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Control, Awareness, and Other Things We Might Learn to Live Without

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If you ask a person why they did something, they will give you a reason. If you ask a social psychologist why that person did something, they will give you a cause. Aside from the vexation of ordinary people trying to talk to social psychologists at dinner parties, this explanatory gap reveals something about why social psychologists have always been drawn to the automatic and the unconscious. This is in part because social psychology's emphasis on the situational causes of behavior lends itself to explaining in terms of mechanisms rather than reasons. In an influential chapter, Wegner and Bargh (1998) noted that many of the classic experiments in social psychology implied automatic influences of the situation. Milgram's (1963) obedience studies, Festinger and Carlsmith's (1959) dissonance study, Asch's (1952) work on conformity, and Schacter and Singer's (1962) studies of emotion all demonstrated influences of which participants were apparently not aware, and which would disappear if participants became aware of them.

To these observations we can add that the deeply counter-intuitive nature of many social psychology findings (both classic and contemporary) tends to focus our explanations on the automatic and the unconscious. When I tell my undergraduate students for the first time about all of the effects a simple priming stimulus can have on people's perceptions and behavior, they look at me like they are waiting for the punch line.

They simply can't imagine, they say, that these experimental participants would be influenced that way. A reasonable enough response, if we were talking about reasons. When people imagine how participants would behave, they are really imagining how they themselves would behave. And when they imagine how they would behave, they are telling a story about how reasonable people ought to behave (Nisbett & Wilson, 1977).

The fact that the causes of behavior sometimes have little to do with reasons for behaving forces us to look elsewhere for explanations. The more counter-intuitive a finding is, the more likely its explanation is to be found in automatic mental mechanisms whose operation is invisible to introspection. And so, social cognition researchers, even more than social psychologists at large, tend to favor automatic explanations as they seek to identify mental mechanisms. To explain the profound effects of subtle cues in the situation by relying only on reasons alone would be too unbelievable, even for the participants themselves.

This chapter concerns what social cognition has learned about automatic and unconscious processes. It is about what we are learning to live without, in two senses. First, it is about how we have learned to explain behavior in many cases without the introspective, reason-based explanations that are easy to generate based on self-report methods. This is the story of explaining people's explanations, in many cases as justifications or

confabulations rather than causal factors in behavior. In a second sense, the chapter is about learning to do without the simple dualistic thinking that characterized early research on automatic thought. Although such broad distinctions as automatic/controlled, implicit/explicit, or System 1/System 2 are convenient shorthand, research over the last three decades has revealed complexities and nuances that cannot be captured by such simple distinctions. Mastering these nuances means accepting a bit more complexity in return for greater precision about how automatic and unconscious processes guide behavior, and how they relate to their opposites, control, and awareness.

The first section reviews what the field means by automatic processing. Automaticity is a hodge-podge of related ideas, rather than a simple definition or a clean dichotomy. This means that a simple duality between automatic and controlled thought is not likely to capture the range and complexity that automatic processing encompasses. This complexity sets the stage for certain confusions that have caused misunderstandings of social cognition research from time to time. The second section takes a look at how we arrived at our current ideas, by considering disparate research traditions that gave rise to distinct criteria for automaticity. Understanding these different traditions helps clarify some of those misunderstandings by placing them in a broader context. The third section draws on contemporary research to summarize six lessons about automaticity in social cognition. These lessons are rooted in the field's traditional understanding of automaticity, but they represent updates or contrasts to views that were widely held 10 or 20 years ago (and in some quarters today).

DEFINING AUTOMATICITY

The roots of automatic social cognition lie mainly in cognitive psychology research of the 1970s and 1980s. These ideas did not have a single inception, but developed in many different laboratories and were applied to many different problems at around the same time. The result is that researchers began invoking a handful of related but distinct ideas for a variety of different purposes, and only later did scholars attempt to organize them into an integrated framework. The most influential framework for thinking about automatic processes in social cognition has been Bargh's (1994) description of four criteria: Awareness, Intentionality, Controllability, and Efficiency. Automatic processes are defined as outside of awareness, lacking intentionality or controllability, and as operating efficiently.

Awareness

In Bargh's (1994) scheme, unconscious processes become a subset of automatic processes because lacking awareness of a process means that it is impossible to control it. People might be unaware of a stimulus itself, as in the case of subliminal perception. In such cases, effects of a subliminal stimulus would necessarily be automatic because if the participant is unaware that any stimulus was presented then the participant cannot be aware of its consequences; or, participants might be perfectly aware of the stimulus but unaware of its impact. Supraliminal primes, such as words embedded in puzzles, are often used to instigate effects of this kind. Participants are aware, for example, that they saw particular words in a word-search puzzle, but they are unaware that the words might have affected their perceptions or behavior (Bargh, 1992). This type of unconscious influence is especially relevant for everyday life because there are few cases outside the laboratory in which people are exposed to truly subliminal stimuli. Instead, unconscious influence in everyday life is most likely to happen because people are simply not attending to a stimulus or because they do not notice how the stimulus is affecting them.

In many cases, participants may be unaware of the effects of a stimulus because of a misattribution. If participants believe they are behaving competitively because they perceive their opponent as being competitive, then they cannot be aware that prime words are the true cause of their behavior. Because people tend to assume that the cause of their reaction is whatever is the salient focus of attention, they are vulnerable to sleights of hand, from magic tricks to priming experiments (Clore & Gasper, 2000; Higgins, 1998).

Intentionality and control

Intentionality and control are so tightly interwoven that they are best considered together. Intentionality refers to how much choice people have over initiating a process, whereas controllability refers to the ability to stop or inhibit it. A lack of intentionality is the focus of most studies in which the automatic *activation* of some idea is key. Automatic evaluation of attitude objects and automatic activation of stereotypes are common examples. Controllability typically concerns whether activated information is actually applied in judgments, decisions, or behaviors. The alternative is to exercise control over activated ideas, by correcting judgments (Martin, Seta, & Crelia, 1990; Wilson & Brekke, 1994), or making a "hard choice" to engage in more elaborate thought processes by seeking out additional information (Fiske, 1989).

Although the four criteria for automaticity are conceptually distinguishable, they often interact, which means that in ordinary life they can be difficult to separate. For example, if a psychology student is unaware that he has been exposed to a prime then he cannot intend to activate the primed thought, nor does he have any basis to attempt to stop it. In more ecologically realistic settings, if a police officer is unaware that racial stereotypes are coloring her impression that a driver looks suspicious, then she will have no reason to suspect that she needs to exert control. The proof is (apparently) evident in the driver's suspicious behavior. And so, exercising intention and control may sometimes depend on awareness. Yet in others cases, as will be discussed in more detail below, awareness may be irrelevant for intent and control, because automatic influences may be so powerful that people are unable to overcome the influence despite being aware of it and overtly attempting to curtail it.

