CHAPTER TEN

CONTROL AND AUTOMATICITY IN SOCIAL LIFE

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Topics come and go in social psychology, and this is one that is coming. This is the first *Handbook of Social Psychology* with a chapter devoted to the role of control and automaticity in social life. *Handbooks* have varied somewhat over the years in how they subdivide the field, acting as barometers to measure the relative importance of topics over time—so we are happy to note that this time around control and automaticity have surfaced as key concepts in the way social psychology is being understood.

These are not, however, flash-in-the-pan ideas. The distinction between automaticity and control of behavior has been with us at least since David Hartley remarked in *Observations on Man* (1749) that "The *Motions* of the body are of two kinds, *automatic* and *voluntary*." Notions of control and automaticity have far earlier pedigrees than this, however, in the philosophical study of free will and determinism, and have resurfaced in psychology as fundamental themes in the debates earlier in this century between the cognitivists and behaviorists. Perhaps as a reflection of these foundations, and also for contemporary reasons we examine in this chapter, it now turns out that control and automaticity have developed into mature and important organizing ideas for the understanding of social behavior. The tricky questions of when and how people control their behavior, and the related but not identical questions of when and how behavior occurs automatically. have arrived in scientific social psychology with a bang. In this chapter, we ask these questions and review what is currently known or surmised about their answers.

As a first step in this analysis, we consider the classic studies of the field with a view toward exploring how concerns about control or automaticity of behavior have been historically central to the field. The middle sections of the chapter serve to define the concepts of control and automaticity in greater detail, first by looking at the nature of each idea and then by considering how they are interrelated. The final major section treats the social psychological literature on a series of topics for which issues of control and automaticity have special relevance. These include attitudes, social cognition, emotion, and expressive behavior.

THEMES OF CONTROL AND AUTOMATICITY IN THE CLASSIC EXPERIMENTS

Even with the capricious comings and goings of topics in social psychology considered over time, there is considerable unanimity in what social psychologists currently see as the core ideas of the field. We make this claim on the basis of a small and decidedly nonrandom sample of social psychologists we recently asked to help us identify the field's classic experiments. As it happens, they seem to settle on the same list almost every time.

The studies nominated for this honor usually include Milgram's (1963) obedience experiments, Asch's (1952) conformity studies, Schachter and Singer's (1962) emotion

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terpretation of the situational meaning of the arousal. For their research, arousal was manipulated through an administration of adrenaline to some participants but not others, but only some of the participants in each condition were informed of the possible excitatory side effects of this "learning drug." During the experiment, a confederate reacted visibly to the assigned task either with euphoria or anger, and this influenced the mood of the uninformed but not the informed participants. That is, participants lacked awareness of the cause of their emotional experience, and if not supplied with a cause by the experimenter, used the confederate's emotional expression as a cue as to how they themselves felt.

Although neither Schachter and Singer (1962) nor Schachter (1964) remark on the awareness or intentionality of this interpretive process, the tenor of their analysis is that people are actively and intentionally looking at the situation and its features and using these to construct the meaning of the physiological state that they are experiencing. However, Schachter and Singer (1962) did not ascribe to people any great degree of accuracy or sensitivity in detecting the true source of the emotional reaction. (Indeed, Schachter's [1964, p. 79] discussion of the source of emotion labels closely followed Skinner's [1953, chap. 17] analysis concerning one's lack of access to the cause of private, internal events.) If people were generally *aware* of the true reasons for their emotional state, it would not have been possible for Schachter and Singer (1962) to move the reported subjective experience around by virtue of how the experimental confederate reacted to the same situation.

Were participants in the Darley and Latané (1968) experiments on bystander intervention aware of the effect that the number of people present had on their likelihood to help? The authors addressed this question by asking all participants whether the presence (or absence) of others had affected their decision to help or not to help. Although all participants reported being aware of the presence of others, they nonetheless did not feel that it made any difference to their behavior (Darley & Latané, 1968, p. 381). In fact, this very *lack of awareness* was taken as a sign of hope by the authors that things could be different, as they ended their article on this optimistic note: "If people understand the situational forces that can make them hesitate to intervene, they may better overcome them" (p. 383). In these studies, it is also clear that participants were behaving in a rushed, impromptu fashion, and thus needed to rely on *efficient* rather than time-consuming judgment processes.

The final classic study we consider is the Haney, Banks, and Zimbardo (1973) prison simulation study, in which the basement of the Stanford psychology building was turned into a mock prison that nevertheless became quite real for its occupants. Randomly assigned to the role of guard or prisoner, participants were so *unable to control or inhibit* the powerful effect of their assigned role that they seemed to forget that it was only an experiment that they could leave at any time. When told they were eligible for parole, 60 percent of the prisoner participants said they would forfeit all money earned for participation in order to be released, oblivious to the fact that as participants in an experiment they could have left at any time if they were willing to forego payment. This study is known for its demonstration of the transforming power of the guard and prisoner roles on the personalities of the participants, turning them into sadistic or servile creatures, respectively—behavior that ran *counter to the participant's intentions* as to how to behave in that situation, as assessed by self-report personality inventories and the participants' responses during the lengthy debriefing process. The participants reported regretting their inability to inhibit the responses to the situation, both as guards and as prisoners.

The classic experiments all seem to highlight a basic conflict between the automaticity of behavior and the desire to control it. In each case, we find people behaving in ways they do not seem to control, but which are at the same time so morally reprehensible or just plain blockheaded that they cry out for control. Participants in these studies believe their own hypocritical lies, make patently dishonest judgments in order to conform, obey instructions to hurt others, blindly mimic others' emotions, ignore the plight of people in distress, or adhere slavishly to assigned roles. They seem to be led almost casually out of control. Each classic experiment is a morality play in which Everyperson is led astray by his or her unwitting susceptibility to social influence, lapsing into unaware automaticity at the precise juncture when conscious control seems so important. The haunting suspicion that people should "know better" appears everywhere in the classics, and it is this fundamental observation that fuels much of the social psychological interest in the nature of control and automaticity.

The Experimental Control of Personal Control

In a way, this had to happen. An emphasis on automaticity is a natural result of the social psychological desire to observe *genuine* behavior. Researchers don't want to be fooled by a participant's self-presentations or deceptive motivations, and in the pursuit of genuineness, they restrict the focus of the experiment's microscope to items that the person couldn't control or even be interested in controlling. Behavior that occurs without an individual's awareness, or that occurs quickly, unintentionally, or uncontrollably, after all, seems to have a stamp of genuiness on it—it is the *real* response to the situation, not just something the person has devised for the experimenter's amusement or misdirection. In the attempt to rule out these strategic explanations, experimental social psychology's special brand of "princi-

havior that is determined. In this view, control is what is left over once the scientific analysis of behavior is completed. As we have seen, the strategy of classic research in social psychology has often been to limit or circumvent the operation of voluntary or control processes with a view toward discovering those automatic forces that determine behavior. In this way of thinking, it seems that the best role left over for a concept of control is as some kind of homunculus—an agent, spirit, or magical entity that has the special property of *being able to do things that are not caused.*

Consternation over this kind of control has troubled psychologists and philosophers alike, and the whole study of goal-oriented activity on the part of humans has carried on under something of a cloud as a result (Wegner & Vallacher, 1987). The philosopher Gilbert Ryle (1949) referred to conscious control as "the ghost in the machine," for example, and dismissed the theory of psychological control as inconsistent with the causal determinism of behavior. He reasoned that the ghost is unnecessary if all it does is haunt the machine that actually churns out everything the person does. And even if the ghost could have an influence on the machine, Dennett (1984) has observed that this hardly provides a kind of free will worth wanting. A controller whose primary activity in life is doing things that are not caused by prior events seems no more than a capricious imp one would not trust with a water balloon.

Why then retain the concept of psychological control? For one thing, most people have an unshakeably insistent sense that they control their behavior in accord with their conscious thoughts and attitudes, and this should not be ignored as long as we hope to continue to stay on speaking terms with the human race. More important, though, is the realization that control is not the opposite of determinism. The way in which people control their behavior is no less determined than the way in which their automatic behavior occurs. Control is merely one conduit by which the determinants of behavior express their influence. Far from the ghost in the machine, then, the process of control is a particularly interesting *machine* in the machine.

This approach may strip away the mystery of control too completely, leaving it naked and squinting in the light. The sense that we humans cause our actions is indeed compelling, and any analysis that offends this sense runs the risk of prompt rejection. We believe that this sense or feeling of control is not good evidence that the ghostly form of control exists, however, as there are people who sense that they control the rotation of the earth and that certainly doesn't mean they do. The sense of control is itself an intriguing property of humans that can be conceptualized as an effect and as a cause of deterministic processes. As we shall see, there is much to be gained by viewing psychological control simply as a process that produces behavior, a process that has certain fundamental characteristics no matter whether the behavior issues from humans, animals, plants, or machines. (Ghosts, however, need not apply.)

The initial discovery that control in humans could be studied in this way is widely attributed to Norbert Wiener's (1948) *Cybernetics,* a book that introduced a computational approach to the problems of control—although glimmerings of the idea are also found in Craik (1948). The use of self-guiding mechanisms had swept the field of engineering in the years just before and after World War II, and it was a natural next step to consider how such control systems might model human thought and behavior (Heims, 1991). Simple mechanical gadgets such as the thermostat, the engine governor, and the logic circuit could be given goals (e.g., 72 Fahrenheit, 2400 RPM, "True"), and they could then regulate the behavior of systems such that those goals could be met. Although it seems perfectly natural now to describe humans as intelligent machines containing control systems, this was a revolutionary idea at the time, as it broke down many of Ryle's and other behaviorists' objections to the study of a "ghost" that behaved in accord with unobservable purposes and goals. Eventually, this breakthrough produced a large literature on control in humans, and it is to the elements of such control that we turn next.

Elements of Control

At the most basic level, to control something is just to influence it in a certain direction. A hat controls hair, for instance, and a person holding a leash controls a dog. We don't usually call influence "control" when its direction is random or unknown. So, for example, we wouldn't say that a tropical windstorm controls hair or that a roomful of humpable knees controls a dog.

These intuitions about the everyday meaning of control coincide well with formal analyses of the elements of control, as such analyses typically begin by distinguishing two features of control—a *control action* (the influence) and a *control criterion* (the direction). Control involves acting upon something until a certain criterion is reached. In the case of the hat, the control action is rather static, as the criterion involves simply keeping the hair from escaping. The case of walking a dog on a leash illustrates dynamic control, in turn, as the criterion might be to get the dog moving toward the park and the action might involve pulling at the leash while the dog leans hard toward something that smells interesting.

