

The potential importance of Bargh's chapter is matched by that of the companion articles. These articles, written by prominent researchers whose interests range from cognitive science to cross-cultural psychology, not only help to refine and extend Bargh's conceptualization but make important contributions in their own right. The issues they explore include: the interactive influence of individual and environmental factors on behavior; the interplay of conscious and nonconscious processes; determinants of affect, emotion and aggression; biological and cultural influences on automatic processes; accuracy in perceiving the sources of influence; memory and resource allocation theories of judgment and performance; and the implications of connectionist models for automaticity. As a result, the volume as a whole makes a valuable contribution to research and theory not only in social cognition, but in many other areas as well.

In addition to the authors themselves, we want to acknowledge the invaluable assistance of Lawrence Erlbaum Associates. Their continued support and encouragement of the *Advances in Social Cognition* series, and their commitment to the publication of a high quality set of volumes, is deeply gratifying. It is a genuine pleasure to work with them.

— Robert S. Wyer, Jr.

Chapter 1

The Automaticity of Everyday Life

John A. Bargh
New York University

MANIFESTO

If we are to use the methods of science in the field of human affairs, we must assume that behavior is lawful and determined. We must expect to discover that what a man does is the result of specifiable conditions and that once these conditions have been discovered, we can anticipate and to some extent determine his actions. This possibility is offensive to many people. It is opposed to a tradition of long standing which regards man as a free agent, whose behavior is the product, not of specifiable antecedent conditions, but of spontaneous inner changes of course.... If we cannot show what is responsible for a man's behavior, we say that he himself is responsible for it. The precursors of physical science once followed the same practice, but the wind is no longer blown by Aeolus, nor is the rain cast down by Jupiter Pluvius.

(Skinner, 1953, pp. 6–7, 283)

As Skinner argued so pointedly, the more we know about the situational causes of psychological phenomena, the less need we have for postulating internal conscious mediating processes to explain those phenomena. Now, as the purview of social psychology is precisely to discover those situational causes of thinking, feeling, and acting in the real or implied presence of other people (e.g., Ross & Nisbett, 1991), it is hard to escape the forecast that as knowledge progresses regarding psychological phenomena, there will be less of a role played by free will or conscious choice in accounting for them. In other words, because of social psychology's natural focus on the situational determinants of thinking, feeling, and doing, it is inevitable that social psychological phenomena will be found to be automatic in nature. That trend has already begun (see Bargh, 1994; Greenwald & Banaji, 1995), and it can do nothing but continue.

Of course, Skinner (e.g., 1978) was incorrect in his position that cognition played no role in the stimulus control of behavior. Even modern animal learning theorists in the Skinnerian tradition (e.g., Rilling, 1992) concluded that as soon as experimental stimuli become more complex and extended over time than the simple static tones and lights used by Skinner, cognitive mechanisms—especially perception and representation—are indispensable for prediction and control of the animal's behavior. However, as Barsalou (1992) pointed out, the fact that cognitive processes can mediate the effects of situational stimuli on responses does not make those responses any less determined by those stimuli:

Like behaviorists, most cognitive psychologists believe that the fundamental laws of the physical world determine human behavior completely. Whereas behaviorists view control as only existing in the environment, however, cognitive psychologists view it as also existing in cognitive mechanism. ... The illusion of free will is simply one more phenomenon in that cognitive psychologists must explain. (p. 91)

In what follows, I argue that much of everyday life—thinking, feeling, and doing—is automatic in that it is driven by current features of the environment (i.e., people, objects, behaviors of others, settings, roles, norms, etc.) as mediated by automatic cognitive processing of those features, without any mediation by conscious choice or reflection.

The Essential Automaticity of Social Psychological Accounts of Human Nature

Theoretical accounts in social psychology have always had a reflexive or automatic flavor, because they lay out the situational factors causing the average person to think–feel–behave in a certain way. Take the following classic examples. For thinking, if your own outcomes will depend on the person you are about to meet, you will spend the extra cognitive effort to learn about him or her as an individual, instead of casually placing him or her into a stock category (Erber & Fiske, 1984). For feeling, if you are in a state of arousal, you tend to interpret your emotional experience in terms of how others in the situation are reacting (Schachter & Singer, 1962). For behaving, if you are told to do something by an authority figure, you tend to do it even if it means lying to another person (Festinger & Carlsmith, 1959) or delivering an electric shock to a person who may be having a heart attack in an adjacent room (Milgram, 1963), and if another person needs help you will help if you are the only person around, but not if there are others in the vicinity who could help (Darley & Latané, 1968).

In these several examples of situational influences on cognitive processing, emotional experience, and social behavior, the relation between situational features and the effect of interest can be stated in *if-then* terms: Given the presence or occurrence of a particular set of situational features (e.g., a person or event), a certain psychological, emotional, or behavioral effect will follow.

The search for specifiable *if-then* relations between situations and psychological effects also characterizes research on automatic cognitive processes. An *automatic mental phenomenon* occurs reflexively whenever certain triggering conditions are in place; when those conditions are present, the process runs autonomously, independently of conscious guidance (Anderson, 1992; Bargh, 1989, 1996). Thus, research and theory in both domains, social psychology and automaticity, have, at the core, the specification of *if-then* relations between situational events and circumstances on the one hand, and cognitive, emotional, and behavioral effects on the other.

The nature of these necessary preconditions (the *if* side of the equation) can vary. Some require only the presence of the triggering environmental event; it does not matter where the current focus of conscious attention is, what the individual was recently thinking, or what the individual's current intentions or goals are. In other words, this form of automaticity is completely unconditional in terms of a prepared or receptively tuned cognitive state. These are *preconscious* automatic processes (Bargh, 1989) and are the major focus of this chapter. They can be contrasted with *postconscious* and *goal-dependent* forms of automaticity (Bargh, 1989; Bargh & Tota, 1988), which depend on more than the mere presence of environmental objects or events. Postconscious automaticity is commonly studied through the experimental technique of *priming*. Priming prepares a mental process so that it then occurs given the triggering environmental information—thus, in addition to the presence of those relevant environmental features, postconsciously automatic processes do require recent use or activation and do not occur without it. Goal-dependent automaticity has the precondition of the individual intending to perform the mental function, but given this intention, the processing occurs immediately and autonomously, without any further conscious guidance or deliberation (e.g., as in a well-practiced cognitive procedure or perceptual–motor skill; see Anderson, 1983; Newell & Rosenbloom, 1981; Smith, 1994).

What it means for a psychological process to be automatic, therefore, is that it happens when its set of preconditions are in place without needing any conscious choice to occur, or guidance from that point on. My thesis is that because social psychology, like automaticity theory and research, is also concerned with phenomena that occur whenever certain situational features or factors are in place, social psychological phenomena are essentially automatic. Which of the different varieties of automaticity a given phenomenon corresponds to depends on the nature of the situational (including internal cognitive) preconditions. Some situations may provoke effects without any conscious processing of information whatsoever, and to make the strongest and most conservative case for the automaticity of everyday life, I confine myself in this chapter to evidence of such preconsciously automatic phenomena. But other situations might have their *if-then* reflexive effects by triggering a certain intent or goal in the individual, resulting in attentional information processing of a certain kind (i.e., an *automatic motivation activation*; see Bargh, 1990). If the situation activates the same goal in nearly everyone so that it is an effect that generalizes across individuals, and can be produced with random assignment of experimental participants to conditions, the only preconditions for the effect are those situational features.

One might well dispute this conclusion by pointing out the importance of mediating conscious processes and choice for the situational effects in the previous research examples. In the case of the bystander intervention research, for example, the feeling of being less personally responsible to help if others are present (i.e., *diffusion of responsibility*) is said to mediate the effect of the number of bystanders on the probability of helping (Darley & Latané, 1968). But if these conscious processes do mediate the situational effect, then they must themselves be tied to those situations in an *if-then* relation for there to be any general effect of the situational variable. This may add extra steps to the *if-then* causal sequence (i.e., *if* other possible helpers, *then* feeling of less personal responsibility and *then* conscious decision not to help and *then* no help given). For the effect to occur with regularity across individuals, the feeling of less responsibility and the decision not to help, and so on, are also automatic reactions to the situational information across different individuals.

But where is the evidence for those presumed conscious process mediators of the effect? I confess I did choose the bystander intervention example for a reason; the researchers had no evidence of the theoretical mediator of diffusion of responsibility but instead inferred it from the effect of number of bystanders (Darley & Latané, 1968). The behavioral measure was taken as an indicator of the presence of the cognitive mediator, in other words (see discussion by Zajonc, 1980).

Bystander intervention research is not unique in this regard. Following a review of those studies in which measures were made of behavior and the cognitive processes believed to mediate it, Bem (1972) concluded:

Increase a person's favorability toward a dull task, and he will work at it more assiduously. Make him think he is angry, and he will act more aggressively. Change his perception of hunger, thirst, or pain, and he should consume more or less food or drink, or endure more or less aversive stimulation. Alter the attribution, according to the theory, and "consistent" overt behavior will follow.

There seems to be only one snag: It appears not to be true. It is not that the behavioral effects sometimes fail to occur as predicted; that kind of negative evidence rarely embarrasses anyone. It is that they occur more easily, more strongly, more reliably, and more persuasively than the attribution changes that are, theoretically, supposed to be mediating them. (p. 50)

Bem continued on to give several examples of studies in which both behavioral and attributional dependent measures were collected, and in which the behavioral measure (e.g., eyelid conditioning, learning performance, pain perception, approaching a feared object) showed clear effects, whereas the measure of the supposed mediating conscious reasoning process showed a weak or absent effect.

Regardless of whether one shares Bem's conclusions regarding the limited mediational role played by conscious thought processes, the burden of proof has been (unfairly) on models that argue conscious choice is not necessary for an effect. To convince skeptics that effects happen outside of consciousness, or do not require conscious processing to occur, researchers have been made to jump through methodological hoops to establish nonconsciousness beyond any reasonable doubt. It might be

a step forward for social psychology to adopt the same level of healthy skepticism for models that include a role for conscious mediation. Where is the evidence that the mediating process exists, and where is the evidence of its mediation of the observed effects? The assumption of conscious mediation should be treated with the same scientific scrutiny as the assumption of automaticity.

The Inevitability of Continued Findings of Automaticity

In developing the argument for the importance of automaticity within all of social psychology, I am contending that social psychology has traditionally focused on situational determinants of behavior, and even within models such as attribution theory that do posit a mediating role for conscious processes as opposed to situational forces alone, there is insufficient evidence to support the position that conscious mediation of situational effects is the rule rather than the exception. Wherever such conscious mediators have been proposed, subsequent research evidence has always constricted their importance and scope.

Note that, as research in areas of social cognition such as attribution, attitudes, and stereotyping progressed since the 1960s, evidence increasingly pointed to the relative automaticity of those phenomena rather than the other way around. Take the case of attribution theory. What were once described in terms of deliberative and sophisticated steps of conscious reasoning (e.g., Kelley, 1967) were found to be "top-of-the-head" (Taylor & Fiske, 1978), heuristic-based (Hansen, 1980), spontaneous (Winter & Uleman, 1984), and finally automatic (e.g., Gilbert, 1989) reactions to the behavior of others. The mediating role of one's attitudes on one's behavior moved from being described in terms of a conscious and intentional retrieval of one's attitude from memory, to a demonstration of automatic attitude activation and influence (Fazio, 1986). The impact of cognitive structures such as stereotypes (e.g., Devine, 1989) and the self (Bargh & Tota, 1988; Strauman & Higgins, 1987) on person perception and emotional reactions were shown to occur without needing involvement of intentional, conscious processing (see Bargh, 1994; Greenwald & Banaji, 1995 for reviews).

The role of conscious choice was diminished even in the realm of selection of an individual's current processing goal. Social cognition models of the 1980s, for instance, recognized how the outcome of processing was different as a function of the individual's purpose in processing the information. Yet the "goal-box" in these flow-chart models was presented as an exogenous variable that directed processing, not as an entity that itself was caused by other factors (see, e.g., Smith, 1984; Srull & Wyer, 1986; Wyer & Srull, 1986). However, as researchers uncovered more of the mechanism inside this black box of goal selection (Atkinson & Birch, 1970; Bargh, 1990; Chaiken, Liberman, & Eagly, 1989; Chartrand & Bargh, 1996; Gollwitzer & Moskowitz, 1996; Karniol & Ross, 1996; Martin & Tesser, 1989; Martindale, 1991; Pervin, 1989; Wyer & Srull, 1989), the role presumably played by free will or conscious choice again was diminished—at least the need decreased to invoke the conscious will as a final recourse as it became a superfluous explanatory concept.

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So even for social psychological models of the presumed cognitive mediating processes, as research has advanced, so the role of conscious processing has diminished. We have detailed knowledge of the situational features that produce a given phenomenon for most people—a specifiable *if-then* relation tantamount to an automatic process. But we also have a host of social-cognitive mediating processes such as attributions, trait categorizations, attitudes, stereotypes, and goals, and these mediators are shown increasingly to be equally automatic, *if-then* reactions to specific situational features.

THE PRECONSCIOUS CREATION OF THE PSYCHOLOGICAL SITUATION

There is historical precedent in theory and recent research evidence that automaticity plays a pervasive role in all aspects of everyday life. Not just in input processes such as perceptual categorization and stereotyping, which have been the principal venue of automaticity research in social psychology (see review in Bargh, 1994); not just in the conscious and intentional execution of perceptual and motor skills, such as driving and typing (see Newell & Rosenbloom, 1981; Bargh, 1996) or social judgment (e.g., Smith, 1989)—but in evaluative and emotional reactions, activation and operation of goals and motivations, and in social behavior itself.

Environmental events directly activate three interactive but distinct psychological systems, corresponding to the historical trinity of thinking, feeling, and doing (see Fig. 1.1). By *direct activation* is meant *preconscious*—the strongest form of automaticity (Bargh, 1989). Preconscious processes require only the proximal registration of the stimulus event to occur—the event must be detected by the individual's sensory apparatus, in other words. Given the mere presence of that triggering event, the process operates and runs to completion without conscious intention or awareness.

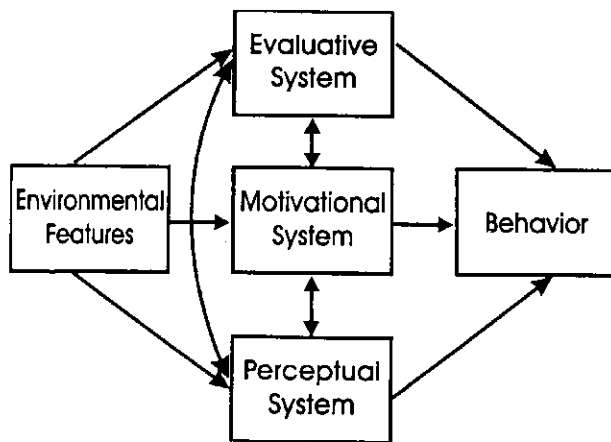


FIG. 1.1 Parallel forms of preconscious analysis.

An individual's cognitive, affective, and motivational reactions to an environmental event combine to constitute the psychological situation for him or her (Koffka, 1925; Lewin, 1935; Mischel, 1973). As it is the psychological situation rather than the objective situation that then serves as the basis for further conscious responses to the situation, the preconscious creation of the psychological situation sets the stage and tone for all that follows an environmental event. My focus is on the ways in which the psychological situation is created preconsciously and automatically for the individual.

The automatic, nonconscious perceptual interpretation of social stimuli was demonstrated by a considerable number of studies (e.g., Bargh & Pietromonaco, 1982; Devine, 1989; Higgins, Rholes, & Jones, 1977; Niedenthal, 1990; Srull & Wyer, 1979). Social behaviors are usually ambiguous enough to support various interpretations or trait categorizations (e.g., independent or unfriendly; brave or reckless), and so the readiness or accessibility of the relevant trait categories in memory—either through recent priming or chronic use in the past—becomes critical as to how that behavior will be understood. Moreover, biased assumptions are often made about individuals based on their social group membership, because stereotypes of those groups automatically become active to influence person perception outside of intent or awareness (see review in Bargh, 1994). The evidence for preconscious evaluation is more recent and perhaps not yet as well known. However, it exists in the domains of social attitudes (e.g., Bargh, Chaiken, Raymond, & Hymes, 1996; Fazio, Sanbonmatsu, Powell, & Kardes, 1986), face recognition (Murphy & Zajonc, 1993), and the neural substrates of emotional reactions (LeDoux, 1989).

Before moving to a discussion of these bodies of evidence and their import, it might be useful to present an a priori case for why preconscious influences should be expected to obtain in motivation and behavior as in perception and affect. First of all, theorists as diverse as Lewin (1935), Mischel (1973), and Berkowitz (1984) all argued that the psychological situation is not restricted to perceptual and cognitive reactions to an event. Thus, for example, when we say something stupid to a friend and wish we could take it back right away, we not only have cognitive reactions, but also immediate emotional, visceral, and behavioral ones. All of these reactions must be represented in the mind.

Goals and behavioral responses do not exist in some mysterious ether, but correspond to mental representations in much the same way as do attitudes and perceptual structures (see Bargh, 1990; Wyer & Srull, 1989). And because they are mental representations, the same principle of automatization that produces automatic perceptual interpretations, for instance, should apply to them as well. That is, as Hebb (1948) described, the principle of *contiguous activation*: Two (or more) representations that tend to be active at the same time develop associative links to one another. So if an individual makes the same categorizations (e.g., loyal) of a given act (e.g., giving help to a friend during an exam) consistently over time, then that trait representation will eventually become active whenever that behavior pattern occurs in the environment (Smith, Branscombe, & Bormann, 1988; Smith & Lerner, 1986). If an individual makes the same evaluation (liking or disliking) of

not known consciously

a given object consistently over time, then that evaluation will eventually become active automatically whenever that object is perceived (Fazio et al., 1986).

And, if an individual has the same goal and intention within a given social situation repeatedly over time, then that goal representation, with its associated plans to attain the goal (Miller, Galanter, & Pribram, 1960; Wilensky, 1983), will become active automatically whenever those situational features are present in the environment to activate the internal representation of that situation (Bargh, 1990; Bargh & Gollwitzer, 1994).¹ This hypothetical automatization of goal representations through the consistent pairing of a given situation with the same intention is at the heart of the auto-motive model of goal-directed action, to be discussed next.

The Interface of World and Mind

How we immediately understand the world from moment to moment serves as the starting point for everything we think, feel, and do in response. Preconscious processing is that initial stage of cognition in which the world makes contact with our mind. It operates on sensory input and reduces and transforms it into meaningful objects and events. The mental representations activated during preconscious input analysis are those that were chronically associated with the stimulus event in the past.

Neisser's (1967) original description of preattentive processing limited it to the recognition of patterns and to figural synthesis, so that what is furnished immediately to our conscious awareness and purposes while walking down the street are cars and people and buildings and trees, not a blizzard of wildly moving light and angles. Neisser, following the earlier work on perceptual microgenesis (Flavell & Draguns, 1957; Werner, 1956; Werner & Kaplan, 1963), persuasively demonstrated that a considerable amount of cognitive work had to occur prior to conscious awareness of a stimulus in order to produce the common objects we take for granted. Nonetheless, our subjective, conscious experience starts with these objects, as we are not aware of the preconscious transformations that furnished them to our awareness (see also Lazarus, 1982).

This principle of preconscious processing extends beyond the construction of simple object percepts to also create for our conscious awareness the givens of our social life and world. I review research showing that preconscious processing of social information occurs as Neisser argued it does for nonsocial information, that

¹Again, although the objective situational features are the triggers that activate the chronic goal, this occurs via the internal representation of that situation (i.e., its chronic construal or appraisal), which may vary from individual to individual. For instance, one person's perceived threat may be another person's perceived opportunity. Goals are formed in response to the way in which the situation is appraised or interpreted by the individual, so the goal becomes automatically associated with the situational representation; but as both the feature-to-representation and the representation-to-goal associations are automatic, the perceptual registration of the objective features automatically results in activation of the goal.

understandings and meanings about people and the social situations they inhabit are furnished by these processes immediately and involuntarily, without any awareness of their operation. We experience the output of these preconscious analysis as if these meanings and understandings were clearly present in the objective world, when in fact they are not (see Jones & Nisbett, 1971).

