. A good example is fastening one's seatbelt before or after starting the car. However, behaviors of interest to psychologists are rarely such simple unitary acts that can easily habituate. Consider, for example, eating at a restaurant. This common event typically involves a sequence of decisions and actions, such as picking a day and time, selecting a restaurant, making a reservation, walking or driving to the restaurant, waiting to be seated, placing the order, and eating, paying, and leaving the restaurant. Some aspects of this familiar behavioral script (Abelson, 1981), perhaps waiting to be seated, require little cognitive effort. Others, however, demand more mindful attention. Before placing their orders, people usually review the menu and take note of any specials offered; and before paying, they generally calculate an appropriate tip to leave for the waiter. These aspects of the script require some measure of awareness and conscious decision-making. It is doubtful, therefore, that even relatively common human behaviors can be described as purely automatic, performed without any conscious awareness or intention. Even when intentions fall below the level of awareness and become implicit, routine behaviors should still be consistent with the original intentions. Consider, for example, two individuals, one regularly taking the bus to work, the other invariably driving a car. Once habituated through repetition, these two individuals do not need to consciously bring to mind their beliefs, attitudes, and intentions to prompt the usual behavior. However, there is no reason to assume that the behavioral choices of these two individuals will be inconsistent with their implicit intentions. If asked, they could, with minimal cognitive effort, retrieve their beliefs, attitudes, and intentions, and it is very likely that the first individual would indicate an intention to take the bus to work, while the second would report an intention to go by car.

Yet some investigators (e.g., Aarts & Dijksterhuis, 2000; Gollwitzer, 1999; Neal, Wood, & Quinn, 2006; Ouellette & Wood, 1998; Verplanken & Aarts, 1999) have proposed that once a behavior has habituated (after being performed repeatedly in the same context), it comes under the direct control of internal or external cues that activate the behavior automatically. As a result,

intentions are assumed to become increasingly irrelevant as a behavior habituates. This reasoning led to the hypothesis that intentions predict relatively novel or unfamiliar behaviors, or when circumstances have changed, but that their predictive validity is less for behaviors that have become routine and when the context remains unchanged.

However, empirical evidence does not seem to support this hypothesis. Ouellette and Wood (1998) and Sheeran and Sutton (unpublished research) performed meta-analyses of studies across different behavioral domains, classifying each behavior as one that can be performed frequently (e.g., using a seatbelt, drinking coffee) or infrequently (e.g., getting a flu shot, donating blood). Habituation was considered to be more likely for the former than the latter behaviors. To be sure, the relative contribution of frequency of past behavioral performance to the prediction of future behavior was found to be greater for high- than for low-opportunity behaviors. This finding reflects the effect of habituation. However, the correlation between intention and future behavior remained about the same, showing that the predictive validity of intentions is undiminished as we go from low- to high-opportunity behaviors. Indeed, contrary to the habit hypothesis, in the meta-analyses of Ouellette and Wood and of Sheeran and Sutton, prediction of high-opportunity behaviors from explicit measures of intention was about as accurate as prediction of low-opportunity behaviors (mean $r = .59$ and $r = .67$, respectively, in Ouellette and Wood's meta-analyses [difference not significant] and mean $r = .51$ and $r = .53$ in the Sheeran and Sutton analysis).

Nor is there evidence to support the related hypothesis that, independent of frequency of performance, intentions are better predictors of behaviors that are performed in an unstable as opposed to a stable context; the predictive validity of intentions was found to be approximately the same in both contexts (Ouellette & Wood, 1998) or, contrary to the habit hypothesis, somewhat better in stable contexts (Sheeran & Sutton, unpublished study; see Fishbein and Ajzen 2010, pp. 51–53, for a discussion). These findings suggest that even when people have had many opportunities to perform a behavior in a stable context, intentions—even if they have become implicit in the moment—can be brought to mind, explicitly reported, and retain their predictive validity.

THE INTENTION-BEHAVIOR GAP

It is well known that people do not necessarily act in accordance with their expressed intentions. The observation that intentions are not always carried out has a long history. It is captured in such adages as “it's easier said than done”

or “the road to hell is paved with good intentions,” and it was documented very early in empirical research on the attitude-behavior relation (e.g., LaPiere, 1934; Linn, 1965). With respect to health-related behaviors, Sheeran (2002) reported that among individuals who express an intention to use condoms, to get a cancer screening, or to exercise, only about 50% actually do so. Similarly, as noted earlier, experimentally induced large changes in intentions are followed by much smaller changes in behavior (Webb & Sheeran, 2006). Findings of this kind have led Sheeran, Gollwitzer, and Bargh (2013) to conclude that conscious processes are insufficient to explain health-related behaviors, and that the gap between intentions and behavior could be due to unconscious processes.

