We propose a new integration of social psychology and situated cognition, which we term socially situated cognition (SSC). This new approach rests directly on recent developments in psychology and cognitive science captured by the label situated cognition, but it also has roots going back to William James and Frederick Bartlett. The approach involves a shift in the guiding metaphor regarding cognition and action, from computation to biology, and highlights four core assumptions that are common to social psychology and the situated cognition perspective. (1) Cognition is for the adaptive regulation of action, and mental representations are action oriented. (2) Cognition is embodied, drawing on our sensorimotor abilities and environments as well as our brains. (3) Cognition and action are the emergent outcome of dynamic processes of interaction between an agent and an environment. (4) Cognition is distributed across brains and the environment (e.g., through the use of tools) and across social agents (e.g., when information is discussed and evaluated in groups). With regard to each of these themes, we review and integrate relevant social psychological research and suggest ways in which the theme can be advanced by rethinking current assumptions. Our overall goals are to make social psychology part of the interdisciplinary integration emerging around the concept of situated cognition, and to advance these four themes as high-level conceptual principles that can organize seemingly disparate areas of research and theory within social psychology itself.

For more than a century, social psychology has developed as the scientific discipline devoted to the study of social cognition and social behavior: of attitudes, social influence processes, person perception, group stereotypes
and prejudice, interaction in groups, and personal relationships, among other topics. Particularly since the 1960s, social psychology has been dominated by experimental methods and by theoretical approaches emphasizing cognitive processes (Devine, Hamilton, & Ostrom, 1994; Jones, 1985). In parallel with the rise of the cognitive perspective throughout psychology, social psychologists focused on analyses of mental representation and process as pathways to understanding social psychological phenomena. The cognitive approach led to the development of robust, sophisticated, and cumulative bodies of theory concerning such issues as the nature of mental representations, the impact of accessible representations on judgments, and the factors affecting people’s use of simple heuristic cues versus more systematic information processing. In more recent years, social psychologists have broadened their focus beyond cognitive processes by directing increased attention to issues of motivation and affect, personal relationships, group memberships, and cultural differences as they have worked toward a more complete understanding of social behavior. The emphasis is now on motivational constraints and situational effects on cognition—with motives and situations taken not just as additional information to be processed, but as fundamental regulators of cognition.

Paralleling these developments within social psychology, a powerful new intellectual movement has arisen across many areas of psychology and cognitive science, which has been termed situated cognition (e.g., Agre, 1997; Barsalou, 1999b; Brooks, 1999; Chapman, 1991; Clark, 1997; Greeno, 1998; Hendriks-Jansen, 1996; Norman, 1993; Steels & Brooks, 1995; Yeh & Barsalou, 2000). A convergent but nonoverlapping school of thought that emphasizes the significance of situated action and cognition is found in sociocultural psychology (e.g., Cole, 1996; Wertsch, 1998). While the sociocultural school traces its intellectual roots to Vygotski’s work (e.g., 1962/1986), the fundamental ideas of the situated cognition movement go back in various forms to Dewey, Mead, and particularly William James and Frederick Bartlett. It is no accident that these same individuals are also frequently named as important forebears of social psychology, for the central thesis of this chapter is that the fundamental assumptions of situated cognition are quite compatible with those of social psychology—so much so that the term socially situated cognition (SSC) seems quite appropriate. Despite this fundamental conceptual similarity, for which we will argue in detail, situated cognition and social psychology have had little or no contact, although neighboring subdisciplines (such as developmental, cognitive, and educational psychology) have been deeply affected by the situated cognition perspective. We believe that vigorous attempts at integration and mutual recognition—from both sides of this conceptual divide—will pay rich dividends in future theoretical and empirical progress.
Situated cognition theorists view cognition as an adaptive process that emerges from the interaction between an agent and the world, both physical and social. This is an idea that can be found in Mead’s (1934) focus on “symbolic social processes” and is fundamental to the symbolic interactionist viewpoint, which makes “joint action” (Blumer, 1969) a central focus. Today the idea is continued in sociocultural psychology, an intellectual tradition strongly influenced by Vygotsky (e.g., 1978) that emphasizes the situated action level of analysis to account for the generation of meaningful activity in social contexts (Cole, 1966; Lave & Wenger, 1991; Wertsch, 1998). The same idea of cognition as a situated interactive process is also found in other recent thinking in cognitive and developmental psychology and cognitive science, disciplines that are conceptually closer to mainstream experimental social psychology than is the sociocultural school (e.g., Barsalou, 1999b; Clancey, 1995, 1997a; Clark, 1997, 1999b; Greeno, 1998; Kirshner & Whitson, 1997; Norman, 1993; Yeh & Barsalou, 2000). An early appearance of the new perspective was in the area of robotics within artificial intelligence (AI), where researchers seeking to build robots that interact with the world ran into the limitations of the traditional mentalist approach to cognition and sought a workable alternative (Agre & Chapman, 1990; Brooks, 1991). The movement then spread: “What originally seemed nothing more than a cute idea turned out to have profound ramifications and changed the entire research disciplines of artificial intelligence and cognitive science. It is currently beginning to exert its influence on psychology, neurobiology, and ethology as well as engineering” (Pfeifer & Scheier, 1999, p. xii).