Efficiency

One reason that people may be unable to curtail an automatic influence is because they lack the cognitive capacity to do so. When people "multitask" by trying to hold a conversation on a cell phone while driving, or watching television while studying, they are inevitably reminded of what psychologists have known for years: the human mind can be brilliant, but for only one thing at a time. Such distracting conditions highlight efficiency, the fourth criterion for automaticity. Whereas controlled processes require cognitive resources including effort, attention, and time, automatic processes are relatively impervious to these needs. The efficiency of a process is sometimes demonstrated by measuring or manipulating the speed of responses. If an effect occurs as strongly (or more strongly) at very fast speeds as compared to slow speeds, then this provides evidence that the effect is efficient. A second way to demonstrate efficiency is to impose a cognitive load such as rehearsing numbers to usurp some of the available cognitive resources. If an effect occurs as strongly (or more strongly) under cognitive load as compared to full attention, then this provides evidence of efficiency.

Efficiency may be the most ubiquitous feature of automatic processing in everyday life, simply because the mind's processing capacity is always limited. Some studies suggest that when a person attempts to focus attention on a task, the mind wanders away from the task up to 50% of the time (Smallwood & Schooler, 2006). Even when we are successful at concentrating attention on the task at hand, efficient processing may influence us to a striking extent. This is because whenever we pay attention to, say, a newspaper article, we are under cognitive load with respect to everything else in the world. And if we then shift attention from the newspaper to an itch on our left foot, we are now under cognitive load from the foot, leaving us vulnerable to automatic influences from the newspaper – and everything else. The fact that we can pay close attention only to one, or at most a few events at once, means that at any one moment we are exercising deliberate control over a tiny fraction of all the influences potentially affecting us.

Relations among awareness, intent, control, and efficiency

Awareness, intent, control, and efficiency are thus too closely related to treat them as if they are independent of each other. I once sat down to draw a box and arrows diagram of how these ideas could relate to each other, and ended up with four boxes and a web of bi-directional arrows cementing every possible connection. Needless to say, this was not a very informative diagram. And yet, these four criteria are connected loosely enough to cause trouble. Despite cautions to the contrary (e.g., Bargh, 1994), researchers sometimes assume that if an effect seems to be automatic by one criteria then it is automatic by other criteria. For example, if stereotypes are shown to influence judgments efficiently, then the effects of stereotypes must also be uncontrollable. This kind of reasoning neglects the fact that although the criteria for automaticity sometimes depend on each other, they do not necessarily have to.

To clarify this state of affairs, several authors have proposed taxonomies to organize thinking and terminology (Bargh, 1989, 1994; De Houwer, Teige-Mocigemba, Spruyt, & Moors, 2009). The message common to these taxonomies is that in order to prevent confusion, authors should use terms that are consistent with the methods used to demonstrate automaticity. For example, if an experiment has used a cognitive load manipulation to demonstrate efficiency, then the effects should be discussed in terms of efficiency, rather than unconsciousness or uncontrollability. Nonetheless, these details are often relegated to methods sections and footnotes. The general terms *automatic* and *unconscious* serve as a common shorthand to communicate a simple idea to a broad audience. For this reason the broader, if less precise, terminology is likely to remain common. Just as these taxonomic approaches encourage authors to be specific in writing,

readers are well advised to be aware of these nuances in order to avoid misunderstandings.

How did these complexities come about? In large part, they result from the fact that social cognition researchers drew on two different research traditions in cognitive psychology when developing the current understanding. The first tradition is research on selective attention and working memory. The second is research on implicit memory. Although there was certainly some cross-talk between these fields, they used different experimental methods and different terminology, the consequences of which are still evident in today's social cognition research. The next section traces these separate influences and highlights how they foreshadowed important findings in implicit social cognition.

TWO TRADITIONS OF RESEARCH

Legacies of attention research: Intent, control, and efficiency

Many early studies of automatic processes in social cognition are rooted in a tradition of research on selective attention and working memory (e.g., Broadbent, 1971; Treisman, 1969). Especially influential for social cognition were studies of attention (Posner & Snyder, 1975; Shiffrin & Schneider, 1977) and studies of working memory (Baddeley, 1986). The key idea in this research was that information processing could be divided into controlled and automatic modes, whose features are close but not identical to the criteria we have been discussing. Automatic processing did not demand attention, was not limited in capacity, and could not be voluntarily initiated or altered, which is to say that this work was concerned with intentionality, controllability, and efficiency. Conscious awareness was not much emphasized. This tradition was especially influential for the development of (a) priming measures in social cognition, which focused on the lack of intent and control over the activation of mental content, and (b) research on the limited capacity of human cognition, which emphasized the efficiency of automatic processing.

Sequential priming measures

Fazio and colleagues' seminal work showing that attitudes can be automatically activated built on these cognitive theories of automatic and controlled processing (Fazio, Sanbonmatsu, Powell, & Kardes, 1986; see also Dovidio, Evans, & Tyler, 1986; Gaertner & McLaughlin, 1983). Fazio's

approach was parallel to semantic priming studies (e.g., Neely, 1977) in which a prime item preceded a target item, and participants made a simple judgment about the target. In Fazio's approach, the primes consisted of pictures or words depicting the object of the attitude. For example, the word "coffee" might be presented as a prime to measure attitudes toward coffee. After a fraction of a second, a second word would appear on the screen. This word had a clear evaluative meaning, such as "wonderful" or "horrible." Participants were instructed to press one of two keys to evaluate the second word as pleasant or unpleasant. Response times to evaluate the second word were used to reveal how participants had spontaneously evaluated the first word. If their evaluation of the prime was positive, then it would facilitate responses to a pleasant target and inhibit responses to an unpleasant target.

Here too, there was little concern with consciousness. For Fazio et al. the key feature of automatic activation was a lack of controllability. In the work of Shiffrin and Schneider (1977) and Posner and Snyder (1975) the degree of learning was critically important for automaticity. Well-learned items were detected or retrieved from memory automatically, whereas poorly learned items required cognitive effort to search for them. Based on these assumptions, Fazio and colleagues distinguished between well-learned (i.e., strong) attitudes that should be activated automatically, and poorly learned (i.e., weak) attitudes that should not.

The connection between the strength of attitudes and their ability to be automatically activated set the stage for the use of sequential priming techniques to measure attitudes without asking participants to report them (Fazio, Jackson, Dunton, & Williams, 1995). This novel approach to indirect measurement would soon become important across many areas of psychology and a central concern in social cognition. Initially, the usefulness of this approach was most obvious for studying racial attitudes. Racial attitudes had always presented challenges for researchers because self-presentation motives meant many participants would not honestly report their attitudes. Priming methods seemed to offer the potential for a *bona fide* pipeline to reach respondents' true attitudes (Fazio et al., 1995).

The challenge of racial attitudes was taken up by both Fazio et al. (1995), who applied his priming technique to measure attitudes toward photos of Black and White people, and Devine (1989). Devine (1989) presented participants subliminally with a list of words that in one condition was mostly related to the stereotype of African Americans, and in the other condition mostly unrelated to that stereotype. Next, participants

evaluated the personality of a person whose race was unspecified. Regardless of their level of prejudice on a self-report questionnaire, participants primed with words mostly related to stereotypes of African Americans liked the new person less than the control group.