While the role of unconscious processes in human behavior is undeniable, and is discussed in greater detail later in this chapter, it is also the case that observed discrepancies between conscious intentions and actions can be due to many reasons other than unconscious influences on behavior. For example, expressed intentions may be biased by self-presentation concerns, as when people profess that they will go on a diet to lose weight, quit smoking, or hire workers with disabilities without actually intending to do so. But even when honestly expressed, people may fail to carry out their intentions for any number of reasons, articulated in the following.

Forgetting

A person may truly intend to return a book on time to the library, yet may forget to do so. Research suggests that such failures of “prospective memory” are more likely when specific aspects of intentions, such as where, when, and how to carry out the behavior, are not encoded in memory, or when one or more of these situational cues is absent (see Brandimante, Einstein, & McDaniel, 1996). These conclusions are consistent with findings that people are more likely to act on their intentions if they form a specific plan (Schifter & Ajzen, 1985) or “implementation intention” (Gollwitzer, 1999; Sheeran & Orbell, 2000) as to where, when, and how they will carry out their intentions.

Instability of Intentions

Clearly, people are free to change their intentions. It stands to reason that if changes in intentions occur after they have been assessed but prior to observation of the behavior, predictive validity will suffer. Indirect support comes from research in which the time interval between measurement of intention and observation of behavior was taken as a proxy for change in intentions—with the passage of time, an increasing number of events can cause intentions to change. Consistent with this line of reasoning, meta-analyses of research in

different behavioral domains have shown that the correlation between intentions and behavior tends to decline with the passage of time (Albarracín, Johnson, Fishbein, & Muellerleile, 2001; Randall & Wolff, 1994; Sheeran & Orbell, 1998).

Perhaps less obvious, people may differ in the extent to which their intentions are stable over time (even when the time interval is held constant). Russell Fazio and his associates (Fazio, 1990; Fazio & Zanna, 1978) have demonstrated the importance of attitude strength, indicated by response latency, as a moderator of the attitude-behavior relation. Compared to weak attitudes, strong attitudes—produced by direct experience or repeated expression of the attitude (Fazio & Zanna, 1981; M. C. Powell & Fazio, 1984)—are more stable over time, more resistant to persuasion, and better predictors of behavior (see Krosnick & Petty, 1995). Just as attitudes vary in strength, so too do intentions. Strong intentions, as measured by fast response latencies, tend to be more stable (Doll & Ajzen, 1992). We would therefore expect that people who have formed strong, stable intentions are more likely to act in accordance with those intentions than are people with relatively unstable intentions.

In their research on the temporal stability of behavioral intentions, Conner, Sheeran, and their associates (Conner, Sheeran, Norman, & Armitage, 2000; Sheeran, Orbell, & Trafimow, 1999) asked participants to express their intentions on two separate occasions. Responses to the second intention measure were used to predict subsequent behavior. Supporting the moderating role of intention stability, in both investigations the correlation between intentions and behavior was found to be significantly stronger among participants with relatively stable, as opposed to unstable, intentions.

Conflicting Intentions

People sometimes intend to attain goals that are in conflict with each other. In those instances, assessing their intentions to achieve one goal but not assessing intentions associated with the other goal can produce relatively low-intention behavior correlations. An interesting case in point comes from a program of research on dieting to lose weight (Stroebe, van Koningsbruggen, Papies, & Aarts, 2013). As is well known, most people fail to adhere to an intended diet and thus fail to lose weight or, after initial success, regain their weight in short order (Mann et al., 2007; Powell, Calvin, & Calvin, 2007). To explain the failure of weight-loss intentions to result in actual weight loss, Stroebe and his associates proposed a goal-conflict model of eating behavior. The two conflicting intentions in the model are the intention to control one's weight and the intention to enjoy one's food. According to this model, dieters often encounter enticing food cues that prime their intention to enjoy their food, produce

preferential processing of palatable food stimuli, and inhibit cognitive activation of the competing intention to control their weight.

Lack of Control

As noted in the description of the theory of planned behavior, intentions are expected to lead to the corresponding behavior only to the extent that people have sufficient behavioral control. Lack of requisite resources, such as knowledge, physical stamina, time, and money, as well as unanticipated obstacles or lack of needed cooperation by others, can prevent people from acting on their intentions (see Ajzen, 2005, for a discussion of internal and external control factors).