Although that influence has not yet touched the mainstream of social psychology, we believe that the central assumptions of situated cognition are largely compatible with those of social psychology. Our discussion of these central assumptions serves the two major goals of this chapter. First, there has been a relative mutual neglect and ignorance between workers in social psychology and situated cognition over the past decade or so. We will attempt to show that social psychology deals directly with the most central themes of situated cognition, and therefore belongs in the emerging interdisciplinary integration around those ideas—in many ways, at its very heart. Second, we will argue that the key themes of situated cognition are at the same time the most fundamental themes of social psychology as well. The themes can therefore conceptually bring together and interrelate seemingly disparate and unrelated bodies of research and topic areas within social psychology, as well as pointing toward new directions for conceptual and empirical exploration. Thus, the emerging interdisciplinary integration carries the potential for theoretical growth and development within social psychology.

The first and most central postulate of situated cognition is that the function of cognition is the control of adaptive action. The insight that
cognition is for action dates back to William James (1890) but has often been overlooked in more recent years, especially in the heyday of the cognitive or information-processing approach (see Fiske, 1992). However, its truth is unquestionable (Barsalou, 1999b; Dewey, 1929/1958; Mead, 1934). The second theme is that cognition depends on our bodily properties and environments, as well as our brains. Therefore, cognition must be regarded as embodied, dependent on and intertwined with (not apart from) sensorimotor processes. Third, adaptive action must be closely tuned to the immediate environment, and therefore cognition must be situated, interactive, and flexible. Cognition emerges from moment-by-moment interaction with the environment rather than proceeding in an autonomous, invariant, context-free fashion. And crucially, the relevant environment is always social, as well as being defined by human artifacts, physical spaces, and tasks. Fourth, cognition is distributed—not encapsulated within our brains, but extended and empowered by tools (both physical and conceptual, crucially including language) and by social resources such as other people and groups.

These four themes represent the organizing framework of this chapter. With regard to each of them, we will first show that social psychologists have produced bodies of relevant research and theory—our field’s potential exports, if we may be so bold, to others interested in situated cognition. At the same time, for each theme we will argue that in some respects social psychology has not yet fully appreciated all the insights of situated cognition. In many cases, these point to new areas for theoretical and empirical exploration or suggest modifications of some typical social psychological assumptions.

Despite its conceptual kinship to social psychology, the situated cognition approach calls for rethinking several assumptions that have been prevalent within social psychology. Most basic is a shift in the guiding metaphor for the analysis of cognition and action, from computation to biology. The computational or information-processing framework analyzes cognition in terms of representational structures and algorithmic processes, drawing on the fundamental concepts and principles of computer science (Marr, 1982; Newell & Simon, 1972; Vera & Simon, 1993). This framework is evident in most prominent theoretical models within social psychology, as they postulate the construction of schemas or associatively linked structures to represent stimulus information, which are then stored in memory and reactivated to affect judgments and social behavior (e.g., Wyer & Srull, 1989).

In contrast, the starting point for the biological metaphor is that all cognition and action constitute an adaptive regulatory process that ultimately serves survival needs. The biological metaphor also invites us to consider cognition and action as embodied—constrained and directed by the nature of our bodies. Because of the importance of adaptation to specific and
varying situations, cognition and action are considered as the emergent outcome of dynamic processes of interaction between an agent and an environment. Finally, SSC emphasizes that cognition is not purely an inner process within an individual brain but is distributed across the environment (e.g., through the use of tools and artifacts) and across social agents (e.g., when information is shared and evaluated in groups; Caporael, 1997). This new approach does not require a complete rejection of computational ideas such as representations, but appears likely to fundamentally transform our understanding of their nature and their role in the overall adaptive process (Clark, 1997).

The biological metaphor is not meant to direct social psychologists toward neuroscience as a substitute for psychological theory nor toward the types of analysis characteristic of some strands of current-day evolutionary psychology (e.g., analyses of mate choice or of sex differences in social behavior). Both neuroscience and evolutionary psychology are valuable levels of analysis, but our focus is on the psychological level. Within that level the biological metaphor calls attention to the relation of all cognition and action to fundamental self-regulatory processes and to the demands of adaptive action. This is an evolutionary approach in a broad sense, the type of “evolutionary view of human cognition inextricably embedded in the social structural context in which it occurs” that Caporael (1997, p. 277) has advocated. A fuller understanding of both cognition and action will result when we integrate the implications of the biological approach and the inherently situated nature of social action, with the strengths of the sophisticated, process-oriented cognitive social psychological research tradition of the last couple of decades.

I. Cognition is for Action

Cognitive scientist Stan Franklin concluded from his analysis of biological and artificial minds: “The overriding task of Mind is to produce the next action (minds are the control structures of autonomous agents)” (1995, p. xx). The first and primary principle of the socially situated cognition perspective is that cognition evolved for the control of adaptive action, not for its own sake. The fundamental evolutionary demands on cognition are the organism’s survival and reproduction, which (for humans) always take place in a social context (Caporael, 1997; Fiske, 1992; Simpson & Kenrick, 1997). In the situated cognition approach, intelligence is not identified with detached thought but with adaptively successful interaction with other agents and with the world. Mind is viewed in action-oriented terms, as
containing “inner structures that act as operators upon the world via their role in determining actions” (Clark, 1997, p. 47). Theorists in this perspective vary in the extent to which they reject traditional conceptions from the computation approach, such as mental representations (Agre, 1997; Beer, 1995). Some follow Gibson (1966) in at least rhetorically denying that representations exist or are useful concepts for analyzing cognition (e.g., Brooks, 1986; Thelen & Smith, 1994). Others acknowledge the existence of representations but see them as differing fundamentally from the text-like abstractions portrayed by classic cognitive science (e.g., Clark, 1997).