Control theories also make a general distinction between the input and output of a control process. The *input* to a control process is information from outside the control system that sets the criterion. The desire to "keep my hair down" might be thought of as the input when a person puts on a hat, whereas the person's desire to "walk the dog to the park" might be thought of as the input in the case of the

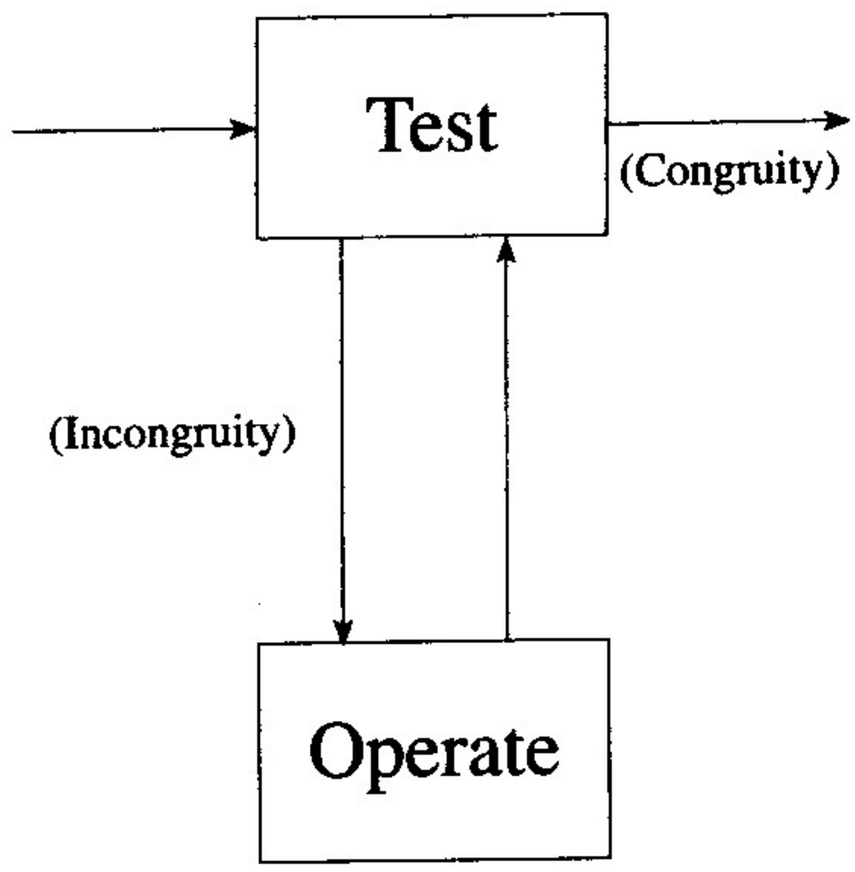

FIGURE 1 A TOTE Unit.

to the environment to determine whether each control action should be taken. The production system is monitoring the robot's progress.

In a sense, then, control involves constant or repeated vigilance, a kind of self-consciousness or self-knowledge that is wired into the control system. The test process is more than a mere error-checker, in this light—it is the critical element that creates the "loop" whereby the system is influenced by its own past actions. Any system that is reflexive in this way has special properties that make it fundamentally more adaptive (and unpredictable) than systems that do not (Hofstadter, 1979). The scientific study of nonlinear dynamical systems and chaos (Gleick, 1987; Vallacher & Nowak, 1994) involves the mathematical description and understanding of just such reflexive systems.

It may have been the resemblance of this reflexive feature of control to the self-awareness people feel in social situations (Duval & Wicklund, 1972; Wicklund, 1975) that inspired Carver and Scheier (1981, 1990) to introduce a general theory focused on the role of self-awareness in the control process. This theory suggests that the adjustments people make in their social behavior arise because self-attention prompts people to reduce discrepancies between their actual behavior and standards of correctness. Noticing that one is not being as helpful as one would like to be (Duval, Duval, & Neely, 1979), for example, or as aggressive as one would hope (Carver, 1975) or as unprejudiced as one would prefer (Macrae, Bodenhausen, & Milne, 1995), all involve monitoring how discrepant one's behavior is from a control criterion. Experimentally increasing self-focused attention beyond its natural levels enhances control in each of these cases, and this points to the crucial role of the monitoring process in the occurrence of control.

A final important element of control processes is the setting of the control criterion—how the control system's input is achieved. When we set a thermostat to a particular temperature and let it control the furnace, for example, we provide the input to the system by giving the thermostat a control criterion. The question of how criteria are set for human control is sometimes just this simple; our commanding officer in the military may set us to "march" or to "shoot" and we may accept that input without question (Milgram, 1974). Miller et al. (1960) suggest, too, that this is how hypnosis operates. The control criterion is set by the hypnotist and the hypnotic subject then acts as a control system seeking that criterion. Environmental reminders can suggest control criteria to us when we are not hypnotized, of course, and so set us toward the purposes they suggest (Bargh & Barndollar, 1996; Bargh & Gollwitzer, 1994).

Sometimes people set their control criteria themselves. When we choose without any obvious external urging to go to college or to take up selling drugs, for example, it could be said that we have set our own control criteria. Carver and Scheier (1981) and Powers (1973) have suggested that the setting of such criteria is the output of a prior control system, and that it is thus possible to imagine a hierarchy of control systems in which the outputs of those above provide inputs for those below. The development of conscious plans to behave, in this light, is the output of a control system that selects from among different alternative actions, perhaps in accord with broader principles or values. The person who chooses college over selling drugs may do so

each day. Full consciousness introduces thoughts *about* what we are thinking and doing. Such higher-order thought is not always present. One's finger could move at the keyboard and one could respond to the music (perhaps by baying softly), quite without full consciousness, as the mind normally carries on many such activities without making us think of the fact that it is doing them. When full consciousness does occur, however, the mind is occupied not only with the keyboard and music, but simultaneously carries on a stream of thought about the fact that it has each of these occupations in turn.

The observation that full consciousness can come and go, visiting some of our minimally conscious activities and skipping past others, has long been appreciated by psychologists. Jastrow (1906) remarked on the common experience of performing some routinized action and finding one's mind wandering away from the act, only then to "come to" and realize that for some time one has been unaware of what one was doing (see also Carpenter, 1874). Such a return of full consciousness can also occur on purpose, and this corresponds to "introspective" consciousness (Rosenthal, 1993). Like full consciousness, introspection involves higher-order thoughts about one's acts of minimal consciousness (Nisbett & Wilson, 1977). In introspection, however, the higher-order thoughts are intended, whereas in normal full consciousness the occurrence of the higher-order train of thought seems unintended.

Full consciousness also seems to have a special connection with language. We don't normally talk about or describe mental events of which we are minimally conscious. The mental events that are fully conscious, on the other hand, are quite readily narrated in language—so readily that it seems that such narration may somehow be a fundamental part of the way in which we become fully conscious (Dennett, 1978). Although we may sometimes have trouble putting our fully conscious contents into the *right* words, we are never doubtful of the possibility that we can put them into *some* words. Part of what happens when we reach the higher-level thoughts about our minimally-conscious contents may involve the translation of the experience into a sequential form that allows it to be rendered in language. In this vein, Dennett (1969) made a distinction much like the one between full and minimal consciousness in which he suggested that being **aware**$_1$ (a verbalizable awareness) is not the same as being **aware**$_2$ (a mere connection with stimulation that causes behavior). Speaking yet more broadly, it may be that the role of consciousness in translating the parallel, time-unbound workings of the mind to the demands of a serial, sequential outside world transcends language per se. Serialization is a property imposed on all responses to the environment (such as actions) which must take place one at a time (see Bargh, 1997; Lashley, 1951; Shallice, 1972; Vallacher & Wegner, 1985), and this seems to be an important part of what full consciousness does.

The leap from minimal to full consciousness has been explained in another related way among developmental psychologists studying the child's "theory of mind" (Astington, Harris, & Olson, 1988; Leslie, 1987; Gopnik, 1993). Researchers in this tradition have observed that children experience a transition during the ages of three to four in which they become capable of thinking about their own mental states and those of others. Before this, a child might report after discovering that a candy box contained pencils, for example, that he or she had always thought it contained pencils and had never held the mistaken belief that it held candy—even though this was clearly the case. Similarly, the child might attribute knowledge of the pencil contents to another child being shown the closed candy box for the first time. This apparent extension of what the child knows now into answers about what the child knew before or about what other uninformed children know now suggests an inability to represent mental contents as independent of reality. This basic ability would seem to be necessary for the operation of the higher-order thinking associated with full consciousness. In this light, full consciousness is something we gain when we develop the capacity not just to have mental states, but to think and talk about them.

With this understanding of consciousness, we can now turn to the question of conscious control. Our analysis of consciousness into two forms suggests that some proportion of a person's control processes may carry on with only minimal consciousness, whereas the remaining control processes have full consciousness. In what follows, we will use the term "conscious control" to refer only to the case of full consciousness.

To examine conscious control, we must be careful to specify *when* the consciousness of interest is occurring. Conscious processes can occur (1) well in advance of behavior as we think, plan, or deliberate about what we will do, (2) in the form of conscious intention that appears in mind just before the behavior occurs, and (3) during a behavior as we consciously notice aspects of the enactment. To keep these epochs of consciousness straight, let us call them *conscious planning*, *conscious intention*, and *conscious monitoring*. Each of these points of conscious contact with control is worth considering separately.

Conscious Planning There seems to be little doubt that work done in the mind, and of which we are fully conscious, can contribute importantly to subsequent control of behavior. Although full consciousness of goal selection and behavior planning may not be a necessary requirement for cognitive control of behavior (Bargh & Gollwitzer, 1994), it is often sufficient. Conceptualizations of conscious planning usually divide it into two kinds of processes (Miller et al., 1960; Vallacher & Wegner, 1985), each of which has attracted considerable research attention. One set of conscious processes deliberates among multiple possible goals of action (e.g., Carver & Scheier,

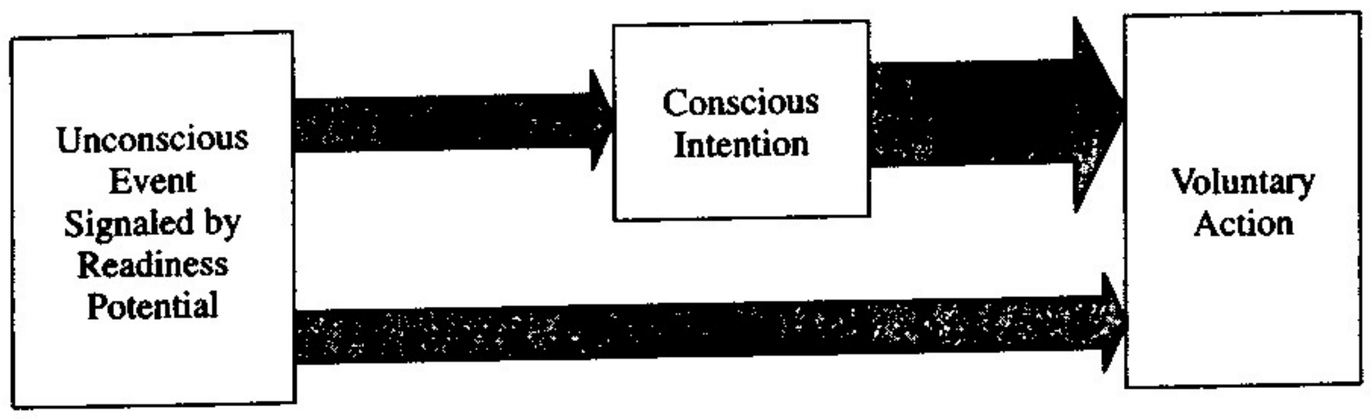

FIGURE 2 Real and Apparent Paths of Action Causation.

a sense, they had intended to intend. Conscious control, then, may involve considerable influence by prior consciousness (in the form of planning and anticipating when actions should be done), but apparently little influence by immediately-prior conscious intention. Consciousness indicates the direction in which voluntary action is being launched, but the momentary conscious intention does not participate in the actual launching.