Aspects of the Psychological Situation

These immediate reactions are not just concerned with the categorization or comprehension of the object or event, however. Lewin (1943) considered the immediate psychological situation for the individual to consist of "needs, motivation, mood, goals, anxiety, ideals" (p. 306)—that is, the totality of his or her immediate reactions to the objective situation. In harmony with Gestalt principles (e.g., Koffka, 1925), Lewin stressed the importance of this set of internal reactions or meanings, and not the objective situation, as the stimulus for the individual's behavior.

Mischel (1973) further developed the notion of the psychological situation in his social-cognitive model of personality. He noted that an individual can have all sorts of immediate reactions to a person or event, not limited to cognitive or perceptual ones, but including (a) expectancies for what was going to happen next in the situation, (b) subjective evaluations of what was happening, (c) emotional reactions one has had in that situation in the past and, most importantly to the present thesis, (d) the behavioral response patterns one has available within the situation based on one's past experience.

What the present argument adds to Mischel's (1973) analysis is that preconscious processes largely create the immediate psychological situation. The preconscious determines perceptual interpretations of the other people's behavior, evaluative reactions to these people based on their physical features as well as their actions, and one's own motives and behavioral responses within the situation.

In other words, there are three basic forms of preconscious analysis of the environment that together constitute the immediate psychological situation: perceptual, evaluative, and motivational-actional (see Fig. 1.1). The remainder of this chapter reviews the evidence that these three types of reactions occur pre-consciously on the mere presence of the triggering stimulus. I argue that these three systems operate simultaneously, in parallel, and communicate with each other, so that the output of one system has consequences for the others. For the same environmental event to be processed immediately in terms of its evaluative, motivational, and perceptual implications, these different processing systems must operate on the same input at the same time (i.e., in parallel). It would make a good deal of sense if they shared information and perhaps operated on the same cognitive representations. Evidence of the existence of these causal links is presented.

I also argue that the operating characteristics of the three systems are not identical. Rather, the three systems are dissociable, and they correspond to separate processing modules (see Fodor, 1983; Jacoby, 1991; Johnson, 1983; and Tooby &

Cosmides, 1992; for similar modularity arguments; and within this same series see the recent contributions of Klein & Loftus, 1993, and Carlston, 1994, for further evidence of dissociations between social-cognitive processes). Evidence that the three systems are dissociated (see Dunn & Kirsner, 1988) is also presented.

THE DEVELOPMENT OF THE PRECONSCIOUS

Civilization advances by extending the number of important operations which we can perform without thinking about them. (Whitehead, 1911, p. 143)

Although Lord Whitehead's claim was made at the grand level of civilization, it holds equally well for the humble, individual human. Theoretically, preconscious processes, like all automatic processes (Shiffrin & Dumais, 1981) develop out of one's frequent and consistent mental, emotional, motivational, and behavioral reactions to a given set of environmental features. Initially these reactions are effortful and require conscious attention and intention. Over time, however, the need for intention and attention diminish, given that the same categories or evaluations or goals are always selected in response to those features. Preconscious automaticity models the regularities in one's reaction to an event, and eventually subsumes them so that the conscious mind no longer has to make decisions and understandings it always makes the same way anyway. If this were not the case, noted Miller et al. (1960), none of us would be capable of getting out of bed in the morning.

Closer to Whitehead's point, the delegation of these routine processes to the preconscious frees up processing capacity for the novel, creative work that only conscious processing can provide—the chess master who can look far ahead because the calculations that burden his or her opponent's attentional capacity are made for him or her nonconsciously, the tennis champion for whom the decisions as to where to run and which type of shot the opponent will attempt are made preconsciously, freeing him or her to surprise and perplex the opponent with a novel bit of strategy. Thus, an individual advances in the same fashion as does civilization.

Preconscious Processes as Mental Servants

Computer programmers are now developing interfaces for personal computers that behave very much like these preconscious mental processes. Such interfaces are known as *agent programming* (Negroponte, 1995). Your personal agent program resides in your computer and performs such tasks as sorting your electronic mail, sifting through the newsgroups you regularly enter, and finding postings that you might be interested in, among other functions. More importantly, such agents are capable of programming themselves, mapping what they do onto the routines and

regularities demonstrated by their human user. At the Massachusetts Institute for Technology's Media Lab, all users have such an intelligent agent program that over time starts to take over, or automate, tasks such as scheduling meetings, electronic mail responses, selection of what net-news to read, and so on. Nicholas Negroponte (1995), the director of the Media Lab, summarized the concept of agent programming:

The best metaphor I can conceive of for a human-computer interface is that of a well-trained English butler.... It has to be able to expand and contract signals as a function of knowing me and my environment so intimately that I literally can be redundant on most occasions.... The concept of "agent" embodied in humans helping humans is often one where expertise is indeed mixed with knowledge of you. A good travel agent blends knowledge about hotels and restaurants with knowledge about you (which often is culled from what you thought about other hotels and restaurants). A real estate agent builds a model of you from a succession of houses that fit your taste with varying degrees of success.... What they all have in common is the ability to model you. (pp. 151, 155)

The present conceptualization of preconscious processes is no different: They are mental servants that take over from conscious effortful processing those choices that hardly ever vary, and so apparently are not worth bothering capacity-expensive conscious processes with.

If you decide that you like something or someone, and you consistently have that reaction, eventually that positive or negative evaluation is made for you when you encounter that person or object, even if you are not thinking about how you feel at all. If you take a certain kind of behavior as kind or insensitive, and do so consistently, your preconscious agent eventually makes this categorization for you, without your conscious involvement or knowledge. If you choose the same goal within a certain situation, and do so consistently over time, that intentional choice is eventually made for you when you enter that situation, and you may well behave in line with that goal without choosing it consciously. Conscious involvement is bypassed in the streamlined preconscious link between the environmental information and one's perception, evaluation, and behavior.

The Preconscious and Skill Acquisition

This streamlining occurs for the same reasons and by the same process as does the proceduralization or compilation of knowledge structures (Anderson, 1983; Smith, 1984, 1994), and skill acquisition (Bargh, 1996; Newell & Rosenbloom, 1981; Wegner & Bargh, 1997). Note that in both skill acquisition and knowledge compilation, what were formerly separate procedures or components of the skill become assembled into a single unit or structure. When learning to drive, for example, each component, such as turning the wheel the proper amount, pushing the accelerator or brake pedal with the right force, or visually checking the traffic

pattern on all sides, requires considerable conscious attention and also needs to be instigated by an act of intention or will. But eventually these components become assembled into a larger unit, called driving, that still requires an act of intention or will to be started, but when it is operating, the individual components no longer require conscious choice or activation to operate. What used to be several separate skills each requiring an act of will to be engaged now become one single skill requiring only one act of will.

The important point is that the basic idea of preconscious thought, evaluation, or motivation—that which does not require an act of conscious will or intention to occur—is already implicit within the research literature on proceduralization and skill acquisition. As skills are acquired or procedures compiled in these models, what originally required an act of will to occur (e.g., hitting the brakes when seeing a stop sign) can occur without that act of will with repeated pairing of stimulus features and the intention to engage in that skill.

THE THREE FORMS OF PRECONSCIOUS ANALYSIS

We now turn to a description of the three forms or systems of preconscious analysis of the environment. In each section, evidence supporting the existence of direct environmental control over that form of psychological reaction is presented. Next, the relation between that system of analysis and social behavior is described along with evidence in support of the automaticity of that pathway. Following the schematic outline of Fig. 1.1, the three routes by which environmental stimuli automatically and nonconsciously produce social behavior are traced: via automatic social perception (i.e., the perception-behavior link), automatic evaluation (i.e., approach-avoidance motivation), and finally automatic goal and motive activation (i.e., auto-motivation). As the claim is made that these are three separate processing modules, evidence is also presented indicating their dissociations.

PERCEPTION

Preconscious effects in social perception—those effects that are not mediated by conscious intention—were demonstrated in both impression formation and in stereotyping.² Preconscious perceptual processes were shown to influence one's

²The automaticity of social perception has been the most widely researched of the three forms of preconscious analysis discussed here. A substantial amount of evidence supports its existence and thus it is the least controversial of the three forms. Because several thorough reviews of this evidence already exist (Bargh, 1989, 1994; Brewer, 1988; Greenwald & Banaji, 1995; Higgins, 1989; Smith, 1994; Wyer & Srull, 1989), it is not reviewed in as much detail here as is the evidence regarding the automatic evaluation and automatic motivation.

categorization and understanding of a person's behavior, and consequently the impressions formed of that person. Trait concepts such as honesty, intelligence, and aggressiveness, after frequent use in understanding behavior relevant to them (i.e., behavior whose features match those in the stored trait representation), can eventually become capable of preconscious automatic activation in the presence of this behavior. This means that the behavior is encoded and categorized in terms of that trait regardless of the current focus of conscious attention or the current processing goal (Bargh & Pratto, 1986; Bargh & Thein, 1985; Higgins, King, & Mavin, 1982; Uleman, Newman, & Moskowitz, 1996; Winter & Uleman, 1984).

Trait Categorization of Behavioral Information

When the behavioral information is clearly diagnostic of a given trait—when the information matches a single trait concept very well and few, if any, others—it activates that trait concept regardless of current conscious purposes. This is shown by the fact that Srull and Wyer (1979) were able to activate or prime the trait concepts of kindness and hostility by presenting scrambled sentences to participants describing trait-relevant behaviors (e.g., "he fell her kicked") in the guise of a language ability test. Even though the participants' goal was not that of using the information to form an impression of anyone, but merely to unscramble the words in the sentence, their subsequent impressions of a target person were more in line with the trait related to those behaviors than were the impressions of nonprimed participants. Winter and Uleman (1984) and subsequent research by Uleman and colleagues (see Newman & Uleman, 1989; Uleman et al., 1996) showed that sentences describing social behavior are encoded in terms of the trait clearly exemplified by that behavior even though participants' task is just to memorize each of the sentences. Gilbert and colleagues (e.g., Gilbert, 1989; Gilbert, Pelham, & Krull, 1988) showed the consequences of this automatic behavior-to-trait encoding effect for conscious attributional processes. When the participant is prevented through attentional overload manipulations from gathering or integrating other information as to the cause of a behavior (e.g., that concerning possible situational causes), all he or she is left with is the automatic, default trait encoding and so tends to attribute the behavior to a dispositional trait of the actor's.

Construct accessibility research (see Bargh, 1989; Higgins, 1989; Wyer & Srull, 1989 for reviews) shows that the same unintended, preconscious interpretation of behaviors can occur when the behavior is less than clearly diagnostic of a given trait category. When the behavior is ambiguously relevant to more than one trait construct (see Bruner, 1957), the trait construct that is the most accessible, or easily activated, from among the set of those applicable or relevant to the behavior will be used to interpret the behavior. This greater top-down influence of construct accessibility is not felt or experienced by the individual. Instead, the behavior is perceived as clearly diagnostic of that trait—even though other participants who do not have the trait as easily accessible would interpret the behavior differently

(Bargh & Pietromonaco, 1982; Higgins, Rholes, & Jones, 1977; Srull & Wyer, 1979). Thus, if the individual is perceptually ready (Bruner, 1957) to perceive a given trait, as a result of its heightened accessibility in memory, preconscious perception can occur even when the behavioral evidence is not diagnostic.

This increased accessibility of trait constructs can come either from recent use—experimentally manipulated in the previous studies through priming techniques in which stimuli semantically related to the trait are presented in an unobtrusive manner—or from frequent use in the past by the individual. Technically speaking, only the latter form of accessibility produces truly preconscious perceptual effects, because there are no conditions for producing such interpretations except the presence of the relevant behavioral information in the environment. Priming effects involve the additional condition that the trait construct in question be recently used (and so are better termed *postconscious* processes; Bargh, 1989)—however, once a construct has been primed or recently used, the interpretive effects it produces while active are indistinguishable from chronic or preconscious effects (see Bargh, Bond, Lombardi, & Tota, 1986; Bargh, Lombardi, & Higgins, 1988).

Stereotyping

In the same way, social group stereotypes were found to be preconsciously activated by the presence of features of the stereotyped group (see review in Bargh, 1994). Racial, ethnic, gender, and age-related features of an individual serve as diagnostic cues to his or her social group membership, and if there is a stored stereotype of assumptions and beliefs about the characteristics of members of this group, it may become automatically active on just the mere presence of the group member (see Brewer, 1988). As with all preconscious processes, what determines whether the stereotype becomes automatically activated in this way is whether it was frequently and consistently active in the past in the presence of relevant social group features.

Evidence of the preconscious nature of stereotype activation comes from studies in which either (a) the stereotype is shown to become active subconsciously (Devine, 1989), (b) conscious processing of the target information is prevented through an overload manipulation (Pratto & Bargh, 1991), or (c) participants are processing the stereotype-relevant information for conscious purposes unrelated to people entirely (Mills & Tyrrell, 1983). Mills and Tyrrell, for example, had participants memorize a list of words presented one at a time. Unbeknownst to participants, on certain series of trials consecutive words were related to either the male or the female stereotype. (This was the only way these series of words were related). Following each series, a word was presented consistent with the opposite stereotype. Results showed that participants recalled words presented on these “switch” trials better than words within the consecutive series. Without participants being aware, the words in the series activated either the male or the female stereotype, which was able to process subsequent stereotype-consistent stimuli using less attentional

capacity—a general feature of automatic processing (see Bargh, 1982; Bargh & Thein, 1985; Gilbert, 1989; Macrae, Milne, & Bodenhausen, 1993). However, on encountering a stimulus word inconsistent with that stereotype, greater attention was required and thus, that word was better recalled later—as are unexpected stimuli in general (see Fiske, 1980; Hastie & Kumar, 1979).

Devine (1989) activated the stereotype of African-Americans held by White U.S. residents through the same subliminal priming manipulation Bargh and Pietromonaco (1982) used to prime a single trait construct. However, Devine demonstrated that a stereotype and not just a single trait construct was pre-consciously activated by using as subliminal primes stereotype-relevant words that were not related to hostility, although hostility was known to be a component of that stereotype. Next, participants read about a fictitious target person (race unspecified) who behaved in an ambiguously hostile manner, and those participants whose African-American stereotype had been primed rated the target as being more hostile. The use of a subliminal priming technique, and the fact that the target person was not explicitly depicted as African-American suggest that the activation and use of the stereotype in this experiment was preconscious. It was activated nonconsciously and unintentionally by environmental features relevant to the stereotype, and then operated to influence perception of the target without participants being aware of this bias.

The Self

The self-concept, which, like stereotypes, comprises a collection of interrelated trait concepts (among other features), was also shown to become active automatically in the presence of self-relevant stimuli, and, therefore, to affect self-perception and emotions (Bargh, 1982; Bargh & Tota, 1988; Higgins, 1987; Strauman & Higgins, 1987). For example, Bargh (1982) showed that trait concepts belonging to the individual's self-concept became active when trait-related stimuli were presented to the unattended ear in a dichotic listening study. This automatic activation was evidenced by greater distraction away from the participant's conscious task compared to when nonself-relevant stimuli were presented to the unattended ear, although participants showed no awareness of the contents of the unattended channel. In a different paradigm, Strauman and Higgins (1987) found that different physiological reactions occurred to words related to the participant's ideal-self (i.e., aspirations) and ought-self (i.e., obligations) concepts. Specifically, participants who felt they had not lived up to their hopes or duties actually experienced dejection and agitation, respectively, after exposure to words related to those aspects of the self. This occurred even though participants were not thinking intentionally or consciously about the self at the time.

In summary, the interpretation of social behavior, whether it be one's own or that of another person, and assumptions and expectancies about others' behavior based on their physical characteristics (e.g., skin color, gender features, voice accent), can all be generated preconsciously in the mere presence of these physical

and behavioral features in the environment. The next section traces the connection between this automatic social perceptual system and behavioral responses to that environment.

THE PERCEPTION-BEHAVIOR INTERFACE

The Principle of Ideomotor Action

Based on the great capacity of humans and other primates for imitative behavior (and speech in humans), many prominent scholars argued that there is a strong associative connection between perceptual and behavioral representations of the same act, such that the very act of perceiving another person's behavior creates a tendency to behave that way oneself (e.g., Bandura, 1977; Hilgard, 1965; James, 1890; Koffka, 1925; Lashley, 1951; Piaget, 1946; see review in Prinz, 1990). James labeled it the *principle of ideomotor action*, that thinking (consciously) about an action activates the tendency to engage in it. Piaget noted that the link between perception and behavior must be innate, as the capacity to imitate is present in early childhood. In mentally retarded or brain-damaged patients for whom other conscious intentional forms of action control are unavailable, echoic or other imitative reactions to others are still present (Prinz, 1990).

The theoretical mechanism invoked by Berkowitz (1984) to account for how violence portrayed in the mass media increased the probability of aggression in the viewer was James' principle of ideomotor action. Activation was said by Berkowitz to spread in memory from representations of the violent acts perceived in the media to other aggressive ideas of the viewer, and this spreading activation occurred "automatically and without much thinking" (p. 410). An experiment by Carver, Ganellen, Froming, and Chambers (1983) tested this ideomotor action model of the effect of aggressive cues on aggression. In a first study, allegedly unrelated to the critical experiment, the concept of hostility was primed for some participants, following the procedure of Srull and Wyer (1979). Then, in what they believed to be an unrelated second experiment, participants were told to give shocks to another participant (who was actually a confederate and received no actual shocks) whenever he or she gave an incorrect answer to a question. Participants primed with hostility-related words gave longer "shocks" to the confederate than did nonprimed participants.

The Automatic Effect of Perception on Action

For our present concern with whether social behavior can be produced entirely automatically (i.e., nonconsciously), a critical aspect of the studies reviewed by Berkowitz (1984) in favor of the ideomotor action hypothesis (including the Berkowitz & LePage, 1967, and Carver et al., 1983, experiments) is that participants always had the conscious and intentional goal (given to them via experimental

instructions) to aggress against the confederate, in that they were instructed to shock the confederate for making incorrect answers. Would participants have behaved in a hostile manner to any degree if they had not been instructed to do so even if the concept of aggression had been primed? To demonstrate the existence of preconsciously determined social behavior via the perception-behavior link, it is necessary to show that the effect does not require conscious involvement or intention, but merely the triggering environmental event. A recent study by Bargh, Chen, and Burrows (1996) tested this prediction.

Behavioral Consequences of Trait Concept Activation. We primed participants with words related to either rudeness (e.g., assertive, rude, interrupt, disturb) or to politeness (e.g., patient, polite, respectful) or neither (in the control condition) in the guise of a language test, in what they believed to be a first experiment. We expected that these primes would activate the perceptual construct of rudeness or politeness in our participants, exactly the same assumption that guided the use of this priming technique in studies of impression formation. However, we expected that this activated construct would have behavioral effects for the individual and not only perceptual effects, in line with the ideomotor action or common-coding hypothesis.

Participants were then instructed to come down the hall to find the experimenter when they were finished, so that they could participate in a second, unrelated experiment. When the participant came down the hall, the experimenter was engaged in conversation with another participant, who was actually a confederate of the experimenter. On seeing the participant, the experimenter surreptitiously started a stopwatch, but continued to answer the questions of the confederate. The experimenter and confederate continued conversation for up to 10 minutes or until the participant interrupted.

Our results showed that considerably more (67%) of the participants randomly assigned to the "rude" priming condition interrupted than did the participant primed with "patience" related words (16%). Subsequent impression ratings of the experimenter showed no differential perception due to the priming manipulation (e.g., as rude or polite) that might have mediated behavior (see Herr, 1986; Neuberg, 1988). We did not expect any such differences because we did not design the experimenter's behavior to be ambiguous in any way with regard to rudeness or politeness; in general all participants felt the experimenter was moderately rude. Extensive debriefing of participants indicated that they had no awareness of the influence of the priming task on their behavior.