We are unaware of studies that have examined the effect of objective control factors on the predictive validity of intentions. However, as noted in the description of the TPB, perceived behavioral control is often used as a proxy for actual control under the assumption that perceptions of control reflect actual control reasonably well. We therefore expect good intention-behavior correspondence only when perceived control is relatively high. Support for this proposition comes from research regarding the effect of self-efficacy beliefs (i.e., perceived behavioral control) on behavior, in particular studies in which self-efficacy was experimentally manipulated (see Bandura and Locke, 2003, for a review). In these studies, people who intended to perform a behavior of interest, or to achieve a certain goal, and who were led to believe that they had a high level of efficacy, that is, that they had control over performance of the behavior or over the attainment of the goal, were more likely to act on their intentions than were people who were led to believe that their level of control was low. The former were more likely to persevere and to work harder at a task and, thus, they were more likely to obtain a desired outcome.

In a study of restrained eating, Papies, Stroebe, and Aarts (2008) provided evidence for the effect of perceived control on the ability of dieting intentions to predict eating behavior. Their data showed that, among people with a weight-loss goal, intentions to avoid pizza, chocolate, French fries, cookies, and chips predicted actual avoidance of these foods much better when the participants had a high ($r = .90$) as compared to a low ($r = .27$) level of perceived control over losing weight¹ (see also Schifter & Ajzen, 1985).

Context Incongruity

One final issue to be discussed in relation to the intention-behavior gap has to do with belief accessibility. According to the TPB, intentions and behavior are, in the final analysis, based on readily accessible behavioral, normative,

and control beliefs. However, contextual factors can have strong effects on the number and kind of beliefs that become readily accessible in the moment (Eitam & Higgins, 2010; Gold, 1993; Schuman & Presser, 1981; Schwarz, 1999). Furthermore, intentions are normally assessed in a hypothetical context that differs considerably from the real context in which behavior is observed. It follows that the behavioral, normative, and control beliefs that are accessible when intentions are assessed by referencing a hypothetical situation may well differ from the beliefs that become accessible when the behavior is to be performed in a real situation. We can expect strong intention-behavior correlations only when the hypothetical and real contexts activate the same beliefs, or beliefs of equivalent valence, in relation to the behavior of interest (Ajzen & Sexton, 1999).

LaPiere's (1934) well-known study on the attitude-behavior relation was designed to demonstrate the discrepancy between attitude expression in a hypothetical context and the constraints of a real situation. Responses to a (hypothetical) inquiry by LaPiere indicated that "members of the Chinese race" would not be accepted at restaurants, hotels, and inns across the United States, but in prior visits to the same establishments, a Chinese couple of considerable means experienced no such discrimination in reality. It is likely that the hypothetical context activated beliefs about members of the "Chinese race" that, at that time, differed considerably from the beliefs activated in the presence of a real Chinese couple who appeared affluent, well spoken, and well dressed. A similar conclusion was reached by Linn (1965) in a study of racial attitudes and behavior in which female participants were first asked to indicate their readiness (intention) to permit use of their photograph with a black man in support of efforts at racial integration, followed by a request to actually provide their signed permission. In post-experimental interviews, participants indicated that when confronted with the actual decision to sign releases of their photographs, beliefs had come to mind that had not been activated when they had earlier considered this issue in a hypothetical context.

Direct support for the hypothesis that the antecedents of intentions in the TPB can differ in hypothetical compared to real behavioral contexts comes from a study on willingness to pay for a public good (Ajzen, Brown, & Carvajal, 2004). In one part of the study, students in small groups were asked to vote on a referendum to contribute \$8 to a university scholarship fund. In one ballot, they were told that the vote was hypothetical: that even if the majority voted in favor, they would not actually have to pay the money, but that they should vote as if it were real. In a second ballot, they were led to believe that everybody actually would have to pay \$8 into the fund if the majority voted yes. As is usually found in studies of this kind, a much larger percentage voted in favor of the referendum in the hypothetical situation (70%) than in the real situation (41%),

a discrepancy known as “hypothetical bias” (e.g., Blumenschein, Johannesson, Blomquist, Liljas, & O’Connor, 1998). Prior to casting their votes, the same participants had completed a TPB questionnaire with respect to voting in favor of the referendum. As expected, attitudes, subjective norms, perceptions of control, and intentions regarding a “yes” vote were significantly more favorable in the hypothetical than in the real voting context.

To mitigate this hypothetical bias, a corrective entreaty was introduced in a second part of the study, which exhorted participants in the hypothetical condition to examine carefully how they would vote if it were real and to consider other possible uses of the money. Following this entreaty, attitudes, subjective norms, perceptions of control, and intentions in the hypothetical situation were no more favorable than in the real situation, and the hypothetical bias disappeared: participants were no more likely to vote “yes” on the referendum in the hypothetical than in the real context.