In contrast, the information-processing perspective emphasizes cognition for its own sake, often losing sight of its links to action and its dynamic and adaptive functions. The prevailing implicit model is of cognition as reception: the person is treated as a passive observer of ongoing stimuli, much like a couch potato watching television. (This is certainly the mode in which participants are placed in most social cognition studies within social psychology.) Cognition becomes the construction and manipulation of inner representations, rather than real interaction with the world, conversation, and so forth.

As an illustration of the close links between cognition and adaptive action, consider one of the early classic studies of neuroscience. In the 1950s, Warren McCulloch and his colleagues analyzed the information transmitted along the optic nerve from the frog’s eye to the brain (in McCulloch, 1988). What they found was not, as might have been expected, a topologically organized map of visual space, with different nerve fibers responding to light impinging on different retinal areas. Instead, certain neurons responded optimally to local convexities—to the light patterns produced by small objects on an underlying surface. Other neurons responded to a sudden overall dimming of the illumination. The researchers termed these types of fibers bug detectors and hawk detectors, respectively, labels that underline their action-oriented properties. Thus, very early in the visual system (in the retina itself) the frog computes not just a maplike image of the surroundings that is neutral with respect to action, but specific affordances for adaptive action—for extending the tongue to eat a bug or for jumping to escape a predator looming overhead.

A. SOCIAL PSYCHOLOGICAL CONTRIBUTIONS TO THE THEME

In many respects, social psychology has long accepted and built on the idea that cognition is for action in a social world. As a result, the field has developed several bodies of theory and research that illustrate the manner in
which cognition is intrinsically shaped by demands for action (Fiske, 1992). We briefly describe this work under several headings: relations of motivation and cognition, the methods by which the demands of action shape cognition and perception, as well as mental representation, and findings illustrating the intimate connections between cognition and overt behavior.

1. Relations of Motivation and Emotion to Cognition

If cognition is for action, then cognition, emotion, and motivation all are parts of an overall self-regulatory process. Despite the conventional opposition of “heart versus mind,” which can be traced back to ancient Greek philosophy, an emotionless cognitive agent would be not smart and rational, but totally nonfunctional (Clark, 1997; Picard, 1997; Sloman, 1997). For example, patients with brain damage affecting their emotional systems are drastically impaired in rational decision making (Damasio, 1994) despite verbal abilities and tested “intelligence” that remain relatively unimpaired. The social psychological literature contains many additional examples of the ways that motivation and affect regulate cognition, including effects of mood on memory and cognitive processing (Singer & Salovey, 1988). Emotion, cognition, and motivation are all equally functionally indispensible and inseparable parts of a self-regulatory system, subserving adaptive action.

Specifically, there have been numerous empirical demonstrations of pervasive effects of motivation on cognitive processes. The very definitions of traits, the basic concepts that make up our impressions of people and groups, are altered in self-serving ways by our own perceived standing on those traits (Dunning & Cohen, 1992). Impressions we form of close relationship partners are affected by motives to perceive our relationships in a positive light (Murray et al., 2000). Stereotype activation or suppression may be governed by our wish to view a member of a stereotyped group in a positive or negative light (for example, because they have praised or criticized us; Sinclair & Kunda, 1999). Several other examples could equally well be cited (Brewer, 1991; Brewer & Harasty, 1996; Gollwitzer & Bargh, 1996; Higgins & Sorrentino, 1990; Sorrentino & Higgins, 1986).

Summarizing all of this evidence into a set of coherent theoretical principles is still a work in progress. However, Kruglanski (1996) has argued that cognition and motivation are in large measure two aspects of the same thing, viewed through different lenses and described in different languages. Kruglanski outlines how motivational constructs are useful for understanding the initiation and termination of processing. For example, a person may rest content with a quick heuristic response that is self-enhancing or
otherwise motivationally congenial, but continue with more extensive processing if the initial response appears less desirable. In other words, virtually all cognitive activity is performed (or not performed) for motivational reasons—little “motivation-free” cognition may exist. Within the course of processing, Kruglanski (1996) argues that motivational effects operate at every stage, including information encoding, memory retrieval, information integration, and judgment formation. But conversely, not only does motivation affect cognition; goals and motives themselves are mentally represented as knowledge structures and operate according to the basic principles of cognition (e.g., spread of activation, construct accessibility effects from recent use). Thus, not only does cognition intrinsically have a motivational aspect, but motivation necessarily has a cognitive aspect (Kruglanski, 1996; Sorrentino & Higgins, 1986).

2. Pragmatic Concerns Involving Action Shape Perception and Cognition

a. Social Perceivers are “Good enough”. A prominent research tradition in the 1970s and 1980s emphasized the susceptibility of social perceivers to “errors and biases” (e.g., Nisbett & Ross, 1980). Current thinking is much different, as Fiske (1992) has noted. We now consider social perceivers as strongly driven by pragmatic concerns, and as striving for and generally attaining sufficient accuracy to suit their everyday needs for adaptive action. For example, accuracy in perceiving others is generally found to be surprisingly high (Kenny & Albright, 1987), even when based on just a few minutes of data (Ambady et al., 2000; Krauss, Freyberg, & Morsella, 2002). Other researchers have noted that accuracy in perceiving others may not even be the most important goal in social interaction, compared to goals such as making the interaction proceed smoothly and predictably (e.g., Snyder & Cantor, 1998). Other aspects of social perception that were initially viewed as “biases,” such as greater sensitivity to negative information than to positive, are now also conceptualized as adaptive and pragmatically useful (Peeters, 1991; Skowronski & Carlston, 1989; Wentura et al., 2000). Even perceivers’ use of cognitive shortcuts and heuristics, once derided as lazy and error-prone, is now more often viewed as adaptive (e.g., Chaiken, Liberman, & Eagly, 1989). In many ways, then, social perceivers can be viewed as functionally attuned to pragmatic concerns—to the demands of action—in the ways that they seek and process information.

