Agenda 2006

What have we been priming all these years?
On the development, mechanisms, and ecology of
nonconscious social behavior

JOHN A. BARGH*
Yale University, USA

Abstract

Priming or nonconscious activation of social knowledge structures has produced a plethora of rather amazing findings over the past 25 years: priming a single social concept such as aggressive can have multiple effects across a wide array of psychological systems, such as perception, motivation, behavior, and evaluation. But we may have reached childhood's end, so to speak, and need now to move on to research questions such as how these multiple effects of single primes occur (the generation problem); next, how these multiple simultaneous priming influences in the environment get distilled into nonconscious social action that has to happen serially, in real time (the reduction problem). It is suggested that models of complex conceptual structures (Lakoff & Johnson, 1980), language use in real-life conversational settings (Clark, 1996), and speech production (Dell, 1986) might hold the key for solving these two important 'second-generation' research problems. Copyright © 2006 John Wiley & Sons, Ltd.

Priming effects are ubiquitous in the social psychological literature these days. Nearly all forms of social representation can be primed, it seems—activated incidentally or unobtrusively in one context, to influence what comes next without the person's awareness of this influence. The original research focused on how the passive activation of trait categories in one situational context carried over to influence social judgments in subsequent, ostensibly unrelated contexts (Higgins, Rholes, & Jones, 1977; Srull & Wyer, 1979). For example, exposing experimental participants to words related to 'kindness' as part of a purported 'language study' caused them to subsequently view a target person as more kind, compared to the impressions formed of the target by a control group (Srull & Wyer, 1979). These priming effects were understood as single concepts or categories 'capturing'' the behavioral input in a competition with other, input-relevant concepts, with this categorization or *construal* of the input serving as the basis for subsequent, consciously-made judgments.

   The past 25 years have seen amazing empirical advances in our knowledge of the kinds of psychological concepts and processes that can be primed or put into motion nonconsciously. Social

*Correspondence to: J. A. Bargh, Department of Psychology, Yale University, 2 Hillhouse Avenue, New Haven, CT 06520, USA. E-mail: john.bargh@yale.edu

norms (Aarts & Dijksterhuis, 2003; Hertel & Kerr, 2001) to guide or channel behavior within the situation; *goals* to achieve high performance, to cooperate with an opponent, or to be fair minded and egalitarian (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Troetschel, 2001; Moskowitz, Gollwitzer, Wasel, & Schaal, 1999); *emotions* that shape our reactions and responses to subsequent, unrelated stimuli (Lerner, Small, & Loewenstein, 2004); and of course, knowledge structures such as *stereotypes* and trait constructs for use in the comprehension and encoding of often ambiguous social behavior (see Bargh, 1989; Higgins, 1996, for reviews). And *social behavior* itself can be produced nonconsciously in the same fashion (Bargh, Chen, & Burrows, 1996; Chartrand & Bargh, 1999; Dijksterhuis & van Knippenberg, 1998).

Still more recently, though, priming effects of even greater complexity have been discovered, such as in the nonconscious activation of deep cultural ideologies (Gardner, Gabriel, & Lee, 1999; Nisbett, 2003; Solomon, Greenberg, & Pyszczynski, 1991) and other interpersonal relations (e.g., power differentials; Smith & Trope, in press) that seem to alter even basic (i.e., non-social) information processing; as well as representations of close relationship partners with their demonstrated variety of self-regulatory effects (Fitzsimons & Bargh, 2003; Shah & Kruglanski, 2003). To some, however, these impressive empirical demonstrations have become an embarrassment of riches; our empirical knowledge has outstripped our ability to understand and conceptualize just what is going on here—what exactly is being primed, and how are these impressive effects produced? As one senior cognitive scientist said to me recently when I described this variety of published effects, 'it seems that you are running where we don't know yet how to walk.'

Clearly, priming research in social psychology has expanded well beyond the original effects on social perception and behavioral interpretation. In fact, it has been shown that the identical priming event can have a variety of qualitatively different effects: for example, priming a stereotype containing the trait of hostility can influence social-perceptual interpretation of ambiguous hostile behaviors (Devine, 1989, Study 2) but also the perceiver's own degree of hostility towards an experimenter (Bargh et al., 1996, Study 3); priming the trait of *achievement* will cause participants to outperform a control group on the focal task, but also influence how achievement-oriented they believe a fictitious target person to be (Bargh et al., 2001, Study 2). Moreover, these effects on different psychological systems do not seem to be mediated by the same underlying process, as they can be shown to be *dissociable* (i.e., differentially moderated by a third variable, such as the passage of time; see review in Bargh, 2005).

And so the 'first-generation' questions (see Zanna & Fazio, 1982) regarding priming effects have been answered, for the most part—we know that such effects are ubiquitous and pervasive across the major forms of psychological phenomena: appraisal and evaluation, motivation and goal pursuit, social perception and judgment, and social behavior. This research has been impressive in demonstrating the wide scope and reach of nonconsciously instigated influences on our daily lives. However, the very ubiquity, and relative ease of obtaining these effects, as well as the rather surprising and dramatic effects that 'mere' priming can have raises many important 'second-generation'' questions, for instance:

- Are they controllable? Under what circumstances? How do they interact with more conscious, intentional ongoing activities?
- How can the same prime have such qualitatively different effects?
- Given that they occur in parallel, how do they interact with one another?
- Which one 'wins,' if conflicting responses are activated?
- Which ones are more likely to occur in natural (complex, stimulus-rich) environments?
- Are there individual differences in priming effectiveness, as might be expected from cultural differences in sensitivity to contexts (e.g., Nisbett, 2003)?
- What is the ontogeny of these effects? How and why do they develop?

Of these issues, researchers are already well onto the track of the first, which has its roots in the standard 'dual process' (conscious or controlled, versus nonconscious or automatic) model that has proven of great utility across a wide variety of social psychological phenomena (see Chaiken & Trope, 1999). These models recognize that both types of information processing are important to self-regulation and how they work together is a centrally important topic for research. Much of this research has been performed in the crucible of stereotyping and prejudice research, such as Jeff Sherman and colleagues' Quad model (Conrey et al., 2005), the PDP model of Keith Payne and colleagues (Payne, Jacoby, & Lambert, 2005), and Brian Nosek's (2005) work on the interaction of explicit and implicit attitudes; Jon Haidt's (2001) dual process model of moral reasoning is an excellent example in another research domain.

In this article I will be describing an approach to the other outstanding issues listed above that has been developing in our lab over the past decade. In this research we have been concerned mainly with two of the more central second-generation questions: (1) how nonconscious goal pursuit is possible, as it involves behavior in an uncertain, somewhat unpredictable environment over extended periods of time (ca. 15–30 minutes), and (2) how is it possible that the same priming manipulation can have, simultaneously, such a variety of distinct psychological effects? The development of these ideas owes a great deal to my collaborators Ran Hassin and Ezequiel Morsella, but it has also been shaped by discussions with several others as well, inside as well as outside the field of social psychology (see Acknowledgements). Indeed, it is the attempt to fit our findings of nonconscious social behavior and goal pursuit into the bigger picture, to the related fields of political science, cognitive science, developmental psychology, psycholinguistics, and philosophy of mind that has probably had the strongest influence.

For in political science, the concept of free will on the part of the individual member of society is an indispensable concept; in her treatment of the Will, Hannah Arendt (1978) pointed out that without it, the field of political science could not even exist. In developmental psychology, much emphasis has been given recently to 'theory of mind,' or the child's ability to appreciate and understand the intentions of others. This research has shown how facile we become, at quite an early age, at doing so (e.g., Bloom, 2004; Tomasello, 1992); moreover, there appear to be brain structures that specifically support such 'mindreading' (see Frith & Wolpert, 2004). This of course raises the seeming paradox of how we could have evolved such sensitivity to the intentions and purposes of others if (as the nonconscious behavior and goal pursuit research might suggest) these do not actually exist, or at least play much of a role in our own behavior. Cognitive science has delineated the notion of 'working memory' as the seat of executive control, or conscious awareness (Smith & Jonides, 1998; Miyake et al., 2000)—yet the findings of nonconscious goal pursuit research show that these same structures must be involved to enable the goal to be pursued in complex interaction with the unfolding events in the environment (Bargh, 2005). Indeed, nonconscious goal pursuit has been shown to operate *flexibly* and adapt to and overcome obstacles and 'rule changes' as in the standard measure of executive functioning, the Wisconsin Card Sorting Task (Hassin, 2005). As awareness, working memory, and flexibility have long been associated (in dual process models) with conscious, not nonconscious processes, here is another paradox raised by the priming and automaticity research in social psychology.

All of this relates, of course, to another rather big question: that of the evolved function and purpose of consciousness, given that so many of its traditional hallmark qualities (goal pursuit, executive function, flexibility) have now been found to hold for nonconscious processes as well (see Bargh, 1997).

Finally—and it is this conundrum that has most occupied my own mind lately—how can nonconscious goal pursuit occur in the real social world where many of our goals can only be carried out in conjunction and collaboration with others? Others (especially when they are strangers to us) whose intents and purposes are not immediately transparent to us (and which they often attempt to keep

hidden from us[1]), and whose available knowledge, expertise, and perspectives have to be taken into account and matched in order for any joint, collaborative activity to be possible in the first place (Clark, 1996)? Does this suggest that the phenomena of nonconscious goal pursuit, for instance, can only occur for goals the person can attain by him or herself (as when working on a paper-and-pencil verbal test)? This seems to me to be the biggest challenge to the generality of our findings to the non-laboratory social world—and certainly a constraint on any complete theory of nonconscious social phenomena.