INTERNAL AND EXTERNAL CUES AFFECTING BEHAVIOR

People’s beliefs are based on information obtained from many different sources: direct experience with the object of the belief; information conveyed by parents, teachers, and friends; exposure to books, newspapers, and mass media; and so forth. In addition, people often draw far-reaching inferences that go beyond the basic information provided by direct experience or external sources (see Fishbein & Ajzen, 2010, for a discussion). As we shall see in the following, some of these beliefs are acquired without awareness, and in other cases their origins are lost to memory. Moreover, just as people can be unaware of the source of their beliefs and attitudes, so too can they be unaware of internal or situational cues that activate their beliefs and attitudes.

Attentional Bias

Research has shown that people preferentially attend to motivationally significant stimuli, and that this attentional bias can influence behavior. As noted earlier, compared to unrestrained eaters, people on a diet to lose weight are more likely to attend to attractive food items following exposure to food cues, and this attentional bias reduces their ability to adhere to their diets (Papies, Stroebe, & Aarts, 2009). Similarly, alcohol consumption was found to be predicted from alcohol-related attentional bias (Fadardi & Cox, 2008), and physical activity was shown to correlate with greater attention to exercise-related stimuli (Calitria, Lowe, Eves, & Bennett, 2009). Shifts in attentional bias are assumed to occur automatically, outside awareness. These studies are therefore

interpreted as evidence that unconscious motivational processes exert their influence by directing attention preferentially to certain kinds of cues, and these cues in turn automatically activate the behavior (see Eitam & Higgins, 2010; Sheeran et al., 2013).

However, one study in this line of research (Calitria et al., 2009) has shown that attentional bias, even if outside awareness, does not affect behavior automatically. The investigators in this study assessed attention to exercise cues and also participants' implicit and explicit attitudes toward exercising. The relation between attention to exercise cues and self-reported physical activity was found to be moderated by participants' explicit attitudes toward exercising, such that higher attentional bias toward exercise cues was associated with higher levels of physical activity only for participants who had positive explicit attitudes toward exercising. This finding suggests that biased attention to certain stimuli increases the likelihood of relevant behavior only if the attention is associated with approach-oriented motivation in relation to the behavior (but see Eitam & Higgins, 2010, for a different interpretation).

Unconscious Activation of Goals and Behaviors

Research has demonstrated that unconscious activation of attitudes and beliefs about social groups and other psychological constructs (e.g., the elderly, African Americans, rudeness, silence) can produce construct-relevant behavior (Aarts & Dijksterhuis, 2003; Bargh, Chen, & Burrows, 1996). Similarly, activation of goals (e.g., achievement) without conscious awareness can motivate goal pursuit (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Troetschel, 2001; Hassin, Aarts, Eitam, Custers, & Kleiman, 2009; Kruglanski et al., 2002). For example, participants primed with stereotypes of the elderly subsequently walked more slowly compared to others who were not primed with elderly stereotypes, and participants primed with the concept of rudeness were more likely to interrupt the experimenter than participants primed with the concept of politeness (Bargh et al., 1996). Similarly, priming the concept of silence induced participants to speak softly, and priming the concept of exclusivity increased the likelihood that participants would remove crumbs after eating a biscuit (Aarts & Dijksterhuis, 2003). Finally, unconscious priming of an achievement goal improved subsequent performance on a word-search task (Bargh et al., 2001).

Findings such as these are typically attributed to automatic enactment of behavior made accessible by priming a behavior-relevant construct (ideomotor expression; see Stock & Stock, 2004). The question, however, is whether or not these construct-to-behavior effects really occur without mediation

by implicit or explicit cognitions. Several theoretical articles have questioned the assumption of automatic behavior activation (see Blair, 2002; Eitam & Higgins, 2010; Loersch & Payne, 2011), and empirical research provides evidence of cognitive mediation linking unconscious goal activation to behavior. For example, according to Cesario, Plaks, and Higgins (2006), priming a construct activates implicit preparatory responses, such as implicit attitudes, and these implicit responses mediate the effect of the prime on behavior. Consistent with this proposition, they found, as in previous research, that priming the elderly stereotype slowed walking speed, but only for participants with positive implicit attitudes toward the elderly; it increased walking speed for participants with negative implicit attitudes. Also inconsistent with the assumption of automatic activation of behavior as a result of goal priming, Klein et al. (2012) reported an experimenter expectancy effect in the experimental paradigm involving elderly stereotypes. Participants primed with the stereotype of the elderly were found to reduce their speed of walking only when experimenters expected them to do so, but not when experimenters expected them to increase their walking speed. This suggests that participants were sensitive to cues associated with the experimenters' expectations, and that these perceptions mediated the effect of the prime on behavior.