b. Time Pressures and Cognitive Processes. One of the main adaptive constraints on cognition is that we often must generate behavior under conditions of time pressure, when leisurely consideration is impossible. Carrying on a dyadic conversation, playing basketball, or participating in a group discussion are examples of social cognition under time pressure.
Social psychologists have developed dual-process theories in many domains that assume that people possess a repertoire of simple processing short-cuts ("heuristics") on which they can rely when the time or inclination for extensive processing is absent (see Smith & DeCoster, 2000 for a review). Theorists assume that in many real-life situations a good strategy is to trade off some increased accuracy, which might be attained by extensive information gathering and effortful consideration, for the sake of increased speed and efficiency (e.g., Chaiken, Liberman, & Eagly, 1989). As attitude researchers have observed, if we stopped to carefully consider our attitude toward every product in a supermarket, a simple shopping trip would take days; this is a circumstance in which readily activated attitudes toward a limited number of products dramatically ease our task.

These dual-process theories also emphasize another point: cognition is not always time pressured. Sometimes we can devote extensive consideration over hours, days, or weeks to developing a plan, elaborating an abstract idea, or making a decision. In fact, the ability to perform such detached or "off-line" cognition may be one of the fundamental traits that sets human beings apart from other animals, whose cognition is probably much more tightly linked to current situations and tasks (Wilson, 2002).

c. Action Relevance and Cognitive Style. Researchers, including Gollwitzer (1990, 1996), have found that the demands of a decision fundamentally affect methods of processing information. For example, Gollwitzer (1990) has studied how people consider and weigh information about a decision they will make in the near future versus a decision made in the recent past. Prior to a decision, people adopt a "deliberative" mindset in which information is considered in a relatively open and unbiased fashion. Information seeking is a key goal. Once the decision is made, however, people switch to an "implemental" mindset in which information is processed with more biases (e.g., with an optimistic focus on the probability of the action’s success) and information seeking is considerably narrowed. Action relevance once again is found to affect cognitive processes.

d. Action Relevance and Person Perception. Consider a perceiver who receives information about another person or a social group in a context detached from action (because the others are fictitious, far away, long-dead historical characters, etc.). Now consider the perceiver receiving the same information about a person or group with whom he or she is about to meet and interact. What differences might this type of action relevance make in person perception processes? Neuberg and Fiske (1987) found that perceivers rely less on stereotypes and devote more effort to forming individuated impressions when they expect to meet the target person. Similarly, Newton and Enquist (1976) find that action relevance changes the way perceivers perceptually segment a videotaped behavioral sequence. And Carlston
based on his AST model of person impressions, advanced hypotheses about the types of differences that action relevance (which he terms behavioral involvement) may create in impressions of others—producing relatively less emphasis on visual appearance and abstract trait information and more on affective responses and concrete behaviors. Thus, in general, action relevance has a variety of effects on person perception processes, all of which serve as reminders that, if perceiving is for doing, studies that put participants in a passive receptive or “TV-viewing” mode may not capture a full picture of social cognitive processes.

**e. Action Relevance and Memory.** Even memory is profoundly affected by action relevance. Two older but highly influential studies emphasize this point. Pichert and Anderson (1977) had people read a brief story about a walk through a house, from the perspective of either a prospective homebuyer or a prospective burglar. Some details in the story (e.g., a leaky roof) were relevant to the homebuyer but not the burglar, and others (e.g., an expensive television) were relevant only to the burglar. When the participants recalled the story later, they were more likely to recall details that were relevant from their assigned perspective, in the sense of having some implications for future action. Zeigarnik (1927), in the early days of social psychology, conducted studies based on her observation that servers in a restaurant could often remember each diner’s order flawlessly until the party finished the meal and paid, but thereafter could not recall the slightest amount. Marsh, Hicks, and Bink (1998) have recently verified this finding with controlled experimental methods. The message of this work is that once information no longer has action relevance, it tends not to be remembered.

**f. Action Relevance and Communication.** The SSC perspective holds that communication is action oriented, intended to accomplish something in the social world. This point is obvious considering many types of speech acts, such as requests, commands, persuasive attempts, or questions: the speaker is overtly trying to change the recipient’s beliefs, attitudes, or behaviors. Although the goal is not always so overtly clear, other types of speech also have implications for social action. Conversations often involve the exchange of information that will facilitate adaptive action in future situations. Even idle gossip involves the sharing and reinforcing of group norms, and often functions to strengthen the social bond within an in-group or dyad that is sharing the gossip.

Research shows that speech acts are geared toward the attainment of situated goals in cooperative or competitive relationships (Semin, de Montes, & Valencia, 2003). Findings regarding “audience design” (Krauss & Fussell, 1996) or message modulation (Semin et al., 2003) support the conception of communication as socially situated action. In this conception, pragmatics (rather than syntactic structure) becomes the central focus of
concern with regard to language use. In contrast, the traditional perspective regards communication essentially as the neutral, unbiased translation or output of inner representations. The situated aspect of communication and its sensitivity to motivations, relationships, and other contextual influences are lost or deemphasized. (These issues will be reviewed more fully in the later section on cognition as distributed.)