The present approach has been developed over the past years with these constraints very much in mind—the notion is that any complete model of nonconscious social phenomena must take these other emerging scientific and theoretical advances into account, and be reconciled to them. We certainly ignore them at our peril, because otherwise, in the bigger picture of the social and cognitive sciences, nonconscious social behavior and goal pursuit could be painted into a corner, seen as an interesting anomaly much like hypnosis or other psychological parlor tricks (see Wegner, 2002). As it turns out, however, paths of reconciliation do seem to exist.

One such path is to turn from the standard cognitive-science approach to language use and concept development in terms of the structure or products of language *per se* (i.e., sentences, words, and speech sounds (language *structure*)—what Clark (1996, p. 55) termed the *product* tradition, exemplified by the work of Chomsky—to at least an active consideration of the *action* tradition, in which the focus is instead on what people *do* with language (as in the work of Vygotsky, Grice, and Goffman). In the product tradition, concepts are studied for what they contain, how they define the external objects, events, and qualities they stand for. One might call this the *intellectual* aspect of concepts. By contrast, the action tradition has been concerned with the functions and purposes of language, how people use it to get things done in their daily lives. It focuses instead on the *experiential* aspect of concepts.

This change has been very beneficial to my own understanding of nonconscious social-action phenomena for two reasons. First, when I looked into the traditional cognitive-science literature on concepts in order to see how it might illuminate the nature of concepts that can be primed to produce the various behavioral and motivational effects described above, I found no help at all. In Greg Murphy's (2002) otherwise masterful, and certainly well-named 'Big Book of Concepts,' for example, there is no mention of the development or nature of behavioral or action concepts—the term does not even appear in the index. (As Lakoff & Johnson (1980/2003, p. 269) noted recently, 'cognitive psychology is dominated by the old idea that concepts are all literal and disembodied.') Concepts, in this research tradition, are not for *doing*, they are for *knowing*. Herbert Clark's 'Using Language' (1996)—and its forerunner, the groundbreaking work by Lakoff and Johnson (1980) on metaphors as not just words, but entire conceptual structures that fundamentally govern how we live—tell a different story. It is hoped that by considering and perhaps even adopting the latter approach to concepts and concept development, we embark on the road to resolving the seeming paradoxes created by the abundance of social priming and automaticity effects.

THE POWER OF CONCEPTS

Priming research has its roots in Hebb's (1949) seminal work on internal mental representations, which he termed *cell assemblies*. As Merlin Donald (1991, p. 361) has reminded us, this theoretical notion was a major break with the dominant behaviorist viewpoint at the time, for it granted the mind some

---

[1]Currently, poker is all the rage in the United States, at least on the television sports channels. Why a card game was considered 'sports' and received so much air time puzzled many of us sports 'purists', myself included, until I heard another sports announcer explain that it is part of the essence of sports to mask or camouflage one's true intentions, to engage in deception and misdirection so that the opponent does not know what you are going to do. Poker, as it involves no real physical performance, can thus be seen as sports stripped down to its intellectual, competitive, mindreading essence (see also Bloom, 2004).

independence from purely environmental determination of behavior. These mental representations, Hebb argued, could be activated by internal (i.e., endogenous, or 'top-down') as well as external ('bottom-up') sources of stimulation. The *Zeitgeist* had to have been raging at the time, for Hebb's model of mental structure gave theoretical support to another emerging and controversial idea—the 'New Look' in social perception (e.g., Bruner & Postman, 1949), in which internal psychological states such as motivations and values were argued to influence one's perception of the external world.

Another important insight of Hebb's model was that these internal representations could remain 'electrically active'' for a short time *independent of external stimulation*. This was the notion of 'phase sequences' or 'self-propagating loops of neural activity' (Donald, 1991, p. 361). For Hebb, this is a necessity for any learning (i.e., formation of a mental representation of some aspect of the physical environment, such as Hebb's own favorite example of a triangle), because to unify a representation containing different elements (e.g., the corners of a triangle) the mind must keep the other elements active while attention shifts (external stimulation switches) from one corner to another. Representations form out of the principle of *contiguous activation*, so there must be some way for recently perceived aspects to remain active in the mind in order to become associated with the other ones, and so build the complex representation (say, of a tree, containing the trunk, branches, and leaves in an 'all or none' fashion; Hayes-Roth, 1977).

This idea of residual activation of a mental representation was crucial to the notion of *priming*, which Karl Lashley (1951) introduced in his groundbreaking analysis of language production. As he showed, to comprehend any typical sentence (especially in spoken language) one must keep the earlier elements in mind until the end of the sentence (i.e., active independently from external stimulation) in order to understand its meaning. As we will see shortly, what is true for language comprehension is also true—perhaps even more so—for the production of language oneself (e.g., Dell, 1986).

These mental representations, or concepts, are the interface between mind and world. One main branch of social cognition research over the years has been to better understand the content and nature of representations of the social world (e.g., individual people, groups, events, settings) and the ways in which these stored knowledge structures interact with events in one's environment to influence or determine responses back to it (e.g., Smith, 1994). Priming research in social psychology over the past 30 years has been a journey in which ever-larger, more complex and sophisticated representations are hypothesized to be 'prime-able,' starting with Higgins et al.'s (1977) seminal study in which trait concepts were primed and shown to influence subsequent impression formation.

Interestingly, perhaps even tellingly, there has always been a healthy skepticism among (mainly) cognitive psychologists about the 'power of priming' in social psychology, the nature of the mental representations that can be passively activated by environmental information, and the extent of the influences they exert on responses back to the world. Anecdotally, one initial response to the original priming studies in the impression formation genre was that 'just words'—not larger or more complex concepts such as trait categories–were being primed—single lexical locations in memory—such that the experimental participant in these studies were just more likely to use the priming stimuli to describe the target person, when asked to later in the study. (There were many aspects of the original data that belied this conclusion, however, such as the fact that participants did not usually use the primes themselves but related synonyms when reporting their impressions.) This skepticism was indeed healthy in the long run however because it has led to impressive advances, over the years, in our knowledge of priming effects and nonconscious influences more generally—a case in point being Devine's (1989) classic studies extending priming from single trait concepts, to group-stereotypic representations. To do so, she had to use as a dependent measure impression ratings on traits that were *not* among those primed (but which were, theoretically, included in the focal stereotype).

Thus in 10 years the grounds for skepticism moved from 'just single words' to 'just single trait concepts'—and in the next decade (the 1990s), when priming research expanded from the domain of

social perception to other important social psychological phenomena—behavior and motivations—the skeptical line moved again, to a position of 'just social perception;' that is, what might be called the *construal alternative* (see Dijksterhuis & Bargh, 2001), in which priming effects on behavior and goal pursuit were viewed as mediated by a change in the construal or interpretation of the experimental situation, with behavior and goal selection flowing naturally (and consciously) from that interpretation.

I bring this up as a kind of preemptive prophylaxis prior to the rest of the present argument, because other theorists have also encountered this same kind of resistance to alternative views of concepts and conceptual structure from those of traditional cognitive science. Lakoff and Johnson, in the 2003 Afterword to their innovative analysis of metaphors (1980) as conceptual structures, remarked that 'the single biggest obstacle to understanding our findings has been the refusal to recognize the *conceptual* nature of metaphor. The idea that metaphors are nothing but linguistic expressions—a mere matter of words—is such a common fallacy that it has kept many readers from even entertaining the idea that we think metaphorically. The fallacy is that metaphor is only about the ways we *talk* and not about conceptualization and reasoning' (p. 245).

The *Generation Problem*: How Can Single Prime Have so Many Qualitatively Different Effects?

The basic idea is that our social-psychological priming manipulations are, and have been, priming more than single concepts. It is hard to see how a single concept (as opposed to a conceptual structure, such as in Lakoff and Johnson's, 1980 theory) can do all of the work required of it to account for the multiple, simultaneous effects the *same prime* can have (Bargh, 1997). In brief, a priming stimulus such as *generous* can be expected to (1) activate affectively similar but otherwise semantically unrelated material in memory (as in automatic attitude or affective priming research; see Fazio, 2001; Ferguson & Bargh, 2004, for reviews); (2) impressions and trait judgments of a target person who behaves in an ambiguously generous manner (Higgins, 1996); (3) increase the likelihood of a generous behavior under relevant circumstances (e.g., being asked to donate to a charitable organization); (4) trigger altruistic motivations and goal pursuits (Bargh & Gollwitzer, 1994). In other words, 'the' effect of the prime in these various types of studies just depends on which dependent variable the experimenter happens to be interested in.

As another illustration, take the recent 'material priming' study of Kay, Wheeler, Bargh, and Ross (2004) in which the presence of a backpack in the experimental room prompted more cooperative behavior, while the presence of a briefcase primed more competitive behavior. Not many of us would be surprised, I suspect, if—had the experimental task been, say, choice of a vacation destination–more participants in the backpack condition chose an outdoors or wilderness experience while those in the briefcase condition were more likely to choose a trip to an exciting metropolitan city. Or, in the case of the 'norm priming' study of Aarts and Dijksterhuis (2003) in which exposing participants to pictures of a library caused them to speak more quietly thereafter, had the dependent variable of interest been how studious is a given target person (social perception), or how much they would pay for an interesting paperback book (evaluation), would we be that surprised by those findings.