These results, along with those of Carver et al. (1983), indicate that the same priming manipulations that were shown to be successful in influencing social perception in previous studies also influence the participant's social behavior. Trait construct priming has the simultaneous effect of causing the participant to be more likely to perceive that trait in another person (given that the other person behaves in a way applicable to the trait construct; see Higgins, 1989), and to behave that way himself or herself if such behavior is appropriate to the circumstances.

Behavioral Consequences of Stereotype Activation. A logical derivation from this parallelism in the perceptual and behavioral effects of contextual trait construct priming can be made to the case of stereotypes. Stereotypes are collections of traits, among other features, and as discussed previously, they—like trait constructs—were demonstrated to become automatically activated in the course of perceiving another person (Brewer, 1988; Devine, 1989; Macrae et al., 1993; Pratto & Bargh, 1991). Therefore, if nonconscious trait construct activation produces trait-consistent behavior as well as perceptual influences, automatic stereotype activation should also make the individual more likely to behave in ways consistent with the content of that stereotype.

Experiment 2 of Bargh, Chen, et al. (1996) investigated the behavioral consequences of automatic stereotype activation, a prediction based on the idea of the perception-behavior link. Previous research on the content of the elderly stereotype (e.g., Brewer, Dull, & Lui, 1981; Perdue & Gurtman, 1990), as well as our own pretesting, showed that it contains the notion of slowness and physical weakness. We primed some participants with those other elements of the elderly stereotype (e.g., *forgetful, Florida, bingo*) in a scrambled sentence test (see Srull & Wyer, 1979) as part of an experiment on language ability. Other participants were presented with priming stimuli unrelated to the elderly stereotype (e.g., *awkward, California, apples*).

In order to demonstrate that the elderly stereotype itself was activated, and not just the focal concept of slowness, none of the elderly priming stimuli was related to slowness or weakness. We expected that the activation of the perceptual construct of slowness or weakness by virtue of its participation in the elderly stereotype would have behavioral effects for the participant. Thus, if the priming stimuli affected subsequent walking speed, it would indicate a mediational role for the elderly stereotype itself on the perceiver's behavior, as opposed to an effect of a single trait concept (this was Devine's, 1989, procedure for demonstrating that the African-American stereotype had been automatically activated).

After the language test was completed, participants were led to believe the experiment was over. They were thanked for their participation, and left the room. The critical dependent measure was how long it took them to walk down the hallway up to a piece of carpet tape about 40 feet away, as measured surreptitiously by a second experimenter (blind to the participant's priming condition) posing as another participant waiting outside the experimental room. As hypothesized, participants primed with the stereotypic content took longer to walk down the hall after leaving the experiment than did control participants. A subsequent replication with an additional set of participants produced the identical result. In both studies, the experimenter caught up with the participant after he or she had passed the taped line and fully debriefed him or her. When later probed by the experimenter, no participant showed any awareness of an effect of the language test on his or her subsequent behavior or energy level.

In order to test an alternative explanation for this result in terms of a mood effect of the elderly priming stimuli—that it might have caused a depressed or sad mood in participants, causing them to walk more slowly—an additional group of partici-

pants were either primed with the elderly or the neutral priming stimuli, and then completed the Salovey and Singer (1989) mood measure. There was no evidence that participants in the elderly priming condition were sadder than participants in the neutral priming condition; if anything, participants in the elderly priming condition reported being in a nonsignificantly more positive mood than did participants in the neutral priming condition.

We conducted a third experiment for two purposes: first, to assess the generality of the elderly stereotype findings to a different stereotype altogether, and second, to prime the stereotype subliminally in order to rule out demand effects or other conscious choice processes as convincingly as possible. In this experiment (Bargh, Chen, et al., 1996, Experiment 3), faces of young adult male African-Americans or of young adult male Whites were subliminally presented on the computer screen. Participants engaged in a dot estimation task in which they were to respond as quickly as they could on each trial as to whether the number of colored dots on the screen was odd or even. Immediately before the presentation of a trial (screen of colored dots), a prime face was presented very briefly (13 msec) and pattern masked. There were 130 trials in the odd-even task, which lasted about 12 minutes. Pretesting showed that participants found this task to be tedious and not enjoyable.

According to Devine (1989) and earlier studies of the African-American stereotype held by many White U.S. residents, hostility is stereotypically associated with African-Americans. Thus, our dependent measure in this study was the degree of hostility shown by the participant to a mild provocation that followed the dot estimation task. Our hypothesis, based on the perception-behavior link, was that subliminal presentation of the African-American faces to White participants should automatically activate the trait concept of hostility as part of the African-American stereotype, and, as a consequence, these participants would be more likely themselves to respond in a hostile manner, relative to participants primed with faces of Whites.

Following the last dot task trial, the participant was thanked by the experimenter and moved to another seat nearby, in view of the screen. Suddenly the computer flashed error messages and beeped in alarm that the participant's data was apparently going to be lost due to a disk error. The experimenter voiced concern and alerted the participant to the problem, saying, "Oh, no, it looks like you might have to do that task over again."

While this was going on, a hidden video camera across the room was recording the participant's facial as well as verbal reactions to this piece of news. We had two judges blind to the experimental hypotheses rate each participant's reaction on scales related to hostility, and after the session was concluded, we also asked the experimenter—who was blind as to the participant's priming condition—to also rate that participant's reaction to the request that he or she redo the dot task (in actuality, no participant had to redo the task, as soon thereafter another message appeared stating that the data had, in fact, been saved after all.)

Results showed that once again, the automatic activation of a stereotype produced stereotype consistent behavior. On the judges' and experimenter's ratings, participants in the African-American prime condition showed a significantly more hostile reaction to the provocation than did participants in the White prime condition.

Implications

We believe these findings have far-reaching implications for the question of the automaticity of social behavior, and for the nature of social interaction. The fact that perceiving another person's behavior, emotions, and so on can make it more likely that we ourselves behave that way suggests a possible explanation of empathic reactions to others (see also Hodges & Wegner, in press). Of course, true empathy would also depend on whether our categorization of the other's behavior matched the person's own understanding of it. Depending on our own chronic and temporary category accessibility, the degree to which the other person feels we understand him or her and empathize could be quite different.

These findings have equally important implications for the self-fulfilling nature of stereotypes (e.g., Snyder, Tanke, & Berscheid, 1977). For example, suppose the automatic activation of one's stereotype for African-Americans causes us to have an automatic (unintentional and outside of our awareness) hostile reaction to an African-American person—perhaps communicated in nothing more than the look on our face. Our own automatic "first strike" might provoke a hostile reaction from this person. However, we would only be aware of the person's apparently unprovoked hostility to us, and so we would interpret it as further supporting evidence for our stereotypic beliefs. A recent study by Chen and Bargh (1997) provided evidence supporting this hypothesis. Compared to a nonprimed control group, participants who were primed with African-American faces caused their subsequent interaction partners to behave with greater hostility, as rated both by blind judges and (even more importantly) by the primed participants themselves.

EVALUATION

There are two main lines of evidence of preconscious evaluation. First, the emotional content of facial expressions was found to be picked up outside of conscious awareness and intent to influence perceptions of the target individual (Murphy & Zajonc, 1993; Niedenthal, 1990; Niedenthal & Cantor, 1986). Second, attitudes toward social and nonsocial objects alike become active without conscious reflection or purpose immediately after encountering the attitude object (Bargh, Chaiken, Govender, & Pratto, 1992; Bargh, Chaiken, et al., 1996; Fazio et al., 1986).

Nonconscious Effects of Emotional Expressions on Evaluation

Several studies showed that people are capable of detecting the emotional expression of faces outside of awareness, and that this information influences their evaluations of target stimuli they subsequently consciously encounter. Niedenthal and Cantor (1986) showed that participants liked the same faces better if the pupils

were dilated rather than constricted in the photograph, although the participant had no awareness that this feature influenced them so. Niedenthal (1990) showed that subliminally presented facial expressions influenced the degree to which subsequent cartoon face was perceived as happy or sad, and Baldwin, Carrell, and Lopez (1990) affected their participants' self-evaluations by subliminally flashing photographs of smiling or frowning authority figures. Edwards (1990) found that subliminally presented facial expression presented prior to an attitude object induced the formation of attitudes in line with the valence of the facial expression and Murphy and Zajonc (1993) found a similar effect of subliminal faces on evaluative judgments of novel stimuli (Chinese ideographs).

Are preconscious evaluation effects restricted to the special case of facial expressions? The research on automatic attitude activation shows that the preconscious evaluation effect is, instead, extremely general across social and nonsocial stimuli.

Automatic Attitude Activation

Original Studies. Fazio et al. (1986) hypothesized that some attitudes ("strong" ones) would be more likely than others to become active automatically in the mere presence of the attitude object in the environment. They operationalized the strength of an attitude in terms of how long it took the participant to give his or her evaluation of the object; the faster the participant could evaluate the object the stronger the attitude was presumed to be. The names of the attitude object corresponding to each participant's fastest and slowest evaluative responses in an initial attitude assessment task served as the priming stimuli in the sequential priming task of Neely (1977). In this paradigm, a priming stimulus is presented for a brief time (ca. 250 milliseconds) followed by a target stimulus to which the participant is asked to respond. This time interval is too brief to allow the participant to develop conscious expectancies and to implement strategic processes regarding the target event (this usually takes at least 500 ms; see Neely, 1977; Posner & Snyder, 1975). Consequently, effects of the priming stimulus on processing of the target stimulus can only occur if the prime was processed preconsciously and automatically.

The target stimuli were positive and negative adjectives, which participants were to evaluate (by pressing a "good" or "bad" button) as quickly as possible. Consistent with their hypothesis, Fazio et al. (1986) found that primes corresponding to the participant's strong (fast) but not weak (slow) attitudes did influence the adjective evaluation response times. That is, when the attitude object prime and the target adjective shared the same valence, those times were faster than when prime-target valence mismatched.

Generality of the Effect. Bargh et al. (1992) sought to investigate the generality of this automatic evaluation effect by studying the midrange of the attitude strength distribution as well as the extremes. Based on normative data for each o

the 92 attitude object stimuli employed in the Fazio et al. (1986) research, we selected sets of positive and negative attitude objects that spanned the middle range of the attitude strength (evaluation latency) distribution, and included them in a replication experiment. We obtained the automatic attitude activation effect for the participant's idiosyncratically selected strong (fast) but not his or her weak (slow) attitude object primes. However, we also obtained the automaticity effect for the preselected midrange set of primes. This result suggested that the automaticity effect was quite general across attitude objects.

Is Evaluation Truly Preconscious? Subsequent experiments investigated the conditions needed to produce preconscious evaluation effects. In these experiments, aspects of the automatic attitude paradigm that might have artificially produced the effect were systematically eliminated. For example, having participants consciously evaluate each of the attitude objects before testing whether their associated attitude is automatically activated could have produced the effect as a result of temporary activation or priming (see Bargh et al., 1986). However, when we placed a 2-day delay between the attitude assessment and automaticity (adjective evaluation) tasks, we did obtain the automaticity effect, but for the participant's weakest, as well as strongest, attitudes (Bargh et al., 1992; Chaiken & Bargh, 1993). In other words, placing a delay between the attitude assessment and automaticity tasks caused the effect to be found more generally for all attitude objects studied.

Another aspect of the paradigm that stood in the way of concluding the effect was preconscious (i.e., unintended) was that in the test of automaticity, participants were given the explicit instructions to evaluate the adjectives as good or bad. This conscious evaluation goal may have operated on the attitude object primes as well as the adjective targets as they were presented concurrently in time; thus the effect would be produced by intention and not be preconscious. To eliminate this problem, three experiments by Bargh, Chaiken, et al. (1996) had participants pronounce the targets as quickly as they could instead of evaluating them. The pronunciation task was shown to be a sensitive paradigm for detecting automatic spreading activation effects (Balota & Lorch, 1986). We found the automatic evaluation effect once again, for the strongest as well as weakest attitudes (Experiment 1). Next, we removed other evaluative aspects of the paradigm, such as the immediately prior attitude object evaluation task (Experiment 2) and the clearly evaluative adjectives (Experiment 3), substituting mildly positive and negative nouns (e.g., *water*, *bean*) as target stimuli. We continued to obtain the preconscious evaluation effect, showing that it does not require conscious intention.

In summary, the automatic evaluation effect occurs regardless of the extremity or strength of the prior attitude toward the object, and under conditions in which all aspects of intentional evaluative processing were removed. If anything, as those conscious strategic processing conditions are eliminated from the paradigm, the effect shows itself more clearly and pervasively. (We return later to a consideration of why removing conscious aspects from the paradigm might also remove the moderating effect of attitude strength as well.) All stimuli are evaluated immediately

as good or bad, without the participant intending to evaluate, having recent thought in terms of evaluation, or being aware of doing so. Therefore, everything one encounters is preconsciously screened and classified as either good or bad within a fraction of a second after encountering it.

The Dissociation of Preconscious Evaluative and Cognitive Processing

The findings of Bargh, Chaiken, et al. (1996), in which any positively evaluated object (e.g., *water*) facilitates the pronunciation of any other positively evaluated object (e.g., *Friday*) even though the prime and target share no other semantic feature in common, cannot be accounted for by extant cognitive models of semantic memory. Such prime-target matches, in which only a single global feature is shared, should produce the weakest of all priming effects (e.g., Balota & Lorch, 1986; Collins & Loftus, 1975). In semantic network models, the degree to which two concepts should prime one another—the probability that activation will spread from one to the other—is a function of the number of relatively unique features the two representations share in common. Features (e.g., *red*; Collins & Loftus, 1975) shared by many representations are posited to produce the weakest priming effects because so many representations share that feature that the amount of activation spreading to any one of them is minimal. Our automatic evaluation results, on the other hand, showed the pervasiveness of activation spread solely as a result of a single feature (i.e., *good* or *bad*) that is shared by more representations than most any other feature. As many theorists argued (e.g., Kuhl, 1986; Zajonc, 1980), there seems to be something special about affective processing, in that it does not play by the same rules as does "cold" cognition.

There is neuropsychological evidence of a separation between affect and cognition as well. Korsakoff's syndrome patients cannot remember any biographical information about target persons after 20 days, yet nearly 80% prefer the one previously described as "good" than the one described as "bad" (Johnson, Kim, & Risse, 1985). In animal research by LeDoux and colleagues (see LeDoux, Iwata, Cicchetti, & Reis, 1988; LeDoux, 1989), brain areas (thalamic relay nuclei) representing the sensory features of acoustic stimuli associated with pain were found to develop subcortical synaptical connections directly to the amygdala (responsible for emotional responses to stimuli), bypassing the sensory cortex. In other words, direct associative connections may develop between the stimulus feature representation and the affective response mechanism, bypassing the cognitive processing mechanism entirely.

Similar findings of a dissociation between affect and cognition were reported by Murphy and Zajonc (1993). They conducted several experiments to test their affect primacy hypothesis—that affective information is processed immediately and non-consciously by a separate mental system. In support of this hypothesis, subliminally presented faces of positive versus negative emotional states were shown to influence judgments of the valence of ambiguous stimuli (Chinese ideographs). However,

nonaffective properties of subliminal stimuli, such as the size of the presented polygons, did not affect judgments of the Chinese ideographs along those dimensions (i.e., whether the ideograph referred to something large or small).

Evaluation as a Qualitatively Different Aspect of Semantic Meaning.

Osgood, Suci, and Tannenbaum (1957) wrote 40 years ago that evaluation was the primary semantic feature (accounting for most of the variance in semantic differential studies of the semantic space) because it was probably accessed first among all semantic features and often in the absence of any other feature being accessed. Osgood and colleagues, in other words, were proposing the same dissociation between affective and nonaffective processing as in the present proposal and its predecessors (e.g., LeDoux, 1989; Zajonc, 1980). As is discussed in the next section, Osgood (1953) gave further reasons for his position that evaluative meaning had a unique status among semantic features.

A study by Bargh, Litt, Pratto, and Spielman (1989) supported the Osgood et al. (1957) contention. Participants were presented with a series of trait words via a tachistoscope at stimulus durations below their conscious threshold. Following the paradigm of Marcel (1983), we asked participants on each trial either about the semantic meaning of the subliminally presented word—whether another word was a synonym—or whether they thought the subliminal word was positive or negative in meaning. Participants correctly answered the evaluative question at a better than chance level, but at the same time were unable to answer the semantic question at a rate better than chance. They had access to the evaluative meaning of the stimuli in the absence of any access to the nonevaluative or semantic meaning.

Bargh, Raymond, and Chaiken (1996) tested whether the automatic evaluation effect held for other major axes of semantic space as it does for evaluation. That is, evaluation might be the major dimension of semantic meaning, but it is not the only one: activity (active–passive) and potency (strong–weak) account for a considerable amount of the variance in semantic differential ratings as well (Osgood et al., 1957). It is a possibility that evaluation is not unique in its automatic qualities, and that if we matched and mismatched primes and targets on activity or potency we might also obtain the automatic priming effect. If we did, it would suggest that the effect is not special or unique to the case of affective processing. Thus, it is critical to test this alternative account.

We asked a large group of students to rate each of the standard set of 92 attitude objects used in the previous automatic attitude research as well as the adjective targets on the dimensions of active–passive and strong–weak. We were then able to construct prime–target pairs in which both were strong, both were weak, or one was strong and the other was weak (in Study 1), and similarly in Study 2 for the active–passive dimension. At the same time, within each prime–target combination, we constructed one half to be of the same valence and one half to be of opposite valence (i.e., both good, both bad, good–bad or bad–good pairs). In this way, we could test for the presence of the evaluative priming effect at the same time we tested for activity or strength priming effects. In both studies, there was no sign of

any automatic priming effect for the other two major dimensions of semantic meaning, but in both studies the automatic evaluation effect was replicated. Thus there does seem to be something special about the evaluative dimension, as the same effects would not hold for other key dimensions of meaning than evaluation.

Strategic Conscious Processes Interfere with Detection of Preconscious Evaluation Effects. The second basis for concluding that the affective system is dissociated from the nonaffective, or cognitive, processing system is evidence that the more the conscious or strategic cognitive aspects of the task are eliminated, the stronger and more general the automatic evaluation effect becomes (see also Chaiken & Bargh, 1993). As noted earlier, Fazio et al. (1986) showed this effect first by including a 1000 msec prime–target delay condition—time enough for strategic conscious processing effects to occur—and eliminating the automatic attitude effect. Then, in our first experiment (Bargh et al., 1992) we replicated the original Fazio et al. (1986) paradigm exactly, and did not find the automatic evaluation effect for the participant's weakest attitudes. But when we separated the attitude assessment task from the automaticity test, we found the effect for all attitude objects, regardless of attitude strength (Chaiken & Bargh, 1993). When we further removed aspects that induced or might have induced a conscious evaluative mindset in some way, such as the participants' explicit instructions to evaluate the targets as good or bad in the automaticity task (replacing this task with pronouncing the targets instead) and common nouns instead of adjectives—clearly positive or negative in meaning—as the targets to be pronounced, the effect became stronger and more pervasive. Throughout this entire series of experiments, therefore, as steps were taken to remove conscious processing from the paradigm, the automatic evaluation effect—the preconscious evaluation of all stimuli, social and nonsocial, delivered through words and via pictures—came through louder and clearer.

These results are supportive of Murphy and Zajonc's (1993) hypothesis that the more that conscious processing aspects were removed from their paradigm, the clearer the affective priming effects would be. They demonstrated this by presenting the same emotional faces above and below the participant's conscious threshold, and only when the stimuli were presented subliminally did they affect judgments of the ideograph targets.

THE EVALUATION–BEHAVIOR INTERFACE (VIA MOTIVATION)

Given the immediacy and pervasiveness of the automatic evaluation effect, the question is, why do we evaluate everything we encounter as good or bad within .25 sec or so after encountering it? To what other systems is the output of the evaluative module connected?