3. Pragmatic Concerns and the Demands of Action Shape Mental Representation

Because cognition is for the control of action, an agent must represent objects in the world in terms of their relations to the agent and their affordances for action, not necessarily their “objective” qualities (Barsalou, 1999a; Gibson, 1966; Glenberg, 1997). Abstract, action-neutral representations simply describe a situation, leaving the implications for action implicit (“Button A is connected to the switch that applies current to the motor;” a city map from the conventional overhead perspective). In contrast, action-oriented representations are exemplified by instructions or directions (“Press button A to start the motor;” “go straight ahead three blocks then turn left.”). As another example, a driver might construct and use a representation of “the car I am currently passing,” an example of the action-oriented or “deictic” representations that have been investigated by Clancey (1997a) and Agre and Chapman (1990). Deictic representations emphasize the object’s role in the agent’s current activity, and its features that are relevant to that activity, such as its relative position, speed, and so on, while neglecting specific individuating features (color, license plate number, etc.). Therefore deictic representations afford a type of generalization or abstraction: “The car I am currently passing” will identify a different car from one minute to the next.

Deictic representations are not solely “in the head” but are patterns of interactive activity, including the agent and the external object. Perception of the object’s action-relevant qualities goes hand in hand with tuning the agent’s actual behavior to accomplish the current goal. Deictic representations are useful not for modeling the world but for letting the agent participate in the world (Chapman, 1991, p. 31). Connectionist networks are particularly well suited for learning and using deictic representations of this type (Chapman, 1991; Clark, 1997). Instead of constructing abstract inner representations of objects in the world, connectionist networks allow signals to flow through them, linking perception directly to adaptive action (Ballard et al., 1997).

Action-oriented deictic representations contrast with traditional assumptions that representations are action neutral and identify specific individuated objects (that car is a blue Honda, license number 123ABC). The traditional perspective assumes that representations are abstract, static, and objective.
The implicit model is textual representations (propositions) or equivalent symbolic structures (schemas, etc.). These descriptions are relatively “objective” independent of the person’s viewpoint, current situation, and goals. Of course, people do seem to construct and use objective or action-neutral representations, at least at times. That is, one might be able to recall that the last car one passed was a blue Honda, despite the action-irrelevance of that information. The notion that cognition is for action does not require the extreme prediction that no action-irrelevant information is ever considered or represented (after all, it might become action-relevant in some unpredicted way in the future), only to the prediction that immediately action-relevant information is the most likely to be processed under normal circumstances.

a. Attitudes. Attitudes have been considered perhaps the most characteristically social psychological concept (Allport, 1954). They have been conceptualized, however, perhaps too narrowly as purely mental representations. In reality attitudes are deictic representations. They capture relationships between the agent and the attitude object, which have implications for the way the agent perceives the object and acts toward it, as well as for the way the person thinks about it. Research shows, for example, that attitudes can be automatically activated to color perceptions and influence judgments and behaviors toward the objects (Fazio et al., 1986). Attitudes are a preeminent example of action-oriented representations, because they specify not just the nature of the object but how to behave toward it (e.g., whether to approach or avoid it).

b. Person Impressions. Person impressions as well as attitudes are action-oriented representations, according to Carlston’s (1994) AST model. This model proposes that impressions of other people include several different types of information that reflect contributions from four underlying representational systems: visual, verbal, affective, and action. For example, an impression may include images of the person’s appearance (visual system) and traits believed to characterize the person (verbal system). Importantly, the impression also includes representations of the emotions felt toward the person (affective system), and the perceiver’s own behaviors toward the person (action system), such as giving the person hugs or teasing him. Evidence of several types (reviewed in Carlston, 1994) supports the general postulates of the AST model, as well as the specific proposition that impressions contain affective and behavioral responses. Thus, impressions are action-oriented representations.

Impressions of others are also regulated by the type of relationships we have with them. We form impressions based not only on a target person’s characteristics, but also on the type of relationship we have with the person. Research supporting this point (e.g., Baldwin, 1992; Fiske et al., 1991; Holmes, 2000) suggests that relational interdependence and its action implications are integral to the way we represent people. For example, studies
demonstrate that other people with whom one has the same type of relationship (as categorized by Fiske’s model, 1991) tend to be confused with each other. This pattern of confusions holds independent of the targets’ personal characteristics, such as age, race, or personality traits (Fiske & Haslam, 1996). The confusion data suggest, then, that we mentally represent others in terms of the types of relationships that we have with those people and therefore the types of actions that we perform toward them, such as communal sharing, market-oriented bargaining, and so forth.

4. Close Connections Between Cognition and Action

Perceiving another person performing a behavior or having the concept of a behavior activated through priming methods leads to the actual performance of the behavior (Bargh et al., 1996; Chartrand & Bargh, 1999). In other words, representations of behaviors are action oriented in the sense that activating those representations—even in the course of perceiving another person or for similar extraneous reasons—tends to lead to the production of the behavior (Prinz, 1990). We use our bodies in the process of perceiving behaviors.