Similarly, priming representations of one's relationship partners has recently been shown to influence the participant's goal-directed behavior—but in one study, it is the goals and standards of the other person (e.g., your mother) for you that become active (Shah & Kruglanski, 2003) and in another study, it is the goals you typically have when with that person (Fitzsimons & Bargh, 2003). But note how this means that these primes are still having all of these effects, in parallel, on participants in each of these studies—this logically has to be the case as the quality of the obtained effect depends only on the happenstance of the experimenter's choice of DV.

One of the more extreme examples of the 'power of concepts' is the well known study by Gardner et al., (1999) in which priming Chinese participants with many first-person singular ('I, me') pronouns caused them subsequently to endorse more Western than Asian values (e.g., individualism over collectivism), while priming North American participants with first-person plural ('we, us') pronouns caused them to endorse more Asian than Western values. Such a simple priming manipulation is sufficient to 'change' (temporarily, of course) the cultural values and orientation of Chinese and Americans? Similarly, in a study by Chen, Lee-Chai, and Bargh (2001) the same kind of pronoun-priming manipulation altered how participants used their assigned power over another participant (i.e., selfishly versus altruistically). These findings seem amazing and mysterious, but I suggest this is to some extent because we find it hard to understand how a *single concept* such as 'I' or 'we' can have such dramatic influence over our behavior in these domains, especially when there is only weak at best semantic relation between prime and dependent measure.

Priming effects, it seems, come in packages—constellations or thematically related sets of effects. Again, it is just hard to see how these can come from the single concepts typically primed in these studies. Some hints as to what might be going on come from related domains such as hypnosis research and how people use language, as well as developmental theories such as Vygotsky's (1962,1978) in which higher mental processes come out of the internalization of behavioral experience. As Lakoff and Johnson (1980, p. 125) argued, 'an account of how people understand their experiences requires a view of definition very different from the standard account . . . On our account, individual concepts are not defined in an isolated fashion, but rather in terms of their roles in natural kinds of experiences. Concepts are not defined solely in terms of inherent properties; instead, they are defined primarily in terms of interactional properties.'

Metaphorical Structures

In their treatment of the role of metaphor in thought and action, Lakoff and Johnson (1980, p. 230) also emphasize the role of experience and interaction with others for the development of understanding. They argue for the existence of *experiential gestalts*, or complex conceptual structures that 'emerge from interaction, from constant negotiation with the environment and other people . . . We understand our experience directly when we see it as being structured coherently in terms of gestalts that have emerged directly from interaction with and in our environment. We understand experience metaphorically when we use a gestalt from one domain of experience to structure experience in another domain.'[2]

In fact, recent evidence in the domain of social judgment and decision-making is already emerging that can be interpreted as consistent with this hypothesis. Trope and Liberman's (2003) *temporal construal* theory posits that events that are distant in time (in the past or in the present) are categorized and understood in a more abstract way than are events in or closer in time to the present. And the authors argue explicitly (p. 403) that their model should apply not only to *temporal* distance, but other, perhaps all forms of 'psychological distance' (Lewin, 1951). Indeed, recent research in the framework of temporal construal theory has borne this out: in a recent paper by Smith and Trope (in press),

[2]Should anyone need an example of how even scientists and experts use metaphors to guide their thinking in new areas, just consider how the computer metaphor has influenced how cognitive science has viewed the mind over the past half century. The early cognitive models involved stages and sequences of serial processing, just like the original computers (see Lachman, Lachman, & Butterfield, 1979), but soon after computer science developed methods of parallel processing, models of the human mind as operating in parallel emerged (Rumelhart et al., 1986). Today, a useful metaphor for understanding how human culture dramatically expands the powers of our individual minds is that alone we are like desktop computers, but culture is like connecting that computer to the internet (Baumeister, 2003).

interpersonal or *status* distance between people, as produced by nonconscious priming of the concept of power, also caused participants to think more abstractly than did control participants, and Fujita et al. (in press) have shown that *geographical* or *spatial* distance between people has a similar effect.

Trope and Liberman (2003; see also Liberman, Trope, & Stephan, in press) and their colleagues discuss these various findings in terms of the unifying theme or framework of 'psychological distance', but it must be recognized that such labeling stops short of a coherent explanation or complete account of these effects. What is 'psychological distance', after all but a *metaphor* that derives its meaning from the more basic and directly experienced concept of physical distance? Indeed, Lakoff and Johnson's (1980) original work on metaphor emphasized the importance of our direct experience of physical location and orientation in space in the development of early conceptual structures onto which other, less directly experienced concepts are *scaffolded onto*–given their meaning by *analogy* to the former. According to the Lakoff and Johnson (1980) theory, the first complex conceptual mental structures to develop are those that come out of our direct experience as infants and young children. One's orientation in space (up-down, forward-backward, etc.) is one such basic structure. Other conceptual structures are then built or scaffolded onto the direct structures in a metaphorical fashion (e.g., 'I'm feeling *up* today'). Indeed, they specifically described how the very concept of *time*—which is where temporal construal research began–is itself scaffolded onto the conceptual structure of *spatial relations*, because time as a concept develops later than does spatial relations for children: 'We have seen that metaphor pervades our normal conceptual system. Because so many of the concepts that are important to us are either abstract or not clearly delineated in our experience (the emotions, ideas, time, etc.), we need to get a grasp on them by means of other concepts that we understand in clearer terms (spatial orientations, objects, etc.)' (Lakoff & Johnson, 1980, p. 115).

The Lakoff-Johnson model of metaphoric-reasoning would thus predict that *any* form of distance— not just temporal (and I would add, not just psychological)—should have the same effects as temporal distance in the Trope and Liberman model, and this is what studies such as by Smith and Trope (in press) and Fujita et al. (in press) have been finding. But the Lakoff-Johnson model also makes specific *directional* predictions: conceptual structures that develop earlier should prime those that are later scaffolded onto them by analogy (analogy and metaphor being basic tools used by caretakers to explain and teach new concepts and ideas to their charges). A set of studies by Boroditsky (2000) directly tested these ideas.

In a first task, Boroditsky (2000) primed spatial information (imagining oneself moving to the left or right), and then in an ostensibly unrelated task, participants were given ambiguous time information (e.g., 'the meeting on Wednesday was moved forward'). The space primes strongly influenced participants' interpretation of the ambiguous time information: 71% of the participants responded in a prime-consistent manner. For example, in the right-spatial-movement condition, 73% thought that the meeting was on Friday, and 27% thought it was on Monday. This effect was replicated in a second experiment: participants were influenced by spatial primes when thinking about time (64% consistent), but (as hypothesized) the reverse effect did not occur: participants were not influenced by temporal primes when subsequently thinking about space (47% consistent). (See Lakoff & Johnson's 1980/2003 Afterword to their 1980 book for a review of other recent evidence supporting their model). These results would suggest that to really understand 'psychological distance' effects, one should delve deeper to seek the reasons why such varied manifestations of 'distance' have such similar effects on construal level. The metaphor model also makes directional predictions that temporal-construal or construal-level theory does not (physical distance should prime psychological distance effects—e.g., time—but psychological distance priming should not affect physical distance judgments; see Boroditsky, 2000), so it should be possible to empirically assess these competing accounts.

These predictions should also apply in the case of another form of distance that is emerging as important in psychological research on emotion regulation, namely *emotional distance* (e.g, Gross, 1998). One

might speculate here that priming, as in Boroditsky's research, the concept of *spatial* distance should cause participants exposed to emotion-arousing stimuli to have more subdued and less reactivity than a control group of participants. Finally, it should also be noted that Boroditsky's (2000) findings can be seen as well as support for the idea that fundamental social perspectives or 'deep ideologies' as described by Tetlock (2003) do exist, as complex conceptual structures, and can be primed—that is, activated and put into operation nonconsciously by environmental stimuli.

Hypnosis

Two of the many interesting aspects of hypnosis phenomena are the power of suggestion itself (not unlike social-behavior priming studies) and the 'full-blown' manner in which the hypnotized individual adopts the suggested role or persona (Hilgard, 1965). If the hypnotist tells you that you will be a chicken when she snaps her fingers, you might well flap your arms as wings, blink a lot, look constantly surprised, make jerky pecking motions with your head, and emit noises such as 'buk-buk-buk'. (This is all tremendously entertaining to your audience, of course.) But what is most relevant here is that hypnotized subjects take on the full chicken persona in all its farmyard glory—like an actor, they *are* the chicken.

Theodore Barber (1969), a skeptic and critic of hypnotic phenomena, nonetheless recognized this 'full blown' role-playing consequence of suggestion in his 'role theory' of hypnosis. Interesting and relevant for present purposes is that his skepticism arose in part because of the dramatic power of such simple suggestions on the part of the hypnotist: 'Another aspect of the hypnotic situation creates surprise and puzzlement. How can we account for the apparent magnitude of response to such a benign stimulus? How can only a verbal request bring about so dramatic a change as analgesia to the surgeon's scalpel?'[3] For Barber, hypnotic phenomena were a kind of demand effect, in which the subject willingly and knowingly takes on the role suggested by the hypnotist. But even if so (and the reality of hypnotic phenomenon as an altered state of consciousness remains controversial; see Kirsch & Lynn, 1998; Woody & Bowers, 1994), it is still remarkable that the person is capable of adopting the role (say, of a person who can feel no pain, or, in a more prosaic example, of an iron rod set across two chairs) to the complete extent that they do. Perhaps, then, what we have been priming all these years is a role, a conceptual structure that contains not only the nuts and bolts of how to act within that persona, but, at essence, the *perspective* a person in that role would have on the world—the purposes and goals and values that person, or animal, or even steel rod, would have. Others have also noted the relation between our openness to suggestion in this way, and how the higher mental processes might operate (Fernyhough, 1996, p. 53; also Gazzaniga, LeDoux, & Wilson, 1977).