The key question for this analysis is, of course, why one would want such a system (cf. Harnad, 1982). Why would it be useful to have a control system that can be prepared for action by prior consciousness, but that produces momentary conscious intentions to act that are not necessarily themselves causal of the act? There are at least two suggestions of functions such conscious intention may serve. For handy reference, we can call them the *responsibility hypothesis* and the *criterion hypothesis.*

The responsibility hypothesis has been long suggested by both social scientists (Mead, 1934) and moral philosophers (Hart, 1948/1949; Feinberg, 1970), and appears as well in current social psychology (Fiske, 1989; Uleman, 1989). The idea here is that we become conscious of our intentions so that the social rewards and costs for our actions can be calculated, both by ourselves and others. This notion hinges on the observation that responsibility is allocated in social life on the basis of our intentional social actions, and that our sense that we "could have done otherwise" allows the distribution of social outcomes for what we did do. We humans develop self-conceptions as agents based on the actions we knowingly and intentionally perform, and then expect and receive social recognition for what we have done and the selves these acts represent. This explanation suggests, in short, that conscious intentions are the currency by which we compute who's been bad and good. This social function presumably has become so pressing that it has created the mental processes that report our intentions to consciousness. This is an evolutionary hypothesis, then, that suggests a long process of development of the human ability to foresee our actions.

A second explanation for why we have conscious intentions is the criterion hypothesis. This is the suggestion that intentions alert consciousness to what we are going to do so that the conscious monitoring of our actions and their outcomes can occur. If we didn't know what we were intending, after all, we wouldn't be able to know whether our intention had been successfully achieved. Vallacher and Wegner (1985, 1987) and Wegner and Vallacher (1986) spelled out this idea in the theory of action identification, suggesting that each person has a specific, verbalizable notion of what he or she is doing available for report during any moment of full consciousness. In other words, the question "What are you doing?" posed to a conscious person always has an answer.

In this view, the intentions that arise in mind as we act inform us consciously of what to watch for in our behavior—and so of what can be counted as completion of the action. When we find ourselves waving a hand in a restaurant, for example, it would be good to know whether we are "signaling the waiter" or "cooling off our fingers." This allows us consciously to observe when the action is finished and whether it is successful, and so to discern what to do next (or whether to do it over). When intentions are understood consciously in advance of action, they allow a constant conscious representation of action to accompany the action and serve as a guide to its proper construction. Conscious intention thus allows conscious monitoring (our next topic) and provides for updates of conscious planning—so to allow action to unfold with the benefit of feedback processes.

To summarize, we should note first that our conclusions about conscious intention in this section are preliminary ones. Libet's research, in particular, has not been followed up by enough other researchers to allow us to draw strong conclusions. But at this point, the implication is that conscious intentions signal the direction of action—but without causing the action. Although the trajectory of controlled action is specified in advance by conscious planning, it appears that the precise brain events that trig-

The Sense of Control

People may sense that they control something when they do not. A disconcerting example of this occurred to one of the authors, for instance, when he was intently operating the controls of a video game for some time, only to find the words "Insert Coin" appearing on the screen—to indicate that the game action was being demonstrated by the machine without any influence from him at all. People may also sense that they do not control something when they actually do. The seemingly magical movement of a Ouija Board pointer is an example of this. Although the sense of control does seem to coincide rather well with actual control in many instances, there are enough divergences to remind us that they are clearly different phenomena (Alloy & Tabachnik, 1984; Ansfield & Wegner, 1996; Langer, 1975).

The sense of control has been far more widely studied and celebrated in social psychology than has actual control. Without much concern about whether the sense of control corresponds with actual control or not, theorists and researchers have examined variations in the sense of control all by itself—usually with the hypothesis in mind that a sense of control is always good. It is difficult to tell exactly where this hypothesis began—as it seems in some ways to resemble the idea (also so popular as to be untraceable) that high self-esteem is a uniformly desirable state (Baumeister, Smart, & Boden, 1996)—and it may be more a North American cultural world view than a derivation from a specific theory. The rise of the idea in modern psychology, however, is often ascribed to White's (1959) theory of effectance motivation.

White held that organisms have an innate desire to have an effect on their environments and gave examples indicating that this desire surfaces in lots of seemingly capricious little expressions of control. Mice who are given a button to push that changes the illumination in their cages, for instance, soon arrive at a preferred level and return the lights to that level if humans attempt to adjust it. The reactions of these testy mice represent, for White, expressions of a general motive for effectance that drives the behavior of all organisms. This need for mastery and autonomy is satisfied not only by actual control over the environment, but also by circumstances that produce illusions of such control.

The largest share of the theory and research on the sense of control has focused on the analysis of individual differences in perceived control, although there has also been interest in situational variations (see Baumeister, 1998, in this *Handbook*; Pittman, 1998, in this *Handbook*). The number of theoretical constructs proposed in the last 30 years either to represent perceived control generally or to express various facets of the idea is truly staggering. An incomplete list would include locus of control (Rotter, 1966; Weiner, 1974), self-efficacy (Bandura, 1977), and intrinsic motivation (Deci, 1975), to be sure, and then embrace constructs including personal causation (DeCharms, 1968), perceived control (Glass & Singer, 1972), attributional style (Peterson, Maier, & Seligman, 1993), illusion of control (Langer, 1975), personal control (Folkman, 1984), optimism (Scheier & Carver, 1985), psychological reactance (Brehm, 1966), personal agency (Vallacher & Wegner, 1989), positive illusions (Taylor & Brown, 1988), and control motivation (Weary, Gleicher, & Marsh, 1993)—to name a few (see reviews by Haidt & Rodin, 1995; Skinner, 1995).

The indications in this voluminous literature that it is psychologically beneficial to perceive control are simply overwhelming. And indeed, this is an important message that has come to be useful in attempts to increase the effectiveness of therapies and interventions of many kinds (e.g., Baltes & Baltes, 1986; S. S. Brehm, 1976). It has come to the point, though, that further demonstrations of perceived control effects are becoming increasingly uninformative. Far too many renamings of the dimension have come and gone, and analyses of the limitations of this broad effect are themselves beginning to gather interest (Colvin & Block, 1994; Burger, 1989; Taylor & Brown, 1994; Thompson, Cheek, & Graham, 1988). Although it is useful to pursue the benefits of perceived control for those individuals to whom real control is by fate impossible, the analysis of perceived control must eventually be integrated with the study of processes of real control if significant scientific progress is to be made.

For our purposes, this literature serves as an important reminder that control must be understood not only as a psychological process but as a *feeling*, an experience one has of controlling or being in control. Control requires effort, and this effort as it is expended yields a continuous sense that one is doing something, not just allowing something to happen. Both the actual expenditure of cognitive effort, and the phenomenal experience of effortfulness, appear to be at a maximum during conscious control.

Summary of Control

This review of the nature of control in social psychology suggests that the concept has both a larger and a smaller meaning. Control in the larger sense is a multifarious psychological process that operates according to control theory. In this sense, "control" incorporates a wide array of the mechanisms and features that seem necessary in the psychological engine that runs a human being. Such control is not opposed to automatic processes and instead can be said to include them as an important special case. But control also has a more limited meaning, one that becomes particularly evident when we consider it in comparison to automaticity. The more limited definition of control includes key properties such as consciousness, and the "closed loop" ability to monitor our behavior so as to vary it flexibly in response to feedback. We turn now to focus

During the rest of the twentieth century, skill acquisition research (see J. R. Anderson, 1982; Newell & Rosenbloom, 1981; Shiffrin & Schneider, 1977; Smith, 1984, 1998, in this *Handbook*) proceeded to deal with the development of mental expertise or "procedural knowledge," and particularly with the ability of some cognitive processes to operate with a minimum of conscious attention. This is the form of automaticity that Bryan and Harter (1899) and Jastrow (1906) had discussed as mental habits, the delegation to the subconscious over time of routine conscious tasks. In line with Anderson's (1982) more recent notion of compilation of mental skills, Bryan and Harter (1899) held that expertise consists of the automatization of units successively higher in a hierarchy of habits—a buildup of ever larger units or "chunks" of knowledge that operate autonomously once activated (see also Hayes-Roth, 1977; Simon, 1974; Vallacher & Wegner, 1987). For present purposes, a critical guiding assumption of skill acquisition research has been that these processes were put into motion by an act of conscious will. That is, driving and typing and searching for a target in a rapidly changing display were described as becoming automatic after practice, but in all cases the individual knowingly and intentionally engaged in the activity.

Research on attentional information processing soon showed it to be relatively time-consuming in completing its assigned task, limited in scope at any given moment, and serial in nature (Miller, 1956; Sternberg, 1966). Because of these limitations, it became clear to attention researchers "that normal human behavior could not take place if all activity had to be governed by attentive processes operating in such a limited fashion" (Shiffrin, 1988, p. 740). There had to be a different, nonattentional, very fast form of processing operating as well.

This logical analysis led to research by Shiffrin and Schneider (1977) and others designed to search for and demonstrate the existence of this other, *automatic* form of information processing. In the Shiffrin and Schneider (1977) studies, participants were given considerable practice in searching for a target stimulus among an array of other, distracter stimuli. Whereas the time participants took to find a target stimulus in a rapidly changing display began as a function of how many distracters were presented along with the target (i.e., set-size), over many trials this set-size variable ceased to matter: participants were just as fast to find the target in a display of sixteen stimuli as in a display of four or nine. This kind of attentional search therefore had to be parallel in nature, able to scan many targets simultaneously, otherwise the time taken to find the target would be an increasing function of the number of stimuli to scan.