These studies both found spontaneous negative reactions to African Americans, even among respondents who denied prejudiced attitudes in their self-reports. Both studies were informed by cognitive theories of automatic and controlled processing (Posner & Snyder, 1975; Shiffrin & Schneider, 1977) and priming techniques (Neely, 1977); both had little to say about conscious awareness of attitudes; and both emphasized the idea that well-learned associations should be activated automatically, but weakly learned associations require cognitive effort to be retrieved.

For Fazio, the implication was that individuals with weak or neutral racial attitudes simply would not show any priming effects, whereas those with strongly negative attitudes or strongly positive attitudes should show corresponding priming effects. But for Devine the important distinction was between the *knowledge* of a social stereotype versus the personal *endorsement* of the stereotype. Because everyone in a culture learns stereotypes in the same way they learn about other categories, such as birds or foods, knowledge of stereotypes should be well-learned for virtually everyone. Stereotypes should therefore be automatically activated for everyone. Personally endorsed beliefs, on the other hand, should vary with one's values and motivations. Thus, in Devine's approach, inescapable stereotype activation was universal; it was endorsed beliefs that distinguished prejudiced from unprejudiced individuals. Both approaches offered an answer to the riddle of continued inequality and discrimination amidst changing values and social norms that took a dim view of racial prejudice. Changing social norms may affect how people intentionally act, but automatic forms of prejudice may nonetheless shape perceptions and behaviors in ways that are unintended and difficult to control (Dovidio, Kawakami, & Gaertner, 2002).

Although sequential priming was initially imported to social cognition for the purpose of measuring prejudice, the method has since been used to study a wide range of constructs. These include political attitudes (e.g., Kam, 2007; Payne, Krosnick, Pasek, et al., 2010), stereotypes (Blair & Banaji, 1996), addictive and impulsive behaviors (Austin & Smith, 2008; Friese & Hofmann, 2009), goals (Ferguson, 2008; Ferguson & Bargh, 2004), and more. A recent meta-analysis suggests that sequential priming measures are reliable predictors of behavior, with an average correlation of 0.28 (Cameron, Brown-Ianuzzi, & Payne,

in press). Researchers in recent years have frequently described the results of such studies as reflecting unconscious attitudes, in contrast to earlier applications of these techniques. I discuss whether such interpretations may be warranted later in the section on lessons learned.

Perilously limited capacity

The idea that humans have limited capacity to process information is not new with social cognition, nor with cognitive psychology research. William James' (1890) theorizing on selective attention provided a touchstone for all psychology research that followed on this topic. As James noted, selectivity entails limited capacity, because for some objects to be selected, others must be left out. Therefore the focus of attention must always be a limited subset of the potential information available. The fact of limited capacity had a multitude of consequences for social cognition. These were highlighted by Fiske and Taylor's (1984) portrayal of perceivers as "cognitive misers," stingy with their limited supply of attention and therefore content to take shortcuts with social judgment. Fiske and Taylor's (1991) refinement of that portrait as "motivated tacticians" portrayed people as misers under some conditions but cognitive spendthrifts under others. This view highlighted the importance of goals and motivations in shaping how much effort people put into their thought processes, consistent with attention theories that acknowledged a role for motivation in regulating attentional capacity (Kahneman, 1973).

Reviewing the literature on selective attention a century later, Johnston and Dark (1986) seemed to conclude that James may have understood attention better than the experimentalists who followed. Nonetheless, research on executive control of working memory (Baddeley, 1986; Logan, 1979) made substantial advances by experimentally dissociating modality-specific control systems (visuo-spatial and auditory/phonological) from domain-general central executive resources. These different control systems could be disrupted by different kinds of secondary tasks. The kinds of tasks that disrupted the central executive (active rehearsal and manipulation of information) turned out to have powerful consequences for social judgments.

Some of the foundational research on efficient processing in social cognition focused on the role of social categories, including stereotypes, in guiding social judgment (Allport, 1954; Brewer, 1988; Fiske & Neuberg, 1990; Lippman, 1922). Drawing on tasks or states known to disrupt central executive processing, social cognition researchers highlighted the counter-intuitive role of cognitive resources in social judgment with

dramatic effect. For example, circadian rhythms in arousal, known to affect executive processing, also influenced whether social judgments were biased by stereotypes (Bodenhausen, 1990). Morning people stereotyped more in the evening, whereas night owls stereotyped more in the morning. Lay intuition holds that people stereotype because of stable beliefs. This research showed that holding beliefs constant, fluctuations in cognitive resources that have nothing to do with beliefs, intent, or other morally relevant cognitions, dictated whether a target was the victim of stereotypical judgments (see also Bodenhausen & Lichtenstein, 1987; Kruglanski & Freund, 1983; Macrae, Hewstone, & Griffiths, 1993; Pratto & Bargh, 1991).

The idea that people stereotype as a way to save effort suggested another counter-intuitive consequence explored by Macrae, Milne, and Bodenhausen (1994). If people have finite attentional capacity, then when they save effort by using stereotypes they should consequently have more capacity left over for other uses. In a series of elegant experiments, Macrae and colleagues (1994) found that when a stereotype was available to help form an impression of a target person, participants performed better on a cognitively demanding secondary task, as compared to a control condition in which no stereotype was available. Studies of dual-task performance and social categorization suggested two novel reasons for the persistence of stereotyping. First, when people are distracted, tired, or otherwise occupied, they may stereotype because stereotyping is more efficient that considering all of the particulars of an individual (Fiske & Neuberg, 1990). Second, the ease afforded by stereotyping offers functional advantages, creating incentives to stereotype.

At about the same time as the efficiency of social categorization was being established, Gilbert and colleagues conducted a series of influential studies demonstrating the efficiency of dispositional, as opposed to situational judgments. The tendency to attribute other people's behavior to dispositional factors and largely ignore situational factors was established in classic experiments before the contemporary concern with automatic processing (Jones & Harris, 1967). Quattrone (1982) suggested a mechanism for the effect in that people begin by assuming a dispositional explanation but then adjust, albeit insufficiently in most cases, to take account of the situation. Gilbert and colleagues elaborated this account and experimentally manipulated the cognitive resources available as perceivers made social judgments (Gilbert & Osborne, 1989; Gilbert, Pelham, & Krull, 1988). Distracted perceivers were less likely to adjust for the situation than those with full attention, suggesting that

dispositional assumptions were efficient but adjusting for the situation required attention.

This two-step correction model – in which perceivers automatically (i.e., efficiently) make initial assumptions based on scant evidence, and then slowly and effortfully revise those impressions – was subsequently broadened into a more general model of inference. The framework was used to explain why people tend to assume whatever they read or hear is true (Gilbert, 1991; Gilbert, Krull, & Malone, 1990). This credulity bias was exaggerated by cognitive load and speeded responding, suggesting that it is efficient to believe a statement, whereas revising that belief in light of contradictory knowledge requires attentional resources. Similar models have been applied to understand why cognitive load increases stereotyping as reviewed above (Gilbert & Hixon, 1991) and how people adjust judgments to take account of their own biases more broadly (Gilbert & Gill, 2000). Although such models use the language of automatic and controlled processes, experiments testing them have relied mainly on manipulations of attentional resources and therefore the sense of automaticity in question is primarily efficiency. Although this suggests that cognitive resources are necessary to exert control over biases, it does not imply that these biases are necessarily automatic in the sense of intention, control, or awareness.