Another aspect of the connection between cognition and action has been explored by researchers working with one of the most characteristic and important theories of social psychology, cognitive dissonance theory (Festinger, 1957). The insight from this theory is that the connection between cognition and behavior is bidirectional. For example, disliking a particular toy is likely to lead a child to decline to play with that toy. Dissonance researchers have shown, conversely, that when the child does not play with an available toy for other reasons, it tends to lead to dislike for the toy. Similarly, having a particular position on an issue is likely to incline people to write an essay advocating that viewpoint. Dissonance researchers find that when people write an essay advocating a position they do not favor, under the correct circumstances it leads them to adopt the corresponding attitude (see Cooper & Fazio, 1984 for a review). All these findings illustrate the same fundamental principle, that cognition and behavior are so closely tied that it is difficult to change one without changing the other.

B. TAKING THE THEME FURTHER

As illustrated by the areas of research just reviewed, social psychologists generally accept the core idea that cognition is for action. Yet they may not have thought through and accepted all the implications of that idea. Here are some areas where the SSC perspective suggests we might be more
radical in rethinking basic assumptions, or more creative in exploring their implications.

1. Language Comprehension

Social psychologists generally recognize that person perception or attitude formation is ultimately driven by action relevance. But what of seemingly more objective, neutral, and passive activities such as text comprehension? Barsalou (1999a) has argued that even text comprehension is best understood as a tool for adaptive situated action. He makes an evolutionary argument, that types of social organization that stress passive “archival storage” of texts (such as formal education) are extremely recent developments—in contrast to the use of language to coordinate various cooperative forms of social action. Thus, in evolutionarily relevant contexts, situated action is much more important than archival storage of verbal information (Barsalou, 1999a, p. 65).

The claim that language comprehension is for situated action does not mean that language always describes situations that are immediately present. Using a hypothetical group of hunters as an example, Barsalou (1999a) describes several types of relationship between language and concrete situations. Language can describe an immediate situation (as when a group of hunters discuss a herd of antelope while viewing them), or an absent situation that had been perceived earlier. Language can describe a situation that is similar (although not identical) to one that the listener has experienced (as when a hunter who has seen other antelope herds is told about the herd sighted today), or a situation that has not been experienced as a whole but is made up of familiar components. Language can also refer to future events (e.g., a discussion of plans for tomorrow’s hunt among individuals who have previously experienced similar hunts or components from other types of hunts). The basic point is that even when language does not refer to an immediately present situation, its use may still be in the service of preparation for situated action. Note that, as Caporael (1997) has argued in her “core configurations” model, this type of language use presupposes not only the small face-to-face groups currently engaged in talking about specific action, but also larger groups or “macродemes” (size of at least several hundred—for example, the population of a small village) that are sufficiently large to stabilize and standardize language (Caporael, 1997, p. 286).

Does this argument hold true only for hypothetical prehistoric hunting bands? Barsalou admits that no rigorous research exists to answer the question, but notes: “Over the course of writing this commentary . . . I have been informally observing the conversations around me. So, for example, I have recently heard discussions of good places to shop for fresh produce, good restaurants with short waits, where best to park on campus, how best
to treat children with sinus infections, the best route for getting to work, neighborhoods where houses are still affordable, how best to ensure that house remodelers finish on time, sports to watch during the NBA strike, and so on” (1999a, p. 68). Such conversations are generally for the support of situated action either in the immediate situation or a later one.

One potential objection to this claim centers on the role of abstract concepts. When people discuss or think about truth, justice, or morality, are they still essentially geared toward effective situated action? Although the point seems less clear than with concrete concepts that are more closely linked to immediate situations, the answer may still be “yes” (Barsalou, 1999b). Abstract concepts are equally important for situated action as are concrete concepts, even though they refer to different aspects of situations. For example, the abstract property of “ownership” has major implications for what one can do with an object. Lakoff and Johnson (1999) and Goldstone and Barsalou (1998) take this analysis further, showing how the most important abstract concepts are underlain by implicit metaphors based on perceptual-motor processes, the body, and situated action. Thus, it is at least arguable that everyday language comprehension can best be viewed as preparation for situated action, rather than for action-neutral “archival storage” (Barsalou, 1999a, but see Wilson, 2002). In line with this emphasis, Glenberg (1997; Glenberg & Robertson, 1999) has noted that much of the background knowledge on which text comprehension relies is experiential and perceptual, rather than itself being verbal and abstract.

For social psychologists, one major implication of this line of thinking is methodological. When we give research participants textual materials, photographs, or other materials, we have to be aware of what types of action they anticipate as they process the information—we cannot assume that they simply strive to form representations that are as precise and accurate as possible given cognitive limitations. For example, participants will no doubt represent material differently if they think they will soon meet the people or groups described in the materials than if they do not anticipate a meeting, and will represent it differently if they expect a cooperative interaction with those persons than if they anticipate competition. Aspects of these predictions have been explored (e.g., Neuberg & Fiske, 1987), but the potential implications are far more general.

II. Cognition is Embodied

The second major theme of socially situated cognition is that cognition is embodied, drawing on our physical bodies and particularly our sensorimotor capabilities as well as our brains. Our experiences of the world originate
from bodily interactions. Thus, the evolved architectures of our body and brain constitute sources of regularity and constraint for cognition, affect, motivation, and behavior. Embodied cognition is one of the central and converging issues of current interest in philosophy, cognitive science, psychology, robotics, and neuroscience (Almassy, Edelman, & Sporns, 1998; Ballard, Hayhoe, Pook, & Rao, 1997; Brooks, 1991; Clark, 1997, 1999b; Damasio, 1994; Glenberg, 1997; Goldstone & Barsalou, 1998; Lakoff, 1987; Lakoff & Johnson, 1999; Smith, Thelen, Titzer, & McLin, 1999; Varela, Thomson, & Rosch, 1991; Wilson, 2002).