It is not the case that the nonconscious effects of priming are entirely equatable with post-hypnotic suggestion phenomena—for one thing, priming effects in social psychology experiments are too easy to obtain with just random samples of university students, whereas only 15% or so of us are capable of post-hypnotic suggestion (Kihlstrom, 1998)—but I'd be surprised if there were not some connection. At minimum, the finding that hypnotic suggestions produce not just discrete actions but the full-blown role, with its associated behaviors, emotions, agendas, and so forth, should be an important clue to us as to what is going on in social-psychology priming studies.

---

[3]Similarly, during a recent talk at Yale, Dick Nisbett jokingly remarked how he never understood how Bargh could get all these effects with such 'rinky-dink manipulations'—until he began to obtain them himself (see Nisbett, 2003). His point regarding priming studies is conceptually the same as Barber's regarding hypnotic phenomena.

Development

Perhaps more than us social cognition researchers, contemporary developmental psychologists take the social and experiential origins of mental concepts quite seriously. As Tomasello (1992) noted, 'following Vygotsky (1978), more and more researchers are recognizing that the ontogeny of human cognition, especially the 'higher mental processes', is fundamentally a social enterprise' (p. 267). According to this view, the experience of the infant and young child with its caregivers leads to the development of internalized roles or *perspectives*, such that participation with the care-taker in events such as taking a bath, or playing a new game, involves—indeed, requires—the ability to know both complementary roles (see also Fernyhough, 1996; Rogoff, 1990). Nisbett (2003)—himself a recent convert to Vygotsky's general approach (p. 86)—remarks how differences in the stress given by Asian versus Western caretakers to different aspects of the ongoing event may underlie the fact that Asian adults are more sensitive to context than are Western adults: Western caretakers might hold up an apple and emphasize its apple qualities ('See the apple—it is red, and good for eating, it comes from apple trees') whereas Asians emphasize less the defining qualities of the apple and more the interpersonal nature of the occasion ('Here is an apple—I *give* it to you. Can you *give* it to me?').

Recent advances in evolutionary biology also point to the critical role that early social interaction plays in the development of conceptual knowledge; indeed, Tomasello, Carpenter, Call, Behne, Moll (in press) have presented compelling evidence that the origins of human culture—and the key difference between humans and other primates—lies in our evolved motivation to share knowledge and engage in collaborative activities with our fellow men and women. From their evidence they 'propose that human beings, and only human beings, are biologically adapted for participating in collaborative activities involving shared goals and socially coordinated action plans (joint intentions).'

For instance, when an adult stops his part in shared activities, 14 month and older infants try to get him to do it and if he still doesn't they do it for him, showing they are well aware of his role (and goals) in the game, enough to take his part in it if need be (Ross & Lollis, 1987). In another study, the experimenter holds a basket (in which toys are usually kept in the room) out to the child: children at 12 months of age (and even more at 18 months) did their part by putting the current toy in the basket. But then the experimenter reversed the situation, giving the child the basket and holding the toy himself— most of the children then hold the basket out towards him and visually anticipate his putting the toy in it. The authors concluded that often, after just a single, initial encounter in one role of an interaction, infants often understand the other role.

In another study reported by Tomasello et al. (in press), 15 month old and older infants were found capable of detecting the specific goal an adult caretaker is trying to attain as she struggles, unsuccessfully, to do it. For example, the adult repeatedly tries to put toys away in a closed cabinet, as if trying to push or insert the toys through the cabinet doors without first opening them—when the infants then imitate the adult's actions, they imitate the intended goal (i.e., they do it successfully, using novel actions), not the failed attempts

Tomasello et al. (in press) also tried hard to find signs of the same perspective-taking or sharing in great apes (who do have, to some extent, the ability to perceive others' intentions and purposes), or in children with autism, but could find nothing like the motivation to share attention, help, or collaborate they consistently found in normal human infants. They concluded from this body of research that 'human infants seem to have from very early in ontogeny a very strong motivation to share emotional states with others, and before the first birthday they express motivations for sharing goals and perceptions with others. By about 12–14 months of age . . . they form joint intentions and participate in joint attention. This means that the child and adult not only construct a shared goal, but they also establish mutually supportive roles by coordinating and sometimes even planning what each will do as they act together toward a common end, attending to things jointly as they do' (p. 16 *ms*).

A very similar point was made by Paul Bloom (2002) in his groundbreaking analysis of how children learn the names of things. According to Bloom, this is not the easy matter it might seem on the surface (i.e., the caretaker points and says the name, and the child easily makes the associative connection), rather sophisticated cognitive abilities have to be involved and operating—general abilities that are there for other purposes as well. For a child to be able to learn words, he or she must be able to understand the caretaker's intentions (that the caretaker means for them to learn the name of the object), be able developmentally to acquire concepts in the first place, have an appreciation of syntactic structure, as well as possess basic learning and memory abilities. Bloom (2002) shows compellingly that even the 'simple' acquisition of single nouns such as *dog* and *tree* and *cup* involves complex social, conceptual, and language capabilities operating and interacting with each other.

Note how care-takers themselves also have to be very alert and sensitive to the child's current level of knowledge and ability to understand—which is of course constantly changing and increasing. The same child at different ages and different children at the same age vary considerably in their levels of understanding, but the care-taker has to discover and match what he or she says and does to that level or else the interaction is going nowhere. As Fernyhough (1996, p. 54) noted, 'One of the requirements made of adults during this kind of interaction is that they be sensitive to the child's current situation definition, so that they can 'pitch' their own situation definition at an appropriate level. . .' According to his *dialogic theory* of higher mental processes, it is this early and very extensive experience with alternative perspectives given to us by our childhood care-takers, cognizant of and sensitive to our developing levels of understanding and capabilities, that becomes the basis for how we reason things out later as adults.

Importantly, given our present concern with explaining the multiple effects of social-construct priming, Fernyhough (1996, p. 53) stressed how the richness and complexity of these internalized perspectives emerge from 'interaction with actual people with actual positions in the world, [so that] they include ontological, axiological, conative, and motivational elements.' This sounds very much like the 'role concepts', or packages of concepts, described above—and also a description of what has emerged, empirically, within the social priming literature; a prediction of Fernyhough's (1996) model, as it were, that has been borne out by social cognition research.

Clark (1996) makes a highly similar point in his analysis of language use as a form of *joint action*. He gives many compelling examples of how we must continually coordinate our actions with others and take their perspective to do so—the shoe clerk helping customer on with shoe; the car driver and a pedestrian at an intersection (p. 19). These situations may be so common in daily life that we have forgotten, or don't appreciate how we have to take on the other's role—decipher her intentions–in order to perform the joint action. But by far the most common of such situations is using language itself—that is, conversing with others. The conversation situation, under Clark's analysis, consists of roles of speaker and addressee, and people must constantly take and switch these roles in a highly coordinated manner (Clark, 1996, p. 11), holding the perspective of the other person in mind at all times.

Tetlock's (2003) *social-functionalist pluralism* model of judgment and reasoning builds on the insights of Clark and Fernyhough. In one of the five basic social mindsets described by his theory[4]–the *intuitive politician*–the content of conscious thought is predicted to be a dialogue between one's own perspective and those of one's 'constituents'—that is, the significant others and groups to which one is accountable (i.e., to whom one's reputation matters for future joint actions). To be able to anticipate the reactions of our 'constituents' to the decisions and actions we might take, we must be able to take on

---

[4]The others are: intuitive *scientists* (with goals of causal understanding and prediction); intuitive *politicians* (goal of maintaining positive social identities among accountability constituents); intuitive *prosecutors* (goal of upholding standards of conduct, detect cheaters and free-riders; reject excuses; close loopholes); and intuitive *theologians* (goal of maintaining belief in the legitimacy of collective/cultural practices). These, he argues, are triggered by specifiable environmental conditions and can operate at the same time and so come into conflict inside the individual.

their perspective (and roles). Tetlock's notion of the *intuitive politician* is explicitly informed by Fernyhough's (1996) dialogic model of conscious thought, in which, 'by taking on the voice of the other, the individual also takes on the perspective manifested by that voice, resulting in a form of mental functioning that consists of an ongoing dialogue between differing perspectives on reality' (p. 53). Tetlock's model is comprehensive as well as integrative across levels of analysis: he considers the basic social mindsets as originating in evolved motives (similar to Tomasello et al., in press), and posits environmental 'triggering conditions' (just like contextual primes) for each.

Thus, several disparate areas of research and social thought lead us to the same conclusion: that one reason for the multiple parallel effects of our priming manipulations is that we might not be priming single concepts, but rather conceptual structures, whether they be called metaphors, roles, perspectives, or mindsets.

MANY ARE CALLED, BUT FEW ARE CHOSEN: THE *REDUCTION PROBLEM*

Understanding how many kinds of psychological effects can be produced by a single priming event is only half of the needed story, however—we must also seek to understand better how these multiple possibilities get reduced and channeled back into single, serial responses. It is as if the mind constantly explodes the outside world into multiple parallel possibilities for action, but must then reduce and distill these back for use in a world in which you can only do one thing at a time. The reduction problem is especially salient when one considers the busy, stimulus-rich real world outside of the laboratory, with all of the priming possibilities available. When I used to give talks on social priming research at NYU, on more than one occasion during the question period an audience member would just point out the window, down many stories to Lower Broadway (talk about your stimulus-rich environment) and all of the potential priming influences of great variety, and ask 'which one wins?' This was then, and remains today an excellent and important pragmatic question. Fortunately, some tentative answers are emerging in recent research.