Preconscious Processing A second tradition of research bears on our contemporary understanding of automaticity. Unlike research on skill acquisition, however, this line of research did not assume that the individual's consent or even knowledge of the process was a necessary condition for the obtained effects. Instead, it focused on the initial perceptual analysis of the environment that occurred prior to conscious awareness and participation in the processing—that is, *preconscious* information processing. This research was inspired by Freudian thinking but was not guided much by psychoanalytic theory per se.

The "New Look" in perception (see reviews in Allport, 1955; Bruner, 1957; Dixon, 1981; Erdelyi, 1974) was the seminal line of this research, as it focused on motivational and personality determinants of conscious perceptual thresholds. (For early theoretical arguments in support of preconscious influences on perception, also see Helmholtz [1867/1968].) The notion of *perceptual defense*—in which thresholds are higher for emotionally threatening stimuli—was controversial at the time because it required perceptual analysis to occur prior to the percept reaching conscious awareness. This violated the then firmly held assumption that conscious perception was entirely determined by qualities of the stimulus (see Stevens, 1951) and so emotional and other experiential reactions to the stimulus had to be both in conscious awareness and post-perceptual. There was great resistance as a result to the idea of preconscious perceptual analysis, and so the New Look research findings were largely discredited and treated with skepticism (Erdelyi, 1974). The rehabilitation of the New Look ideas took place only after advances in cognitive theory and research had diminished the importance of consciousness in perceptual analysis (Neisser, 1967; Shiffrin, 1988).

A major reason for the reduced importance given to conscious, intentional processes in perceptual interpretation was a separate research thread on selective attention, which grew out of Broadbent's (1958) work. Broadbent's theory was that selective attention is driven by an early internal gating of incoming information, based on its physical features. Sources of information to which attention is not directed are simply not picked up. Quickly, however, it became apparent that some information did get through this attentional barrier, being processed despite the fact that conscious attention is directed elsewhere. Treisman (1960) found that narration presented to the unattended ear in a dichotic listening task sometimes drew attention if it was related to the meaning of the content presented to the attended ear (although this effect occurred relatively infrequently). This could only occur if the material presented to the unattended ear was analyzed for meaning at least to some extent.

Following Treisman's (1960) finding, there was considerable debate between so-called early-selection and late-selection theorists. Broadbent and Treisman were among those who believed there is only a limited amount of nonattentional analysis of informational input for meaning;

These processes also occurred quickly, within 200 or 300 milliseconds. (Because they were concerned with processes occurring at the time of the original perceptual encoding of the stimulus, the Posner-Snyder theory and research was in the tradition of the New Look and other studies of preconscious perceptual analysis.)

Conscious processes take longer to develop—at least 500 or 600 milliseconds—and require considerable attentional resources, but they are flexible and can be suited to meet strategic processing goals. As for the interaction of these two processes, Posner and Snyder (1975) held that if given enough time to develop, strategic conscious processes can override automatic ones if the responses suggested by the two are incompatible, but if there is insufficient time or attentional resources to support the conscious process the automatic one would prevail.

Empirical support for this model was quick to come. Neely (1977), using a lexical decision task, had participants indicate as quickly as possible whether each of a series of target stimuli was a word or nonword. Prior to the presentation of each target a prime word was presented. Target words were members of the category BODY (i.e., parts of the body such as *heart* or *leg*) or the category FURNITURE (e.g., *chair, table*). The prime stimulus was either the word BODY or the word FURNITURE. A key element of Neely's (1977) design was to vary the delay between prime and target presentation. With brief delays (e.g., 250 milliseconds), only automatic effects should be able to occur; thus, the prime BODY should facilitate (speed up) responses to names of parts of the body (and likewise for FURNITURE and names of pieces of furniture) because strong, automatic connections are assumed to exist between these target concepts and their higher-order category concept. Only with longer delays (e.g., 750 milliseconds) should strategic conscious expectations be able to influence responses.

In the critical experimental condition, participants had a conscious expectancy for the *opposite* of the semantically consistent prime-target combination. In other words, they expected the BODY prime to be followed by names of pieces of furniture and for FURNITURE to be followed by names of body parts. However, the automatic effect would remain the same as always, as it reflects long-term associations and cannot flexibly adapt to temporarily altered circumstances. In support of the Posner-Snyder model, Neely (1977) found that under these conditions, category-name primes continued to facilitate responses to members of that category under the short prime-target delay conditions—even though the usual pairing in the experiment was for the prime to be followed by members of the other category. And under the longer prime-target delay, category-name primes facilitated responses to members of the alternative category, despite the automatic activation of same-category members.

This research confirmed several important features of automatic processing and its interaction with conscious processing. First, automatic processes are a mapping of the long-term regularities of the environment and do not change or adapt to short-term fluctuations in those regularities. Conscious control processes, on the other hand, are flexible and can be tuned to map the local circumstances when they differ from the usual. Second, when automatic and conscious control processes suggest competing responses, the conscious process dominates the automatic. This would seem quite a functional arrangement in that it allows adaptation to those times when "what one knows is wrong." Indeed, for it to be the other way around and have the automatic process dominate would make the flexible conscious or strategic processing entirely superfluous. Implicit in this second point is that the interaction of the two modes of processing nonetheless produces a single response instead of an attempt to make both (or many, given the parallel nature of automatic processing). For the conscious process to "win out" over the automatic response in the critical opposed-responses condition of the Neely (1977) study, it must inhibit the automatic response.

This points to a third difference between automatic and conscious processes—the controlling or inhibitory nature of conscious processes and the inhibitionless nature of automaticity (see also Shallice, 1972). Although such inhibition does not come without a cost of attentional effort and thus time (resulting in longer response times, as in the Stroop color-word effect; see Logan, 1980), it nonetheless enables a single, nonhabitual response to the environment.

Fourth, and finally, automatic processes—at least during perceptual encoding—do not require the person's intention that they occur and in fact are not controllable; clearly in the Neely (1977) study the participants were trying to control the automatic response when it was known to be incorrect, as they did so when they had enough time to accrue the attentional resources to do so (i.e., in the long prime-target delay condition).

The Shiffrin-Schneider Research Whereas the Posner-Snyder theory and related research were in the tradition of preconscious automaticity research, Shiffrin and Schneider's (1977) research grew out of the skill acquisition tradition. Shiffrin and Schneider (1977) demonstrated the development of automatic attention responses to target stimuli over time, with such attentional skills depending on frequent and consistent mapping of a given target or set of targets to the detection goal. In other words, if a given stimulus (e.g., the letter "G") was the target to be detected on some trials (by pressing a button as quickly as possible after it was presented) within a display of items (the others being distracters), but was on other trials a distractor item (with some other letter as the target), automatic detection capabilities did not develop. When a given stimulus was

This means that automatic processes often seem very much like conscious control processes and function in many of the same circumstances. The process that determines whether we say "hello" to someone we pass on the street can vary in seemingly minor ways, and move dramatically as a result from a conscious control process to automatic or back the other way. Automatic and conscious control processes have many of the same kinds of behavioral consequences and may respond to many of the same kinds of environmental inputs. In essence, although they may differ at a fundamental level, they both fall broadly under the rubric of psychological control processes. With this in mind, we can now consider the relationships that exist between control and automatic processes.

Control and Automaticity Together: Their Basic Relations

The complicated interplay of control and automatic processes in everyday life can be parsed into a relatively small set of basic relations. In what follows, we enumerate these with a view toward capturing what we see to be the fundamental ways in which these processes combine and interact in psychological functioning.

1. Multitasking: Control and Automatic Processes Can Run in Parallel The flow of thought and behavior pieces together an array of processes. At any one time, one process is probably consciously controlled (Shallice, 1972). A very limited number of others can be consciously controlled if they can claim enough attention (Neisser, 1976). By and large, however, because of their lower attentional requirements, automatic processes can run in parallel, not only with control processes but also with each other (Bargh, 1997). It is not clear what limits there might be to the number of parallel automatic processes (Shiffrin, 1988).

In a social interaction, for example, we may well respond rather automatically or "mindlessly" (Langer, 1978, 1989) to the conversation of one person that has long since ceased to interest us, but at the same time effortfully plan a witty remark in order to impress another person standing nearby. Are we interacting automatically here, or consciously? If we think of the entire interaction as a single process no clear answer can be given to that question, but if we analyze the interaction into its components, then the matter is much clearer. Both automatic and control processes are operating; even when we are "on automatic" about one aspect of our environment, the conscious attentional capacity that is freed up is able to be deployed in the pursuit of other important goals we have. Ultimately, both kinds of processes are responsible for the successful negotiation of the social world.

2. Delegation: A Control Process Can Launch an Automatic Process In social psychology many studies have shown that dispositional attribution, social judgment, and stereotyping processes are so efficient as to be capable of operating in the absence of conscious attention. Yet in all these studies, participants were explicitly instructed to engage in social perception or judgment tasks (see Bargh, 1989, 1994, for reviews). Thus the processing was under intentional control, while at the same time being very efficient and autonomous. These are examples of automatic processes that are instigated by a control process.

3. Orienting: An Automatic Process Can Launch a Control Process Orienting happens when a distinctive, salient event automatically attracts our attention and control processing. Something out of the ordinary happens, a friend does something totally out of character, or we see something really unusual—and control processes are instigated in order to understand and fit this new piece of information into what we already think we know. The literature discussed in this chapter on attention effects documents this case of orienting, when control processes are automatically triggered by environmental events or stimuli.

4. Intrusion: An Automatic Process Can Override a Control Process Automatic processes have been held suspect as the causes of errors that get in the way of consciously controlled behavior for many years, certainly since Freud (but see Bargh, 1997; Bargh & Barndollar, 1996). Research on ironic processes of mental control (Wegner, 1994) illustrates a variety of cases in which counterintentional automatic processes are produced that inhibit conscious control, not just randomly but as a direct result of their inherence in conscious control. When we try to suppress a thought while we are under mental load and find it coming back more often, we suffer from an automatic process that intrudes upon and inhibits conscious control.

5. Regulation: A Control Process Can Override an Automatic Process When control processes have access to enough attentional capacity, they can inhibit automatic processes (Bargh, 1989). As Devine (1989) has pointed out, for example, stereotyping consists of the automatic activation of the stereotypic representation of the social group, and the use of the information stored within that representation in making judgments about an individual. Her research showed the first, activation component process to be uncontrollable given stimuli related to the stereotyped group (African Americans) but the second, application component process to be controllable for individuals motivated to engage in that act of control. Control processes are commonly marshaled in service of just such inhibition (see also Fiske, 1989).

classical conditioning: the association of the novel attitude object with another object or event that already has a positive or negative valence. The original studies that attempted to demonstrate classical conditioning of attitudes (e.g., Staats & Staats, 1958) were open to alternative interpretations, the most problematic being demand effects (see review in Eagly & Chaiken, 1993, pp. 399–412). However, a study by Krosnick, Betz, Jussim, Lynn, and Stephens (1992) used subliminal presentation of the unconditioned stimulus (UCS)—faces with either positive or negative emotional expressions—in order to eliminate such objections. Novel attitude object stimuli were paired with subliminal emotional facial expressions, and subsequently expressed attitudes toward these novel objects were in line with the valence of the UCS (facial expressions) associated with them during the study phase of the experiment. A similar interpretation could be made of the finding by Niedenthal (1990) that subliminally presenting an emotional (human) face just before a target cartoon face affected whether the cartoon character was perceived as being sad or happy. Although Niedenthal (1990) interpreted the effect in terms of affective priming, in light of Krosnick et al.'s (1992) results, it could also be that the valence of the subliminal facial expression conditioned the participants' attitudes toward the cartoon characters.