Thin slice judgments: Efficient accuracy

The research just reviewed highlighted the ways that stereotypes and other biases can automatically bias social judgments. In each case, effortful controlled processing was an antidote to these errors and biases. Yet research on "thin slice" judgments (also called zero acquaintance judgments) suggests that there are many aspects of social judgment that can take place with surprising efficiency and accuracy. An influential study showed that silent video clips of teachers displayed for 30, 10, or even 2 seconds were sufficient evidence to make judgments about teaching effectiveness (Ambady & Rosenthal, 1993). Ratings of effectiveness by naïve judges correlated reliably with teacher evaluations from the teachers' classes.

Studies have since demonstrated thin-slice accuracy in many domains. A quick glimpse at the face or body can reveal information about a person's personality traits (Yeagley, Morling, & Nelson, 2007), sexual orientation (Ambady, Hallahan, & Conner, 1999; Rule & Ambady, 2008a), political ideology (Rule et al., 2010); prejudiced attitudes (Richeson & Shelton, 2005), and intelligence (Murphy, Hall, & Colvin, 2003).

Psychologists know how difficult it is to predict future behavior, but ordinary social perceivers have some skill at doing just that from observing mere thin slices of behavior. Naïve judges successfully predicted patient outcomes from viewing thin slices of physical therapists at work (Ambady, Koo, Rosenthal, & Winograd, 2002). Judgments of political candidates' competence based on photos predicted the candidates' chances of winning congressional elections (Todorov, Mandisodza, Goren, & Hall, 2005). Judgments of Fortune 100 chief executive officers' success based on photos predicted their company's yearly profits (Rule & Ambady, 2008b).

These findings are surprising and impressive when judged against the common intuition that thin slices should provide no valid information for such judgments. To place the findings in context, it is important to note that the levels of accuracy in these studies are reliably above chance, but not close to 100%. The striking aspect of the results is their efficiency. In many studies, the accuracy achieved after a few seconds is not improved by additional viewing time.

There is an apparent inconsistency between research showing that, on the one hand, effortful correction is necessary to counteract the biasing influences of social categories and stereotypes, and yet, on the other hand, people are adept at efficiently extracting accurate information from thin slices. This inconsistency, however, is more apparent than real. One reason is conceptual. Although bias and accuracy are often thought of as opposites, they are actually independent of each other (in the sense of sensitivity and response bias in signal detection theory). A second reason is methodological. In studies of bias, the target stimuli are typically held constant, save for the critical biasing influence (e.g., describing the target as a man in one condition and a woman in the other condition). In contrast, studies of accuracy typically hold biasing factors constant (or let them vary randomly) and the stimuli vary systematically in the factors of interest (e.g., actual sexual orientation, electoral success, etc.). Because of these different experimental approaches, effects that are the "signal" to one researcher are "noise" to another.

A final reason is psychological. Social perception is not a fixed phenomenon that happens the same way regardless of time, place, and context. Instead, it is something people do. That means that people may do it in a variety of ways. The kinds of information that people extract efficiently is likely to depend on their goals and social motives. As an example, participants in one study were primed with photos of men and women, as well as objects, each of which was followed by a letter string (Macrae et al., 1997). The letter

strings included non-words, and words that were stereotypical of men and women. Participants were divided into three groups, each of which had a different goal regarding the photos. One group made a meaningful semantic judgment of whether it was animate or inanimate; a second group judged whether or not there was a white spot on the photo; and the third group simply indicated when anything appeared on the screen. Results showed that the photos of men and women facilitated responses to gender-stereotypic words, but only in the condition where the faces were processed semantically. Seeing the same faces apparently did not activate stereotypes when participants were treating them simply as visual features rather than living people.

Wheeler and Fiske (2005) found that processing goals also affected neural activity in response to Black versus White faces. When participants judged Black and White faces using social categories (i.e., sorting by age), amygdala activation was greater in response to Black than White faces. However this difference vanished when making visual feature judgments (i.e., detecting a dot on the photo) and was reversed when judging the photos as individuals (e.g., guessing each individual's preferences). These studies highlight that evidence of efficiency is not evidence of inevitability.

Legacies of implicit memory research: Awareness, awareness, awareness

The studies discussed so far have focused on the distinction between automatic and controlled processing, emphasizing notions of inescapability and efficiency rather than unconsciousness. But in the following years the automatic/controlled distinction often gave way to the dichotomy between conscious and unconscious processes (or the synonymous terms *implicit* and *explicit*). Despite the fact that awareness is only a subset (i.e., one of four criteria) of automaticity, the language of unconscious processing has caught on faster than the language of automaticity. A *Psychinfo* search using the terms *automatic* and *social cognition* returned 413 results. A search using *unconscious or implicit* and *social cognition* returned more than 22,000. This shift was inspired in part by Greenwald and Banaji's (1995) influential review, which built on a different research tradition of cognitive psychology. Rather than building on theories of attention and short-term memory, they drew on research on implicit memory.

Implicit memory has been defined as influences of past experience on later performance, in the absence of conscious memory for the earlier

experience (Graf & Schacter, 1985; Jacoby & Dallas, 1981; Schacter, 1987). Whereas explicit memory may be measured by recognition tests (e.g., presenting a word and asking whether it was on a previously studied list) and recall tests (e.g., presenting a word stem such as el_____ and asking participants to complete the stem with a previously studied word), implicit memory is measured without reference to previous experience. For example, researchers might present a word stem (el_____) and ask participants to complete it with the first word that comes to mind. Participants are more likely to complete such items with previously studied words, even if they cannot consciously recall studying the item. Amnesic patients, for example, tend to perform at chance when asked to recognize words they have previously studied. But when asked to guess how to complete word fragments, they perform more accurately for studied than unstudied words (Warrington & Weiskrantz, 1968). The effect of prior study on later performance, despite the inability to consciously remember it, is taken to indicate implicit memory.

This idea strongly shaped Greenwald and Banaji's (1995) definition of implicit attitudes as "introspectively unidentified (or inaccurately identified) traces of past experience that mediate favorable or unfavorable feeling, thought, or action toward social objects" (p.8). Just as implicit memory was defined as consequences of past experience in the absence of conscious awareness for the experience, implicit attitudes were defined as traces of past experience in the absence of conscious awareness for the experience. Implicitness was identified with unconsciousness.