Motivations and Goals Reduce Input

Bruner (1957) was facing a similar situation to the one we are in today regarding the need to account for strong but somewhat mysterious priming effects—he was seeking to explain how the 'New Look' findings of motivational and value-driven biases in perception, in terms of basic underlying psychological processes. His efforts gave us the extremely useful notions of *goal-directed [selective] attention* in which one's currently active goal drives what one attends to in the busy real world, and of *category accessibility*, the theoretical mechanism by which goals could exert this influence on attention. An active goal (e.g., to find something to eat) caused the mental representations relevant to attaining the goal (e.g., restaurants, bodegas) to become somewhat more active than usual and thus more ready to become activated by corresponding stimuli in the environment.

This insight has remained enormously influential in social psychology, on a par with Hebb's (1949) contribution to cognitive psychology. Selective attention is a powerful tool in the reduction of the often overwhelming abundance of information available in the current environment. Selective attention, as noted above, is a key component of any collaborative or joint activity, in which we must pay close attention to our collaborators in order to coordinate our speech and actions with theirs. It is sometimes quite striking how powerful this selective attention process is in reducing what 'gets through' to influence us; the phenomenon of 'inattentional blindness' being a dramatic example (Most, Scholl,

Clifford, & Simons, 2005). In one study, for example, participants involved in a computer-simulated three-person 'ball toss' game very often did not notice—and were surprised to find out later—when a large gorilla walked right through the game across the middle of the screen (Simons & Chabris, 1999; see also earlier work by Neisser, 1979; Neisser & Becklen, 1975).

One's current goal, then, as it helps drive selective attentional processes, takes a big chunk out of the reduction problem. Although research in this area is just starting, one would expect that selective attention would serve to reduce the number of potential priming influences at any given moment, with priming influences more likely to occur among selected than nonselected information. And it appears that not only one's temporary, current goal can have this influence on attention: Neuberg, Maner, and their colleagues (Maner et al., 2005; Neuberg, Kenrick, Maner, & Schaller, 2004) have extended Bruner's (1957) original insight from current goals to chronic, evolved motives (e.g., avoid germs and disease, sexual attraction); in an innovative and important line of research, they are showing that these fundamental, evolved motivations do drive selective attention and thus likely reduce for the individual the set of potential priming influences. (For other recent analyses of fundamental social motivations, see Fiske, 2004; Haidt, 2001; Tetlock, 2002).

When in Conflict, Motivations Trump Everything Else

Of course, even within this reduced set of potential priming influences there can still be competing and conflicting suggestions for responding back to the world. Given the qualitatively different effects the same prime can have, such a conflict can happen even with a single priming event. For example, say while walking down lower Broadway I come across a small boy sitting by himself on the curb, crying to himself. The *behavioral* priming effect here, through the perception-behavior link, should cause me to imitate the boy—that is, sit down next to him and start crying myself. Happily, this does not usually happen—but why not? Because there are other responses primed as well. The situational norm or goal of helping someone so clearly in need (cite) would also be activated (see Aarts & Dijksterhuis, 2003; Hertel & Kerr, 2001, for examples of norm priming), and dominate the nonmotivational, behavior priming influence.

Macrae and Johnston (1998) were the first to pit such competing priming influences against each other; participants were primed with helping related stimuli and were then presented, in the elevator leaving the experimental session, with a chance to help. A confederate in the elevator dropped some pens, and helping-primed participants were more likely than a control group to pick up the pens for the confederate—unless the pens were leaky and messy. Helping behavior in that case would conflict with a stronger goal to avoid dirt and contamination (see Neuberg et al., 2004).

The general principle seems to be that one's current goal or motivational state will 'win out' over other potential influences when they are in conflict. A classic example of this in the experimental psychology literature is the Stroop (1935) effect, in which participants are to name the color in which a target word is presented. On the critical trials, the word meaning (e.g., Red) is put in conflict with the color in which it is presented (e.g., blue). The Stroop effect *per se* is that it takes people longer to respond in these conflict trials—but note that even here, the task-correct response is almost always made. This shows how current purposes govern the response and how automatic, chronic responses are overcome when the two are in conflict. (For more on the mechanics of how a current task goal can override automatically suggested alternative responses, see Cohen, Dunbar, & McClelland (1990).)

Recent work in social cognition also shows that active goals can override even effects that have long been understood as obligatory or uncontrollable, such as the automatic or implicit attitude effect. Olson and Fazio (2003) review evidence that the results of the well-known 'implicit association test' (IAT; Greenwald, McGhee, & Schwartz, 1998) measure of one's automatic attitudes can be moderated by

current goals or need states; for example cigarette smokers often have a negative implicit attitude towards smoking, but not when it has been a long time since their last cigarette (Sherman et al., 2003). This need not reflect any shortcoming of the IAT as a measure of automatic attitudes; rather, it shows how even automatic or preconsciously activated (Bargh, 1989) attitudes can be modified by current needs or goals. The same result has now been obtained with the other measure of automatic attitudes, the sequential priming task. Ferguson and Bargh (2004) showed that goal pursuits change these 'automatic' attitudes—temporarily while the goal is active—such that a typically negative automatic-attitude object (e.g., rat) functions as a positive prime in the sequential priming task (indicating it is an 'automatic' positive attitude) if it has a positive incentive value *in the context of that goal* (e.g., finding as many pictures of rats as you can in an embedded-figures test). Importantly, when the goal-task has been completed (i.e., the goal is now inactive), the valence of that attitude object reverts back to its default state (see also *appraisal theories* of emotion; e.g., Lazarus, 1991).

A set of experiments by Moskowitz et al. (1999) provides particularly dramatic evidence of the power of chronic goals or motivations to overcome even strong automatic influences on social perception. In their studies, participants who had shown themselves to be committed to the goal of egalitarian treatment of people, especially minority groups, showed evidence of having the same knowledge of the cultural stereotype of a minority group as did the other participants, yet the egalitarian goal was shown to cause the inhibition or suppression of any influence of that stereotype on their responses—remarkably, given that responses were to be made very quickly, the egalitarian goal shut down the automatic stereotyping effect within half a second. This shows that a chronic motivation is capable of dominating even the strongest and fastest-acting conflicting responses.

Saying is for Doing; Therefore, Doing is Like Saying

The ways that currently active goals and motives can reduce the number of potential external influences, through both selective attention and internal response-conflict resolution processes (for more on these, see Morsella, 2005), help us greatly with the reduction problem. However, multiple *goals* can be active and come into conflict with each other, and this has recently been shown to affect one's internal subjective states—goal conflict is an uncomfortable feeling even when one is not aware of the conflict (i.e., it has been induced nonconsciously; Oettingen, Grant, Smith, Skinner, & Gollwitzer, 2006). Some of these conflicts seem to be resolved for us (as in the Moskowitz et al., 1999, study in which the egalitarian participants were unaware of the operation of the motive to suppress the stereotypic influence), and some not. We need to know more about how this conflict resolution process occurs (see Morsella, 2005); Tetlock (2002) considered the problem of how we resolve internal conflicts between conflicting social-functional mindsets to be one of the more important questions facing his theory.

Analysis of basic social interactional formats shows how multiple goals are operating at any given time; Clark's (1996, p. 34) theoretical analysis of joint action breaks these down into 'domain' goals (e.g., buying something at a drugstore), procedural goals (doing it quickly), interpersonal goals (presenting self as friendly to the cashier), and so on, all of which are operating simultaneously. One can decompose simple conversations into multiple goals as well: the listener role, for example, consists of three levels of action, according to Clark (1996, pp. 20–21; see also Goffman, 1981): selective attention to the speaker, identifying and understanding what the speaker is talking about, and formulating one's response back, all of which are operating concurrently, in real time. Thus even the simplest social exchanges seem to require multiple role perspectives operating.

How can all of these be managed so that they all influence responses (as they are all relevant to making appropriate, intended responses) but coordinated such that responses are still made serially, in

real time, and in the correct sequential order? It may be that the same theories and models that helped above to understand how there could be multiple effects of the same prime (the *generation* problem) can also help us here with the puzzle of how these parallel influences get channeled back through the bottleneck of having to act in real time (the *reduction* problem). To presage the argument that follows, language is for doing things, for accomplishing goals with others (as opposed to by oneself), and so we might want to look to language production models—how ideas and thoughts are expressed—for insights as to how (other forms of) behavior are expressed. These models have already tackled the problem of how parallel processes (thoughts, ideas, intentions) are transformed into serial speech acts (Dell, Burger, & Svec, 1997). And if theorists such as Clark, Lakoff and Johnson, and others are on the right track as far as language being in the service of behavior (a sub-goal, if you will), then it may be that serial, real-time behavior *in general* follows the same principles—even, perhaps, the same mechanism.