A form of automatic attitude formation appears in the finding of Cacioppo, Priester, and Berntson (1993) that muscular feedback influences attitude formation. When an individual's arm was flexed (bent with hand near shoulder), he or she tended to form favorable attitudes toward novel stimuli; when the arm was extended straight out, the individual tended to form negative attitudes. Presumably, arm flexion is associated with approach motivations (see Lewin, 1935), in that the arm is in the position of pulling something in toward the body. Arm extension is associated with avoidance motivations, as the arm is pushing away from the body. Because people are motivated to approach those objects that they positively evaluate, and to avoid those they negatively evaluate, the muscular feedback associated with approach and avoidance reactions was apparently associated with the novel stimuli, producing another type of classical conditioning of attitudes. Again, this effect on attitude formation is preconsciously automatic (and a case of *multitasking*) because the participants in the experiment were not aware of any relation between their arm positions and their feelings about the novel attitude objects.

There appear to be immediate, automatic processes operating in belief formation as well as in attitude formation. In an analysis of the dynamics of belief formation, Gilbert (1991, 1993) contrasted the Cartesian model, in which an idea is first represented in the mind and then (consciously and deliberately) assessed for its truth value, with the argument by Spinoza that ideas are by default (i.e., automatically) accepted as true—that is, they are believed—and only then tested for falsity (via a conscious and deliberate process). In terms of the various relations between automatic and control processes, Descartes' position on belief formation is clearly one of control *regulation* of the automatic belief representation, whereas that of Spinoza is one of *multitasking* as automatic belief happens independently of concurrent control processing.

As with Gilbert's (1989; Gilbert & Malone, 1995) related work on default attribution processes, the importance of positing an initial automatic belief stage is that if the second, conscious stage of checking the initial belief for veracity is prevented for some reason—a common one being a momentary lack of attentional resources to support the conscious process—then the idea will be accepted and believed when it otherwise might not have been.

Gilbert, Tafarodi, and Malone (1993) tested the Spinozan against the Cartesian model of belief formation by having participants allegedly learn a new language. They saw statements of the form "An X is a Y" with either the word true or the word false coming on the screen after each statement. On some trials, the task was interrupted prior to the appearance of true or false and participants instead were confronted with a reaction time task. The effect of this manipulation was to prevent the second stage of truth assessment. If ideas were merely represented initially without being automatically accepted as true, then statements presented on these interruption trials should be no more likely to be accepted as true as other statements. However, in line with Spinoza's claims, participants were more likely to misidentify these interruption-trial statements as true when they were in fact false than false items on noninterruption trials. And also consistent with Spinoza's model, the interruption manipulation had no effect on the subsequent correct identification of true statements. In another experiment, Gilbert et al. (1993) showed the real-life importance of automatic initial acceptance of information. In a jury trial simulation, false information about a defendant was nevertheless believed by participants and affected their sentencing decisions if participants' attentional resources were diverted by a secondary task. Without the conscious processing resources to correct or check the veracity of incoming information, then, we tend by default to believe it to be true.

Models of Attitude Change The road to attitude change may sometimes lead through a reasoned, effortful consideration of message content and other features of the communication—or it may happen automatically and without much conscious thought at all. Models of persuasion taking into account such dual processes bear some similarity to the distinction between control and automatic processes but also differ from it in important ways.

One such model is Chaiken's (1980) heuristic-systematic model (HSM), a distinction between *heuristic* and *sys-*

to be shown that the mere presence of the attitude object was all that was needed to activate the associated attitude.

Several tests of this hypothesis were provided by Fazio, Sanbonmatsu, Powell, and Kardes (1986). In a conceptual replication of the Neely (1977) experiment, the names of attitude objects were presented as prime words, followed by a target adjective to which participants responded. In all three experiments, a trial consisted of one attitude object name appearing as a prime, and then an adjective as a target, and participants were to press a button (either one labeled "good" or one labeled "bad") as quickly as they could to report whether the adjective was positive or negative in meaning. On the critical trials, following Neely's (1977) procedure, the delay between prime and target was too brief (ca. 250 milliseconds) for any conscious, strategic processing of the attitude object prime. Thus, if the name of the attitude object automatically activated its associated attitude in memory—with *attitude* defined by Fazio et al. (1986) as the evaluation of the object as good or bad—then participants should be predisposed to make that response (i.e., "good" or "bad") to the target adjective that followed. This would facilitate or speed up responses to adjectives of the same valence as the attitude object prime (i.e., good-good or bad-bad trials), and also cause responses to adjectives of the opposite valence to be slowed down (i.e., good-bad or bad-good trials) because of the need to inhibit the automatically activated incorrect response (see Logan, 1980).

Fazio et al. (1986) predicted such an automatic activation effect only for the participant's strongest attitudes, not for all attitudes. In line with the *automatization* relation between control and automatic processes, Fazio et al. (1986) held that attitudes become automatic through frequent and consistent controlled evaluation of the object. The strength of an attitude was defined operationally in terms of how quickly participants evaluated each of the attitude object stimuli as quickly as they could after its name was presented on the computer screen. The attitude objects corresponding to the four fastest "good" and "bad" responses, and to the four slowest "good" and "bad" responses, were selected to serve as the attitude object primes for the experimental phase of the study.

Results confirmed that the automaticity effect occurred for the participants' strongest but not weakest attitudes; in two experiments, only the names of the participants' "strong" attitude objects facilitated responding to adjective targets of the same valence, compared to when the targets were of the opposite valence. Given the brief time between prime and target (stimulus onset asynchrony, or SOA) on those trials, too short for a conscious expectancy to develop regarding the valence nature of the target word, such an effect could only occur if the strongly held attitudes had become activated automatically. Under conditions in which the SOA was longer (1000 milliseconds), control regulation of the automatic process did occur.

Subsequent research by Bargh, Chaiken, and their colleagues (Bargh, Chaiken, Govender, & Pratto, 1992; Bargh, Chaiken, Raymond, & Hymes, 1996; Chaiken & Bargh, 1993) centered on two issues. First, given that the effect occurred for the strongest but not the weakest of the participants' attitudes, what about the great majority of the participants' attitudes across the middle of the strength distribution? Was automatic attitude activation a rare or a common event? Second, was the effect truly automatic in that it would occur if—unlike in the original paradigm—participants were not explicitly instructed to evaluate the target words and had not just given their evaluations of the prime words? Did attitudes spring to mind automatically in real world situations, in which one has not recently thought about one's likes and dislikes?

The answer to the first question turned out to be related to the answer to the second question. When these problematic aspects of the Fazio et al. (1986) procedure were removed—when a two-day delay was interposed between the attitude assessment phase and the automaticity task, for instance, and when participants pronounced instead of explicitly evaluated the target stimuli—the effect was obtained for all attitude objects studied, and with no moderation by attitude strength (Bargh et al., 1996; Chaiken and Bargh, 1993). That is, when intentional, control evaluative processing aspects of the paradigm were removed in order to test for their contributing role in producing the effect, not only did the effect continue to occur (strongly demonstrating its automaticity), but it occurred more generally, across a wide range of attitude strengths, and was not moderated by differences in strength.

As it turns out, Kihlstrom (1987) had presaged this exact pattern of results a decade ago. Specifically, he argued that deliberate, control processing of a given stimulus could restrict or interfere with implicit and nonconscious affective reactions to that stimulus. It is important to note that over the same ten-year period, research programs in several other domains have produced the same conclusion. In a meta-analytic review of the mere exposure effect, Bornstein (1989) concluded that subliminal presentations of the novel stimuli produced stronger effects than did supraliminal presentations. Research on the "affective primacy" hypothesis has experimentally demonstrated that subliminal presentation of affect-laden stimuli results in stronger and more pervasive affective priming effects than supraliminal presentation of the same primes (Murphy, Monahan, & Zajonc, 1995; Murphy & Zajonc, 1993). And there are suggestions in the ongoing research on automatic stereotype activation (see below) that passive processing of stereotype-relevant features results in a more pervasive stereotype activation effect than do experimental conditions involving more active, control processing of the stereotypic features (see Bargh, Chen, & Burrows, 1996; Devine, 1989; Fazio, Jackson, Dunton, & Williams, 1995).

It appears, then, that the automatic activation of evalua-

(i.e., the *orienting* relation), at least if we have engaged in that goal often enough (such as walking down a street safely). When we are driving a car, for example, the red light or stop sign automatically grabs our attention and we respond accordingly, our foot moving toward the brake pedal without our need to intentionally decide to do so. But if we are just walking down the street, or looking out our office window at it, the red light or stop sign has no such effect (see Bargh, 1992b). The automatic attention response is dependent on which intentional control process is currently operating.

Therefore, as Jones and Thibaut (1958) first noted, the information that is picked up in a social interaction is heavily dependent on the person's current conscious purpose, or operating control processes (see Bargh, 1990; Gollwitzer & Moskowitz, 1996; Read & Miller, 1989; Wyer & Srull, 1989, for reviews). It is very much as if the conscious operating goal *delegates* to automatic processes the job of detecting and alerting the system to the presence of goal-relevant information. These goals are not only the one most frequently studied in social cognition experiments, however—the goal of impression formation. Often if not usually one has other important goals to pursue during the interaction. One's pickup of information when interacting with people is largely determined by their utility for achieving that goal (Wicklund & Steins, 1996) rather than by their personal characteristics. If an individual is trying to ingratiate or impress another person, for example, information concerning whether that person is reacting favorably or not is gobbled up voraciously, whereas one cares much less about such evaluative feedback if the other is a subordinate to whom one is giving instructions (see Fiske, 1993; Kipnis, 1976).

"Most Favored Information" Status: Privileged Access to the Judgment Process In addition to information relevant to our current goals, there are forms that seem to gain access to our minds independently of these goals—and thus serve as a chronic and consistent source of influence on our judgments. There are four such privileged types of information that we should note: information related to the *self;* information that is *frequently experienced;* information about *negatively valued* social behavior; and *social category* information.