Evaluation as a Trigger of Approach and Avoidance Reactions

Several theorists, beginning with Lewin, proposed a direct link between evaluation and approach-avoidance motivation. In his 1931 paper (reprinted in Lewin, 1935), he proposed this link quite explicitly: "Positive valence of an object in the field has attached to it an attraction motive or goal within the psychological situation, and negative valenced objects have avoidance motives attached to them" (p. 92). In accounting for why evaluation accounted for the lion's share of semantic meaning of a concept, Osgood (1953) argued that the meanings of "signs" or semantic representations are associated with overt (i.e., motoric) instrumental or behavioral responses to the object in question. Specifically, he contended that semantic representations are linked to evaluative reactions such as approaching or avoiding the object, and that these behavioral dispositions were included in the representation, or meaning, of the sign.

Neurophysiological Evidence. Recent neurophysiological evidence is consistent with Lewin's and Osgood's conjectures. LeDoux et al. (1988) found that separate pathways were involved in autonomic and behavioral responses to fear-conditioned stimuli in rats. Electrolytic or chemical damage to one pathway between the amygdala and the lateral hypothalamus interfered with the autonomic nervous system reaction (increased blood pressure) to the conditioned stimulus but not the behavioral response (bodily "freezing"), whereas damage to the other midbrain interfered with the freezing response but not the autonomic. Thus there seems to be a direct connection between emotional and behavioral representations in rats.

Lang, Bradley, and Cuthbert (1990) proposed the valence of a stimulus is a basic dimension by which the brain deals with information, with either a positive approach or a negative avoidance motivational system activated by the stimulus. These two basic affective-motivational systems are an appetitive, or approach, one based on positive valence, and an avoidance one based on negative valence. Activation of one or the other motivational system by like valenced stimuli are said to produce *action dispositions*. All affects, according to their model, are "primitively associated" (p. 377) with either approach (approach, attachment, consummatory) or avoidance (escape, defense) motives.

Recent research by Lang et al. (1990) and Cacioppo, Priester, and Berntson (1993) provide further support for the evaluation-motivation connection. In the studies by Lang and colleagues, basic reflex behaviors such as the startle response to a sudden loud noise, or the knee flexion reflex, are stronger and more probable when the participant is in a negative emotional state than a positive one. Positive reflexes such as salivation in response to a tasty food stimulus are enhanced if the participant is in a positive emotional state or set and attenuated if he or she is in a negative set. Thus one's emotional or evaluative state predisposes one to valence-consistent, approach versus avoidant behaviors, at an automatic and unintended level (i.e., reflexes).

Cacioppo et al. (1993) showed that approach and avoidance feelings induced by arm flexion versus extension influence attitude formation. Participants liked stimuli more when at the same time their arm was flexed (i.e., pulling towards them) compared to when their arm was extended (i.e., pushing away). Again, this effect is not intended nor conscious, as participants were unaware of any connection between the position of their arm and their evaluations of the stimuli.

The Automatic Evaluation Effect and Approach-Avoidance Behavior. Therefore, according to Osgood (1953), LeDoux (1989), and Lang et al. (1990), and consistent with the findings of Cacioppo et al. (1993), the automatic evaluation response demonstrated by Bargh, Chaiken, et al. (1996) should be connected to and cause approach and avoidance behavioral responses (see also Lewin, 1926, 1935). It turns out that a student of Osgood's at Illinois, Solarz (1960) already tested this prediction in an ingenious experiment.³ Participants held a lever that they could either push away or pull towards them. On each trial, a card with a word printed on it was exposed on a device mounted above the lever, which started a timer. On one set of trials, participants were told to push the word away from them if it was unpleasant in meaning, and to pull the word toward them if it was pleasant; on other blocks of trials they were given the opposite instructions. Results supported Osgood's hypothesized linkage between evaluation and motivation: Participants were faster to push away the unpleasant than the pleasant words, and faster to pull toward them the pleasant than the unpleasant words.

Chen and Bargh (1996) recently conducted two experiments in order to directly test the potential connection between the preconscious evaluation effect and approach and avoidance motivations. In our first study, we conceptually replicated the Solarz (1960) experiment, having participants evaluate as good or bad each of a series of 92 stimulus words taken from the Bargh et al. (1992) norms. In a first block of trials, participants either pushed a lever as quickly as they could to indicate they disliked the stimulus whose name appeared on the screen and pulled the lever to indicate they liked it, or vice versa. In the second block these instructions were reversed. Our findings replicated those of Solarz exactly. Participants were faster to make liking judgments by pulling the lever than by pushing it, and were faster to make disliking judgments by pushing the lever than by pulling it.

However, in this replication as well as the original Solarz study, participants had the conscious goal of evaluating the stimuli, and the thesis of the present chapter is that these evaluative and motivational effects will occur just on the presence of the stimulus; that is, preconsciously, without the need for conscious involvement. Thus it must be that the same effects would occur if participants did not have the conscious goal of evaluation. Following the same logic, Bargh, Chaiken, et al. (1996) showed that the automatic evaluation effect was preconscious, as it occurred even when participants did not have any conscious goal or intent to evaluate the stimuli, but merely pronounced them.

³My thanks to Jerry Clore for alerting me to this study.

Therefore, in Experiment 2 of Chen and Bargh (1996), we informed participants that we were interested in reaction times, and instructed them to move the lever as quickly as they could when a word came on the screen, in order to "knock it off." The words—again the names of positive and negative stimuli from the Bargh et al. (1992) norms—were presented at random time intervals to enhance the reaction time cover story. On one half of the trials, participants pushed the lever to remove the word from the screen; on the other half, they pulled the lever (the order in which they pushed or pulled was randomized for each participant). Nothing in the experimental instructions mentioned evaluation of the stimuli. Nevertheless, on the trials in which participants pushed the lever, they were faster when the stimulus had a negative valence, and on the trials in which they pulled the lever, they were faster when the stimulus had a positive valence.

These findings show that the preconscious evaluation response extends to the activation of motoric response tendencies, a direct preconscious route from stimulus to motivation and behavior in line with the proposals of Osgood (1953), Lang et al. (1990) and others. Because the preconscious effect demonstrated by Solarz (1960) and Chen and Bargh (1996) travels through the evaluative system to predispose the individual to certain behavioral responses, it constitutes another source of evidence of automatic motivation—one that is continually occurring for all stimuli the individual encounters based solely on their emotional valence.

GOALS AND MOTIVATIONS

Goals Are Strategies That Interact With the Environment

One of the historical roots of modern automaticity research is research on skill acquisition (see Bargh, 1996). Any skill, be it perceptual, motor, or cognitive, requires less and less conscious attention the more frequently and consistently it is engaged (e.g., Newell & Rosenbloom, 1981). Eventually, with enough practice and use, it becomes capable of operating with no conscious attention at all. In social psychology, Smith's research (e.g., 1994) has documented the decreasing need for conscious guidance of social judgments with increased experience in making them.

These skills are intentional processes. Although they are very efficient and require very little attention, they still require an act of intention or will to occur. Consider walking down the street. As automatic as that skill might be for most of us—allowing us to daydream, plan, chew gum, and do lots of other things without having to monitor or guide our legs and feet—we still have to intend to walk somewhere in the first place. With experience, these automated skills come to operate autonomously, so that once initiated they interact with the complex environment as automated strategies. We adjust our walking to the other people and the vehicular traffic and the weather and the light conditions without trying

to; part of the skill of being able to walk is the intake of current information and basing our responses on it. But the intake of walking-relevant information and our adaptation to it is just as much part of the automated walking skill as are lifting our legs and placing our feet on the pavement. Because it is automated, we are not aware of how we are selecting and using and reacting to the environmental information.

Vera and Simon (1993) called this aspect the *functional transparency* of the skill. Given sufficient experience in the domain, the relevant information is represented at a highly abstract functional level, and it is this level (e.g., "driving to work") of which one is aware, not the concrete level of details (e.g., "going down Depot Street, wait for the light, signal a left turn, left onto Madison ..."). When one is just learning how to drive, one has to make every decision consciously, even as detailed as when to let go of the steering wheel during a turn. With practice, that decision does not need to be made consciously, as it is subsumed or *compiled* (Anderson, 1983) as part of the "making a turn" unit. Nonetheless, at this level of skill, the driver still has to decide consciously when to make the turn. Eventually, even that decision becomes functionally transparent—no longer needing to be made consciously—under the even more abstract goal of "following the road" or "driving to work."

Therefore, the goal that is operating here autonomously and without conscious guidance is not a single, static behavioral response to a stimulus, but an automated strategy or plan for interacting with the environment in order to achieve a desired goal. What is active is a mental structure that not only interacts with environmental information, it requires that information to operate just as a car requires gasoline. When we refer to a goal or motive being triggered preconsciously, in other words, it is a goal with associated plans to achieve an outcome. As Vera and Simon (1993) described them, "Plans are not specifications of fixed sequences of actions, but are strategies that determine each successive action as a function of current information about the situation" (p. 17).

It is clear from the skill acquisition literature that the goals an individual frequently and consistently pursues in a given situation are capable of operating autonomously and without the need for conscious guidance. What starts them in motion? It is the activation of the goal or intention, the "top node" in the goal system under which the substrategies and processes are subsumed.

The Auto-Motive Model

Once activated, functionally transparent or automated skills can interact with the environment in a sophisticated way, taking in information relevant to the goal's purposes, and directing appropriate responses based on that information, without the need for conscious involvement in those responses. The auto-motive model of goal-directed action (Bargh, 1990) added just one assumption to this idea: The entry point or trigger that starts that goal into operation can itself be subsumed and removed from conscious choice. It can do so if that conscious choice point itself becomes routinely associated with a set of environmental features. Environmental representation and choice point can be compiled together if the situational repre-

resentation and the goal in question are repeatedly active together (Hayes-Roth, 1977; Hebb, 1948).

Although to claim that one can engage in these goal-directed actions without consciously intending to do so is also to argue that often one does not have conscious control over one's responses to the environment, there seems no a priori reason not to extend the principle of functional transparency to the instigation of the goal itself. As long as the same principles that caused conscious choice to be subsumed and eliminated from the originally separate components of that skill apply to the instigating choice itself, that choice should likewise be capable of delegation to the environment.

Thus, the central hypothesis of the auto-motive model is that this goal or intention, this complex strategy of interacting with the world, can be started in motion by environmental stimuli. Stimuli in the environment can directly activate a goal, which will then become operative and guide cognitive and behavioral processes within that environment, without any need for conscious decision.

This position, that the goals and motives guiding behavior can operate nonconsciously, has precedent. Jung (1927) argued that people often engage in routine and regular patterns of behavior, the motive for which might not be accessible to consciousness. However, the individual may nonetheless experience the behavior as consciously chosen, for he or she would supply a conscious motive or "rationalization" for it:

We have grown accustomed to scrutinizing our own actions and to seeking rational explanations for them. But it is by no means certain that our explanations will hold water, indeed it is highly unlikely. ... As a result of our artificial rationalizations it may seem to us that we were actuated not by instinct but by conscious motives. (p. 301)

The notion of unconsciously operating motives does not appear only in the writings of psychodynamic theorists, however. Gazzaniga (1985) noted the same phenomenon in split-brain or Korsakoff's patients, of behavior generated by unconscious activation of a goal that is then given a conscious rationalization. If a message is flashed to the right hemisphere of such a patient, such as to get up and leave the room, the behavior will occur. But when stopped by the experimenter and asked why he or she is leaving, the patient is likely to respond almost immediately with a plausible reason, such as, "I needed to get a drink of water." Hypnotized people, who have ceded control over their behavior to the hypnotist (see Hilgard, 1965), show the same ability to quickly rationalize behavior they did not instigate themselves. Hilgard (1977) gave the example of a participant who was given the command to walk around on the floor on her hands and knees after she woke up. She was awakened, and then crawled around on the floor, saying, "I think I lost an earring down here."

According to the auto-motive model, because goals and motives must be represented in the mind just as are other knowledge structures, they should be capable of becoming automatically associated with representations of those environmental features they are consistently paired with, just as do other automatic associations (e.g., Shiffrin & Schneider, 1977). Thus, if an individual nearly always pursues the same goal within a given situation, that goal will come eventually to be

preconsciously activated within that situation, independently of the individual's conscious purposes at that later time.

When the auto-motive model was first presented (Bargh, 1990), it had the status of an untested hypothesis, but since then several relevant experiments were conducted. Two general types of automatic goal effects were studied: cognitive or information-processing goals, and social-behavioral goals.

Automatic Activation of Information-Processing Goals

Several studies support the idea that an activated goal can operate outside of awareness and can therefore unconsciously influence processing. One set of such experiments looked at the residual effects of activated goals. Participants are given a certain processing goal or mind set via explicit experimental instructions in a first task, and then it is shown that this goal continues to operate in a subsequent, ostensibly unrelated task.

Deliberation Versus Implementation. Gollwitzer, Heckhausen, and Steller (1990) performed the first study of this kind. The experimenter induced either a deliberative or an implemental mindset in the participant by instructing him or her to think about a personal problem in one of two ways: either in terms of alternative ways to solve it, or in terms of specific steps they might take to solve it. Next, in an ostensibly unrelated second experiment, participants were given a story completion task. The story was one of several fairy tales and the participant was given just the first few sentences. One, for example, concerned a medieval king who was going off to war but did not want to leave his daughter alone in the castle unprotected. Participants could complete the story any way they chose, but those who had been given a deliberative mind set in the first experiment wrote more about all the possibilities the king was considering, whereas those given an implemental, action-oriented mind set continued the story with what the king actually did in order to solve his problem. Apparently, the goal used in the first experiment was still active and hence operated on relevant input in the second study, without participants being aware of or choosing this mode of processing.

Motives in Processing Persuasive Communications. Chaiken and colleagues (Chaiken, Giner-Sorolla, & Chen, 1996; Chen, Shechter, & Chaiken, 1996) also used the unrelated-task paradigm to prime various processing goals. In the first task, participants were given scenarios to read in which the target person was portrayed as being concerned with accurately understanding what was going on, or with making a good first impression on another person. This manipulation was intended to activate either an accuracy or an impression-management motivation in the participant. In the second, apparently unrelated experiment, participants were given an attitude issue (e.g., gun control) and informed that they would be discussing this issue with another participant (in reality there was no other partici-

People or I know how they do control their do.
or often they generate inaccurate explanations

part). The other participant was described as holding either a pro or con position with respect to that issue.

Next, participants read an essay containing arguments on both sides of the controversy, during which they wrote down their reactions to the essay. Then, after reading it, participants were asked to give their own attitude about the topic. The stated attitudes of participants who had earlier read about a person trying to make a good impression were more in line with that of the participant they expected to meet than were the positions of participants who had read about a person concerned with accurate information processing. Furthermore, content analysis of the thought protocols revealed that participants evaluated essay arguments supporting the other participant's position more positively in the impression-management condition than in the accuracy condition.

Thus, in this study, as in Gollwitzer et al. (1990), the conscious activation of a cognitive processing goal or motivation in one context increased the likelihood that this goal, rather than other, relevant goals, was used in processing subsequent information. This occurred even though participants were not aware of and did not intend this subsequent influence.

Cognitive Consistency Motivation. In research by Bator and Cialdini (1995; Cialdini, 1994), cognitive consistency goals were either primed or not primed in a first experiment. Then, the same participants took part in an ostensibly unrelated cognitive dissonance experiment. Participants were told they would be interacting with another person, and then had them read an essay purportedly written by that person. The content of this essay either communicated that the other person really valued consistency in beliefs and behavior, or did not. Next, in what was an allegedly unrelated experiment, participants were asked to write an essay in favor of their university implementing comprehensive examinations as a requirement for graduation. This position was opposite to all participants' actual personal positions on the matter. Participants wrote this counterattitudinal essay either under free choice or no choice conditions. Following completion of the essay they were asked for their own positions on the issue.

According to dissonance theory, participants writing counterattitudinal essays under free choice conditions should become more favorable towards the issue than participants who believed they had no choice in writing the essay (Wicklund & Brehm, 1976). In the Bator and Cialdini (1995) study, this effect was obtained only for those participants whose consistency motivation had been primed in the ostensibly unrelated first experiment. Participants in the no-prime condition held the same final position on the comprehensive exam issue whether they had written the essay under free choice or no choice conditions. The results supported Cialdini's (1994) hypothesis that dissonance and other consistency effects were obtained in previous research because of the communication of subtle-consistency cues to the participant by the experimenter in those paradigms, a situation that the consistency priming manipulation simulated. For our purposes, the fact that cognitive consistency motivations can be primed is encouraging support for the auto-motive model.

Preconscious Activation and Operation of Social Information Processing Goals

To demonstrate the preconscious activation and subsequent nonconscious operation of cognitive processing goals, however, the role of conscious intent must first be eliminated. At present, the evidence shows that a goal, recently consciously chosen and pursued, has a lingering influence in subsequent contexts in which it is not consciously chosen. As such, this is a postconscious effect of recent experience (Bargh, 1989) that depends on a conscious choice of the goal in order to occur. To demonstrate that the cognitive processing goal is triggered directly and unconditionally by the environmental event with no intervening role played by intentional conscious processing whatsoever, one must show that the goal can be primed passively or nonconsciously and still produce its signature effects.

A pair of experiments by Chartrand and Bargh (1996) supports this prediction. We replicated two previous research paradigms, both of which had shown different processing outcomes (memory organization, judgments) depending on the participant's processing goal when encountering the stimulus information. However, whereas the previous studies gave participants one or the other processing goal via explicit instructions, we primed the goals passively, and in one case, subliminally.

Impression Versus Memory Goals. The first experiment replicated the classic study by Hamilton, Katz, and Leirer (1980). In their study, participants read a series of behaviors with instructions either to form an impression of the actor or to memorize the information. Participants had greater free recall of the target's behaviors, and greater degree of organization of the material in memory according to trait category (sociable, intelligent, athletic, religious), when they had an impression formation objective than when they had a memory objective.

In our study, we did not give our participants any explicit instructions in how to process the information. Rather, we told them merely to read it as we would ask them questions about it later. To prevent participants from spontaneously having an impression formation goal, we presented only the behavioral predicates (as had Hamilton et al., 1980; e.g., "had a party for some friends last week"), without informing them that the behaviors had been performed by a single individual. Before exposing participants to the behaviors, however, we had them perform an ostensibly unrelated "language experiment" in which they were unobtrusively exposed to the priming stimuli via the scrambled sentence test described earlier (Srull & Wyer, 1979). Embedded in the 15 items of this test were words related either to the goal of forming an impression of someone (e.g., opinion, personality, evaluate) or to the goal of memorizing information (e.g., absorb, retain, remember).

Our results replicated those of Hamilton et al. (1980) exactly. That is, participants whose impression formation goal was primed recalled significantly more of the behaviors than did participants in the memorization condition. Moreover, their recall protocols showed significantly higher clustering according to trait category.

On-Line Impression Formation. Our second experiment was a replication of Hastie and Kumar (1979) and related person memory studies that used their paradigm (e.g., Bargh & Thein, 1985; Srull, 1981). Unlike those studies, however, we did not give our participants any explicit goal to form an impression of the target person, and we again presented only behavioral predicates. Instead, we subliminally primed the impression formation goal for some participants, presenting impression related stimuli outside of conscious awareness (i.e., parafoveally, very briefly, and masked) in the context of a speeded reaction time task (Bargh & Pietromonaco, 1982). Other participants were not exposed to such impression related stimuli during the reaction time task. This task was described to participants as a separate experiment from the critical task that followed.