THE QUESTION OF AWARENESS

Relying on the theory of planned behavior, we have, up to this point, dealt primarily with the role of conscious beliefs, attitudes, and intentions, even though we have acknowledged that, in the case of well-rehearsed behaviors, these variables can become implicit and can be automatically activated without much conscious effort. However, in the latter part of the twentieth century, research began to focus on the possibility that people may acquire and hold beliefs and attitudes outside awareness, and that these beliefs and attitudes may have powerful effects on their intentions and actions. This type of theorizing, which complements the TPB and extends beyond it, was initially prompted by the cognitive revolution in psychology that resulted in the development of new theories and methods of measuring implicit memory (Jacoby, 1991; Roediger & McDermott, 1993; Schacter, 1987) and semantic associations (Meyer & Schvanaveldt, 1971; Neely, 1977; and Posner & Snyder, 2004). These cognitive theories and methods were adapted by social psychologists to investigate implicit social cognition (for more on the history of implicit social cognition see Banaji, 2001; Bazerman & Banaji, 2004; Greenwald et al., 2002).

ATTITUDES AND BELIEFS FORMED AND EXPRESSED WITHOUT AWARENESS

Because implicit attitudes and beliefs are conceptualized as spontaneous mental associations, they are typically measured using techniques that bypass respondents' deliberation and introspection. These techniques do not ask individuals to self-report their attitudes and beliefs, but instead rely on the speed or accuracy of their responses to different categories of stimuli, with the goal of capturing underlying associations indirectly (Gawronski & Payne, 2010). In comparison, explicit measures, such as those used to assess the constructs in the TPB, rely on participants' responses to direct questions about their beliefs, attitudes, and intentions in the form of self-reports on multiple-choice items, feeling thermometers, semantic-differential scales, or structured interviews. A burgeoning body of empirical evidence confirms the existence of implicit beliefs and attitudes in addition to explicit beliefs and attitudes (Cunningham, Preacher, & Banaji, 2001; Hofmann, Gschwendner, Nosek, & Schmitt, 2005; Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005; Nosek, 2005; Nosek & Smyth, 2007).

Most theoretical models consider implicit and explicit attitudes to be two correlated but conceptually distinct systems of psychological processing (Epstein, 1991; Gawronski & Bodenhausen, 2006; Greenwald & Banaji, 1995; Greenwald et al., 2002; Kahneman & Frederick, 2005; Sloman, 1996; Strack & Deutsch, 2004; but see Keren & Schul, 2009). Information processing in the controlled system is relatively effortful and slow, relying on symbolic representations and reasoning. The processes described in the theory of planned behavior fall squarely within this mode of operation. Information processing in the spontaneous system is relatively fast and effortless, characterized by associative connections and broad generalizations.

As a case in point, one model—the Associative-Propositional Evaluation (APE) model—contends that attitudes arise from two different processes, one associative and the other propositional in nature (Gawronski & Bodenhausen, 2006). Associative processes—the primary basis of implicit attitudes and beliefs—are simple, spontaneous reactions that occur in response to a stimulus based on a previously learned association between that stimulus and an attribute (which may be a trait or simply a good/bad evaluation). These stimulus-attribute associations are often learned because they co-occurred in time and the co-occurrence is repeated with some frequency. Several experiments have shown that attitudes and beliefs can be learned automatically when an object and an attribute are repeatedly paired with each other, consistent with classical conditioning principles (e.g., Krosnick, Betz, Jussim, & Lynn, 1992; Olson & Fazio, 2001; Seger, 1994; Staats & Staats, 1958). In some studies,

these repeated pairings involve subliminal presentations where the perceiver is not consciously aware of the pairings but nevertheless learns the attitude or belief as a result of such exposure (Rydell et al., 2006; Zajonc, 1980).

Once learned, the presentation of the stimulus automatically activates the associated attribute or evaluation. These automatic activations can occur outside awareness and require little cognitive capacity. Importantly, the likelihood of an association being activated is independent of its perceived "truth value," that is, associations can be activated even when the person considers them invalid (but see Eitam & Higgins, 2010). For example, a spontaneous negative attitude may pop into mind when a perceiver sees someone who is African American, even if the perceiver consciously rejects that negative attitude (Devine, 1989; Nosek, Banaji & Greenwald, 2002).