Self-relevant information chronically attracts our attention and intrudes on our ongoing control processing, the most famous example being our own name—a phenomenon known as the "cocktail party effect" (Cherry, 1953). We may have no idea what a cluster of people at a party are talking about, engaged as we are in our own conversation with others, but if someone in that other group says our name, suddenly our ears zero in on their conversation. It is as if we have sensitive antennae that pick up self-relevant information even when we are not intending to pick it up; such information is often able to break through the attentional barrier set up by our current goals and purposes.

Other research has shown that we are similarly sensitive to any information directly relevant to the self, not just to our name. In an important early study, Postman, Bruner, and McGinnies (1948) found that people had lower recognition thresholds to words related to their idiosyncratically important values (e.g., religiosity, justice); they saw and reported these words at briefer presentation times than words related to values not as personally important to them.

We are also generally more sensitive to information related to our self-concepts. In one study (Bargh, 1982), participants engaged in a dichotic listening task in which they shadowed or repeated aloud each of a series of words presented to one ear, and tried to ignore words presented concurrently to the opposite ear. On one block of trials, the words presented to the unattended ear were related to the trait of independence. For participants for whom the trait was an important part of their self-concept (see Markus, 1977), the presence of those independence-related words distracted attentional resources from the controlled shadowing task (as measured by a probe reaction time task), indicating that they were detected and processed automatically, outside of awareness (though the control task was able to regulate the automatic process from usurping awareness). In another study that made use of the dichotic listening task, Nielsen and Sarason (1981) showed that participants made more shadowing errors (i.e., were distracted to a greater extent) when words related to their anxieties (i.e., dating, school) were presented to the unattended channel (see also Geller & Shaver, 1976; Hull & Levy, 1979).

Bargh and Tota (1988) used the Markus (1977) adjective endorsement task to assess the efficiency with which the self-concept becomes active. In one condition of the experiment, participants were to judge the self-descriptiveness of each of a series of positive and negative trait adjectives, by saying yes or no as quickly as they could. Half of the participants performed this task by itself, but the remaining participants had to hold a six-digit number (different each trial) in memory while making each judgment, so that the degree to which the two types of judgments required attentional resources could be assessed. To the extent the judgment could be made automatically, response latencies should be unaffected by the concurrent attentional load. Results showed that participants think about themselves automatically in positive trait terms, such that they were just as fast to make those judgments with a concurrent memory task as without it. With negative trait judgments, however, the attentional load manipulation slowed responses, showing that these traits did not become active automatically.

Other research has shown that the effect of attentional load is to make the self-concept more favorable (Paulhus, Graf, & Van Selst, 1989). Thus, if one can use what comes

an impression of each of several target persons whose behavior was conveyed by means of photographs. Participants were allowed to advance at their own pace the slide projector displaying the photographs, and Fiske (1980) surreptitiously measured how long the participant looked at each one as an indication of relative attention. In general, negative behaviors were looked at longer and subsequently were given more weight in the participant's impressions of the targets, than were positive behaviors.

In a related finding, Pratto and John (1991) had participants name the colors in which a variety of personality trait terms were presented (i.e., the Stroop task) and obtained longer naming latencies for undesirable than desirable trait terms. This finding confirms that the greater attention given to the negative social behaviors, as in Fiske's (1980) experiment, is due to an automatic attention response, because participants in the Pratto and John (1991) study could not control the attention-demanding nature of the negative personality information. Pratto (1994) reported further studies demonstrating the strong tendency to orient toward negative social information, in which the greater attention allocation occurred even after participants were told about the effect and encouraged to overcome it if they could.

Features that signal a person's *social category membership* represent a fourth kind of "most favored information" that has privileged access to the mind. Easily discriminable *personal features*—especially the "big three" of gender, race, and age—tend to activate preconsciously the categories or stereotypes associated with them (e.g., Bargh, 1994; Brewer, 1988; Fiske & Neuberg, 1990; Macrae, Stangor, & Milne, 1994), with these stereotypes consisting in part of collections of personality trait constructs (Hamilton & Sherman, 1994; Stangor & Lange, 1994). These features tend to be easily encoded and detectable, such as skin color, and age-related and gender-related characteristics. They are not limited to visual features, however; regional (e.g., Southern United States) and national (e.g., German, Chinese) stereotypes can be triggered by speech accents and dialects as well (especially over the telephone when no visual features are present). Also, the mere presence of features associated with a particular role in society (e.g., a waiter's or police officer's uniform) can also trigger stereotypes associated with that role (see Cohen & Ebbesen, 1979; Taylor, 1981).

To a certain extent, categorizing and pigeonholing people quickly and efficiently in terms of their group membership is adaptive and defensible in that we cannot possibly attend and individuate everyone we encounter. Macrae, Milne, and Bodenhausen (1993; see also Macrae, Bodenhausen, et al., 1994) have found that stereotypes do allow for more efficient processing of information about people, in that less attentional capacity is needed and can thus be devoted to other, goal-relevant tasks. Dijksterhuis and van Knippenberg (1996a) provide evidence suggesting that stereotype activation also inhibits stereotype-inconsistent information from gaining access to control processes. Thinking accurately and completely about anything—including people and attitude issues—takes effort, and unless an individual is especially motivated to engage in this effort, control over the default automatic process is usually not taken (Devine, 1989; Fiske & Neuberg, 1990). And, if the person is not aware that a stereotype has been activated and is influencing his or her judgment, no control is possible anyway (Bargh, 1989; Strack & Hannover, 1996).

Is Stereotyping Inevitable? The automaticity of the pickup of stereotype-relevant information makes one wonder whether stereotyping is indeed obligatory in social judgment. This remains, however, an open question. The evidence to date suggests that automatic stereotype activation depends on the strength of the association between the representation of the group (including distinguishing group features) and the representation of the group stereotype in memory. While for many stereotypes this connection may be so frequently used by most people that it becomes automatic for the average person, for other stereotypes that are less implicitly assumed by members of the culture, this connection may be more tenuous.

Devine (1989) has found that white Americans' stereotype of African Americans becomes active when verbal stimuli related to that stereotype are presented subliminally; thus stereotypes can become activated without the individual being aware of it and consequently, unintentionally, given the presence of group features in the environment. Pratto and Bargh (1991) found that gender stereotypes become active to influence judgments about a target person even under information overload conditions; that is, efficiently (see also Macrae et al., 1993). But Gilbert and Hixon (1991) did not find an influence of the mere presence of an Asian-American in a videotape on stereotypic completions of word fragments (e.g., S_Y as SHY instead of SPY) when participants' attentional capacity was loaded by a secondary task (whereas the stereotypic influence did occur in the nonoverload condition). It appears, therefore, that stereotypes may vary in their ease or automaticity of activation. Those that are activated more consistently upon the presence of a member of the stereotyped group will be more likely subsequently to become activated unintentionally and efficiently.

One might expect this connection between representation of a group and its stereotypic trait concepts to vary in strength as a function of the prejudice level of the individual. That is, the more prejudiced a person, the more likely he or she activates those stereotypic trait concepts when encountering a member of that group. Devine (1989), however, found that the probability of automatic activation of the African-American stereotype did not fluctuate as a function of scores on the Modern Racism Scale (McCona-

automatic process that serves the same purpose as the control process. Rather, the production of such ironic inferences appears to occur as a result of the creation of automatic monitoring processes in the service of conscious control—one which serves a purpose opposite the control process (Wegner, 1994). Part of the mind looks automatically for the stereotypic thought the conscious mind is trying to control.

In their studies of the instructed suppression of a stereotype, Macrae, Bodenhausen, Milne, and Jetten (1994) have found that instructed control of prejudice can be problematic in just this way. These researchers asked participants to suppress stereotype thoughts in imagining the life of a target person belonging to a stereotyped group (a "skinhead"), and then later gave these participants the opportunity to write their impressions of another person of this group. As compared to the impressions of participants who did not first suppress stereotyping, these participants formed more stereotypical impressions of the second target. In another study in this series, Macrae, Bodenhausen et al. (1994) examined the effects of this manipulation on participants' choices of how close to sit to a target just after having controlled their stereotypes of the target in an earlier impression-formation session. As compared to participants who were not instructed to suppress, these participants indeed had created less stereotypical imaginings about the target. However, also as compared to these uninstructed participants, the stereotype suppressors subsequently chose to sit at a greater distance from the target.

According to the theory of ironic processes of mental control (Wegner, 1994), to suppress a prejudiced state of mind is to introduce operating and monitoring processes and their inevitable potential for the production of ironic thoughts and actions. Macrae, Bodenhausen et al. (1994) provided evidence for this in their third study. They examined the effect of stereotype suppression on participants' lexical decision latencies. Participants suppressing the stereotype of a skinhead indeed wrote less stereotypical impressions of him, but at the same time were faster in making correct decisions about stereotype-related words. So, although they were successful in controlling their overall impressions, they appeared to be influenced by an ironic monitoring process that enhanced the automatic activation of stereotype inferences.

A similar eventuality has been tested in research by Wegner, Erber, Bowman, and Shelton (1996) on the mental control of sexism. Participants for one study were given the task of completing sentences that prompted sexist responses (e.g., "Women who go out with lots of men are ____," either under time pressure (mental load) or without such pressure. Some participants were instructed not to be sexist in their completions, whereas others were given no particular instruction. Ratings were made by observers of the degree of sexism in each sentence completion. It was found that without the imposition of time pressure, participants indeed made fewer sexist responses when they were trying not to be sexist. However, with time pressure imposed, participants made more sexist responses when they were trying not to be sexist than when they were not attempting any mental control at all. The desire to control sexist responding, under the conditions of diminished cognitive resources produced by time pressure, created the ironic tendency instead to blurt out sexist remarks.

This ironic tendency was observed in a second experiment that called for participants to respond rapidly to sexist and nonsexist statements by judging them true or false (Wegner, Erber et al., 1996). When participants were specifically instructed not to be sexist, they made unwanted judgments (calling a sexist statement true or an egalitarian statement false) more quickly than desired judgments (calling sexist statements false or egalitarian statements true). Without the instruction not to be sexist, these judgments were all made with similar latencies. In both of these experiments, the ironic effect was similar for both males and females—and was no more pronounced for people of either sex who were high in dispositional sexism. This suggests that extreme underlying attitudes may not increase the likelihood of ironic monitoring errors

Behavior Categorization Effects We have been concerned thus far with automaticity and control primarily in the pickup of social information. A next step in social judgment is connecting social information to more abstract conceptions of personality. Now as it happens, social behaviors, once perceived, tend automatically to activate personality trait constructs to which they unambiguously correspond (Carlston & Skowronski, 1994; Moskowitz & Roman, 1992; Srull & Wyer, 1979; Winter & Uleman, 1984).