THE ROOTS OF SOCIAL COGNITION IN LANGUAGE RESEARCH

The idea here is that we might well look to extant models of language production for a solution to the reduction problem. That is, the problem of reducing multiple goals (task, interpersonal, procedural) and levels of representation (lexical, phonological) into serial speech in a conversation, seems very similar in structure to our present problem of reducing parallel relevant representations (goals, evaluations, behaviors) into fluid, serial action. And there is a second good reason: many of the key concepts of social cognition—especially priming and automaticity—also came originally from psycholinguistic theory and research. The fruits of the study of language and speech has, in fact, a rather impressive track record over the past 50 years of being applicable and of high predictive utility in social cognition:

1. The notion of *priming* originated in Karl Lashley's (1951) analysis of language comprehension; how we need to hold some sentential information temporarily in mind in order to comprehend it. Tory Higgins then showed that what was true for the lexical and phonemic concepts used in language comprehension and production also held for more complex (i.e., trait) concepts as well. (It is relevant here from a historical perspective that Higgins' graduate training at Columbia was in fact in psycholinguistics.) And we know now that priming phenomena hold for social behavior and goal pursuit as they just as they do in speech.
2. The concept of *automatic activation* came out of Cherry's (1953) description of the 'cocktail party effect' in which one's attention is automatically diverted to the sound of one's name in a nearby conversation that you hadn't noticed before; and also from LaBerge and Samuels (1974) model of the process of reading text, in which words in the text were argued to automatically activate their corresponding lexical and semantic nodes in memory, effortlessly and uncontrollably. Both of these notions—derived from language comprehension research–were the basis for the idea that perhaps other self-relevant information, such as trait concepts related to one's self-schema, could also break through the attentional barrier and be processed automatically (Bargh, 1982), and later on, how group features could activate even more complex group-stereotype representations (Devine, 1989).
3. The pioneering work of Meyer and Schvaneveldt (1971) on word associations (e.g., *ocean-water*)— how activation spreads automatically from one node in memory to others to which it is strongly associated–introduced the 'sequential priming' paradigm that was then applied successfully to social psychological issues of whether complex social attitude concepts had such automatic associations with their evaluations as positive or negative (Fazio, Sanbonmatsu, Powell, & Kardes, 1986), and whether goal concepts were linked to representations of environmental features (Bargh, Raymond, Pryor, & Strack, 1995).

In each of these cases, the study of language comprehension and production has provided social cognition with highly useful models that have enabled us, over the years, to discover 'new' and important social psychological phenomena. Given this stellar track record it might be the case that the underlying mechanisms of language production and of social behavior production *are one and the same*.

As Clark (1996, p. 220) has reminded us, language itself *is* action; it arose out of a need for joint action, the need to find the common ground between collaborators on a joint project, to get everyone 'on the same page', or 'up to speed' which is the necessary first step for any effective collaborative activity. From the standpoint of any complete model of social behavior and goal pursuit, this point is absolutely critical, because *often we can't attain our goals on our own*—and childhood when these conceptual structures and processes are developing, we absolutely cannot.

So: if language *is* action, then how language is produced may well be how behavior in general is produced. The point about language production I'd like to highlight here is that we do not usually formulate sentences in our mind prior to saying them. Rather, we may have some vague ideas about what we want to say, the ideas or points we want to make, and these guide what we say, but the ways in which we express these intentions, out loud, with words, are opaque to us. That is, language is complex yet spontaneous, in most cases: it has a goal, but no pre-set concrete plan, yet it is nevertheless produced automatically and nonconsciously (Bock & Levelt, 1994; Levelt, 1989).

Clark (1996) points out that 'conversations often seem organized around a set plan, but that is an illusion . . . Although people talk in order to get things done, they don't know in advance what they will actually do. The reasons are obvious: They cannot get anything done without the others joining them, and they cannot know in advance what the others will do . . . Conversations, therefore, are *purposive* but *unplanned* . . . Conversations look planned and goal-oriented only in retrospect. In reality, they are created opportunistically piece by piece as the participants negotiate joint purposes and then fulfill them'' (pp. 337, 319).

The 'open-ended nature' of conversations, and of joint action more generally (Fernyhough, 1996) is highly similar to the situations in which Peter Gollwitzer and I have tested our model of nonconscious goal pursuit (e.g., Bargh & Gollwitzer, 1994; Bargh et al., 2001). That is, the goal of interest is first primed, and then the participant is placed in a situation in which the goal is relevant, and is then shown to operate and produce the same outcomes as when it is given consciously, as through explicit task instructions. In these situations, not only does the participant not know the goal has been activated and is operational, they do not know in advance what will happen in the experimental situation, they do not know yet what information will be coming their way on which the goal will operate. The goal, if it is to operate over extended periods of time, must do so in the context of an uncertain and to some extent unpredictable environment (see Bargh, 2005). Yet it does, transforming the information to suit its purposes, and guiding the person towards attainment of the primed goal, all without their awareness of this happening (see especially Bargh et al., 2001, Study 2).

Ran Hassin (e.g., 2005) has further explored how nonconscious goals operate in uncertain real-world contexts. He specifically addressed the issue of *flexibility*, or the ability of the nonconscious goal to adapt to sudden changes in the task rules or structure. On the Wisconsin Card Sorting Task, the standard measure of (flexible) executive processes (Miyake et al., 2000), participants primed with the goal of achievement or high task performance outperformed control participants even though high performance here means *changing* one's response set more quickly than others do when the rules of the game suddenly and unexpectedly change. (Note that in the WCST participants are never told at the outset that what constitutes a correct answer will change in task midstream, so this is unexpected to all participants.)

Other studies have also shown that nonconsciously operating goals are able to overcome obstacles in their path to attainment (Bargh et al., 2001, Studies 3 and 4; Spencer, Fein, Wolfe, Fong, &

Dunn, 1998). The Spencer et al. (1998) finding is especially dramatic in that it showed that self-protective motives (to derogate minority group members in order to enhance one's own self-esteem) are able to overcome conditions of attentional shortage (i.e., memory load) that previous research had shown sufficient to prevent such stereotyping from occurring (Gilbert & Hixon, 1991).

So to Speak: A Cascade Approach to Action Production

All in all, then, the emerging evidence as to how nonconscious goal pursuit occurs is strikingly similar to how Clark (1996) and others describe language production in conversations. The nonconscious goal operates in complex interaction with the unfolding and unpredictable events in the environment, and manages to achieve its ends, just as we have goals and purposes in conversation and language production but no preset formulated sentences or even knowledge of exactly how it is going to come out of our mouths. Just as in nonconscious goal pursuit, speech production in conversation starts with an activated goal or intention and then produces and guides the desired behavior through automatic, nonconscious mechanisms. Accordingly, recent work in our lab has begun to apply *cascade models* of language production (e.g., Dell, 1986; Morsella & Miozzo, 2002; Navarette & Costa, 2004) to these next-generation questions concerning social behavior production (Morsella, Levine, & Bargh, 2005).

Cascade models of language production are particularly promising in this regard, as they are based on parallel-distributed processing models of cognition (e.g., Rumelhart, McClelland, and the PDP Research Group, 1986) in which multiple levels of representation are operating at the same time. A cascade cognitive architecture suggests that the semantic activation arising from perceiving an object automatically leads to the activation of the various action plans with which the object is associated. From this point of view, activation cascades from a conceptual-semantic level of analysis onto an action planning level. Cascade models of speech production also capture speech production phenomena such as how words expressing our ideas and intentions are put into the correct (grammatical) order 'for us' nonconsciously (Dell et al., 1997). Clearly, any ecologically valid model of action production must do this as well.

In summary, there are many good reasons to expect that models of language and speech production, in which multiple levels of response are active in parallel and must then be reduced into a coherent, serial product—all of which are carried out nonconsciously—will also apply to the case of multiple primed behavioral responses which must then be funneled through the bottleneck of real-time, serial responding. The initial returns on this attempt have been promising but, to quote with approbation one of Tomasello et al.'s (in press) conclusions, 'there is of course still much we do not know about all of this.'

CONCLUSIONS: CHILDHOOD'S END?

Priming research in social psychology has had an exciting childhood, to be sure–full of discoveries and surprises—but now we must face the important questions it has raised. We must seek to extend the findings of nonconscious perceptual, appraisal, motivational, and behavioral effects from our laboratories, where they have mainly been studied in isolation from each other, into the complex and noisy real world in which they all combine, somehow, to drive our actions. We need further to consider how processes such as nonconscious goal pursuit operates when the attainment of one's goal depends on the cooperation and collaboration of other people, not just our own actions (as has been studied heretofore). At a more mechanistic level, we need to understand better how the few (primes) can

produce the many (parallel response potentialities), and then how the many get reduced into the few, in order for us to act in real time, and in coordination with the behavior of others.

It is very encouraging as we start on this new road that scholars in such disparate research domains are drawing such similar conclusions from their work. Evolutionary biologists (e.g., Tomasello et al., in press), students of language use (e.g., Clark, 1996; Lakoff & Johnson, 1980), cultural psychologists (e.g., Nisbett, 2003), philosophers of mind (e.g., Fernyhough, 1996), and political psychologists (e.g., Tetlock, 2002) alike are all arguing that our basic conceptual structures might be richer and more complex than we'd previously realized, and that they correspond to internalized perspectives or stances on the world. Each of these scholars has come to this conclusion from very different routes and points of origin, from outstanding and unexplained issues in their own domain of research. Above and beyond the logical and empirical support for the present arguments, described above, this growing consensus is an encouraging sign that we are on the right track.

As another recent 'agenda for the future' article has emphasized, 'the mechanisms underlying mind and behavior are not fully explicable by a biological or a social approach alone but rather a multilevel integrative analysis may be required' (Cacioppo, Berntson, Sheridan, & McClintock, 2000, p. 829). By constraining and informing our models of nonconscious processes in social psychology with theoretical and empirical developments in these related fields of inquiry, we can help assure that research in our own little neck of the woods will continue to matter in the long run, and to the larger picture.

ACKNOWLEDGEMENTS

REFERENCES

Aarts, H., & Dijksterhuis, A. (2003). The silence of the library: Environment, situational norm, and social behavior. *Journal of Personality and Social Psychology, 84*, 18–28.

Arendt, H. (1978). *The life of the mind*. New York: Harcourt Brace.