The major prediction was that participants whose impression formation goal had been subliminally activated would show evidence of on-line impression formation (Bargh & Thein, 1985; Hastie & Park, 1986; Lichtenstein & Srull, 1987), that is, impressions formed prior to being explicitly asked for their opinion of the target person by the experimenter. We hypothesized that participants whose impression goal had not been primed would not form an impression until asked for it by the experimenter (Srull, 1981), and so they would not show evidence of on-line impression formation effects. There are three signatures of on-line impression formation. One is a direct influence of the information presented on impression judgments that is not mediated by the information the participant has just recalled (prior to the impression ratings) on a surprise free recall test. Separating the direct from indirect influences can be done through path analytic techniques (Bargh & Thein, 1985). Another indication of on-line impressions would be judgments that more greatly differentiated the target persons on the trait dimension on which they varied (honesty–dishonesty), given that there were clear differences in the degree of honesty of the two targets. One half of the participants were presented with 12 honest and 6 dishonest (and 6 neutral) behaviors, and one half the participants with 6 honest and 12 dishonest (and 6 neutral) behaviors (following Bargh & Thein, 1985). The third signature of on-line impression formation for which we tested was the emergence of a recall bias for the minority behavior type, which occurs only after the participant forms an impression and then processes subsequent impression-incongruent information more elaborately, in an attempt to integrate it with that impression (Srull, Lichtenstein, & Rothbart, 1985).

After the behaviors were presented, all participants were given a surprise free-recall test, being asked to write down all of the behaviors they could remember. Then, they were told that all behaviors had been performed by the same person and were asked to rate the person with respect to both honesty and other, unrelated traits. Having participants give their impressions after just recalling the behaviors should increase the degree of correspondence between the memory and impression rating measures. However, if participants had formed and stored an impression on-line during information acquisition (see Carlston, 1980), honesty ratings should be a direct function of the proportion of honest (vs. dishonest) behaviors presented, independently of the proportion of honest to dishonest behaviors the participant had just recalled.

Our findings supported these predictions. Only for participants whose impression formation goal had been triggered subliminally were impression ratings a direct and significant function of the information presented. Moreover, the impressions formed by these participants were significantly more polarized along the honest–dishonest dimension than those of other participants, more accurately reflecting the clear difference in the honesty of the two target people.

Goals Operate the Same Whether Activated Consciously or Nonconsciously

These results provide clear support for the hypothesis, generated from the auto-motive model, that goals operate on relevant information and attain their purpose (e.g., impression formation), regardless of whether they were activated consciously or nonconsciously. That is, the source of the activation does not matter, nor does whether the person intends to pursue the goal, or whether the person is aware of having that goal at the time.

The auto-motive model argues that motivations such as accuracy, defense, impression management, and consistency exist in chronic form in some individuals, and that every person has chronic goals that are triggered automatically by environmental stimuli. Priming is an excellent technique for experimentally manipulating automatic goal activation and operation. However, the results of priming studies are intended to generalize beyond temporary contextual influences to chronic, context-independent states. The effects of chronic accessibility mimic those of priming or temporary accessibility, and the two forms combine additively, suggesting a common underlying mechanism (i.e., amount of activation; Bargh et al., 1986; Bargh et al., 1988; Higgins, Bargh, & Lombardi, 1985). Thus, the auto-motive model assumes that the findings of studies in which goals are primed generalize to cases in which those goals exist for the individual in a chronically accessible form, so that absolutely nothing is needed for that goal to become active within the situation to which it is associatively tied, not even recent prior use (as in priming studies). However, this is an assumption, and the arguments of the auto-motive model would be strengthened if the same motivations were to be shown to exist in chronic form as individual differences.

In the Chaiken et al. (1996) and Cialdini (1994) research, chronic individual differences in impression-management motivation and consistency motivation, respectively, were demonstrated. The same effects were obtained in their paradigms when the individual difference variable was substituted for the experimental priming manipulation, without the need of introducing a recent priming event. In a study by Chen, Shechter, and Chaiken (1996), high self-monitors showed a greater tendency than did low self-monitors to have impression-management motivations within persuasion situations and to adapt their own expressed attitudes to what they believed to be the attitudes of their experimental partner. Cialdini, Trost, and Newsom (1995) demonstrated individual differences in a "preference for consistency" questionnaire that predicts responses in the foot-in-the-door, balance, and

dissonance experimental paradigms. The classic findings in those paradigms were obtained only for those participants with a chronic consistency motivation. Those with no such chronic motivation did not show consistency effects within the standard experimental situations.

Automatic Social Behavior

Bargh, Gollwitzer, and Barndollar (1996) examined a goal-conflict situation, that between achievement and affiliation in a classroom setting. Many of us have experienced a conflict between wanting to raise our hands constantly to a teacher's questions and wanting to avoid having the other students dislike us because we are showing them up. Often this conflict is resolved by "dumbing down" and not achieving at the highest possible level in order to also have friends and be accepted by our peers.

Priming Achievement Versus Affiliation. In the experiment, we primed participants with words related to achievement (e.g., strive, success) or affiliation (e.g., friend, sociable) in an initial word search puzzle. Then, the participant worked together with another participant (actually a confederate) as a team to find as many words on each of a series of five additional word search puzzles. This confederate, however, was very bad at the task and, as the experimental session progressed, became more and more humiliated for not doing well. The participant was thus placed in a goal-conflict situation where he or she could achieve a high score, but at the cost of hurting the confederate's feelings. Participants primed with achievement stimuli found significantly more words on the puzzle than did participants primed with affiliation stimuli, especially on the early trials of the task. It was expected that the priming effect might become overwhelmed by the affiliation demands of the experimental situation itself, because the priming manipulation simulates a situational effect and the actual situational features themselves are a much more powerful contextual effect. Although this effect held as a main effect across all participants, it was much more apparent for males than females. Debriefing of participants revealed no awareness of the possible influence of the priming manipulation on their performance.

The second experiment determined whether priming manipulations interact with chronic motivations in the same way they do with chronic construct accessibility in impression research (Bargh et al., 1988; Higgins et al., 1985). In those social perception studies that pitted priming effects against competing chronically accessible alternatives for the same behavior (e.g., independent vs. aloof), priming effects determined impressions for a short period but after that chronic tendencies dominated.

The Interaction of Primed and Chronic Goals. In our second experiment we again made use of the achievement versus affiliation paradigm, but also preselected participants for the study based on their chronic achievement and affiliation motivations. Achievement motivation was measured in the standard way using the

Thematic Apperception Test (TAT; Murray, 1943), a projective device that has been used to measure the achievement motive for many years (McClelland, 1953; Sorrentino & Higgins, 1986). As part of a mass testing demonstration at the beginning of the semester, potential participants were asked to tell what was going on in a picture (from the standard TAT) of a young man looking out of an open window. The questions asked of participants about the picture were the standard ones such as "What is going on in the picture?" "What will happen next?" "What is the person in the picture thinking?" and we coded answers to these questions in terms of achievement-related themes following the scoring key of Heckhausen (1990). To assess affiliation motivation, we administered the Jackson (1974) Personality Research Form (PRF), which contains an affiliation subscale. Participants who were selected for the experiment had either a high achievement motive and a low affiliation motive, or a low achievement motive and high affiliation motive. Within these two groups of participants, one half were primed on achievement and the others were primed on affiliation.

Again, as in our first experiment, for female participants there were no significant effects for either the priming manipulation or due to the chronic achievement-affiliation differences. For males, however, results replicated our first study for the early trials: Participants whose achievement goal had been primed performed at a reliably higher level than did the other participants on the word search task. On the later trials, for males again, the temporary goal priming wore off, and now the participant's chronic motivational tendencies took over. On the later trials, for males, chronically achievement-motivated participants scored higher than did the chronically affiliation motivated participants.

Why were the results stronger for males and weaker or nonexistent for females in these studies? Actually, the sex difference we obtained is identical to that in most previous studies of achievement motivation effects using the TAT as a selection device (see Horner, 1974, for a review). It is so common not to find these effects for women, for instance, that even when the same data are available for female participants they are not even analyzed (Reumen, Alwin, & Veroff, 1984). Thus, the lack of achievement motivation priming effects for females actually replicates the classic achievement motivation literature, and strengthens our belief that we are priming achievement motivation with our manipulation.

A second potential reason why there was no difference in the achievement and affiliation conditions for women, either in primed or chronic form, could be that women are socialized to fulfill their achievement motives through affiliation if that is possible in the situation (Higgins, 1991). Thus, our female participants may have not experienced the achievement versus affiliation goal conflict we created as did the male participants, attaining both goals by focusing on the feelings of the confederate.

In any case, as in the Cialdini (1994) and Chaiken et al. (1996) research on primed and chronic information-processing goals, the nonconscious effects of primed achievement and affiliative goals also exist in the real world in chronic form. This is important because priming is used as a stand-in within the auto-motive

model for chronic motivational tendencies. The finding that primed and chronic achievement and affiliation motives interact over time in the same way as primed and chronic trait constructs is crucial because it demonstrates that we are activating nonconsciously with our achievement and affiliation priming manipulations the same underlying variable as chronic individual differences in achievement and affiliation motivation (see Bargh et al., 1988). Thus, our results support the auto-motive postulate that chronic motivational states can be triggered nonconsciously and then operate to affect behavior, in this case, actual performance on a word search task.

Dissociation Evidence: Motivational Qualities of Primed Goal States

We are claiming that the achievement and affiliation primes are activating motivational states. Why do we contend that the stereotype priming effect is due to a perception-behavior pathway, and the achievement priming effect is due to a motivation-behavior pathway? As both effects are produced by trait construct priming manipulations (in the case of stereotype activation, the trait construct is primed indirectly via its stereotype membership), why are different explanations invoked?

First of all, it is difficult to see how the same mechanism could have produced the achievement priming effects and also the stereotype-behavior effects. Assume to begin with that both effects are due to goal activation and not to perceptual activation. If so, then what is the goal or motive in the elderly stereotype study just described (Bargh, Chen, et al. 1996), in which priming the elderly stereotype caused participants to walk more slowly down the hall following the experiment? It is hard to see how priming the elderly stereotype produces a motive in the participant to walk more slowly. It is similarly difficult to understand the African-American study results in terms of a motive, although one could argue that there is a motivation to act in a hostile manner towards African-Americans as part of that stereotype. Still, we know of no evidence or prior conjecture of such an automatic motivational component to that (or any other) stereotype.

Alternatively, assume that both effects are due to automatic perceptual and not motivational activation. That is, it could be argued that what was activated in the achievement-affiliation studies was not an achievement or affiliation motive but the perceptual trait construct of achievement or affiliation, and this passive "chameleon effect" is what caused the participants' tendency to score higher on the word search task (or not). This seems more plausible. However, the fact that we attain the same quality of effect with our achievement priming manipulation as with the classic TAT measure of achievement motivation argues that we did indeed prime a motivational state. And it is hard to reconcile the sex difference we obtained with a purely perceptual account, because it is highly unlikely that men but not women possess the perceptual trait construct of achievement. As noted, a motivational account has no difficulty with the sex difference, as achievement motivation effects using the TAT as a selection device historically have been obtained for men but not for women.

Still, in order to make a stronger case that motives and not perceptual structures are responsible for these behavioral effects, we conducted additional studies to test for the presence of qualities associated with motivational states—qualities that are not predicted by any purely cognitive account of our findings. These qualities are (a) persistence on a task in the face of interruptions or obstacles (Lewin, 1926; Ovsiankina, 1928; see also Heckhausen, 1990; Wicklund & Gollwitzer, 1982), and (b) an increase in motivational tendency over time (Atkinson & Birch, 1970), as opposed to the decrease in activation strength over time predicted by all cognitive accounts of priming (e.g., Higgins et al., 1985).⁴

Persistence in the Face of Obstacles. Bargh, Gollwitzer, Lee-Chai, and Barndollar (1997) showed that achievement-primed participants show greater persistence on a task in the face of an obstacle than do neutral-primed participants. Some participants were primed with achievement-related stimuli, and the remaining participants with neutral stimuli. Participants participated three at a time, with partitions between their desk chairs so that they could not see each other. However, all three participants faced the front of the room, where a hidden video camera recorded them during the experimental session. After completing the priming task, under the instructions that it was a separate "language ability" measure, participants were given a rack of Scrabble letter tiles and told to find as many words with those letters as they could in the next 3 minutes, and write each down on the piece of paper provided. The experimenter then explained that she had to leave the room to run another experiment, but that if she could not get back by the end of the 3 minutes, she would give the signal to "stop" over the room's intercom.

Participants were then told to begin, and the experimenter left the room. At the end of the 3 minutes, participants were told to stop. The dependent measure was the proportion of participants who continued to work on finding the words after the signal to stop was given, as monitored by the experimenter via the hidden video camera. The results were as predicted: 55% of the participants in the achievement priming condition persisted in the task after being told to stop, whereas only 22% of those in the no priming condition did so.

Male and female participants alike showed this achievement priming effect. This supports the explanation for the earlier lack of effect for female participants in terms of the presence of affiliation opportunities in the situation (see Higgins, 1991). In

⁴A distinction needs to be made between the strength of a priming effect per se and the relative influence over time of a decision or judgement that has been influenced by priming. I am referring to the former, to the relative potential strength of a priming effect as time passes prior to its influences on responses to the environment. Wyer and Srull (1989) documented (e.g., Srull & Wyer, 1980, 1983) that the relative effect of a trait judgment that was influenced by priming may increase over time as the other possible sources of influence (i.e., the behavioral information itself) are cleared from working memory. There is a difference between predicting an increase over time in a primed construct's potential effect prior to use, and an increase in the relative impact of a judgment influenced by a priming manipulation. No cognitive model of priming, spreading-activation (e.g., Higgins et al., 1985) or otherwise (e.g., Wyer & Srull's, 1989, bin model) predicts an increase with time in the eventual effect of a priming event.

the Bargh et al. (1997) paradigm, affiliation was not an option, and so it could not be used as a route for women to express their achievement goal. Consequently, achievement priming influenced their behavior in the face of the stop-signal obstacle.

Increase in Motivational Tendency Over Time. In a second experiment, another motivational quality was assessed: whether the priming effect increased over time, as Atkinson and Birch (1970) argued was true of unfulfilled motivational states. A purely cognitive explanation cannot predict an increase in the priming effect itself, as all accounts of perceptual and cognitive activation predict a decrease or decay in activation following the priming event (e.g., Higgins et al., 1985). In Wyer and Srull's (1989) bin model, as time passes the probability increases that other relevant constructs will displace the primed one on top of the bin (i.e., as the most accessible for use). Even then, the bin model does not predict an increase in the primed construct's accessibility as there is nowhere to go but down from the top. Thus, it should be possible to demonstrate this hypothesized dissociation in the effect over time of the identical priming manipulation on an impression formation versus a behavioral task.

Participants first performed a matrix word search task in which achievement-related or neutral priming stimuli were presented. Next, one half of the participants in each priming condition experienced a 5-minute delay before the dependent measure was assessed, whereas the other half did not. Delay condition participants drew their family tree in as much detail as they could (this task did not satisfy any primed achievement motive). Next, some participants read about a target person who behaved in an ambiguously achievement-oriented way (e.g., he had not studied all semester and stayed up all night before the test to cram for it) and then rated the target on achievement-related trait dimensions, whereas others found as many words as they could in a set of Scrabble letter tiles.

The impression task results replicated previous findings: With no postpriming delay, achievement-primed participants rated the target person as more achieving and striving than did participants in the neutral priming condition. After a 5-minute delay this difference disappeared, indicating that the priming effect on perceptual interpretation had dissipated. The behavioral task results showed exactly the opposite effect. That is, the achievement-primed participants performed better than the neutral-primed participants when there was no delay, replicating the Bargh, Gollwitzer, et al. (1996) findings, but this effect increased over time. The performance level of neutral condition participants remained the same in the no-delay and the delay conditions, but that of achievement-primed participants significantly increased as a function of postpriming delay.

These results show a clear dissociation between the behavioral and judgmental effects of priming over time, in that the direction of the effect of delay is reversed between the two dependent measures (Dunn & Kirsner, 1988). The increase in performance as a function of achievement priming cannot be explained except by recourse to motivational qualities of the primed state. Our obtained effect of achievement priming on behavior, in other words, cannot be merely an effect of the activation level of a perceptual representation.

One additional point to be made in the wake of these results is that it is a goal or strategy that is clearly being activated by our priming manipulation, and not a specific behavioral tendency. If we were just priming a specific behavioral tendency, as in a simple S-R connection, it would be enacted right away. Instead, the activated goal follows the principle of applicability (Higgins, 1989): An accessible representation does not operate on its own, in the absence of relevant input, but only in the presence of environmental information for which it is applicable. Notably, Ach (1935), an early theorist of the will, defined intentional states in a similar way. According to Ach, it is usually not the case that one begins acting immediately on the activation of a motivational tendency. Rather, one waits for the opportune moment in time; the occurrence of situational events that give one the chance to attain the goal (see also Vera & Simon, 1993).

Automatic Goal Effects are Independent of Current Conscious Purposes

Another objection might be raised to our conclusion that automatically activated goal states operated nonconsciously in these studies. It might be that although goal states were indeed primed, this merely made them more accessible to conscious choice processes. Although participants were not aware of the source of this accessibility (i.e., the relation between the priming event and the subsequent tasks), they still could have consciously chosen to achieve, or affiliate, when put into the task situation.

The evidence discussed thus far argues against this possibility, however. First of all, our own debriefing of participants gave us no indication that they had consciously chosen their various behavioral strategies. The Bargh et al. (1997) experiments, which revealed increasing effects of primed goal states over time, speak against the role of conscious choice as well. In these studies, the dependent measure was not the choice of behavior among possible alternatives, as in the previous studies, but the presence of heightened goal desire and increasing effort over time. It is difficult to see how these effects are somehow a matter of deliberate choice.

It is nonetheless important to test this final and key proposal of the auto-motive model: once goals are activated, they operate on any relevant input without conscious intent or guidance. As stated earlier, it does not matter for goal operation whether the activating event was conscious and intentional or not, just like it does not matter for construct accessibility effects in social perception whether the activating event was conscious and intentional or passive and unintentional (Bargh, 1992; Higgins, 1989). Once activated and set in motion, goal representations theoretically operate on any relevant input, even those the person does not mean to process in that way. With this final postulate, the auto-motive model is complete in specifying that the entire chain of events from environmental stimulus to goal operation can occur nonconsciously, without the person needing to intend or be aware of having that goal or pursuing it (see Fig. 1.2).

1. Goals are mental representations
2. Mental representations (e.g., stereotypes) are capable of becoming activated preconsciously
3. ∴ Goals can be activated preconsciously
4. Once activated they operate outside of awareness to guide information processing and behavior
5. The entire sequence from environmental event to cognitive process execution or behavior enactment is nonconscious
6. Automatically activated goals display qualities of motivational states.

FIG. 1.2. The Auto-Motive Model (summarized from Bargh, 1990).

The standard method for demonstrating that an effect is not due to conscious intent is to show that it differs from the effect that would occur when that unconscious influence is not operating (Jacoby, 1991; see review in Bargh & Barndollar, 1996). Therefore, in order to show that activated goals operate in the absence of conscious guidance, we assessed whether an activated goal could produce effects opposite to those found when participants intend it to be operative.

Unintended Operation of Intentional Processing Goals. Bargh and Green (1996) presented participants with a videotape of a conversation between two men, with participants told beforehand either that the tape concerned (a) a job interview for a restaurant waiter position, (b) a job interview for an investigative crime reporter position on a city newspaper, or (c) a conversation between two acquaintances who had not seen each other for some time (this "acquaintance" condition was intended as a control in which no explicit evaluative goal was given). Pretesting had shown that the qualities of a good reporter (e.g., tough, aggressive, dominant) were believed to be the opposite of those that would make a good waiter (e.g., friendly, acquiescent). All participants saw the same conversation, which was scripted to be ambiguous enough to fit any of the three cover stories.

Halfway into the conversation, a third male ("Mike") knocked, entered the doorway of the room, and asked the interviewer (who had his back to the camera) whether he was ready for lunch. The interviewer said he was sorry but he was too busy at the moment to go to lunch, and maybe later or another time. At this point, the critical experimental manipulation occurred: In one condition, Mike became irritated and told the interviewer that he was also very busy that day and could not wait. When the interviewer persisted that he could not leave right then, Mike said that he could not wait, they would have to make it another time, and shut the door hard behind him. In the other condition, Mike became very apologetic for interrupting and quite calmly said he would wait outside.