Although the parallel between concepts of implicit memory and implicit attitudes is close, it is not complete. There was a subtle shift between the two concepts that has important consequences for implicit social cognition. In the case of implicit memory, it is the experience of some past event that is not consciously available. In memory studies, the "event" is often the presentation of a particular word or a picture in a learning task. The experimenter has control over whether a particular stimulus was presented, and therefore knows with certainty whether the participant experienced a particular learning episode. Moreover, the definition of implicit memory focuses on performance, which is an operational definition. From this perspective, implicit memory is based on the effects of past experiences, controlled by the experimenter, on later performance, which is directly observable. For implicit attitudes, in contrast, the definition refers to *traces* of past experience which *mediate* later responses. This definition is more mentalistic than for implicit memory.

In fact, implicit social cognition researchers usually do not control conscious awareness of past experiences giving rise to attitudes, stereotypes, and other such traces. Unlike implicit memory tests, the measures employed in implicit social cognition research do not test for awareness of the formative experiences. Moreover, although Greenwald and Banaji (1995) referred to unawareness of the experiences giving rise to attitudes, subsequent writers have sometimes conflated awareness of the source with awareness of the attitude itself. The degree to which the constructs measured with cognitive tests may be unconscious, and how to empirically confirm such claims remains a topic of debate, discussed in greater detail in the section on lessons learned.

Some of the early approaches to measuring implicit social cognition had direct parallels in implicit memory research. For instance, Greenwald and Banaji (1995) adapted Jacoby's false fame paradigm from implicit memory to study gender stereotypes (Jacoby, Kelley, Brown, & Jasechko, 1989). Jacoby and colleagues asked participants to read a list of non-famous names, explicitly labeled as such. After a day's delay participants judged whether previously studied and new names were famous. Because explicit memory for the names faded over the delay but the fluency gained by reading the names persisted, participants misjudged the non-famous names they had previously seen as famous. Greenwald and Banaji (1995) modified the procedure by separately analyzing male and female names. They reasoned that status differences stereotypically associated with men and women would lead male names to be misremembered as famous at higher rates than female names. As predicted, gender stereotypes were reflected in false fame judgments.

The false fame procedure places explicit memory for the names in opposition to implicit memory processes (fluency or familiarity) because explicit memory for reading non-famous names would provide a basis for knowing that the names were not famous. Only if explicit memory fails and the name seems familiar should participants falsely claim that it is famous. In this paradigm, it is clear what conscious awareness refers to: the source of apparent fame. Stereotyping in this procedure is unconscious in the sense that participants are influenced by a prior exposure and by stereotypic knowledge, but they misattribute those influences to the name being famous. Because they are unaware of the true source of apparent fame, they are left with no basis for exerting control over the bias. This procedure therefore establishes a lack of awareness, which in turn determines controllability.

Implicit memory paradigms such as the false fame procedure have the advantage of theoretical

clarity. It is clear how performance can be mapped onto notions of awareness and control. However, implicit memory paradigms often have low internal consistency (Buchner & Wippich, 2000) and therefore are problematic for individual difference measures. Perhaps for this reason, Greenwald and Banaji shifted their focus from implicit memory to developing an implicit test based on response compatibility.

Implicit Association Test

With the development of the IAT (Greenwald et al., 1998), implicit social cognition research rapidly accelerated. The IAT maps four response categories onto only two response keys. For example, participants decide whether words are related to *flowers* versus *insects*, and also whether they are *good* versus *bad*. In a compatible block of trials, one response key might be labeled "flowers or good" and the other key labeled "insects or bad." In another block, the pairings would be rearranged to be incompatible ("flowers or bad" and "insects or good"). Associations between flowers versus insects and good versus bad evaluations are measured by comparing response times on compatible versus incompatible blocks. Although sequential priming tasks had been available for several years (e.g., Dovidio et al., 1986; Fazio et al., 1986; Gaertner & McLaughlin, 1983), researchers now had a task that seemed to make implicit social cognition research much easier. Facilitation scores from priming procedures often suffered from low reliability and relatively small effect sizes. But the IAT had good reliability and very large effects.

The IAT has been used in hundreds of studies with millions of participants, making it the most widely used measure of individual differences in implicit social cognition. Reviewing this large body of research is beyond the scope of this chapter, but readers are referred to two meta-analyses that summarize the relationships between the IAT and behaviors (Greenwald, Poehlman, Uhlmann, & Banaji, 2009) and explicit attitude measures (Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005).

In what sense are IAT effects automatic? IAT effects are driven by reduced speed in incompatible blocks. Aside from the occasional botanophobic entomologist, most people simply cannot respond as fast when flowers are paired with bad and insects are paired with good, compared to when these pairing are reversed. The involuntary nature of IAT effects suggests that they lack both intention and controllability. And the fact that associated pairs are processed fast can be seen as evidence of efficiency. The only criterion for automaticity that is not readily apparent is awareness.

Ironically, this is the criterion most commonly attached to IAT studies, which are frequently described as demonstrations of unconscious social cognition. Claims of unconsciousness often rest on a lack of correlation between implicit measures such as the IAT and self-report measures. This evidence is evaluated more fully in the section on lessons learned.

Effects of primes on behaviors and goals

Among the most influential work on automatic and unconscious processes has been research demonstrating that passive exposure to primes can influence subsequent behavior and goals. These studies are striking because they suggest that the slightest of stimuli (e.g., prime words) can have the most potent of effects. Implicit memory research, as reviewed above, had demonstrated that primes can influence memory accuracy and performance on a variety of tasks such as judgments of fame, familiarity, or pleasantness. Research on impression formation had shown that priming personality traits or social categories could influence personality impressions (Higgins, Rholes, & Jones, 1977; Srull & Wyer, 1979). But demonstrations that simple primes could increase aggressive behavior (Bargh, Chen, & Burrows, 1996), increase intelligent performance (Dijksterhuis & van Knippenberg, 1998) or alter voting patterns (Berger, Meredith, & Wheeler, 2008) suggested that automatic influences might be more profound than previously thought (see Bargh & Chartrand, 1999).

This research is included under legacies of implicit memory research with some hesitation, because it was influenced by multiple research traditions in addition to implicit memory. It drew upon earlier research in learning theory showing that verbal cues associated with a behavior could activate that behavior (Berkowitz & LePage, 1967; Loew, 1965). It also drew upon cueing paradigms and associative models used in person memory research (Hamilton et al., 1980; Higgins, Rholes, & Jones, 1977; Srull & Wyer, 1986). Nonetheless, one factor that made this new research program so influential was that great care was taken to ensure that participants were not aware that their behaviors were influenced by the priming event. As with implicit memory research, primes influenced behaviors in the absence of conscious awareness of the source of influence.

Automaticity in this research was thus defined in terms of the awareness criterion. In some studies, participants are rendered unaware of the priming stimuli themselves by presenting them subliminally. In other studies, participants are aware of processing the primes, say, as part of a word puzzle, but they are unaware of the

connection between the priming manipulation and later tasks. Awareness of the stimulus does not seem to matter so long as the connection to later behavior remains unknown (Bargh, 1992). As with implicit memory studies, it is the influence of prior exposure to a stimulus that is outside of awareness. Lacking awareness of the influence, in turn, means that no intent is required to set the process in motion, and there is little reason for participants to attempt to control such influences. Still, this does not imply that effects of primes on behavior are inescapable. When primed goals are in conflict with consciously adopted goals, the conscious goal may prove to be the dominant force (Macrae & Johnston, 1998).