Barber, T. X. (1969). *Hypnosis: A scientific approach*. New York: VanNostrand Reinhold.

Bargh, J. A. (1982). Attention and automaticity in the processing of self-relevant information. *Journal of Personality and Social Psychology, 43*, 425–436.

Bargh, J. A. (1989). Conditional automaticity: Varieties of automatic influence in social perception and cognition. In J. S. Uleman, & J. A. Bargh (Eds.), *Unintended thought* (pp. 3–51). New York: Guilford.

Bargh, J. A. (1997). The automaticity of everyday life. In R. S. Wyer Jr. (Ed.), *The automaticity of everyday life: Advances in social cognition* (Vol. 10, pp. 1–61). Mahwah, NJ: Erlbaum.

Bargh, J. A. (2005). Bypassing the will: Towards demystifying the nonconscious control of social behavior. In R. Hassin, J. Uleman, & J. Bargh (Eds.), *The new unconscious* (pp. 37–58). New York: Oxford.

Bargh, J. A., & Gollwitzer, P. M. (1994). Environmental control over goal-directed action. *Nebraska Symposium on Motivation, 41*, 71–124.

Bargh, J. A., Chen, M., & Burrows, L. (1996). Automaticity of social behavior: Direct effects of trait construct and stereotype activation on action. *Journal of Personality and Social Psychology, 71*, 230–244.

Bargh, J. A., Raymond, P., Pryor, J. B., & Strack, F. (1995). The attractiveness of the underling: An automatic power → sex association and its consequences for sexual harassment. *Journal of Personality and Social Psychology, 68*, 768–781.

Bargh, J. A., Gollwitzer, P. M., Lee-Chai, A., Barndollar, K., & Troetschel, R. (2001). The automated will: Nonconscious activation and pursuit of behavioral goals. *Journal of Personality and Social Psychology, 81*, 1014–1027.

Baumeister, R. F. (2003). *The cultural animal: Human nature, meaning, and social life*. New York: Oxford University Press.

Bloom, P. (2002). *How children learn the meaning of words*. Cambridge, MA: MIT Press.

Bloom, P. (2004). *Descartes' baby: How the science of child development explains what makes us human*. New York: Basic Books.

Brian Nosek, A. (2005). Moderators of the relationship between implicit and explicit evaluation. *Journal of Experimental Psychology: General, 134*, 565–584.

Bock, J. K., & Levelt, W. J. M. (1994). Language production: Grammatical encoding. In M. A. Gernsbacher (Ed.), *Handbook of psycholinguistics* (pp. 945–984). San Diego, CA: Academic Press.

Boroditsky, L. (2000). Metaphoric structuring: Understanding time through spatial metaphors. *Cognition, 75*, 1–28.

Bruner, J. S. (1957). On perceptual readiness. *Psychological Review, 64*, 123–152.

Bruner, J. A., & Postman, L. (1949). Perception, conception, and behavior. *Journal of Personality, 18*, 14–31.

Cacioppo, J. T., Berntson, G. G., Sheridan, J. F., & McClintock, M. K. (2000). Multilevel integrative analyses of human behavior: Social neuroscience and the complementing nature of social and biological approaches. *Psychological Bulletin, 126*, 829–843.

Chaiken, S., & Trope, Y. (1999). *Dual-process models in social psychology*. New York: Guilford.

Chartrand, T. L., & Bargh, J. A. (1999). The chameleon effect: The perception-behavior link and social interaction. *Journal of Personality and Social Psychology, 76*, 893–910.

Chen, S., Lee-Chai, A. Y., & Bargh, J. A. (2001). Relationship orientation as a moderator of the effects of social power. *Journal of Personality and Social Psychology, 80*, 173–187.

Cherry, E. C. (1953). Some experiments on the recognition of speech, with one and two ears. *Journal of the Acoustic Society of America, 25*, 975–979.

Clark, H. H. (1996). *Using language*. New York: Cambridge University Press.

Cohen, J. D., Dunbar, K., & McClelland, J. L. (1990). On the control of automatic processes: A parallel distributed processing account of the Stroop effect. *Psychological Review, 97*, 332–361.

Conrey, F. R., Sherman, J. W., Gawronski, B., Hugenberg, K., & Groom, C. (2005). Separating multiple processes in implicit social cognition: The Quad-Model of implicit task performance. *Journal of Personality and Social Psychology, 89*, 469–487.

Dell, G. S. (1986). A spreading activation theory of retrieval in sentence production. *Psychological Review, 93*, 283–321.

Dell, G. S., Burger, L. K., & Svec, W. R. (1997). Language production and serial order: A functional analysis and a model. *Psychological Review, 104*, 123–147.

Devine, P. G. (1989). Stereotypes and prejudice: Their automatic and controlled components. *Journal of Personality and Social Psychology, 56*, 5–18.

Dijksterhuis, A., & Bargh, J. A. (2001). The perception-behavior expressway: Automatic effects of social perception on social behavior. In M. P. Zanna (Ed.), *Advances in Experimental Social Psychology, 33*, 1–40.

Dijksterhuis, A., & van Knippenberg, A. (1998). The relation between perception and behavior or how to win a game of Trivial Pursuit. *Journal of Personality and Social Psychology, 74*, 865–877.

Donald, M. (1991). *Origins of the modern mind*. Cambridge, MA: Harvard University Press.

Fazio, R. H. (2001). On the automatic activation of associated evaluations: An overview. *Cognition and Emotion, 14*, 1–27.

Fazio, R. H., Sanbonmatsu, D. M., Powell, M. C., Kardes, F. R. (1986). On the automatic activation of attitudes. *Journal of Personality & Social Psychology, 50*, 229–238.

Ferguson, M. J., & Bargh, J. A. (2004). Liking is for doing: The effects of goal pursuit on automatic evaluation. *Journal of Personality and Social Psychology, 87*, 557–572.

Ferguson, M. J., Bargh, J. A., & Nayak, D. A. (2005). After-affects: How automatic evaluations influence the interpretation of subsequent, unrelated stimuli. *Journal of Experimental Social Psychology, 41*, 182–191.

Fernyhough, C. (1996). The dialogic mind: a dialogic approach to the higher mental functions. *New Ideas in Psychology, 1*, 47–62.

Fiske, S. T. (2004). *Social beings: A core motives approach to social psychology*. New York: Wiley.

Fitzsimons, G. M., & Bargh, J. A. (2003). Thinking of you: Nonconscious pursuit of interpersonal goals associated with relationship partners. *Journal of Personality and Social Psychology, 84*, 148–164.

Frith, C., & Wolpert, D. (Eds.). (2004). *The neuroscience of social interaction: Decoding, imitating, and influencing the actions of others*. New York: Oxford University Press.

Fujita, K., Henderson, M., Eng, J., Trope, Y., & Liberman, N. (in press). Spatial distance and mental construal of social events. *Psychological Science*.

Gallese, V., Fadiga, L., Fogassi, L., & Rizzolatti, G. (1996). Action recognition in the premotor cortex. *Brain, 119*, 593–609.

Gardner, W. L., Gabriel, S., & Lee, A. Y. (1999). 'I' value freedom, but 'we' value relationships: Self-construal priming mirrors cultural differences in judgment. *Psychological Science, 10*, 321–326.

Gazzaniga, M. S., LeDoux, J. E., & Wilson, D. H. (1977). Language, praxis, and the right hemisphere: Clues to some mechanisms of consciousness. *Neurology, 27*, 1144–1147.

Gilbert, D. T., Hixon, J. G. (1991). The trouble of thinking: Activation and application of stereotypic beliefs. *Journal of Personality and Social Psychology, 60*, 509–517.

Goffman, E. (1981). *Forms of talk*. Philadelphia: University of Pennsylvania Press.

Greenwald, A. G., McGhee, D. E., & Schwartz, J. K. L. (1998). Measuring individual differences in implicit cognition: The Implicit Association Test. *Journal of Personality and Social Psychology, 74*, 1464–1480.

Gross, J. J. (1998). Antecedent- and response-focused emotion regulation: Divergent consequences for experience, expression, and physiology. *Journal of Personality and Social Psychology, 74*, 224–237.

Haidt, J. (2001). The emotional dog and its rational tail: A social intuitionist approach to moral judgment. *Psychological Review, 108*, 814–834.

Hassin, R. R. (2005). Nonconscious control and implicit working memory. In R. Hassin, J. Uleman, & J. Bargh (Eds.), *The new unconscious*. New York: Oxford.

Hayes-Roth, B. (1977). Evolution of cognitive structures and processes. *Psychological Review, 84*, 260–278.

Hebb, D. O. (1949). *Organization of behavior*. New York: Wiley.

Hertel, G., & Kerr, N. L. (2001). Priming ingroup favoritism: The impact of normative scripts in the minimal group paradigm. *Journal of Experimental Social Psychology, 37*, 316–324.

Higgins, E. T. (1996). Knowledge activation: Accessibility, applicability, and salience. In E. T. Higgins, & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 133–168). New York: Guilford.

Higgins, E. T., Rholes, W. S., & Jones, C. R. (1977). Category accessibility and impression formation. *Journal of Experimental Social Psychology, 13*, 141–154.

Hilgard, E. R. (1965). *Hypnotic susceptibility*. New York: Harcourt, Brace & World.

Kay, A. C., Wheeler, S. C., Bargh, J. A., & Ross, L. (2004). Material priming: The influence of mundane physical objects on situational construal and competitive behavioral choice. *Organizational Behavior and Human Decision Processes, 95*, 83–96.