One aspect of embodiment is suggested by studies of how we perform natural tasks. Findings suggest that people routinely use bodily (sensorimotor) capabilities to support and enable cognition. For example, mental imagery draws on our sensory capabilities (Kosslyn, 1994), and is an important tool in many kinds of problem solving and text comprehension (Glenberg & Robertson, 1999; Johnson-Laird, 1983). Ballard et al. (1997) argue on the basis of their research that “at time scales of approximately one-third of a second, the momentary disposition of the body plays an essential role in the brain’s symbolic computations. The body’s movements at this time scale provide an essential link between processes underlying elemental perceptual events and those involved in symbol manipulation and the organization of complex behaviors” (p. 723). For example, eye movements can act as “pointers” in the computational sense, directing cognitive processes to analyze or act on specific objects and ignore others. This is not the classic type of “pointer” (an inner data structure), but a bodily action that simultaneously affects perceptual processes. In this approach, cognition is treated as distributed across neural, bodily, and environmental features.

Bodily movements, such as hand gestures, also play a role in cognitive processes including memory retrieval. For example, when people’s hand gestures are restricted, they are less able to retrieve words based on semantic cues or to recall earlier-presented words (Frick-Horbury, 2002; Frick-Horbury & Guttentag, 1998). Gestures appear to be used as a code that is represented with items in memory and can facilitate their retrieval.

Another example of the embodiment principle comes from work on categorization—one of the fundamental enabling mechanisms of cognition. Recent work by Barsalou and colleagues (Barsalou, 1999b; Goldstone & Barsalou, 1998) has provided convincing evidence that categorization is grounded in perception, rather than being based on conceptual features that are abstracted from the concrete and perceptual. For example, perceptually driven impressions of similarity are key in many types of categorization, and perceptual features affect performance even on many cognitive tasks that have no explicit perceptual components. In a different way, Edelman’s (1987) work also underlines the importance of embodiment in the process
of category learning. He argues that forming discrete object categories based on real sensory inputs (as opposed to abstract feature vectors used in models or simulations) is extraordinarily difficult. Sensory inputs are continually changing due to distance, orientation, lighting conditions, the agent’s own movements, etc. Instead of the near-impossible task of mapping these sensory inputs to inner representations, categorization can best be considered as a problem of sensorimotor coordination (Edelman, 1987; Pfeifer & Scheier, 1997). The agent’s movements, instead of adding additional variation to sensory inputs, actually allow the formation of cross-modal associations (e.g., between an object’s visual appearance and its tactile qualities), which are at the heart of concept formation (Pfeifer & Scheier, 1997; Thelen & Smith, 1994). Thus, categorization depends on the embodiment of cognition (i.e., on sensorimotor capabilities).

Damasio’s work (1994) makes a similar although perhaps broader point: that our cognitive abilities depend on bodily processes of emotion. Damasio (1994; see also Clancey, 1999) argues that emotions not only serve a directive function or “point us in the proper direction.” Instead, emotions actually organize the perception and categorization of objects. Emotion is “not just a response to objects, but an organizer playing a causal role in categorization of objects” (Clancey, 1999, p. 218). The emotional feelings that help us categorize objects and the concepts of those objects form and develop side by side, rather than concepts forming first and emotions being mere passive reactions.

In contrast to the new picture of cognition as embodied, the traditional perspective identifies cognition with abstract, disembodied information processing. Perceptual and motor systems are seen as mere “transducers” converting between abstract, amodal inner symbols (the stuff of real “cognition”) and the external world. The mind/body separation is taken to an extreme, as the role of bodily constraints and needs in shaping cognitive abilities and processes is essentially ignored.

A. SOCIAL PSYCHOLOGICAL CONTRIBUTIONS TO THE THEME

1. Embodiment of Cognitive Processes

   a. Attitudes. Consistent with the embodiment assumption, recent work in social psychology (Neumann & Strack, 2000) underlines the close connections of attitudes to sensorimotor systems and therefore to our bodies. For instance, motor movements (isometric flexion and extension of the upper arm) have been shown to influence evaluative judgments
(e.g., Cacioppo, Priester, & Berntson, 1993). Similarly, horizontal or vertical head movements influence evaluations (Wells & Petty, 1980) and recognition performance (Förster & Strack, 1996). In all these cases, bodily movements associated with approach or approval (arm movements pulling something toward the person or nodding the head vertically) cause evaluations to be more positive, or facilitate recognition of evaluatively positive material. Conversely, movements associated with avoidance or disapproval (pushing something away from one or shaking the head horizontally) cause evaluations to be more negative, or facilitate recognition of negative material.

Other studies (Neumann & Strack, 2000) present words on a computer screen overlaid on a background of a rotating spiral pattern. Rotation in one direction gives an appearance that one is moving toward the screen, while rotation in the other direction generates the appearance of moving away. When the screen appears to be moving toward one, positive words can be more quickly classified, and when the screen appears to be moving away, negative words are given faster responses. All of these findings suggest that evaluations are not just “in the head” but involve the perceiver’s whole body, being linked to movement toward or away from objects in a real physical sense.

b. Stereotypes. Stereotypes of social groups are also, like attitudes, affected by bodily states and processes. In an early study of this issue, Bodenhausen (1990) provided information about an Anglo or Hispanic individual who was accused of an assault to participants who were either “morning people” or “night people.” When tested at their nonoptimal time of day (e.g., in the morning for night people), the participants relied more on their ethnic stereotypes, judging that the Hispanic was more likely to have committed the crime. As we will describe later, other types of bodily states such as emotions and moods also influence stereotyping.

c. Creative Thought. Friedman and Foerster (2000, 2002) show that approach and avoidance motor movements affect the creativity of responses that people generate, indicating once again close connections between bodily movements and mental processes.