The logic of opposition

The most direct descendent of implicit memory research in social cognition is an approach based on the process dissociation procedure, which was developed as a means of separating conscious and unconscious influences of memory (Jacoby, 1991). In social cognition studies, the approach has been used not only to study social influences on memory (Hense, Penner, & Nelson, 1995; Payne, Jacoby, & Lambert, 2004) but also stereotypes (Payne, 2001; Payne, Lambert, & Jacoby, 2002), attitudes (Payne, Cheng, Govorun, & Stewart, 2005), and decision making (Ferreira, Garcia-Marques, Sherman, & Sherman, 2006) more generally. The key idea is that performance on any given task is likely to reflect a combination of automatic and controlled processes that jointly contribute to responses. These processes can be separated by arranging experimental conditions that place automatic and intentional influences in opposition in some cases, and in concert in others. This is what Jacoby (1991) has termed *the logic of opposition*.

As an example, Payne (2001) used a priming task to demonstrate effects of race stereotypes in mistaking harmless objects for weapons. A priming task presented Black and White faces as primes, followed on each trial with a briefly presented target object (half were guns, the other half were tools). Participants were more likely to mistake a harmless tool for a gun when it was primed by a Black face. From the perspective of traditional social cognition approaches this would be considered to be an automatic effect because participants attempted to distinguish guns from tools, but they were biased unintentionally by the primes. This, however, assumes that the task reflects only automatic processing and no controlled processing. From the process dissociation perspective, the task is assumed to reflect both automatic and controlled processing, and the aim is to estimate the influence of each using a simple algebraic model.

By this model, if a process is automatic it influences responses regardless of whether it is consistent with intent or inconsistent with intent. In contrast, when a process is controlled it influences responses only when intended, but not otherwise. Thus, automatic and controlled processes are defined in terms of intent and control. When a Black face precedes a gun, stereotypes and intent are in concert. Responding based on either will lead to the correct response. When a Black face precedes a harmless object, stereotypes and intent are in opposition. The relationships between intentional control, automatic stereotyping, and behavioral responses can be formalized using algebraic equations (Jacoby, 1991; Payne, 2001). We can then decompose responses into numeric estimates of two processes: automatic stereotyping and cognitive control.

Applying the model to the studies just reviewed sheds light on the factors driving the weapon bias. For example, the race of the primes influenced only the automatic component, and implicit measures of race attitudes correlated with the automatic but not the controlled component (Payne, 2005). In other cases, differences in intentional control are critical. For example, time pressure (Payne, 2001) and self-regulation depletion (Govorun & Payne, 2006) affected only the controlled component. Notice that the process estimates are defined in terms of intent and controllability, but once they are computed they can be used to test other varieties of automaticity such as efficiency by examining effects of speed, cognitive depletion, and so forth (for reviews of process dissociation in social cognition see Payne, 2008; Payne & Bishara, 2009).

When the task is to distinguish between weapons and harmless objects there is a correct answer, and accuracy can be useful in estimating how much control one has over responses. Yet in many cases in life there is no correct answer. Such ambiguous cases have been captured by a different priming task. In the affect misattribution procedure (AMP) participants are asked to evaluate the pleasantness of an abstract symbol such as a Chinese pictograph, following the presentation of a pleasant or unpleasant prime (Murphy & Zajonc, 1993; Payne, Cheng, Govorun, & Stewart, 2005). Participants are explicitly warned not to let the primes influence their pleasantness ratings of the symbols, but the primes nonetheless influence ratings reliably. Individual differences in performance on this task can be used to predict a wide range of behaviors. For example, presenting a cigarette as a prime tends to elicit unpleasant judgments from non-smokers, but pleasant responses from smokers who are craving a cigarette. The AMP has been used to predict behavior in the domains of cigarette smoking (Payne,

McClernon, & Dobbins, 2007), alcohol consumption (Payne, Govorun, & Arbuckle, 2008), prejudice (Payne, Burkley, & Stokes, 2008), electoral politics (Payne, Krosnick, Pasek, et al., 2010), and moral judgment (Hofmann & Baumert, 2010).

The AMP is similar to sequential priming tasks reviewed earlier, except that the outcome of interest is the respondents' evaluations of ambiguous items rather than response times to unambiguous items. The task generates large effect sizes and high reliability like the IAT, but it also has the simplicity of sequential priming tasks. The AMP is conceptually aligned with the process dissociation approach because the warning pits participants' intentional strategies against the unintended influence of the primes. Still, results of this test cannot be said to purely reflect automatic processing, because some participants may succeed to some degree in ignoring or correcting for influences of the primes. A process dissociation-like model has been developed to mathematically separate three components of task performance (Payne, Hall, Cameron, & Bishara, 2010). This model separates task performance into automatic influences of the primes (A), the likelihood of misattributing affective responses from the primes to the target pictographs (M), and evaluations of the pictographs themselves (P). Thus, by placing intentional response strategies in opposition to automatic effects of primes, the process dissociation approach which began as a means for separating conscious and unconscious forms of memory can be used to separate a range of automatic and controlled contributions to social cognition. Applications of this and similar models in social cognition have expanded in recent years. In addition to the process dissociation model and the AMP model described above, a variety of related multinomial models have been developed to model a range of specific processes and tasks (Conrey et al., 2005; Klauer, Voss, Schmitz, & Teige-Mocigemba, 2007; Stahl & Degner, 2007).

SIX LESSONS

The remarkable growth of research on automatic and unconscious processes has led to rapid advances in social cognitive theory. In the final section of this chapter, I review what I regard as important lessons learned in the past few decades. In some cases, these lessons were surprising correctives to early assumptions that turned out to be wrong. In reviewing these lessons it becomes apparent how far the field has come in our understanding of automatic and unconscious thought.

Lesson 1: Automaticity by some criteria but not others does not constitute a "weak" form of automaticity

Reviewing early research on automatic processing in social psychology, Bargh (1989) observed that cognitive psychology research had defined automaticity as an all-or-none affair, in which effects considered automatic by one criteria were also considered automatic by the others. However, Bargh pointed out that unlike the constrained laboratory paradigms used in studies of basic cognition, most social phenomena of interest to social psychologists were more complex. As a result, we are not likely to find many phenomena that are automatic in every possible way. Instead, the different criteria for automaticity are qualitatively different, and they may or may not co-occur (Bargh, 1994).