However, when people are asked directly about their attitudes toward African Americans, the APE model proposes that an entirely different process is set in motion (Gawronski & Bodenhausen, 2006). In this case, people engage in deliberative inferential processes similar to those described in the TPB by considering information that they regard as relevant to their racial attitudes and beliefs. This information may reflect specific exemplars of the group African Americans (e.g., "I like President Obama"); it may also include other considerations, such as one's values (e.g., "I should judge people as individuals, not based on their race") or self-presentational concerns (e.g., "I don't want other people to think I am racist"). People might even consider information based on their spontaneous reactions if they are aware of them (e.g., "I sometimes feel uncomfortable around Black people"). The most important aspect of the explicit inferential process is a determination of which thoughts and feelings are considered valid and which are considered invalid for the judgment at hand. The end result is an explicit attitude or belief based on a set of information that the individual considers valid. As implied in the foregoing example, a determination that one's spontaneous reactions are invalid will lead to the exclusion of these reactions from the explicit attitude report, resulting in a discrepancy between the implicit and explicit attitude measures. However, when one's spontaneous reaction is consistent with other information one considers valid, that reaction will be integrated into the explicit attitude, and there is a higher likelihood that implicit and explicit attitude measures will correspond. In sum, explicit attitudes result from considering various pieces of information that come to mind, weighing them against each other, and creating consistency among them. Implicit attitude is one piece of information that plays a variable role in this process. Its effects depend on individuals' awareness of it and whether they consider it a valid piece of information to include in their explicit attitude reports.

WHEN DO IMPLICIT BELIEFS AND ATTITUDES PREDICT BEHAVIOR?

In the past 15 years, implicit attitudes and beliefs regarding a wide variety of objects have been the focus of study. They include implicit attitudes and beliefs about social groups (race, gender, age, sexual orientation, political parties), political candidates, academic disciplines, consumer products, food, controlled substances (alcohol, drugs, tobacco), clinical disorders, and self-concept (personality, relationship style, self-esteem). These implicit attitudes and beliefs have been associated with various decisions and behaviors, including interpersonal behavior and judgments, employment decisions, political choices, academic behavior, consumer choices, use of controlled substances, clinical behavior, medical diagnoses, and other health behaviors (for reviews see Blair, Dasgupta, & Glaser, 2014; Dasgupta, 2004; Greenwald et al., 2009; Jost et al., 2009). A recent meta-analysis of 122 research reports (184 independent samples) revealed that in many cases both implicit and explicit responses incrementally predict behavioral outcomes controlling for the other. In a few cases, implicit attitudes and beliefs predict behavior better than their explicit counterparts, whereas in many other cases, explicit responses predict behavior better than their implicit counterparts (see Greenwald et al., 2009, Figure 2). In the following we consider the conditions under which implicit attitudes and beliefs are more (vs. less) likely to predict behavior than their explicit counterparts.

Controlled Versus Automatic Behaviors

People are aware of, and can control, many of their behaviors, but some aspects of behavior remain outside awareness or are difficult to control. In the early days of implicit social cognition research, the working hypothesis was that controllable behavior would be better predicted from explicit beliefs and attitudes, whereas automatic behavior would be better predicted from implicit beliefs and attitudes (e.g., Dovidio et al., 2002; Fazio et al., 1995; McConnell & Leibold, 2001). In these studies, for example, the data showed that implicit racial attitudes better predicted spontaneous (less controllable) nonverbal friendliness in interracial interactions, whereas explicit racial attitudes better predicted deliberate (more controllable) interracial behavior such as verbal statements. Similarly, in the health domain, some research found that clinicians' implicit racial attitudes better predicted their interpersonal behavior with Black patients (Blair et al., 2013; Cooper et al., 2012; Penner et al., 2010) than their deliberative medical decisions (Haider et al., 2011; Sabin et al., 2008; Sabin & Greenwald, 2012).

However, as this literature has grown, it has become clear that the early hypothesis is untenable. Of relevance for our present discussion, implicit attitudes and beliefs were found to predict not only spontaneous but also controlled behavior (decisions, choices, and judgments; for reviews see Dasgupta, 2004; Greenwald et al., 2009). For example, in the medical domain, one study (Green et al., 2007) found that doctors' implicit racial attitudes predicted differential medical diagnostic tests they recommended for Black compared to White patients presenting the same clinical symptoms, such that more high-quality tests were recommended for White compared to Black patients. Similarly, in employment settings, people who harbored implicit bias against racial and ethnic groups, implicit bias against obese people, and implicit gender stereotypes were less likely to hire members of the stereotyped group despite their qualifications (Agerstrom & Rooth, 2011; Rooth, 2010; Rudman & Glick, 2001; Yogeeswaran & Dasgupta, 2010). In academic settings, elementary school-teachers' implicit attitudes toward ethnic minorities were associated with their differential expectations of minority versus majority children in their classrooms (van den Bergh et al., 2010). In all these cases, the common theme is that implicit attitudes and stereotypes predicted behaviors and judgments that were clearly consciously controllable. It remains an open question as to the conditions under which implicit attitudes and beliefs will better predict behaviors that are relatively automatic compared to others that are relatively more controlled.