In initially proposing this idea, Smith and Miller (1979) suggested that such trait categorization is a pervasive response we make to any and all behaviors, even when we aren't trying to form impressions of the actor. To the extent the features of the behavior match closely with the features of the trait representation—that is, if the behavior is unambiguous and clearly diagnostic of that trait—the trait category is activated as part of perceiving the behavior. But if the behavior is vague or ambiguous, open to more than one interpretation, then which category is used to interpret it becomes a matter of the relative accessibilities—or ease of activation—of the various relevant categories in memory (Bruner, 1957; Higgins, Rholes, & Jones, 1977). It is important, conceptually, to separate this categorization of the behavior in trait terms from any subsequent attributional processing in search of the cause of the behavior (e.g., Trope, 1986).

accessibility to the clarity and unambiguity of the information itself. This is both good news and bad news. Taking the bad news first, priming and other accessibility influences operate as nonconscious biases, and if a person is not aware of a source of bias, he or she cannot adjust or control for it (Bargh, 1989). The good news is that the "bias" may be less of an error than a reflection of the individual's frequent or recent experience; in a way, then, accessibility influences add in "priors" or base-rates of behavioral probabilities into the interpretation equation (see Higgins & Bargh, 1987; also Anderson, 1990).

Assumed in this discussion is that priming results in the assimilation of the ambiguous behavioral information into the accessible category; that is, the behavior is seen as an instance of that trait. This is the passive or automatic effect of priming. However, if the person is aware of possibly having been influenced by the priming events, *regulation* occurs and control is exerted over that influence. Herr, Sherman, and Fazio (1984) showed that when extreme examples of a trait-type are used as primes (e.g., Dracula as a prime of the trait of hostility), the outcome is contrast away from, rather than assimilation into, the category. The observation "Donald demands his money back at a store" pales somewhat as an instance of hostility compared to the practice of sucking the blood out of countless victims. One possible reason for the contrast effect (instead of assimilation) is that extreme primes are especially memorable, and so are likely to still be in consciousness later on when judging the ambiguous target behaviors. This is consistent with the principle that for control over a social judgment to be exerted, the individual must be aware of the (potential) influence.

Additional support for this interpretation comes from several subsequent studies (Lombardi, Higgins, & Bargh, 1987; Newman & Uleman, 1990; see Strack & Hannover, 1996) in which awareness of the priming events at the time of the later impression formation task resulted in contrast effects, while a lack of residual awareness resulted in assimilation effects. Awareness was assessed by seeing if participants could still recall any of the earlier priming events. Another manipulation likely to increase the chances that the priming events will still be in consciousness later at the time of the impression task—a more effortful processing of the priming stimuli by participants (Martin, Seta, & Crelia, 1990)—also results in contrast instead of assimilation effects.

Intriguingly, there seems to be something automatic about this control process, because all that was required to produce contrast in the Lombardi et al. (1987) study was that the priming stimuli were still in consciousness enough to be recalled; participants were not aware of how they were being influenced by those priming stimuli, which had been presented (as is usual) as part of a separate, earlier experiment.

Control over a priming effect need not always result in contrast effects, however. Wegener and Petty (1995) have shown that it depends on that participant's theory of how he or she might have been influenced by the prime. If the theory is that the effect should be one of contrast, such as judging the desirability of Salt Lake City as a vacation destination after being primed with names such as Bermuda and San Francisco, then the control process results in assimilation, not contrast, to the primed categories.

Finally, it appears to be possible for control over priming effects to be exerted even before the primes have been presented. Thompson, Roman, Moskowitz, Chaiken, and Bargh (1994) informed some participants that they would have to justify and defend their judgments to others later on. This "accountability" manipulation (Tetlock, 1985) prevented subsequently presented priming stimuli from influencing impressions for these participants, while participants not made to feel accountable showed the usual assimilative priming effect. Apparently, motivations to be accurate can protect even against priming influences on judgments.

Are Social Judgments Made Automatically? Once social information is detected and comprehended—and has activated trait categories, stereotypes, and other stored information in memory—are there automatic ways in which these sources of information are subsequently used? Research on the automaticity of social judgments has shown, for the most part, that impressions and other judgments are not made unless the individual has both the *intention* and the *attention* (i.e., enough processing capacity) to make them (Bargh, 1989, 1990). Bargh and Thein (1985), for example, gave participants explicit instructions to form an impression of a target person, but those for whom attentional resources were in short supply (due to rapid presentation of the relevant information) were not able to do so while the target information was being presented.

What if the participant had the attention but not the intention? Chartrand and Bargh (1996) presented to participants the same information as in the Bargh and Thein (1985) study, giving them plenty of time to read and consider each behavior, but with no explicit instructions other than to read them in order to answer questions about them later. Participants in the control condition showed no signs of having formed an impression about the target person. (The impression-formation goal was primed subliminally for other participants in the experiment, and they *did* form an on-line impression of the target.) Thus, it appears that both the intention to form an impression and the attentional capacity to do so are necessary ingredients if judgments are to be made.

Research on the *spontaneous trait inference* effect (Lupfer, Clark, & Hutchison, 1990; Newman & Uleman, 1989; Winter & Uleman, 1984; Winter, Uleman, & Cun-

Automatic Activation of Judgment Standards There are other aspects of the judgment process besides informational input that can exert unintended, automatic influences. Judgments involve a comparison of the observed behavioral event to a comparison standard (e.g., Helson, 1964; Biernat, Manis, & Nelson, 1991), with the event being either assimilated to or contrasted against that standard. Higgins and Stangor (1988) found in a *change of standard* effect that if one keeps the informational input the same, but changes the judgment standard, the judgment is changed as well. This accounts for why it may seem to us that it snowed more when we were kids than now as adults, because back then it frequently came all the way up to our knees.

Because judgments involve a comparison of input to a standard, automatic activation of standards can exert an unseen influence on judgments just as can automatic informational input. Several studies have now demonstrated such effects. Baldwin, Carrell, and Lopez (1990; see also Baldwin & Holmes, 1987) subliminally primed participants with the faces of significant others in their lives and showed an effect of these primed standards on participants' self-evaluations. Strauman and Higgins (1987) presented participants with stimuli related to either their self-standard for how they ought to be or to their self-standard for who they ideally want to be. These stimuli automatically produced physiological reactions in line with the emotions associated with these standards (i.e., anxiety/higher arousal to the activated ought standard, dejection/lower arousal to the activated ideal standards), as predicted from the fact that participants' opinion of the actual self was significantly discrepant from these standards.

Summary In general, informational input to social judgment as well as behavioral response processes can be furnished either through automatic or control process means. The preconscious automatic processing of certain features of people and their behavior occurs, by definition, regardless of the current focus of control processing (i.e., *multitasking*). If there is no current control process operating to pick up information relevant to it, then subsequent social judgment processes will, by default, be based largely on automatically furnished sources of input (Bargh, 1989). Current purposes add into the mix the forms of information relevant to those purposes; for example, if one is motivated to form an accurate, fleshed-out impression of an individual, the control process will attend to and pick up individuating details about that person, so that the impression will not be based only on the automatically supplied input (largely stereotypic assumptions based on easily observable features; see Fiske & Neuberg, 1990).

There are a variety of internal representations that become activated automatically in the course of social life, such as attitudes, representations of social groups, anything to do with one's sense of self, and whatever is relevant to achieving one's current goals. Not only do these activated representations then play a major role in one's impressions and judgments about the situation, they also directly and nonconsciously affect one's behavior in it. All these automatic effects—from attitude activation to stereotype activation to behavior categorization—appear to be more pervasive and general when the environmental event is not currently the focus of control processing, and to vary in probability as a function of one's frequency of experience with the event when it is the current focus of deliberate processing.

Emotion Experience

In the traditional philosophy of emotions, the passions arise in us only to be overcome by reason. Emotional states happen to us automatically, in other words, and then we may try to stop them through the implementation of some control process (Clark & Isen, 1982; Gilligan & Bower, 1984; Öhman, 1993). So, for example, we automatically get angry when we are provoked by a bad driver and then we try to control this anger, ideally before we get out of the car and bite someone. As it happens, though, automatic starting and controlled stopping are not the only processes governing emotional experience. There are times when it is useful to think of controlled starting of emotions (as when our conscious thought processes help us to understand what emotion we should be feeling in an ambiguous situation), and there are also instances when automatic stopping becomes evident (as when we anticipate fear or sadness and immediately try not to think about it). In this section, we consider separately the cases of emotion-relevant processing suggested by the fourfold table of automaticity versus control and starting versus stopping.

Automatic Starting The automaticity of emotion onset seems almost definitional of the concept of emotion. Emotions typically interrupt our activities, reorienting us toward something we had not been considering (Simon, 1967). We may have the conscious goal of emptying the wastebasket, for example, and be interrupted by an emotional reaction when we see something disgusting at the bottom. Mandler (1984) points out, though, that emotional interruptions do not invoke irrelevant or bizarre concerns. Rather, they reorient us toward items that we may not have currently been considering in consciousness, but that are background concerns that always matter in some sense, and that probably should be considered consciously *at this time*. In this sense, the processes that produce emotions may be said to yield unconscious vigilance for items of potential significance to us.

The idea that emotion onset is automatic comes from a

gest that the operation of this monitoring process does function to instigate effective labeling of emotional states.

The notion that control processes are involved in emotion appraisal brings with it the implication that emotional situations and the emotions themselves may differ in their reliance on automatic versus control processes. Certain broad or important emotional meanings (in particular, the positive-negative dimension) might exert their influences on the person quite automatically, whereas other meanings might require significant cognitive effort and conscious reflection to appreciate (see Leventhal, 1979; Scherer, 1984; Zajonc, 1980). Many emotional states, then, might be "fine points" placed on our automatic responses, in the sense that they require the operation of conscious processes even for the emotion to be felt. The specific emotion one feels in a grocery store upon having someone push a cart over one's foot, for example, might begin automatically with some global negative feeling, and then resolve over time with a conscious review of the circumstances into a specific feeling of anger or annoyance.

Controlled Stopping The role of control processes in emotional experience is, as we mentioned previously, usually understood as an inhibitory one. The prototypical emotion control processes are, after all, the defense mechanisms, and their role in protecting the individual from unwanted negative emotions is widely celebrated in Freudian psychology. The operation of defense mechanisms has not been empirically verified in a satisfying way by psychoanalysis proper, but the reconceptualization of such processes in terms of emotion control has occurred in many quarters (e.g., Lazarus, 1966, 1975; Meichenbaum, 1977) and has produced a rush of research and discovery.