Kihlstrom, J. F. (1998). Dissociations and dissociation theory in hypnosis: Comment on Kirsch and Lynn (1998). *Psychological Bulletin, 123*, 186–191.

Kirsch, I., & Lynn, S. J. (1998). Dissociation theories of hypnosis. *Psychological Bulletin, 123*, 100–115.

LaBerge, D., & Samuels, S. J. (1974). Toward a theory of automatic information processing in reading. *Cognitive Psychology, 6*, 293–323.

Lachman, R., Lachman, J. L., & Butterfield, E. C. (1979). *Cognitive psychology and information processing: An introduction*. Hillsdale, NJ: Erlbaum.

Lakoff, G., & Johnson, M. (1980). *Metaphors we live by*. Chicago: University of Chicago Press.

Lakoff, G., & Johnson, M. (1980/2003). Afterword 2003. In G. Lakoff, & M. Johnson (Eds.), *Metaphors we live by*. Chicago: University of Chicago Press.

Lashley, K. S. (1951). The problem of serial order in behavior. In L. A. Jeffress (Ed.), *Cerebral mechanisms in behavior: The Hixon symposium* (pp. 112–146). New York: Wiley.

Lazarus, R. S. (1991). *Emotion and adaptation*. New York: Oxford University Press.

Lerner, J. S., Small, D. A., & Loewenstein, G. (2004). Heart strings and purse strings: Carry-over effects of emotions on economic transactions. *Psychological Science, 15*, 337–341.

Levelt, W. J. M. (1989). *Speaking: From intention to articulation*. Cambridge, MA: The MIT Press.

Lewin, K. (1951). *Field theory in social science*. New York: Harper.

Liberman, N., Trope, Y., & Stephan, E. (in press). Psychological distance. In A. W. Kruglanski, & E. T. Higgins (Eds.), *Social psychology: Handbook of basic principles* (2nd ed.). New York: Guilford.

Macrae, C. N., & Johnston, L. (1998). Help, I need somebody: Automatic action and inaction. *Social Cognition, 16*, 400–417.

Maner, J. K., Kenrick, D. T., Becker, D. V., Robertson, T., Hofer, B., Delton, A. W., Neuberg, S. L., Butner, J., & Schaller, M. (2005). Functional projection: How fundamental social motives can bias interpersonal perception. *Journal of Personality and Social Psychology, 88*, 63–78.

Meyer, D. E., & Schvaneveldt, R. W. (1971). Facilitation in recognizing pairs of words: Evidence of a dependence between retrieval operations. *Journal of Experimental Psychology, 90*, 227–234.

Miyake, A., Friedman, N. P., Emerson, M. J., Witzki, A. H., Howerter, A., & Wager, T. D. (2000). The unity and diversity of executive functions and their contributions to complex frontal lobe tasks: A latent variable analysis. *Cognitive Psychology, 41*, 49–100.

Morsella, E. (2005). The function of phenomenal states: Supramodular interaction theory. *Psychological Review, 112*, 1000–1021.

Morsella, E. & Miozzo, M. (2002). Evidence for a cascade model of lexical access in speech production. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 28*, 555–563.

Morsella, E., Levine, L. R., & Bargh, J. A. (2005). *Incidental objects and people activate nonconscious action plans: A cascade approach.* Manuscript submitted for publication, Yale University.

Moskowitz, G. B., Gollwitzer, P. M., Wasel, W., & Schaal, B. (1999). Preconscious control of stereotype activation through chronic egalitarian goals. *Journal of Personality and Social Psychology, 77*, 167–184.

Most, S. B., Scholl, B. J., Clifford, E., & Simons, D. J. (2005). What you see is what you set: Sustained inattentional blindness and the capture of awareness. *Psychological Review, 112*, 217–242.

Murphy, G. L. (2002). *The big book of concepts.* Cambridge, MA: MIT Press.

Navarette, E., & Costa, A. (2004). How much linguistic information is extracted from ignored pictures? Further evidence for a cascade model of speech production. *Journal of Memory and Language, 53*, 359–377.

Neisser, U. (1979). The control of information pickup in selective looking. In A. Pick (Ed.), *Perception and its development* (pp. 201–219). Hillsdale, NJ: Erlbaum.

Neisser, U., & Becklen, R. (1975). Selective looking: Attending to visually specified events. *Cognitive Psychology, 7*, 480–494.

Neuberg, S. L., Kenrick, D. T., Maner, J. K., & Schaller, M. (2004). From evolved motives to everyday mentation: Evolution, goals, and cognition. In J. Forgas, & K. Williams (Eds.), *Social motivation: Conscious and unconscious processes* (pp. 133–152). New York: Cambridge University Press.

Nisbett, R. E. (2003). *The geography of thought: How Asians and Westerners think differently . . . and why.* New York: Free Press.

Oettingen, G., Grant, H., Smith, P. K., Skinner, M., & Gollwitzer, P. M. (2006). Nonconscious goal pursuit: Acting in an explanatory vacuum. *Journal of Experimental Social Psychology.*

Olson, M. A., & Fazio, R. H. (2003). Relations between implicit measures of prejudice: What are we measuring? *Psychological Science, 14*, 36–39.

Payne, B. K., Jacoby, L. L., & Lambert, A. J. (2005). Attitudes as accessibility bias: Dissociating automatic and controlled components. In R. Hassin, J. A. Bargh, & J. S. Uleman (Eds.), *The new unconscious.* New York: Oxford University Press.

Prinz, W. (1990). A common coding approach to perception and action. In O. Neumann, & W. Prinz (Eds.), *Relationships between perception and action* (pp. 167–201). Berlin: Springer.

Rogoff, B. (1990). *Apprenticeship in thinking.* New York: Oxford University Press.

Ross, H. S., & Lollis, S. P. (1987). Communication within infant social games. *Developmental Psychology, 23*, 241–248.

Rumelhart, D. E., McClelland, J. L., and the PDP Research Group. (1986). *Parallel distributed processing: Explorations in the microstructure of cognition* (Vols. 1–2). Cambridge, MA: MIT Press.

Shah, J. Y., & Kruglanski, A. W. (2003). Automatic for the people: How representations of significant others implicitly affect goal pursuit. *Journal of Personality and Social Psychology, 84*, 661–681.

Sherman, S. J., Rose, J. S., Koch, K., Presson, C., & Chassin, L. (2003). Implicit and explicit attitudes toward cigarette smoking: The effects of context and motivation. *Journal of Social and Clinical Psychology, 22*, 13–39.

Simons, D. J., & Chabris, C. (1999). Gorillas in our midst: Sustained inattentional blindness for dynamic events. *Perception, 28*, 1059–1074.

Smith, E. E., & Jonides, J. (1998). Neuroimaging analyses of human working memory. *Proceedings of the National Academy of Science, 95*, 12061–12068.

Smith, E. R. (1994). Procedural knowledge and processing strategies in social cognition. In R. S. Wyer Jr., & T. K. Srull (Eds.), *Handbook of social cognition* (2nd ed., Vol. 1, pp. 99–151). Hillsdale, NJ: Erlbaum.

Smith, P. K., & Trope, Y. (in press). You focus on the forest when you're in charge of the trees: Power priming and abstract information processing. *Journal of Personality and Social Psychology.*

Solomon, S., Greenberg, J., & Pyszczynski, T. (1991). A terror management theory of social behavior: The psychological functions of self-esteem and cultural worldviews. In Mark Zanna (Ed.), *Advances in experimental social psychology* (Vol. 24, pp. 93–159). Orlando, FL: Academic Press.

Spencer, S. J., Fein, S., Wolfe, C. T., Fong, C., & Dunn, M. A. (1998). Automatic activation of stereotypes: The role of self-image threat. *Personality and Social Psychology Bulletin, 24*, 1139–1152.

Srull, T. K., & Wyer, R. S. Jr. (1979). The role of category accessibility in the interpretation of information about persons: Some determinants and implications. *Journal of Personality and Social Psychology, 37*, 1660–1667.

Stroop, J. R. (1935). Studies of interference in serial verbal reactions. *Journal of Experimental Psychology, 18*, 643–662.

Tetlock, P. (2002). Social functionalist frameworks for judgments and choice: Intuitive politicians, theologians, and prosecutors. *Psychological Review, 109*, 451–471.

Tomasello, M. (1992). *First verbs: A case study of early grammatical development*. New York: Cambridge University Press.

Tomasello, M., Carpenter, M., Call, J., Behne, T., & Moll, H. (in press). Understanding and sharing intentions: The origins of cultural cognition. *Behavioral and Brain Sciences*.

Trope, Y., & Liberman, N. (2003). Temporal construal. *Psychological Review, 110*, 401–421.

Vygotsky, L. S. (1962). *Thought and language*. Cambridge, MA: The Massachusetts Institute of Technology Press.

Vygotsky, L. S. (1978). *Mind in society: The development of higher mental processes*M. Cole, et al. (Eds.), Cambridge, MA: Harvard University Press.

Wegner, D. M. (2002). *The illusion of conscious will*. Cambridge, MA: MIT Press.

Woody, E. Z., & Bowers, K. S. (1994). A frontal assault on dissociated control. In S. J. Lynn, & J. W. Rhue (Eds.), *Dissociation: Clinical and theoretical perspectives* (pp. 52–79). New York: Guilford.

Zanna, M. P., & Fazio, R. H. (1982). The attitude-behavior relation: Moving toward the third generation of research. In M. P. Zanna, E. T. Higgins, & C. P. Herman (Eds.), *Consistency in social behavior: The Ontario Symposium* (Vol. 2, pp. 283–301). Hillsdale, NJ: Lawrence Erlbaum Associates.