Immediately after the tape had finished, we informed participants that we were actually interested in their opinion of Mike, the person who interrupted about the lunch date, and asked participants to rate Mike's likability. We hypothesized that even though our participants had no conscious intention to evaluate Mike, as their

attention was focused on the conversation between the other two men, they would nonetheless do so in line with the goal that was currently operating based on the experimental instructions. In other words, if they were evaluating the target person in terms of his qualifications for being a waiter, they would evaluate Mike using the same processing goal without knowing it, and likewise if they were evaluating the target person for a crime reporter position. In each case, their evaluation of Mike would be more positive if his behavior fit the qualities that were valued for that job description, and more negative if his behavior did not fit those qualities. In the control condition, in which participants were not given the waiter or the reporter processing goal, evaluations of Mike should be in line with how one would evaluate another person in general, based on his or her behavior.

Specifically, we expected participants in the control condition to like "polite Mike" more than "surlly Mike." We expected this difference to be even more pronounced in the waiter-goal condition, given the value placed on deference and docility in a waiter. And, our major prediction was that participants in the reporter condition would like surlly Mike better than polite Mike because surlly Mike was a better fit to the position of a crime reporter.

As expected, participants in the control condition did like the polite version of Mike better than the surlly version. Also as predicted, this difference was stronger in the waiter-goal condition. Most importantly, participants in the reporter-goal condition, who were considering the interviewee (not Mike) for the crime reporter position liked surlly Mike better than polite Mike—even though, judging from the control condition results, those same participants would have formed the completely opposite evaluations had they not been assessing an entirely separate individual for a crime reporter job.

Auxiliary trait ratings of Mike showed that these effects on liking were not due to participants categorizing Mike's behavior differently based on their particular processing goal. For instance, in the reporter condition, participants rated surlly Mike just as stubborn and rude and disagreeable as did the other participants, and waiter condition participants rated polite Mike just as unadventurous and passive as did the reporter participants. In other words, reporter-condition participants liked surlly Mike better despite having accurately perceived him as behaving badly. And if they had not been thinking about a third party's suitability for a particular line of employment, their liking ratings of Mike would have been very different.

Again, these results are predicted by the auto-motive model. When a goal is operating, it operates on any and all available information for which it is applicable, regardless of whether that is the source of information (e.g., person) the individual intends it to process. Activated processing goals, in other words, operate on their own, autonomously. Judgments are made as a result that are clearly counter to what the individual would make if he or she intended to process that source of information; for instance, our pretest participants who focused their attention on Mike instead of the other two actors in the tape clearly disliked surlly Mike and liked polite Mike. Real-world versions of this effect are not difficult to imagine. For example, a person who works all day in an environment that values certain traits (e.g., an aggressive, competitive atmosphere) might well become attracted to a coworker

because he or she possesses those qualities, with potentially disastrous results—because if you asked him or her off the job about the ideal mate, you would very likely get a different description.

Simulating Actual Environment–Goal Links

In the research described thus far, the assumption was made that the experimental situations correspond to real-world counterparts—specifically, to social environments containing features that are chronically associated with cognitive or behavioral goals. However, these experimental manipulations actually activated the goal in question through presentation of stimuli directly relevant to the goal itself: words like *impression* and *evaluate* for the impression goal, and *succeed* and *strive* for the achievement goal, and so forth. Although these stimuli were successful in activating the corresponding goal concept and producing goal-directed behavior, they did not correspond to situational features. What is needed is a demonstration that environmental stimulus features that are semantically unrelated to the goal in question are capable of automatically activating that goal.

Previous priming research uniformly relied on stimuli that are synonymous with or directly relevant to the mental representation they are intended to activate: words synonymous with *kind* to activate the concept of kindness (e.g., Srull & Wyer, 1979), or the word *furniture* to activate the names of kinds of furniture (Neely, 1977), and so on. Early tests of spreading activation theory in the 1970s (e.g., Collins & Loftus, 1975; Lorch, 1982; Meyer & Schvaneveldt, 1971) did involve stimuli that were not synonyms but were still close semantic associates (e.g., sun–moon, doctor–nurse). But the auto-motive model posits that features of environments will activate goals associated with them, and these features and goals need not share any semantic features whatsoever. Thus, the situation *party* could activate the goal *withdraw*, *be unobtrusive* in an individual who has pursued that social strategy within parties habitually in the past (see Bargh, 1990). The environmental feature *school* could activate the goal *achieve* or the goal *affiliate* depending on which chronic goal the individual possesses in that situation; but there are no semantic features in common.

Power as a Situational Feature Linked to Goals. In considering ways of testing this aspect of the model, we considered what kinds of environmental features were likely to become associated with goal-states. And there is one such feature that, more than any other, is associated with goals: situations in which one has *power*. By definition, power in a situation is the ability to attain your own personal goals (Cartwright, 1959; Russell, 1938; Thibaut & Kelley, 1959). Thus, the concept of power is a likely candidate to become automatically linked with the individual's goals, especially those he or she pursues when in a position of relative power within a given situation.

One social problem that is noteworthy for the role that situational power plays in it is sexual harassment, and, in a different sense of "power," sexual aggression (see

Bargh & Raymond, 1995; Bargh, Raymond, Pryor, & Strack, 1995; Brewer, 1982; Pryor, 1987; see also Kipnis, 1976). Frequently, cases of sexual harassment involve power differentials such that the (almost always male) perpetrator has some form of power over the important outcomes of the (almost always female) victim (see Brewer, 1982; Fitzgerald, 1993), and uses that to coerce her into granting sexual favors. What made this issue especially intriguing as a potential application of the auto-motive model is that in the majority of cases, perpetrators do not realize or understand that their behavior is harassment (Fitzgerald, 1993)—something the Bob Packwood diaries illustrated all too clearly.

How could this be? Brewer (1982) cogently applied the actor–observer attribution difference to this situation (Jones & Nisbett, 1971; see also Kipnis, 1976, on the role played by actor–observer perceptual differences in the abuse of power more generally), noting that the relatively powerful perpetrator does not perceive his own power within the situation. Rather, what he sees is the subordinate's friendliness, agreeability, passivity, and so on. The subordinate, on the other hand, is well aware of the power position of the boss and of his control over her outcomes. Thus, the boss may attribute his behavior to those situational features (the smiling, agreeable subordinate), whereas the subordinate may attribute it to features that are salient to her (the boss and the implied threat to her if she does not go along with him).

The auto-motive model can be applied to this situation. Those who sexually harass and aggress do so at least in part because of an automatic association between the concept of power and the goal of sexuality (Bargh et al., 1995). That is, the goal of sex is automatically associated with mental representations of situations in which the individual has power. If power features of the situation activate the sexuality goal automatically, this goal will operate outside awareness to guide behavior, and the individual will not be aware of this influence (i.e., the role that his relative power played in his behavior toward the woman). Rather, he will attribute his behavior to those features of the situation he is aware of (her smile or compliments or deference; Kipnis, 1976) and his activated sexuality goal may well cause him to interpret those features in sexualized ways (e.g., she is flirting with me; she is attracted to me).

The Automatic Power–Sex Association in Sexual Harassers. A key prediction then is that men who are likely to sexually harass or aggress (or both) should show evidence of this automatic link between power and sex, whereas men who are not likely to harass or aggress should not. In addition, it should then be possible to prime the goal of sexuality with stimuli semantically unrelated to sexuality, but synonymous with the situational feature presumed to be tied to that goal—namely, power related stimuli. Men who are likely to sexually harass or aggress, therefore, should show evidence of having their sexuality goal primed when they are primed with power related stimuli—for example, by finding a woman more attractive than otherwise; whereas other men should show no effect of power priming on their attraction toward the woman.

The results of two experiments reported by Bargh et al. (1995) confirmed these predictions. Participants in both studies were preselected based on their responses

to Pryor's (1987) Likelihood to Sexually Harass (LSH) scale and Malamuth's (1989) Attractiveness of Sexual Aggression (ASA) scale. The LSH presents participants with 10 scenarios in which a male protagonist has some form of leverage over an attractive woman, such as catching her taking money from the cash register where they both work. For each scenario, participants are asked to give the probability that they would propose not using that leverage in return for sexual favors, if they were sure that nothing bad would happen to them as a consequence. The ASA asks participants to indicate how arousing and attractive are each of a wide variety of sexual practices. The key items for our purposes were rape and otherwise using force to have sex with a woman. Participants who either scored in the highest or the lowest quartiles on these scales participated in our studies.

In Study 1, participants pronounced a series of words as quickly as they could. This pronunciation task was demonstrated to be a sensitive measure of automatic mental associations (Balota & Lorch, 1986; Bargh, Chaiken, et al., 1996). On each trial, prior to the presentation of the target word to be pronounced, a prime word appeared very briefly (90 msec), at a randomized location on the screen that was outside of the participant's foveal (roughly, conscious; see Bargh et al., 1986) processing area, and was immediately masked by a string of letters. These procedural steps combined to ensure that the prime words were presented subliminally and that participants were not even aware that words were being presented at all. Phenomenally what they experienced were flashes of light.

Primes and targets were related to the concepts of either power or sex or neither (the control stimuli; the sex-related stimuli were only ambiguously related—such as *bed* and *motel*—because of the likely distorting effect of embarrassment or surprise on pronunciation latencies for directly related words such as *intercourse* or *sex*). Thus, we could assess the effect of power related primes versus neutral primes on the speed of pronouncing both sexually related stimuli and power related targets. Participants who scored highly on the LSH or ASA were significantly faster to pronounce the sexuality related targets that were preceded by power related primes compared to control primes. Thus, the results showed that there indeed was an automatic link between the concepts of power and sex for these subjects, but not for others.

A second experiment of Bargh et al. (1995) tested whether the presence of power cues in a situation would automatically activate the goal of sexuality, causing the operation of that goal within an interpersonal situation. This should also be true only for those participants for whom the automatic link exists between power and sex. Participants took part in the experiment individually, along with a female confederate posing as another participant. In what was purported to be an unrelated first experiment on language ability, both participant and confederate completed a 16-item word-fragment completion task. For one half of the participants, 6 of the items were related to power (e.g., *str—g, aut—ri-y*), and for the remaining participants none of the items contained power related words.

Next, participant and confederate worked separately, but at adjacent tables, on a task allegedly to do with understanding visual illusions. Standard visual illusions were projected on a wall, and in each case, the participant and confederate were asked to give an explanation of why the illusion occurred. Finally, the participant

and confederate were shown into separate rooms, and the participant was informed that the experiment was actually about impression formation, specifically the kinds of impressions people formed of those with whom they had only a minimal interaction, such as between himself and the "other participant." He was asked to complete a questionnaire concerning his impression of her, being led to understand she was doing the same concerning him in the other room.

This questionnaire contained two key items, concerning how attractive the participant found the confederate, and also his desire for future contact with her. As predicted, participants likely to sexually aggress found the confederate to be more attractive when their concept of power had been primed than when it had not been; the power priming manipulation had no effect on participants who were not likely to sexually aggress. In short, men with a tendency or proclivity to sexually aggress against women found the identical woman more attractive when their concept of power had been surreptitiously activated than when it had not been. To generalize to the workplace, the boss or supervisor who finds his subordinate attractive might well not find her so if he had met her outside of the office, on an equal power footing.

There are obvious practical implications of automatic power-goal associations for sexual harassment and aggression, and the misuse of power in general (see Bargh & Raymond, 1995; Kipnis, 1976), but these findings are of theoretical import as well. They show that perceptions as well as behavior (see Pryor, 1987) are indeed triggered nonconsciously by environmental features, and that individual differences corresponding to chronic feature-goal associations do exist and result in different reactions to the same situation. These are important findings for priming research in general because they move priming effects out of the direct activation of the mental representation by synonymous stimuli onto a level of representation closer to the outside world. In other words, representations of situations activated directly by relevant features are directly connected to second-level representations of goals, so that the perception of the feature preconsciously activates the goal.

Summary

These studies have several implications. First, behavioral and cognitive goals can be directly activated by the environment without conscious choice or awareness of the activation. Second, the goals, once activated, direct information-processing and social behavior. Third, the states activated by the priming manipulations in these studies have motivational qualities. Fourth, these states also exist in chronic form and there are individual differences in these chronic motivations. Finally, the activated goals operate autonomously, bypassing the need for any conscious selection or choice, but producing outcomes different from those that would occur if the individual would choose if the goal were not primed. In short, every postulate of the auto-motivation model (Bargh, 1990) was supported by these studies, demonstrating that the entire sequence from environmental information to goal and

motivation to judgment and action can and does occur automatically and unconsciously.

MOVING FROM SOCIAL COGNITION TO SOCIAL IGNITION

The study of automaticity progressed dramatically in the 1990s. No longer are researchers content to confine themselves to perceptual or judgmental phenomena; not once was it recognized that everything psychological was fair game—that anything could be primed.

What Have We Been Priming All These Years?

It is easy to fall into the trap of thinking that the only effect an experimental manipulation is having is the one that is being measured. The recent evidence of automatic evaluation, motivation, and behavior shows that in about 1975, social cognition labs began priming not just what they thought they were—perceptual trait constructs—but behavioral tendencies and motivations and evaluations. All of these systems, according to the present proposal, are engaged immediately and in parallel by an environmental event. We may choose one dependent variable to catch certain effects of our priming manipulation, but this does not mean the other effects are not occurring.

This should have been clear as long ago as the Carver et al. (1983) study, which used the same hostile priming manipulation as did Srull and Wyer (1979) but instead of influencing impression formation with it, influenced participants' own behavior. That was the clue that both the perceptual and the behavioral effects were primed in parallel—in fact, Carver et al. (1983) proposed the idea of the behavioral schema to account for these simultaneous effects. In my view, we are only now catching up with the implications of that study.

Associations Between Systems

Because the three types of effects described are occurring in parallel, we need to learn more about how they influence each other. It would be surprising if these different reactions were not highly interassociated with each other. By the basic principle of contiguous activation (Hebb, 1948), all of these reactions occurring in parallel should be richly intertwined. Thus the activation of the internal representation of a social situation by those features in the environment should set in motion immediate perceptual, affective, and behavioral responses, to the extent those were regularly enacted in the past.

Several forms of such interrelations were discussed: Perception is linked strongly to behavioral tendencies and evaluation to behavior via approach-avoidance motivation. Goals are linked to perception and to evaluation as well as to behavior:

Nonconscious activation of cognitive processing goals affects person perception in the Chartrand and Bargh (1996) studies, nonconscious activation of consistency motivation affects evaluative processes such as attitude change (Bator & Cialdini, 1995), and nonconscious activation of impression management, defense, or accuracy motivation affects evaluation of persuasive messages (Chaiken et al., 1996). Previous theorists (e.g., Fazio, Chen, McDonel, & Sherman, 1982; Fiske & Pavelchak, 1986; Strauman & Higgins, 1987) described mechanisms by which the act of perception can have automatic affective or evaluative consequences (see review in Spielman, Pratto, & Bargh, 1988): if the evaluation is stored within the perceptual category (Fiske & Pavelchak, 1986) or so strongly associated with the object representation that it is activated in the course of perceiving the object (Fazio et al., 1982), or the affect is generated by a discrepancy between the trait concept activated in perception and the individual's stored standards for his or her behavior (Strauman & Higgins, 1987). That is another interconnection between processing systems: Automatic perceptual processes have automatic evaluative consequences.

Dissociations Between Systems

The claim is that these three preconscious processing modules are richly interconnected, but at the same time they have different internal operating structures and rules, so they are different, too. Why is it necessary to propose separate, parallel modes of preconscious processing of social information?

Because across the board of our proposed lines of research—evaluation, perception, and action—no one general cognitive model can account for all of our obtained results. Existing spreading activation models of semantic memory cannot account for the pervasive and strong evaluative priming effect, which occurs based on the sharing of a single, common feature (see Bargh, Chaiken, et al., 1996); or why the effect is stronger and more pervasive when the role that strategic cognitive processes play in the paradigm is reduced. No purely cognitive model of priming effects predicts an increase in strength of the achievement goal priming effect over time, as the Bargh et al. (1997) experiment found for the behavioral—but not the perceptual—task. Likewise, passive effects of perception on behavior, especially the elderly stereotype effects found by Bargh, Chen, et al. (1996), are difficult to explain in terms of automatic motivation. And social-perceptual effects of priming on impression formation are content-specific and not globally evaluative or affective in nature. If a positive or negative trait construct is primed that is not applicable to the ambiguous target behavior, there is no priming effect—a finding of the very first priming study (Higgins et al., 1977) and replicated consistently thereafter (see Bargh et al., 1986; Erdley & D'Agostino, 1988; Higgins, 1989). Thus, trait construct priming effects appear to be due to the perceptual system as they cannot be accounted for by the evaluative (immediate and global good vs. bad classification) system.

THE ROLE OF CONSCIOUSNESS IN AN AUTOMATIC WORLD

Automaticity pervades everyday life, playing an important role in creating the psychological situation from which subjective experience and subsequent conscious and intentional processes originate. Our perceptions, evaluations, and the goals we pursue can and do come under environmental control. Because these perceptual interpretations, likes and dislikes, and reasons for our behavior are not consciously experienced, we make sense of them in terms of those aspects of which we are consciously aware, and our theories as to what would have caused us to feel or act that way (Karniol & Ross, 1996; Nisbett & Wilson, 1977). For example, the sexual harasser (with the automatic power–sex mental association) attributes his feelings of attraction towards a woman to her physical features or her friendly (perceived as flirtatious) behavior or both (Bargh et al., 1995). Of course, as this choice of example illustrates, our understandings of what cause us to think, feel, and do are in large part after-the-fact rationalizations (Gazzaniga, 1985; Steele, 1988). As Gazzaniga argued, consciousness may exist in order for us to make sense and a coherent pattern out of all of it, so that one feels a sense of stability and control—a quite adaptive feeling to have, judging by the consequences when it is not present (e.g., Abramson, Seligman, Teasdale, & D'Agostino, 1985; Taylor, 1989).

I emphatically push the point that automatic, nonconscious processes pervade all aspects of mental and social life, in order to overcome what I consider dominant, even implicit, assumptions to the contrary. But in making the case, *pace* Skinner, that even goal-directed, complex social behavior need not require conscious cognitive choice processes, something must be said about the conditions under which nonconscious control is believed to occur, and exactly how unnecessary I am claiming consciousness to be.

The Assumption of Conscious Mediation: A Legacy of the Serial Stage Model

Let us consider what has changed in psychology since the 1960s, concomitantly with the decreased role of conscious choice. The most fundamental change was a movement away from serial stage of cognition based on the computer metaphor (e.g., Atkinson & Shiffrin, 1968; Newell & Simon, 1972) to models in which many mental operations are carried out simultaneously, in parallel (e.g., Hintzman, 1988; Rumelhart & McClelland, 1986). In my opinion, it was the serial stage model in which conscious judgment and reasoning processes were assumed to follow perception and precede responses to the environment that caused us to overestimate the mediational role of conscious processes. This meta-assumption put conscious recognition and reasoning processes as a causally prior stage, almost as a roadblock in the way of affective reactions and behavioral responses.

Early cognitive models, in other words, equated cognition with conscious cognition (see Bowers, 1981; Lazarus, 1982), and we have been cleaning up after this

misconception ever since. It led to the assumption that conscious recognition was a necessary precondition for affective reactions. Erdelyi (1974) showed that the reason why perceptual defense findings as a concept ultimately failed to persuade most psychologists in the 1950s and 1960s was that no one could get around the notion that the stimulus had to 'be perceived before it was perceived'; that in order for it to be defended against and shut out of consciousness, it had to first be perceived to be known to be something to be defended against. It was implicitly assumed that perceptual registration had to be conscious, so it was impossible to understand how something could be consciously perceived before it had been consciously perceived. Erdelyi almost single-handedly restored the good name of the New Look by amassing conceptual and empirical objections to this assumption.

Zajonc's (1980) argument that affective reactions could be immediate and independent of "cognitive" (i.e., conscious) information processing was counterintuitive only because of the implicit belief in the serial stage model. If different psychological functions can operate on input at the same time, the hypothesis of immediate affective reactions prior to or in the absence of conscious recognition of the stimulus appears much more plausible.