Cognitive Depletion

When cognitive resources are depleted, people's implicit beliefs and attitudes better predict their health-related behavior than explicit beliefs and attitudes. For example, in a series of studies, Friese, Hofmann and colleagues (Friese, Hofmann & Wanke, 2008; Hofmann & Friese, 2008) manipulated participants' cognitive resources by increasing the demands of a secondary task, depleting self-regulation resources, or increasing alcohol intake. When participants were low in resources, their consumption of potato chips, candy, or beer was better predicted by their implicit than their explicit health attitudes. When cognitive resources were not so constrained, these same behaviors were guided more by participants' explicit than their implicit attitudes. Note that in all conditions the measured behavior was exactly the same, but the ability to control one's behavior was manipulated by varying inner cognitive resources.

Social Desirability

For decades, social scientists have known that social desirability bias is a critical reason that explicit attitudes and beliefs do not always predict behavioral outcomes in socially sensitive domains. Concerns about others' perception of oneself can prevent honest self-reporting of one's attitudes and beliefs (Crosby, Bromley, & Saxe, 1980; Sigall & Page, 1971, 1972). Implicit attitude measures can help overcome social desirability biases by assessing the strength of attitudes and beliefs using tasks that bypass self-report. For example, a large meta-analysis (Greenwald et al., 2009; also see Blair et al., 2014) found that when it comes to attitudes and beliefs about racial and ethnic groups, religious groups, the elderly, and so on, people's implicit attitudes and beliefs about these groups better predict their behavior toward group members than their explicit attitudes and beliefs. Relatedly, the higher the likelihood of social desirability bias in a given attitude domain, the stronger was the relation between respondents' implicit attitudes and behavior, controlling for their explicit attitudes.

Uncertainty

Feelings of uncertainty also influence the effect of implicit attitudes on behavior. In the realm of political behavior, right before an election some voters inevitably report that they have not yet decided which political candidate to vote for. Consistent with the argument that uncertainty allows implicit attitudes to play a stronger role in behavior, Galdi and colleagues (Galdi, Arcuri, & Gawronski, 2008; Galdi et al., 2012) found that among voters who were undecided one week before an election, their ultimate vote was predicted by their implicit but not by their explicit attitudes, whereas for voters who were decided before the election, their vote was better predicted by their explicit attitudes.

Behavioral Context

Implicit stereotypic beliefs appear to predict people's behavior when the social context activates a relevant stereotype. For example, Yogeewaran and Dasgupta (2010) found that people who harbored an implicit stereotype that *real* Americans are White were less likely to recommend hiring a non-White job candidate (specifically an Asian American) for a national security job, but this implicit stereotype did not influence hiring decisions for a virtually identical corporate job. A subsequent study confirmed that the relation between implicit stereotype about who is legitimately American and hiring bias in national security was mediated by participants' doubts about Asian

Americans' loyalty to the United States. In a conceptually similar manner, Ziegert and Hanges (2005) found that implicit racial attitudes predicted hiring discrimination only when participants had received information that suggested the company encouraged decisions based on race.

Taken together, research on implicit social cognition shows that people's judgments, decisions, and behaviors can be influenced by factors that lie outside their awareness. In many of these studies (with the possible exception of studies involving nonverbal behavior) people are clearly aware of engaging in a particular behavior, but they are unaware that their behavior is molded by implicit attitudes and beliefs. Given their awareness of the behavior, it is logical to infer that in most cases people consciously intend to engage in that particular behavior (that is, they intend to hire a new employee, provide a medical diagnosis, interact with a patient or a fellow student), but they probably do not intend that behavior to be shaped by implicit attitudes and beliefs about which they are unaware.

PRECONSCIOUS INTENTIONS

In the preceding discussion we have tried to show that implicit beliefs and attitudes can predict behavior independent of, or in combination with, explicit beliefs and attitudes. We now consider evidence for the existence of preconscious intentions to behave in a certain way (Chen & Bargh, 1999; Libet et al., 1983; Miller & Maner, 2011; Miller, Zielaskowski, Maner, & Plant, 2012; Ozono, Watabe, & Yoshikawa, 2012). In a series of studies, Libet and colleagues investigated the link between behavioral intention, awareness of one's intention, and action. They measured cortical EEG from participants while they were engaged in a task in which they moved their fingers. Participants were asked to indicate the time at which they became aware of their intention to move their fingers and compared the time-course of self-reported intentions to the observed action and to EEG signals. Results indicated that self-reported intentions consistently preceded the actual behavior by 300 ms. But more important for our purpose, participants' EEG responses showed a consistent negative potential arising from the supplementary motor area well before the self-reported intention, preceding it by 1000 ms or more. From these data Libet concluded that the brain initiates or prepares to act well before there is any reportable subjective awareness that such a decision has taken place.