I occasionally read reviews or hear comments in talks expressing the belief that if a process is not automatic by all criteria, then it is not automatic in an important way. This way of thinking confuses quantity for quality. To see why, consider the research reviewed earlier suggesting that attitudes measured by implicit tests are automatic in that they are activated without intention or control, but that in many cases participants are well aware of the attitude being measured. If attitude activation is uncontrollable, then awareness does not weaken its consequences for judgments and behaviors. For example, in research on weapon bias, participants are able to accurately express when they have made a mistake after the fact (Payne, Shimizu, & Jacoby, 2005); however, that does not allow them to prevent making racially biased mistakes when responding quickly. If an automatic influence leads a police officer to discriminate, or if it leads consumers to change their purchasing decisions, or if it leads voters to change their votes, then it matters little whether the influence is automatic by many criteria or few. Automaticity by many versus few criteria, therefore, is not "better" or "worse" in any meaningful sense. The four criteria for automaticity are qualitative differences, not a four-point scale.

Lesson 2: Measures of automatic effects are not pure measures of automatic processes

As just reviewed, most phenomena in social psychology are sufficiently complex that they are not automatic in all senses. They are also not likely to be completely automatic or completely controlled. It is common in social psychology to categorize some measure, task, or behavior as either automatic or controlled. Yet doing so

overlooks the likelihood that both automatic and controlled processes contribute to any given behavior. One common example is the use of implicit tests to measure implicit attitudes. Although the implicit attitude is assumed to be a purely automatic evaluation, the test that measures it depends not only on an automatic evaluation but also on how the evaluation affects processing in the main task (e.g., categorization of words and pictures). Scores on any given test, then, reflect a combination of intentional processes aimed at completing the main task, as well as unintended influences that interfere with the main task.

Recent efforts using process dissociation and related models, as just noted, have begun to separate the processes underlying tests from the test scores themselves. This is important because the different processes contributing to task performance often relate differentially to other variables of interest. For example, research using process dissociation to study automatic stereotyping has found that intentional control over responses is reduced by speeded responding (Payne et al., 2002), self-regulation depletion (Govorun & Payne, 2006), and ironically by anxiety over being perceived as biased (Lambert et al., 2003). Controlled estimates were associated with individual differences in measures of executive functioning and attention control (Payne, 2005) and event-related potential (ERP) signatures related to conflict detection and executive control (Amodio, 2010; Amodio et al., 2004). None of these factors affected estimates of automatic stereotyping. Instead, automatic bias was affected by the race of primes (Payne, 2001), was ironically increased by warnings against being biased (Payne et al., 2002), and was associated with individual differences in implicit measures of prejudice (Payne, 2005). Similar dissociations were found for other topics. Ferreira and colleagues (2006) used the process dissociation procedure to separate rule-based (controlled) reasoning from heuristic (automatic) reasoning in classic decision-making tasks. They found that controlled estimates were reduced by cognitive load, increased by instructions to response logically, and increased by training in logical reasoning. In contrast, the automatic component was increased by a prime that encouraged participants to respond intuitively.

These findings suggest that when researchers interpret a difference between experimental conditions as "an automatic effect" or "a controlled effect" they will tend to gloss over important differences. Although most research on this topic has been conducted in the context of implicit measures, it is equally relevant to experimental paradigms such as behavioral priming. The effects observed on behaviors likely reflect the joint operation of automatic and controlled influences.

The factors affecting automatic contributions and those affecting controlled contributions are each of interest in their own rights. They can only be studied on their own if they are separated, rather than equating measurement techniques or experimental paradigms with automatic processes.

Lesson 3: Measures of automatic effects do not necessarily measure unconscious constructs (although they have the potential to do so)

The distinction between unconsciousness and other aspects of automaticity is by now quite clear. The lesson described here is about what researchers can – and cannot – conclude from results of measures (such as the IAT or priming tasks) or laboratory paradigms (such as behavior priming). If we take seriously the differences between separate criteria for automaticity, then it becomes clear that simply because a cognition is activated automatically (e.g., without intent) it does not follow that the cognition is unconscious. Yet it is common to administer an implicit measure or experimental procedure and then draw conclusions about unconscious beliefs, thoughts, and feelings.

One way to illustrate this point is with a simple example. Suppose a researcher measured your preference for Coke versus Pepsi using an implicit test. You probably know your own preference very well in this case. Now, just because the researcher has applied an implicit test there would seem to be no reason to conclude that the attitude measured must be unconscious. In fact, when attitudes toward such mundane topics are measured, implicit and explicit tests usually agree (Nosek, 2007). In most cases, claims of unconscious attitudes are based on a lack of correlation between implicit and explicit measures. However, there are many reasons the implicit and explicit tests might not be related. These include measurement reliability (i.e., implicit tests sometimes have low reliability which limits correlations), procedural differences between tests (i.e., implicit and explicit tests often ask participants to do very different things and measure responses of different scales), and social desirability (i.e., implicit tests are often used when participants will not be candid on self-reports). Because all of these factors (and more) are sufficient reason for null correlations between implicit and explicit tests, such null correlations are not strong evidence for unconsciousness (Gawronski, Hofmann, & Wilbur, 2006).

Nevertheless, some research suggests that implicit tests might in some cases measure attitudes of which respondents are unaware. In one study, implicit and explicit measures of attitudes

toward a referendum vote were measured among respondents who either had decided or had not decided how they would vote (Galdi, Arcuri, & Gawronski, 2008). Among those who had decided, the explicit measure was more predictive than the implicit measure of later voting. Among the undecided, in contrast, the implicit measure was more predictive. This suggests that implicit tests have the potential to assess attitudes before the respondent has made up his or her mind. This finding does not depend on a null correlation between measures, and so it provides stronger evidence than previous research that implicit tests may reflect attitudes of which the respondent is unaware. It does not follow, of course, that every time an implicit measure is used the construct must be unconscious. This highlights that unconsciousness, like other criteria for automaticity, are not properties of a particular measure or paradigm. They are features that describe momentary states which may depend on a variety of contextual factors, as discussed next.

Lesson 4: Control and awareness are often momentary states

Terms like "implicit attitudes" or "the unconscious mind" suggest stable structures that are hidden from awareness. But such a static view of automaticity is inconsistent with much that is known about the nature of attention and its relationship to control and awareness. Theories of selective attention often invoke the metaphor of a spotlight. This emphasizes that attention is always focused on some things at the expense of others. It also emphasizes the transient nature of focal attention, as the spotlight may zip from one target to another. The transient nature of attention implies that mental representations that are unconscious at one moment may become conscious with a shift of attention. This principle can apply to many mental and physical states, from your breathing rate, to your posture, to your attitude toward gays and lesbians. The same argument applies to intention and control. A process that operates without intention or control when attention is elsewhere may operate with intention and control when one focuses attention on it. At some times when driving we may stop at a light without intention or awareness because we are absorbed in a conversation; but at other times we may stop with conscious intent. These examples highlight that when some experimental effect is described as unconscious or unintentional, these are statements about participants in the specific context of the experiment. At other times and under other conditions, the unconscious may become conscious and the uncontrolled may become controlled.