My own implicit adherence to the stage model nearly led me to conclude that the extent of direct automatic influences of the environment on social cognition was limited to perceptual interpretation and did not extend to making judgments or behavioral decisions or other responses to the environment (Bargh, 1989, 1990). The assumption I held was that these judgments and decisions had to precede and determine any intentions the individual formed and any behavior he or she enacted. It was only by playing devil's advocate as to how the direct effect of the environment could possibly breach this apparent asymptote at the judgment and decision (i.e., goal-setting) stage that the hypothesis of automatic goal activation was formed (Bargh, 1990). Again, it was the metaview of serial processing stages that made the notion that motivations could be directly activated by the current environmental information difficult for me to see.

In parallel models such as the present one, there is no theoretical, a priori requirement for conscious processes to mediate the perceptual, evaluative, or behavioral effect, as there was in the serial stage models of the 1960s that still pervade, implicitly or explicitly, social cognition today. This is despite the fact that since the 1960s, the research evidence has caused the explanatory power of conscious mediational processes to dwindle dramatically. As noted earlier, whereas attributional models once posited sophisticated, "analysis of variance" reasoning processes to be the rule (e.g., Kelley, 1967), we now know that much of attributional judgment is spontaneous, unintended, and nonconscious (e.g., Gilbert, 1989; Newman & Uleman, 1989; Taylor & Fiske, 1978; Uleman et al., 1995). Whereas evaluative judgments were once thought to be computed consciously based on a consideration of recognized stimulus features (e.g., Anderson, 1974), Zajonc (1980) argued, and research verified (e.g., Bargh, Chaiken, et al., 1996; LeDoux, 1989; Murphy & Zajonc, 1993; Niedenthal, 1990), that affective reactions can be prior to, more immediate, and independent of even the most basic conscious processes such as recognition of the stimulus. And now, as the research reviewed demon-

strated, even intentions and goals, and the cognitions and behaviors that are carried out in pursuit of those goals, can become automated and bypass conscious choice and guidance.

Is Consciousness Riding Into the Sunset?

In removing consciousness from its privileged place at the mediational center of everything, by moving from a serial stage to a parallel process metatheory, one is not claiming that there is no role or function for conscious processing. When Galileo removed the Earth from its privileged position at the center of the universe, the Earth still existed, just with diminished importance. When Darwin removed human beings from their privileged position among living creatures, human beings still existed, just with a diminished sense of importance. Consciousness still exists as we move from a serial to a parallel model of mind. In fact, by getting rid of its overstated position in the middle of serial models, we may end with a clearer sense of its role and purpose.

For one thing, although conscious processing can no longer be viewed as necessary for behavior and judgments and evaluations to be made in a given situation, it is of course necessary for the development of those preconscious processes in the first place. These had to be enacted or engaged in effortfully and consciously to begin with, and like any skill or mental process, only after considerable use could they recede into the preconscious (Vera & Simon, 1993). Without conscious processes to construct them, adapt them, modify them in the face of trial and error, and then engage in them consistently and frequently over time, the preconscious processes discussed in this chapter would not exist. Moreover, as stated at the outset, preconscious perceptual and evaluative processes provide the starting point for conscious, subjective experience and decisions as to how to respond to that subjective environment (Neisser, 1967). They were described as mental servants that free up conscious capacity for nonroutine tasks.

This is less true of preconscious motivations, because the automatically activated goal then takes control over the rest of the mind's machinery (see Wyer & Srull, 1989). But even in the case of these automatic motivations, it is possible for a person to become aware of his or her actions and, as in the case of bad habits, attempt to change those behavior patterns. This question of how automatic and conscious motivations interact when in conflict is one of practical as well as theoretical importance, and we are now investigating parameters of this interaction.

But those who believe free will is not a scientific concept, and that as research advances the contents of the black box of "conscious choice" will grow ever smaller (e.g., Barsalou, 1992; Skinner, 1953), will likely object that these flexible and novel conscious processes are nonetheless determined by situational and cognitive factors. With enough knowledge, that is, we will be able to predict those apparently "free" mental processes as well. Certainly the trend of research since 1980 is in this direction. So it may well be that there ultimately is no future role for conscious processing in accounts of the mind, in the sense of free will and choice.

But there is another quality to what we call conscious processes that is unlikely ever to be shown to be unnecessary, and that is its serial and inhibitory nature. Many years ago, Lashley (1951) wrestled with the problem of how the mind, in which thoughts, images, memories, and ideas were not bound to time and space, could direct behavior in the real world, where events happened one at a time. Klüver (1951), in discussing Lashley's paper at the symposium in which it was presented, posed the problem quite succinctly:

As regards the relation of thinking to temporal organization, we are, it seems to me, confronted with a certain dilemma. Ideas, concepts, and meanings themselves have no reference to time and space, and, yet, the expression, formulation, and identification of ideas are processes proceeding in time and occurring in space. (p. 136)

The difficulty is that the mind is exquisitely capable of moving around in time, and of doing many things at once, but the body cannot. The individual must live and act in a physical world in which time is a dimension and in which events happen in order, not simultaneously. Not coincidentally, conscious processing is serial in nature, with an inhibitory capability that prevents one from trying to do more than one thing at a time (see Posner & Snyder, 1975; Shallice, 1972). The purpose of consciousness, therefore, may be to connect a parallel mind to a serial world. Ironically, then, moving from a serial to a parallel model of the mind may have greatly decreased the causal importance of conscious processes in everyday life, but at the same time guaranteed that Skinner ultimately will lose his long argument that consciousness is an epiphenomenon.

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REFERENCES

- Abramson, L. Y., Seligman, M. E. P., & Teasdale, J. (1978). Learned helplessness in humans: Critique and reformulation. *Journal of Abnormal Psychology, 87*, 49-74.
- Ach, N. (1935). Analyse des Willens. In E. Aderhalden (Ed.), *Handbuch der biologischen Arbeitsmethoden* (Vol. 6, Part E). Berlin: Urban & Schwarzenberg.
- Anderson, J. R. (1983). *The architecture of cognition*. Cambridge, MA: Harvard University Press.
- Anderson, J. R. (1992). Automaticity and the ACT* theory. *American Journal of Psychology, 105*, 165-180.
- Anderson, N. H. (1974). Cognitive algebra: Integration theory applied to social attribution. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 7, pp. 1-101). New York: Academic Press.

- Atkinson, J. W., & Birch, D. (1970). *A dynamic theory of action*. New York: Wiley.
- Atkinson, R. C., & Shiffrin, R. M. (1968). Human memory: A proposed system and its control processes. In K. W. Spence & J. T. Spence (Eds.), *Advances in the psychology of learning and motivation* (Vol. 2). New York: Academic Press.
- Baldwin, M. E., & Lopez, D. F. (1990). My adviser and the Pope are watching me from the back of my mind. *Journal of Experimental Social Psychology*, 26, 435-454.
- Balota, D. A., & Lorch, R. F., Jr. (1986). Depth of automatic spreading activation: Mediated priming effects in pronunciation but not in lexical decision. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 12, 336-345.
- Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Bargh, J. A. (1982). Attention and automaticity in the processing of self-relevant information. *Journal of Personality and Social Psychology*, 43, 425-436.
- Bargh, J. A. (1989). Conditional automaticity: Varieties of automatic influence in social perception and cognition. In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 3-51). New York: Guilford.
- Bargh, J. A. (1990). Auto-motives: Preconscious determinants of thought and behavior. In E. T. Higgins & R. M. Sorrentino (Eds.), *Handbook of motivation and cognition* (Vol. 2, pp. 93-130). New York: Guilford.
- Bargh, J. A. (1992). Being unaware of the stimulus versus unaware of its interpretation: Why subliminality *per se* does not matter to social psychology. In R. Bornstein & T. Pittman (Eds.), *Perception without awareness* (pp. 236-255). New York: Guilford.
- Bargh, J. A. (1994). The four horsemen of automaticity: Awareness, intention, efficiency, and control in social cognition. In R. S. Wyer & T. K. Srull (Eds.), *Handbook of social cognition* (2nd ed., pp. 1-40). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Bargh, J. A. (1996). Principles of automaticity. In E. T. Higgins & A. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 169-183). New York: Guilford.
- Bargh, J. A., & Barnsdollar, K. (1996). Automaticity in action: The unconscious as repository of chronic goals and motives. In P. M. Gollwitzer & J. A. Bargh (Eds.), *The psychology of action* (pp. 457-481). New York: Guilford.
- Bargh, J. A., Bond, R. N., Lombardi, W. J., & Tota, M. E. (1986). The additive nature of chronic and temporary sources of construct accessibility. *Journal of Personality and Social Psychology*, 50, 869-878.
- Bargh, J. A., Chaiken, S., Govender, R., & Pratto, F. (1992). The generality of the automatic attitude activation effect. *Journal of Personality and Social Psychology*, 62, 893-912.
- Bargh, J. A., Chaiken, S., Raymond, P., & Hymes, C. (1996). The automatic evaluation effect: Unconditionally automatic attitude activation with a pronunciation task. *Journal of Experimental Social Psychology*, 32, 185-210.
- Bargh, J. A., Chen, M., & Burrows, L. (1996). Automaticity of social behavior: Direct effects of trait construct and stereotype activation on action. *Journal of Personality and Social Psychology*, 71, 230-244.
- Bargh, J. A., & Gollwitzer, P. M. (1994). Environmental control of goal-directed action: Automatic and strategic contingencies between situations and behavior. *Nebraska Symposium on Motivation*, 41, 71-124.
- Bargh, J. A., Gollwitzer, P. M., & Barnsdollar, K. (1996). *Social ignition: I. The automatic activation of motivational states*. Manuscript submitted for publication, New York University.
- Bargh, J. A., Gollwitzer, P. M., Lee-Chai, A., & Barnsdollar, K. (1997). *Social ignition: II. The motivational qualities of primed goal states*. Manuscript in preparation, New York University.
- Bargh, J. A., & Green, M. (1996). *Unintended consequences of intentional information processing*. Manuscript submitted for publication, New York University.
- Bargh, J. A., Litt, J., Pratto, F., & Spielman, L. A. (1989). On the preconscious evaluation of social stimuli. In A. F. Bennett & K. M. McConkey (Eds.), *Cognition in individual and social contexts: Proceedings of the XXV International Congress of Psychology*. (Vol. 3, pp. 357-370). Amsterdam: Elsevier/North-Holland.
- Bargh, J. A., Lombardi, W. J., & Higgins, E. T. (1988). Automaticity of Person x Situation effects on impression formation: It's just a matter of time. *Journal of Personality and Social Psychology*, 55, 599-605.

- Bargh, J. A., & Pietromonaco, P. (1982). Automatic information processing and social perception: The influence of trait information presented outside of conscious awareness on impression formation. *Journal of Personality and Social Psychology*, 43, 437-449.
- Bargh, J. A., & Pratto, F. (1986). Individual construct accessibility and perceptual selection. *Journal of Experimental Social Psychology*, 22, 293-311.
- Bargh, J. A., & Raymond, P. (1995). The naive misuse of power: Nonconscious sources of sexual harassment. *Journal of Social Issues*, 51, 85-96.
- Bargh, J. A., Raymond, P., & Chaiken, S. (1996). *The automatic evaluation effect: Does it hold for the other major dimensions of semantic meaning as well?* Unpublished manuscript, New York University.
- Bargh, J. A., Raymond, P., Pryor, J., & Strack, E. (1995). Attractiveness of the underling: An automatic power-sex association and its consequences for sexual harassment and aggression. *Journal of Personality and Social Psychology*, 68, 768-781.
- Bargh, J. A., & Thein, R. D. (1985). Individual construct accessibility, person memory, and the recall-judgment link: The case of information overload. *Journal of Personality and Social Psychology*, 49, 1129-1146.
- Bargh, J. A., & Tota, M. E. (1988). Context-dependent automatic processing in depression: Accessibility of negative constructs with regard to self but not others. *Journal of Personality and Social Psychology*, 54, 925-939.
- Barsalou, L. W. (1992). *Cognitive psychology: An overview for cognitive scientists*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Bator, R. J., & Cialdini, R. B. (1995). *Priming a consistency motivation enhances cognitive dissonance effects*. Manuscript submitted for publication, Arizona State University.
- Bem, D. J. (1972). Self-perception theory. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 6, pp. 1-62). New York: Academic Press.
- Berkowitz, L. (1984). Some effects of thoughts on anti- and prosocial influences of media events: A cognitive-neoassociation analysis. *Psychological Bulletin*, 95, 410-427.
- Berkowitz, L., & LePage, A. (1967). Weapons as aggression-eliciting stimuli. *Journal of Personality and Social Psychology*, 7, 202-207.
- Bowers, K. S. (1981). Knowing more than we can say leads to saying more than we can know: On being implicitly informed. In D. Magnusson (Ed.), *Toward a psychology of situations: An interactional perspective*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Brewer, M. B. (1982). Further beyond nine to five: An integration and future direction. *Journal of Social Issues*, 38, 149-158.
- Brewer, M. B. (1988). A dual process model of impression formation. In T. K. Srull & R. S. Wyer, Jr. (Eds.), *Advances in social cognition* (Vol. 1, pp. 1-36). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Brewer, M. B., Dull, V., & Lui, L. (1981). Perceptions of the elderly: Stereotypes as prototypes. *Journal of Personality and Social Psychology*, 41, 656-670.
- Bruner, J. S. (1957). Going beyond the information given. In H. E. Gruber, K. R. Hammond, & R. Jessor (Eds.), *Contemporary approaches to cognition* (pp. 41-69). Cambridge, MA: Harvard University Press.
- Cacioppo, J. T., Priester, J. R., & Berntson, G. G. (1993). Rudimentary determinants of attitudes: II: Arm flexion and extension have different effects on attitudes. *Journal of Personality and Social Psychology*, 65, 5-17.
- Carlston, D. E. (1980). The recall and use of traits and events in social inference processes. *Journal of Experimental Social Psychology*, 16, 303-329.
- Carlston, D. E. (1994). Associated systems theory: A systematic approach to cognitive representations of persons. In R. S. Wyer, Jr. (Ed.), *Advances in social cognition* (Vol. VII, pp. 1-78). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Cartwright, D. (Ed.). (1959). *Studies in social power*. Ann Arbor, MI: Institute for Social Research.
- Carver, C. S., Ganellen, R. J., Froming, W. J., & Chambers, W. (1983). Modeling: An analysis in terms of category accessibility. *Journal of Experimental Social Psychology*, 19, 403-421.
- Chaiken, S., & Bargh, J. A. (1993). Occurrence versus moderation of the automatic attitude activation effect: Reply to Fazio. *Journal of Personality and Social Psychology*, 64, 759-765.

- Chaiken, S., Giner-Sorolla, R., & Chen, S. (1996). Beyond accuracy: Defense and impression motives in heuristic and systematic information processing. In P. M. Gollwitzer & J. A. Bargh (Eds.), *The psychology of action* (pp. 553–578). New York: Guilford.
- Chaiken, S., Liberman, A., & Eagly, A. H. (1989). Heuristic and systematic information processing within and beyond the persuasion context. In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 212–252). New York: Guilford.
- Chartrand, T. L., & Bargh, J. A. (1996). Automatic activation of impression formation and memorization goals: Nonconscious goal priming reproduces effects of explicit task instructions. *Journal of Personality and Social Psychology*, 71, 464–478.
- Chen, M., & Bargh, J. A. (1996). *An automatic effect of (all) attitudes on behavior: Preconscious approach and avoidance responses to liked and disliked stimuli*. Manuscript submitted for publication, New York University.
- Chen, M., & Bargh, J. A. (1997). Nonconscious behavioral confirmation processes: The self-fulfilling nature of automatically activated stereotypes. *Journal of Experimental Social Psychology*.
- Chen, S., Shechter, D., & Chaiken, S. (1996). Getting at the truth or getting along: Accuracy and impression-motivated heuristic and systematic processing. *Journal of Personality and Social Psychology*, 71, 262–265.
- Cialdini, R. B. (1994, October). *The strain for consistency: A history, a measure, and a surprise*. Plenary address to the annual meeting of the Society for Experimental Social Psychology, Lake Tahoe, NV.
- Cialdini, R. B., Trost, M. R., & Newsom, J. T. (1995). Preference for consistency: The development of a valid measure and the discovery of surprising behavioral implications. *Journal of Personality and Social Psychology*, 69, 318–328.
- Collins, A. M., & Loftus, E. F. (1975). A spreading activation theory of semantic memory. *Psychological Review*, 82, 407–428.
- Darley, J. M., & Latané, B. (1968). Bystander intervention in emergencies: Diffusion of responsibility. *Journal of Personality and Social Psychology*, 8, 377–383.
- Devine, P. G. (1989). Stereotypes and prejudice: Their automatic and controlled components. *Journal of Personality and Social Psychology*, 56, 680–690.
- Dunn, J. C., & Kirsner, K. (1988). Discovering functionally independent mental processes: The principle of reversed association. *Psychological Review*, 95, 91–101.
- Edwards, K. (1990). The interplay of affect and cognition in attitude formation and change. *Journal of Personality and Social Psychology*, 59, 202–216.
- Erber, R., & Fiske, S. T. (1984). Outcome dependency and attention to inconsistent information. *Journal of Personality and Social Psychology*, 47, 709–726.
- Erdelyi, M. H. (1974). A new look at the New Look: Perceptual defense and vigilance. *Psychological Review*, 81, 1–25.
- Erdley, C. A., & D'Agostino, P. R. (1988). Cognitive and affective components of automatic priming effects. *Journal of Personality and Social Psychology*, 54, 741–747.
- Fazio, R. H. (1986). How do attitudes guide behavior? In R. M. Sorrentino & E. T. Higgins (Eds.), *Handbook of motivation and cognition* (Vol. 1, pp. 204–243). New York: Guilford.
- Fazio, R. H., Chen, J., McDonel, E. C., & Sherman, S. J., (1982). Attitude accessibility, attitude-behavior consistency, and the strength of the object-evaluation association. *Journal of Experimental Social Psychology*, 18, 339–357.
- Fazio, R. H., Sanbonmatsu, D. M., Powell, M. C. & Kardes, F. R. (1986). On the automatic activation of attitudes. *Journal of Personality and Social Psychology*, 50, 229–238.
- Festinger, L., & Carlsmith, J. M. (1959). Cognitive consequences of forced compliance. *Journal of Abnormal and Social Psychology*, 58, 203–210.
- Fiske, S. T. (1980). Attention and weight in person perception: The impact of negative and extreme behavior. *Journal of Personality and Social Psychology*, 38, 889–906.
- Fiske, S. T., & Pavelchak, M. (1986). Category-based versus piecemeal-based affective responses: Developments in schema-triggered affect. In R. M. Sorrentino & E. T. Higgins (Eds.), *Handbook of motivation and cognition* (pp. 167–203). New York: Guilford.