In other research, preconscious intentions can be inferred by measuring the speed with which people approach or avoid stimuli. For example, Chen and Bargh (1999) asked participants to respond to positive and negative stimuli shown on a computer screen by pushing or pulling a lever. Sometimes participants were asked to pull the lever toward them for

positive stimuli and push it away for negative stimuli. For other trials, task instructions were reversed. Results showed that participants were faster at pushing the lever away from themselves than pulling it toward themselves for negative stimuli, suggesting that these stimuli activated preconscious avoidance tendencies. In contrast, participants were faster at pulling the lever toward them than pushing it away for positive stimuli, suggesting that positive stimuli activated approach tendencies. The *differential speed* of pulling versus pushing in this experiment is suggestive of approach versus avoidance intentions, respectively.

Another study illustrates that specific emotions activate theoretically meaningful preconscious intentions (Miller et al., 2012). For example, fear is known to elicit avoidance intentions. When White participants were made to feel afraid, eliciting in them the motivation to protect the self from danger, they displayed nonverbal avoidance tendencies (indicated by pushing away a lever) upon seeing faces of Black men but not White or Asian men, which was predicted given negative racial stereotypes associating Black men with danger. This differential speed of pushing responses among fearful participants in response to Black male faces as compared to White or Asian faces is suggestive of avoidance intentions. When White participants were made to feel disgusted, eliciting the motivation to protect the self from contamination, there was no race bias in avoidance tendency (Miller et al., 2012).

A large body of research has shown that a reliable indirect measure of approach and avoidance motivation involves using electroencephalography (EEG) to capture asymmetric activity in the frontal cortex (Davidson, 1992; Harmon-Jones, 2003) such that relative left-sided asymmetry is associated with approach motivation and right-sided asymmetry is associated with avoidance motivation (for a review, see Coan & Allen, 2003). For example, using EEG to measure preconscious motivations, Amodio et al. (2007) had White participants view a multiracial series of faces while their cortical EEG activity was recorded. Some participants received bogus feedback suggesting that their responses to these faces were racially biased. Participants in this condition reported elevated guilt, which is typically associated with the intention to halt a transgression (avoidance motivation) and a subsequent intention to engage in reparation (approach motivation). Results showed that elevated guilt was correlated with changes in frontal cortical asymmetry consistent with a reduction in preconscious approach motivation. When the same participants were presented with an opportunity to engage in prejudice-reducing behavior, guilt was associated with another shift in frontal cortical asymmetry, this time consistent with increased approach motivation. These results reveal the ways in which guilt elicited by an external event is associated with adaptive changes in preconscious motivation and subsequent behavior.

SUMMARY AND CONCLUSIONS

We have seen that, in accordance with the theory of planned behavior, explicit beliefs, attitudes, and intentions can account for considerable variance in behavior. However, we have also seen that a variety of factors can influence the predictive validity of intentions, among them forgetting, instability of intentions, and a discrepancy between hypothetical situations to which intentions are expressed and the real contexts in which behavior occurs. The conscious processes described in the TPB are likely to be invoked only for novel and/or important decisions, whereas routine behaviors in everyday life tend to habituate and no longer require conscious deliberation. Nevertheless, we have seen that implicit beliefs and attitudes can have strong effects on important decisions.

Complementing the reasoned action approach, theory and research on implicit social cognition start with the assumption that beliefs and attitudes are sometimes learned and expressed without people's awareness, and even when people are aware of their beliefs and attitudes, their self-reports may not be entirely honest. When this is the case, implicit beliefs and attitudes, and preconscious intentions and motivations, can add to the prediction of behavior. Furthermore, just as people may be aware or unaware of the beliefs and attitudes that guide their behavior, so too may they be aware or unaware of the factors that activate these beliefs and attitudes. Because most everyday behavior is routine, and the factors guiding it are often outside awareness, it is easy to construe it as largely automatic (Bargh & Chartrand, 1999).

Consistent with this line of reasoning, activation of constructs or goals below conscious awareness has been found to influence behavior and goal striving. However, we have tried to show that even when constructs and goals are activated outside awareness, their effects on behavior are not completely automatic but are instead mediated by implicit beliefs and attitudes that for most behaviors ultimately produce an explicit behavioral intention.

NOTE

1. We are grateful to Wolfgang Stroebe for providing us with these correlation coefficients, which were not reported in the published article.

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