It is of course possible that some mental content is inaccessible to consciousness and control under all circumstances. However, it is difficult to produce empirical evidence for such a claim. Recent research has made good progress toward acknowledging the transience of awareness and control. One study measured implicit attitudes toward gay people and also asked participants to explicitly rate their attitudes toward gays using scales that distinguished between "gut reactions" and "actual feelings." (Ranganath, Smith, & Nosek, 2008). Whereas "actual feelings" did not correlate with the implicit measure, ratings of "gut feelings" correlated significantly with implicit attitudes. This pattern suggests that participants may have conscious access to implicit attitudes, at least when their attention is properly directed. Depending on how participants interrogate their own reactions, they may appear to be aware or unaware of their implicit attitudes.

Recent theoretical perspectives that emphasize the role of metacognition in the processing of implicit responses seem well equipped to explain such findings. Hofmann and Wilson's (2010) self-inference model argues that although people never have direct access to mental processes themselves, they can make use of subjective feelings or observable behaviors that accompany them to make inferences about their own minds. For example, although people cannot perceive the activation of an idea, they may be aware of the content that is currently in mind, as well as feelings of processing fluency that may have accompanied the idea as it popped easily to mind. If a person has negative thoughts that pop easily to mind when they encounter a gay man, they may infer that they have negative attitudes toward gays. However, the kinds of inferences they draw depend on the focus of selective attention. If the person is not paying attention to his or her mental states at all, then he or she may draw no inferences. As a result, the attitude would remain outside of awareness.

In line with the study by Ranganath and colleagues, drawing attention to key distinctions between "gut reactions" and "actual feelings" may change the kinds of inferences people make. Models such as the self-inference model are valuable because they provide a framework for thinking about the mechanisms by which mental content can become conscious or unconscious as the result of specific metacognitive operations (see also Petty & Briñol, 2006; Gawronski & Bodenhausen, 2006). These models highlight that awareness and control may be present at some moments and absent at others. Thus, awareness and control vary with attention and other cognitive processes, rather than varying as a function of specific representations or specific paradigms.

Lesson 5: Automatic does not mean unchangeable

If awareness and control fluctuate from one context to the next, this challenges the common assumption that automatic influences are unchangeable. This assumption grew from early theorizing based on attention and learning, which argued that well-learned responses are activated automatically (Shiffrin & Schneider, 1977). Given this, it was a reasonable assumption that automatically activated ideas must have been very well learned, and should therefore be very resistant to change. However, many studies have demonstrated that scores obtained with implicit measures often increased, decreased, or even reversed as a function of the context. Spending five minutes imagining a "strong woman" led to weaker implicit gender stereotyping (Blair, Ma, & Lenton, 2001). Pictures of African Americans in the role of prisoners evoked negative implicit evaluations, but presenting the same individuals in the role of lawyers elicited positive implicit evaluations (Barden, Maddux, Petty, & Brewer, 2004; see also Dasgupta & Greenwald, 2001; Wittenbrink, Judd, & Park, 2001). These findings suggested that implicit responses were highly malleable.

Effects of primes on behavior also depend on the context. For example, Loersch and colleagues (2008) found that watching a competitive game of tennis engendered competitive behavior when the tennis players belonged to the participants' ingroup but not otherwise. Cesario and colleagues (2010) found that when participants were enclosed in a small space, exposing them to primes related to African Americans increased aggressive behavior, replicating earlier research (Bargh, Chen, & Burrows, 1996). However, when participants were in a wide open space, the same primes led to distancing behavior. These studies suggest that the meaning of the primes within a social context shapes the kinds of behaviors that are activated. Although it is tempting to equate automaticity with rigidness, the evidence suggests that automatic responses are not necessarily difficult to change.

Lesson 6: Automatic responses are not more genuine than controlled responses

There is a tendency in social cognition to treat implicit tests as lie detectors. This grows largely out of the fact that early efforts with implicit measurement were aimed at studying prejudice, a topic in which self-reports are suspect. Indeed, there is a great deal of evidence that social desirability and motivations to conceal prejudice

affect explicit measures of attitudes and beliefs much more than they affect implicit tests (e.g., Friese, Hofmann, & Schmitt, 2008). Taken alone, these findings would suggest that the major difference between implicit and explicit measures is susceptibility to dissembling. As discussed earlier, however, there are many reasons that implicit and explicit tests may disagree.

The question of whether automatic or controlled responses are more "genuine" is a bit like the question of whether drunken behavior is more or less reflective of a person's true character than sober behavior. On the one hand, we can argue that spontaneous responses reveal a person's attributes at some deep level because they are unedited for self-presentation. On the other hand, we could argue that everybody has thoughts and impulses that they reject, and what distinguishes genuine responses is whether a person reflectively endorses or rejects them. Both perspectives can be found in scholarship on the idea of the "true self." Some suggest that what counts as a person's "true self" involves only those attitudes that are reflectively endorsed, whereas others suggest that the most revealing attitudes are the ones that occur spontaneously and unintentionally.

At bottom this is a philosophical question, not an empirical one. A more empirically defensible position is to assume that both automatic and controlled responses reflect genuine aspects of the mind, to the extent that they matter for behavior. The empirical questions may then concern the conditions under which each drives behaviors. Some research suggests that implicit attitudes are associated primarily with spontaneous responses such as non-verbal behavior, whereas explicit attitudes are associated with deliberative responses such as overt judgments (e.g., Dovidio, Kawakami, & Gaertner, 2002). Other studies have found that implicit and explicit attitudes are independently associated with the same behaviors (e.g., Payne, Krosnick, Pasek, et al., 2010). This may be because many behaviors include both spontaneous and deliberative aspects. For the purposes of what we have learned about automatic processes, however, the lesson seems clear. Experimental methods that identify automatic processes cannot reveal if the automatic response is genuine or not: therefore, assumptions that automatic responses reveal the true self are suspect.

CONCLUSION

In this chapter I traced the development of two traditions of research on automatic and unconscious processes. Research in the tradition of selective attention studies has tended to emphasize

intent, control, and efficiency. Research in the tradition of implicit memory, however, has emphasized awareness. Maintaining clear distinctions among these criteria helps prevent confusions that have sometimes obscured understanding of automatic processes in social cognition. Applying this principle led to six lessons that social cognition research has generated over the past few decades, some of which overturned early assumptions.

Some readers may wonder whether these lesson steal some of the excitement away from studies of automatic social cognition. For example, if automatic responses are not necessarily unconscious; if awareness and control are momentary rather than fixed; if automatic responses do not provide a lie detector to reveal one's true self, then are automatic processes as important as we once assumed?

In my view the answer is absolutely yes. Automatic social cognition is the logical culmination of classic studies on the power of the situation and research showing that we know less about the causes of our own behavior than we think (Nisbett & Wilson, 1977). Automatic social cognition is important, not because it is always unconscious (although it sometimes is). It is important not because automatic cognition is fixed or rigid, or because it reveals the true inner self (although it sometimes does). The study of automatic and unconscious processes is important because it has changed the way scientists see human behavior. It has overturned the intuitive reliance on introspection as an explanation for why we behave as we do. Beliefs that we are always aware of the causes and in control of our behaviors have an intuitive appeal. But these are beliefs that we may be learning to live without.

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