The basic theme in this research is that people often desire to avoid certain emotional experiences, and they therefore perform significant mental and behavioral work in the attempt to prevent or terminate them. Research has indicated, for instance, that people attempt (with variable success) to control sad moods (Clark & Isen, 1982; Morris & Reilly, 1987; Salovey, Hsee, & Mayer, 1993), depression or sorrow (Nolen-Hoeksema, 1993; Pennebaker, 1989; Tait & Silver, 1989; Wenzlaff, 1993), anxiety and worry (Roemer & Borkovec, 1993), pain (Cioffi, 1993), and anger (Tice & Baumeister, 1993). On occasion, even positive emotions are controlled when they become unwanted (Erber, Wegner, & Therriault, 1996; Parrott, 1993). These control processes include behavioral attempts to avoid situations that would evoke the emotions, as well as processes that are more specifically targeted at the suppression of mental contents and behavioral expressions associated with the emotion (cf. Schneider, 1993; Wegner, 1989).

Emotion control processes vary in their effectiveness for two key reasons: *strategy choice* and *control expertise* (Wegner, 1994). Like any form of mental control, emotion control depends on how it is done and how well it is done. Strategy choice is a key element of emotion control because many strategies can simply be faulty, not up to the job. The person who tries to overcome social anxiety by envisioning the awkwardness and weirdness that could happen in an upcoming social encounter, for example, is not likely to enjoy much control over this emotion. Strategies vary dramatically in their effectiveness for emotion control, as clinical research clearly documents (e.g., Klinger, 1993), and quite different strategies are needed, too, for the control of different emotions (Frijda, 1986). The most nettlesome problem in strategy choice, though, occurs because people do not seem naturally to appreciate the fact that simple suppression strategies usually backfire. There is now a considerable body of evidence to indicate that while thoughts themselves might subside for a time (e.g., Kelly & Kahn, 1994; Wegner & Gold, 1995), emotions are often intensified by our attempts to suppress thoughts about them (Foa & Kozak, 1986; Pennebaker, 1990; Rachman, 1980; Wegner et al., 1990; Wegner & Gold, 1995; Wegner et al., 1993). Strategies involving distraction or reinterpretation that differ from suppression only subtly may, nevertheless, be quite helpful (Nolen-Hoeksema, 1993; Wegner & Wenzlaff, 1996), and for this reason the complexities of strategy choice can be challenging indeed.

The second general factor in the effectiveness of emotion control is the individual's level of expertise in controlling the emotion. Often, this just comes down to practice. The depressed person has frequently pushed sadness from mind, for example, and so becomes somewhat adept at doing this under certain conditions (Wegner & Zanakos, 1994). So, while emotion control may be conscious and intentional, it can benefit from the kinds of automatization processes that occur with frequent use. Still, the automaticity of emotion control that is achieved by a depressed person who repeatedly tries not to entertain sad thoughts, or the anxious person who attempts recurrently to avoid thoughts of the anxiety-producing situation, is likely to be fragile. One typical emotion control strategy in depression, for example, is to focus constantly on the future in a fierce attempt to find a way out of the current situation; usually these repeated attempts fail and the individual is left with a chronic and negative set of beliefs about the future (Andersen, Spielman, & Bargh, 1992). Moreover, because attempts to control emotion frequently call for strategies that can instigate ironic processes, even practiced control processes can occasionally introduce ironic monitoring that reinstates the unwanted emotion intrusively and repeatedly. It may be only when emotion control processes become so skilled as to be deployed without conscious intent that they can quell emotion without inadvertently creating it.

This line of thinking suggests that a range of emotional

1990). And more generally, the muscles in the lower half of the face are more open to voluntary control than those in the upper half (Ekman & Friesen, 1975). It is interesting that the most "voluntary" parts of the face are also those involved in talking.

The differing neural pathways of voluntary and spontaneous facial expressions have been traced in detail. According to Rinn's (1984) comprehensive review, volitionally induced movements of the face arise in the cortical motor strip and course to the face through the pyramidal (cortical) tract. Impulses for spontaneous emotional facial expressions, in turn, arise from a phylogenetically older motor system known as the extrapyramidal motor system. Just as the cortex produces intelligent and flexible behavior in general, while subcortical processes yield heartbeats, sneezes, and yawns, it appears that the more flexible forms of facial expression arise cortically whereas the less flexible forms arise subcortically.

These differing pathways are particularly clear in the double dissociation of the voluntary and spontaneous facial expression systems found in clinical cases (Rinn, 1984). Some patients show "mimetic facial paralysis" in which the facial muscles can be moved voluntarily, but all spontaneous movement is lost. Other patients, in turn, show involuntary laughing and/or weeping (with only slight or no provocation), but with an inability to inhibit these responses voluntarily. In the case of facial expression, then, automaticity and control appear to be highly differentiated anatomically. Although it may not be the case that such distinct systems produce automatic versus controlled behavior of other kinds, the possibility of such partitioning may be worthy of further study.

Difficulty of Control Perhaps the most emphatic theme in the literature on expressive behavior is the difficulty of expressive control. The control of nonverbal behavior for self-presentational purposes often sets control processes against automatic processes, after all, and this *regulation* conflict is often won by automaticity—so to result in *intrusion*. Ekman and Friesen (1969) dubbed this phenomenon "nonverbal leakage," the occurrence of uncontrolled expressive behavior reflecting the person's genuine emotions or attitudes even in the face of attempts at the conscious control of social impressions. We all know what it is like to plan to be nice to someone we dislike, for example, only to encounter the person and have our intended smile twist into a demented grimace.

The central problem of the control of expressive behavior is that there seems to be so much to control. To create a positive impression on a potential employer in an hour-long interview, for example, one might potentially try to control one's words, of course, but also facial expressions, gestures, postures, leanings, sighs, and vocal intonations. This is not to mention the control of coughs, yawns, eye-rolling, sneezes, blushes, itches, hooting, and all the other little horrors of interview hell. The accumulated literature on nonverbal communication shows that the failure to control almost any of these little acts can yield an unwanted interpretation (e.g., DePaulo, 1992; Ekman, 1985), and the prospect of trying to control all of this, or even just some tiny part of it, seems not just daunting but preposterous. How does a person ever fool anyone in everyday life?

One avenue to successful control is *automatization*. The repeated practice of self-presentational strategies may result in fluid and well-integrated performances that can be deployed at will (DePaulo, 1902; Jones & Pittman, 1982; Paulhus, 1993). Expressive actions that were once deliberate can take on the appearance of genuineness when they flow so well that they no longer require conscious control. The added benefit of automatization is that individual expressive acts become linked together such that each one need not be thought about or controlled individually, and instead the entire sequence becomes performable as one piece. Vallacher and Wegner (1985, 1987) have suggested that this integration allows the person to control the action through higher-level action descriptions. So, for example, someone who is practiced in impressing others can simply intend to make a good impression, and so will not need to identify all the components of this act separately and control them one by one (e.g., smile, shake hands, don't sweat, don't undress immediately, etc.). People who have not practiced a particular self-presentation will not benefit by such an integrative understanding, however, and may even be hurt by trying to control the overall impression they make. Their performance could be hurt by the *disruption* of automaticity by conscious control.

Several studies have tested this *optimal identification level* hypothesis. Experimental participants in such studies are given a self-presentational task that is easy or difficult for them; they are told that a person they are meeting is easy or difficult to impress (Vallacher, Wegner, McMahan, Cotter, & Larsen, 1992), or that an audience is easy or difficult to convince (Vallacher, Wegner, & Somoza, 1989). Ritts and Patterson (1996) manipulated such difficulty by testing socially anxious people (for whom self-presentation was assumed to be more difficult) and comparing them to the nonanxious. Participants are then given either big self-presentation tasks to perform (e.g., make a good impression), or small ones (e.g., remember to smile). The finding of these studies is that people who identify their act of control at the level appropriate for the difficulty of the task perform most successfully and feel best about their performance. So, when the task is easy and likely to be automatic, one can jump right in and try to "make a good impression." When the task is difficult and likely to require control of many details, however, it is better to focus on some one detail (e.g., smiling) and attempt to control that alone.

of inquiry leads to an appreciation of the fact that control and automaticity are not only functions within the person, but are themselves perceived and studied by others in the conduct of social interaction.

CONCLUSION

Are people in control of their behavior in interactions with other people, the opinions they form of those others, their emotional reactions to events of the day? To what extent are people aware of the important determinants of their judgments, emotions, and actions, such as the powerful effects of authority and conformity and the presence of others? These are questions that the classic studies in social psychology were designed to address. These are issues that lie at the heart of most social psychological phenomena we study today.

We have seen in this chapter that the classic studies highlight automatic forms of human responding. Like much of social psychology, these studies take the conscious control of behavior as a kind of backdrop, a taken-for-granted assumption that makes interesting news when it is shown to be in error. And in fact, this is a theme that has served social psychology well and no doubt will continue to do so as we march forward in our continued quest to test science against any and all sacred cows. As it turns out, however, this chapter has also revealed that the larger portion of mental processes, including those involved in social life, are characterized by mixtures, transformations, and relations between control and automaticity. We have attempted to classify the forms of these interactions, such as when a behavior is governed by a control versus an automatic process, and what consequences this has for the phenomenon in question. The field is learning, as have we, that there is a fundamental interplay between these processes in social life. The mere observation that people don't have control here or don't have control there may no longer be sufficient to create "classic" social psychological investigation.

We have also emphasized that control and automaticity both can be described broadly in terms of control theories. That is, both kinds of processes operate in the service of the individual's goals and purposes. Automatic processes furnish a massive amount of information to control judgment and decision processes, more efficiently than would be possible with the slower and energy-demanding control processes alone. They transform complex patterns of stimulation and produce simplifying categorizations on which the slower and more limited control processes can then operate. Conscious control processes can then consider this input in a flexible and creative fashion should that serve the current purpose of the person—such as when it matters to be accurate and complete in one's opinion or decision. Moreover, the control process is capable of regulating the habitual or automatic process, again given the motivational impetus to exert this control.

We have also discovered, in our reviews of the classic and contemporary research in the field, that control and automatic processing are not merely interesting topics for cognitive psychologists to research. They parlay into very serious consequences for a person's phenomenal experience (such as to the degree to which one has control over one's emotions) and for one's relations with others (such as whether one's opinions and treatment of them is biased). They relate to the way in which attitudes form and change, to the way in which inner states are expressed to others, and by implication, to one's degree of free will in obeying authority, conforming to others, and reacting to people in need of help.

The distinction between control and automatic mental processes is of critical importance in social psychology precisely because it is the dividing line between what we purport to know about ourselves and what we do not. While the classic experiments in our field have shown us to be largely ignorant of the powerful effects that authority figures and majority opinion have on our behavior, at the same time they demonstrate our rather automatic ability to get along with others and function smoothly in a social organization, instead of as individuals acting in the service of our separate goals. Automatic processes constitute a broad undercurrent of life that keeps us connected to the world and behaving effectively on many planes in response to a welter of environmental and internal stimulation. Yet at the same time a thin thread of conscious control organizes these automatic processes and relates them to our goals and concerns. The moment-to-moment interaction between control and automatic processes is therefore the place where human goals and mental processes meet, and where the daily tasks of survival become infused with larger purposes and direction.

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