- Fitzgerald, L. F. (1993, February). *The last great open secret: The sexual harassment of women in the workplace and academia*. Edited transcript of a Science and Public Policy Seminar presented by the Federation of Behavioral, Psychological, and Cognitive Sciences, Washington, DC.
- Flavell, J. H., & Draguns, J. (1957). A microgenetic approach to perception and thought. *Psychological Bulletin*, 54, 197–217.
- Fodor, J. A. (1983). *The modularity of mind*. Cambridge, MA: Bradford Books.
- Gazzaniga, M. (1985). *The social brain*. New York: Basic Books.
- Gilbert, D. T. (1989). Thinking lightly about others: Automatic components of the social inference process. In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 189–211). New York: Guilford.
- Gilbert, D. T., Pelham, B. W., & Krull, D. S. (1988). On cognitive busyness: When person perceivers meet persons perceived. *Journal of Personality and Social Psychology*, 54, 733–739.
- Gollwitzer, P. M., Heckhausen, H., & Steller, B. (1990). Deliberative and implemental mind-sets: Cognitive tuning toward congruous thoughts and information. *Journal of Personality and Social Psychology*, 59, 1119–1127.
- Gollwitzer, P. M., & Moskowitz, G. (1996). Goal effects on thought and behavior. In E. T. Higgins & A. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 361–399). New York: Guilford.
- Greenwald, A. G., & Banaji, M. R. (1995). Implicit social cognition: Attitudes, self-esteem, and stereotypes. *Psychological Review*, 102, 4–27.
- Hamilton, D. L., Katz, L. B., & Leirer, V. O. (1980). Organizational processes in impression formation. In R. Hastie, T. M. Ostrom, E. B. Ebbesen, R. S. Wyer, D. L. Hamilton, & D. E. Carlston (Eds.), *Person memory: The cognitive basis of social perception* (pp. 121–153). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Hansen, R. D. (1980). Commonsense attribution. *Journal of Personality and Social Psychology*, 39, 996–1009.
- Hastie, R., & Kumar, P. (1979). Person memory: Personality traits as organizing principles in memory for behaviors. *Journal of Personality and Social Psychology*, 37, 25–38.
- Hastie, R., & Park, B. (1986). The relationship between memory and judgment depends on whether the judgment task is memory-based or on-line. *Psychological Review*, 93, 58–268.
- Hayes-Roth, B. (1977). Evolution of cognitive structure and process. *Psychological Review*, 84, 260–278.
- Hebb, D. O. (1948). *Organization of behavior*. New York: Wiley.
- Heckhausen, H. (1990). *Motivation and action*. New York: Springer-Verlag.
- Herr, P. M. (1986). Consequences of priming: Judgment and behavior. *Journal of Personality and Social Psychology*, 51, 1106–1115.
- Higgins, E. T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review*, 94, 319–340.
- Higgins, E. T. (1989). Knowledge accessibility and activation: Subjectivity and suffering from unconscious sources. In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 75–123). New York: Guilford.
- Higgins, E. T. (1991). Development of self-regulatory and self-evaluative processes: Costs, benefits, and tradeoffs. & L. A. Sroufe (Eds.), *The Minnesota Symposia on Child Development: Self processes and development* (Vol. 23). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Higgins, E. T., Bargh, J. A., & Lombardi, W. (1985). Nature of priming effects on categorization. *Journal of Experimental Psychology: Learning, memory, and cognition*, 11, 59–69.
- Higgins, E. T., King, G. A., & Mavin, G. H. (1982). Individual construct accessibility and subjective impressions and recall. *Journal of Personality and Social Psychology*, 43, 35–47.
- Higgins, E. T., Rholes, W. S., & Jones, C. R. (1977). Category accessibility and impression formation. *Journal of Experimental Social Psychology*, 13, 141–154.
- Hilgard, E. R. (1965). *Hypnotic susceptibility*. New York: Harcourt Brace & World.
- Hilgard, E. R. (1977). *Divided consciousness*. New York: Wiley.
- Hintzman, D. L. (1988). Judgments of frequency and recognition memory in a multiple-trace memory model. *Psychological Review*, 95, 528–551.

- Hodges, S., & Wegner, D. M. (in press). Automaticity and control of empathy. In W. J. Ickes (Ed.), *Empathic accuracy*. New York: Guilford.
- Horner, M. S. (1974). Fear of success in women. In J. W. Atkinson & J. O. Raynor (Eds.), *Motivation and achievement* (pp. 76-117). Washington: Winston.
- Jackson, D. N. (1974). *Personality Research Form Manual*. Port Huron, MI: Research Psychologists Press.
- Jacoby, L. L. (1991). A process dissociation framework: Separating automatic from intentional uses of memory. *Journal of Memory and Language*, 30, 513-541.
- James, W. (1890). *The principles of psychology*. New York: Holt.
- Johnson, M. K. (1983). A multiple entry, modular memory system. In G. H. Bower (Ed.), *The psychology of learning and motivation* (Vol. 17, pp. 81-123). New York: Academic Press.
- Johnson, M. K., Kim, J. K., & Risse, G. (1985). Do alcoholic Korsakoff's syndrome patients acquire affective reactions? *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 11, 22-36.
- Jones, E. E., & Nisbett, R. E. (1971). The actor and the observer: Divergent perceptions of the causes of behavior. In E. E. Jones, D. Kanouse, H. H. Kelley, R. E. Nisbett, S. Valins, & B. Weiner (Eds.), *Attribution: Perceiving the causes of behavior* (pp. 79-94). Morristown, NJ: General Learning Press.
- Jung, C. G. (1927). The structure of the psyche. In R. F. C. Hull (Trans.), *Collected works of C. G. Jung* (Vol. 8, pp. 283-342). Princeton, NJ: Princeton University Press.
- Karniol, R., & Ross, M. (1996). The motivational impact of temporal focus: Thinking about the future and the past. *Annual Review of Psychology*, 47, 593-620.
- Kelley, H. H. (1967). Attribution theory in social psychology. In D. Levine (Ed.), *Nebraska Symposium on Motivation* (Vol. 15, pp. 192-241). Lincoln: University of Nebraska Press.
- Kipnis, D. (1976). *The powerholders*. Chicago: University of Chicago Press.
- Klüver, H. (1951). Discussion of Lashley's chapter. In L. A. Jeffries (Ed.), *Cerebral mechanisms in behavior: The Hixon Symposium* (pp. 136). New York: Wiley.
- Klein, S. B., & Loftus, J. (1993). The mental representation of trait and autobiographical knowledge about the self. In T. K. Srull & R. S. Wyer, Jr. (Eds.), *Advances in social cognition* (Vol. 5, pp. 1-49). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Koffka, K. (1925). *Die Grundlagen der psychischen Entwicklung*. Osterwieck: Zickfeldt.
- Kuhl, J. (1986). Motivation and information processing: A new look at decision making, dynamic change, and action control. In R. M. Sorrentino & E. T. Higgins (Eds.), *Handbook of motivation and cognition* (Vol. 1, pp. 404-434). New York: Guilford.
- Lang, P. J., Bradley, M. M., & Cuthbert, B. N. (1990). Emotion, attention, and the startle reflex. *Psychological Review*, 97, 377-395.
- Lashley, K. S. (1951). The problem of serial order in behavior. In L. A. Jeffries (Ed.), *Cerebral mechanisms in behavior: The Hixon Symposium* (pp. 112-136). New York: Wiley.
- Lazarus, R. S. (1982). Thoughts on the relations between emotion and cognition. *American Psychologist*, 37, 1019-1024.
- LeDoux, J. E. (1989). Cognitive-emotional interactions in the brain. *Cognition and Emotion*, 3, 267-289.
- LeDoux, J. E., Iwata, J., Reis, D. J. (1988). Different projections of the central amygdaloid nucleus mediate autonomic and behavioral correlates of conditioned fear. *Journal of Neuroscience*, 8, 2517-2529.
- Lewin, K. (1926). Vorsatz, Wille und Bedürfnis. *Psychologische Forschung*, 7, 330-385.
- Lewin, K. (1935). *A dynamic theory of personality*. New York: McGraw-Hill.
- Lewin, K. (1943). Defining the 'field at a given time.' *Psychological Review*, 50, 292-310.
- Lichtenstein, M., & Srull, T. K. (1987). Processing objectives as a determinant of the relationship between recall and judgment. *Journal of Experimental Social Psychology*, 23, 93-118.
- Lorch, R. F., Jr. (1982). Priming and search processes in semantic memory: A test of three models of spreading activation. *Journal of Verbal Learning and Verbal Behavior*, 21, 468-492.
- Macrae, C. N., Milne, A. B., & Bodenhausen, G. V. (1993). Stereotypes as energy-saving devices: A peek inside the cognitive toolbox. *Journal of Personality and Social Psychology*, 66, 37-47.
- Malamuth, N. M. (1989). The attraction to sexual aggression scale: Part One. *Journal of Sex Research*, 26, 26-49.

- Marcel, A. J. (1983). Conscious and unconscious perception: Experiments on visual masking and word recognition. *Cognitive Psychology*, 15, 197-237.
- Martin, L. L., & Tesser, A. (1989). Toward a motivational and structural theory of ruminative thought. In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 306-326). New York: Guilford.
- Martindale, C. (1991). *Cognitive psychology: A neural-network approach*. Pacific Grove, CA: Brooks/Cole.
- Meyer, D. E., & Schvaneveldt, R. W. (1971). Facilitation in recognizing pairs of words: Evidence of a dependence between retrieval operations. *Journal of Experimental Psychology*, 90, 227-234.
- McClelland, D. C. (1953). *The achievement motive*. New York: Appleton-Century-Crofts.
- Milgram, S. (1963). Behavioral study of obedience. *Journal of Abnormal and Social Psychology*, 67, 371-378.
- Miller, G. A., Galanter, E., & Pribram, K. H. (1960). *Plans and the structure of behavior*. New York: Holt, Rinehart & Winston.
- Mills, C. J., & Tyrrell, D. J. (1983). Sex-stereotypic encoding and release from proactive interference. *Journal of Personality and Social Psychology*, 45, 772-781.
- Mischel, W. (1973). Toward a cognitive social learning reconceptualization of personality. *Psychological Review*, 80, 252-283.
- Murphy, S. T., & Zajonc, R. B. (1993). Affect, cognition, and awareness: Affective priming with optimal and suboptimal stimulus exposures. *Journal of Personality and Social Psychology*, 64, 723-739.
- Murray, H. (1943). *The Thematic Apperception Test manual*. Cambridge, MA: Harvard University Press.
- Neely, J. H. (1977). Semantic priming and retrieval from lexical memory: Roles of inhibitionless spreading activation and limited-capacity attention. *Journal of Experimental Psychology: General*, 106, 226-254.
- Negroponce, N. (1995). *Being digital*. New York: Knopf.
- Neisser, U. (1967). *Cognitive psychology*. New York: Appleton-Century-Crofts.
- Neuberg, S. L. (1988). Behavioral implications of information presented outside of awareness: The effect of subliminal presentation of trait information on behavior in the Prisoner's Dilemma Game. *Social Cognition*, 6, 207-230.
- Newell, A., & Rosenbloom, P. S. (1981). Mechanisms of skill acquisition and the law of practice. In J. R. Anderson (Ed.), *Cognitive skills and their acquisition* (pp. 1-55). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Newell, A., & Simon, H. A. (1972). *Human problem solving*. Englewood Cliffs, NJ: Prentice-Hall.
- Newman, L. S., & Uleman, J. S. (1989). Spontaneous trait inference. In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 155-188). New York: Guilford.
- Niedenthal, P. M. (1990). Implicit perception of affective information. *Journal of Experimental Social Psychology*, 26, 505-527.
- Niedenthal, P. M., & Cantor, N. (1986). Affective responses as guides to category-based influences. *Motivation and Emotion*, 10, 217-231.
- Nisbett, R. E., & Wilson, T. D. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review*, 84, 231-259.
- Osgood, C. E. (1953). *Method and theory in experimental psychology*. New York: Oxford University Press.
- Osgood, C. E., Suci, G. S., & Tannenbaum, P. H. (1957). *The measurement of meaning*. Urbana: University of Illinois Press.
- Ovsiankina, M. (1928). *Die Wiederaufnahme unterbrochener Handlungen* [The resumption of interrupted goals]. *Psychologische Forschung*, 11, 302-379.
- Perdue, C. W., & Gurtman, M. B. (1990). Evidence for the automaticity of ageism. *Journal of Experimental Social Psychology*, 26, 199-216.
- Pervin, L. A. (Ed.). (1989). *Goal concepts in personality and social psychology*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Piaget, J. (1946). *La formation du symbole chez l'enfant*. Paris: Delachaux & Niestlé.
- Pitman, T. S., & D'Agostino, P. R. (1985). Motivation and attribution: The effects of control deprivation on subsequent information processing. In J. H. Harvey & G. Weary (Eds.), *Attribution: Basic and applied issues* (pp. 117-142). San Diego, CA: Academic Press.

- Posner, M. I., & Snyder, C. R. R. (1975). Attention and cognitive control. In R. L. Solso (Ed.), *Information processing and cognition: The Loyola symposium* (pp. 55-85). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Pratto, F., & Bargh, J. A. (1991). Stereotyping based on apparently individuating information: Trait and global components of sex stereotypes under attention overload. *Journal of Experimental Social Psychology*, 27, 26-47.
- Pryor, J. B. (1987). Sexual harassment proclivities in men. *Sex Roles*, 17(5-6), 269-290.
- Prinz, W. (1990). A common coding approach to perception and action. In O. Neumann & W. Prinz (Eds.), *Relationships between perception and action* (pp. 167-201). Heidelberg: Springer-Verlag.
- Reuman, D. A., Alwin, D. F., & Veroff, J. (1984). Assessing the validity of the achievement motive in the presence of random measurement error. *Journal of Personality and Social Psychology*, 47, 1347-1362.
- Rilling, M. (1992). An ecological approach to stimulus control and tracking. In W. K. Honig & J. G. Fetterman (Eds.), *Cognitive aspects of stimulus control* (pp. 347-366). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Rumelhart, D. E., & McClelland, J. L. (1986). *Parallel distributed processing*. Cambridge, MA: MIT Press.
- Russell, B. (1938). *Power: A new social analysis*. New York: Norton.
- Salovey, P., & Singer, J. A. (1989). Mood congruency effects in recall of childhood versus recent memories. *Journal of Social Behavior and Personality*, 4, 99-120.
- Schachter, S., & Singer, J. L. (1962). Cognitive, social, and physiological determinants of emotional state. *Psychological Review*, 69, 379-399.
- Shallice, T. (1972). Dual functions of consciousness. *Psychological Review*, 79, 383-393.
- Shiffrin, R. M., & Dumais, S. T. (1981). The development of automatism. In J. R. Anderson (Ed.), *Cognitive skills and their acquisition* (pp. 111-140). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Shiffrin, R. M., & Schneider, W. (1977). Controlled and automatic human information processing: II. Perceptual learning, automatic attending, and a general theory. *Psychological Review*, 84, 127-190.
- Skinner, B. F. (1953). *Science and human behavior*. New York: Free Press.
- Skinner, B. F. (1978). Why I am not a cognitive psychologist. In B. F. Skinner (Ed.), *Reflections on behaviorism and society* (pp. 97-112). Englewood Cliffs, NJ: Prentice-Hall.
- Smith, E. R. (1984). Model of social inference processes. *Psychological Review*, 91, 392-413.
- Smith, E. R. (1989). Procedural efficiency: General and specific components and effects on social judgment. *Journal of Experimental Social Psychology*, 25, 500-523.
- Smith, E. R. (1994). Procedural knowledge and processing strategies in social cognition. In R. S. Wyer & T. K. Srull (Eds.), *Handbook of social cognition* (2nd ed., Vol. 1, pp. 99-152). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Smith, E. R., Branscombe, N. R., & Bormann, C. (1988). Generality of the effects of practice on social judgment tasks. *Journal of Personality and Social Psychology*, 54, 385-395.
- Smith, E. R., & Lerner, M. (1986). Development of automatism of social judgments. *Journal of Personality and Social Psychology*, 50, 246-259.
- Snyder, M., Tanke, E. D., & Berscheid, E. (1977). Social perception and interpersonal behavior: On the self-fulfilling nature of social stereotypes. *Journal of Personality and Social Psychology*, 35, 656-666.
- Solarz, A. (1960). Latency of instrumental responses as a function of compatibility with the meaning of eliciting verbal signs. *Journal of Experimental Psychology*, 59, 239-245.
- Sorrentino, R. M., & Higgins, E. T. (1986). Motivation and cognition: Warming up to synergism. In R. M. Sorrentino & E. T. Higgins (Eds.), *Handbook of motivation and cognition* (Vol. 1 pp. 3-19). New York: Guilford.
- Spielman, L. A., Pratto, F., & Bargh, J. A. (1988). Automatic affect: Are one's moods, attitudes, evaluations, and emotions out of control? *American Behavioral Scientist*, 31, 96-311.
- Srull, T. K. (1981). Person memory: Some tests of associative storage and retrieval models. *Journal of Experimental Psychology: Human Learning and Memory*, 7, 440-463.
- Srull, T. K., Lichtenstein, M., & Rothbart, M. (1985). Associated storage and retrieval processes in person memory. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 11, 316-345.

- Srull, T. K., & Wyer, R. S., Jr. (1979). The role of category accessibility in the interpretation of information about persons: Some determinants and implications. *Journal of Personality and Social Psychology*, 37, 1660-1672.
- Srull, T. K., & Wyer, R. S., Jr. (1980). Category accessibility and social perception: Some implications for the study of person memory and interpersonal judgment. *Journal of Personality and Social Psychology*, 38, 841-856.
- Srull, T. K., & Wyer, R. S., Jr. (1983). The role of control processes and structural constraints in models of memory and social judgment. *Journal of Experimental Social Psychology*, 19, 497-521.
- Srull, T. K., & Wyer, R. S., Jr. (1986). The role of chronic and temporary goals in social information processing. In R. M. Sorrentino & E. T. Higgins (Eds.), *Handbook of motivation and cognition* (pp. 503-549). New York: Guilford.
- Steele, C. M. (1988). The psychology of self-affirmation: Sustaining the integrity of the self. *Advances in Experimental Social Psychology*, 21, 261-302.
- Strauman, T. J., & Higgins, E. T. (1987). Automatic activation of self-discrepancies and emotional syndromes: When cognitive structures influence affect. *Journal of Personality and Social Psychology*, 53, 1004-1014.
- Taylor, S. E. (1989). *Positive illusions*. New York: Basic Books.
- Taylor, S. E., & Fiske, S. T. (1978). Saliency, attention, and attribution: Top of the head phenomena. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 11, pp. 249-288). New York: Academic Press.
- Thibaut, J. W., & Kelley, H. H. (1959). *The social psychology of groups*. New York: Wiley.
- Tooby, J., & Cosmides, L. (1992). The psychological foundations of culture. In J. H. Barkow, J. Tooby, & L. Cosmides (Eds.), *The adapted mind* (pp. 19-136). New York: Oxford University Press.
- Uleman, J. S., Newman, L. S., & Moskowitz, G. B. (1996). People as spontaneous interpreters: Evidence and issues from spontaneous trait inference. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 28, pp. 211-279). San Diego, CA: Academic Press.
- Vera, A. H., & Simon, H. A. (1993). Situated action: A symbolic interpretation. *Cognitive Science*, 17, 7-48.
- Wegner, D. M., & Bargh, J. A. (1997). Control and automaticity in social life. In D. Gilbert, S. Fiske, & G. Lindzey (Eds.), *Handbook of social psychology* (4th ed.). Boston, MA: McGraw-Hill.
- Werner, H. (1956). Microgenesis and aphasia. *Journal of Abnormal and Social Psychology*, 52, 347-353.
- Werner, H., & Kaplan, B. (1963). *Symbol formation: An organismic-developmental approach to language and the expression of thought*. New York: Wiley.
- Whitehead, A. N. (1911). *An introduction to mathematics*. New York: Henry Holt.
- Wicklund, R. A., & Brehm, J. W. (1976). *Perspectives on cognitive dissonance*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Wicklund, R. A., & Gollwitzer, P. M. (1982). *Symbolic self-completion*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Wilensky, R. (1983). *Planning and understanding*. Reading, MA: Addison-Wesley.
- Winter, L., & Uleman, J. S. (1984). When are social judgments made? Evidence for the spontaneity of trait inferences. *Journal of Personality and Social Psychology*, 47, 237-252.
- Wyer, R. S., Jr., & Srull, T. K. (1986). Human cognition in its social context. *Psychological Review*, 93, 322-359.
- Wyer, R. S., Jr., & Srull, T. K. (1989). *Memory and cognition in its social context*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Zajonc, R. B. (1980). Feeling and thinking: Preferences need no inferences. *American Psychologist*, 35, 151-175.
- Zillman, D., & Bryant, J. (1974). Effect of residual excitation on the emotional response to provocation and delayed aggressive behavior. *Journal of Personality and Social Psychology*, 30, 782-791.