2. The Perception-Behavior Link

Interest in the “ideomotor” or perception-behavior link has a long history in psychology, dating back to William James (1890). Some research (reviewed earlier) by Bargh et al. (1996) and Chartrand and Bargh (1999) shows that subtly activating a concept such as “polite” can actually influence people’s behavior in the direction of being more polite. The same conclusion is supported by studies of the so-called mirror neurons found in the motor cortex in monkeys (Rizzolatti & Arbib, 1998). These neurons are found to be
active both when the monkey performs some specific action (e.g., scratching its head) and also when the monkey observes another performing the same action. This finding suggests that perception of others’ actions involves a motoric code, including at least some of the same components as actually performing the action. Perhaps the “ideomotor” effects described by Chartrand and Bargh (1999) and others involve similar internal mechanisms, with embodied action being intertwined with perception from the very beginning.

3. Affect-Cognition Interfaces

Social psychological researchers have identified a number of ways in which affect (either general mood or specific emotions) influences cognition. Early work (as summarized, for example, by Isen, 1987) focused on mood and specifically on a positive/negative mood dichotomy. A number of simple bivariate relationships were identified, such as positive mood increasing creativity or negative mood increasing scrutiny of information. Later researchers, inevitably, identified moderators and boundary conditions for many of these effects. We now know, for example, that mood can not only influence the amount of processing (e.g., through alterations in motivation or cognitive capacity) but also regulates processing in very fundamental ways. Considerable evidence supports the mood-as-information model of Schwarz and Clore (1996) and related proposals by Bless and others (Bless, 2000; Bless & Schwarz, 1999). In these models, positive mood is a signal that the situation is safe and that processing can rely on general rules based on repeated past experiences. In contrast, negative mood signals that a situation is problematic, implying a need for effortful or vigilant processing of information (as conceptualized in the various dual-process models; see Smith & DeCoster, 2000). In these models, then, mood takes its place as an integral component of an overall regulatory system that governs many aspects of cognitive processing.

Research interest in the effects of specific emotions on cognition is more recent. Lerner and Keltner (2000), working from the perspective of appraisal/emotion theory, find that when people experience a given emotion, they make judgments in line with the appraisals that are linked to that emotion. For example, an appraisal of uncertainty is part of the emotion of fear (compared to other negative emotions such as disappointment or anger) and so when people are experiencing fear, they judge events as more uncertain than when they are experiencing disappointment (Tiedens & Linton, 2001). This line of research and theory even suggests a reinterpretation of some of the work on mood and cognition, in that moods have often been induced through specific emotions (e.g., by having participants read stories, watch films, or recall
autobiographical episodes that are either happy or sad). The specific appraisals associated with the happy or sad emotions, rather than the valence (positive or negative) of the resulting mood state, might thus be responsible for some or all of the cognitive processing changes identified by research (Tiedens & Linton, 2001).

An additional and more general effect of emotion on cognition has been identified by Niedenthal and her associates (1999). When people are in an emotional state, they categorize objects differently than they do in a neutral state. Specifically, the researchers present participants with three objects, such that one word (e.g., joke) is semantically related to a second (speech) and is related by emotional connotation to the third (sunbeam). Participants are asked to pick which of the latter two words is most similar to the first. In a neutral state people generally choose the semantically related word, but in an emotional state (whether sadness, happiness, or some other emotion) people see the emotionally related words as most similar. All of these types of research support the notion that emotion and affect are closely and fundamentally interrelated with our cognitive processes, rather than constituting separable systems. This is what would be expected from a viewpoint that emphasizes cognition as an adaptive control mechanism for behavior (with emotions being part of the overall process) rather than one that views cognition as computation, disembodied and abstracted from the organism’s requirements for adaptive living.

4. Evolved Psychological Mechanisms

The constraints of embodiment impact psychological processes in another way, which has been explored by evolutionary psychology theorists. The demands of social living pose certain recurrent problems (e.g., mate choice, child rearing, alliance formation). This fact sets the conditions for psychological mechanisms specific to these problems to evolve over time (Caporael, 1997; Simpson & Kenrick, 1997). Thus, evolutionary psychologists believe that specific aspects of our psychological makeup can be understood in terms of their adaptiveness in an evolutionary timeframe. For example, preferences for mating partners with smooth skin and symmetrical facial features are thought to have evolved because these are cues to relatively good genes and freedom from parasites and infections. Males’ preferences for younger females are believed to have evolved because youth is correlated with fertility. On a different front, the fact that people have relative difficulty with certain logical problems (such as the Wason selection task) unless they are framed in terms of violations of social norms is argued to show that we have evolved psychological mechanisms specifically for detecting “cheaters” such as norm violators (Cosmides, 1989). Many of these claims are controversial, and
critics note that the evolutionary explanations are not the only plausible accounts for the observations (Wood & Eagly, 2002). Still, the evolutionary story points out another very broad potential effect of embodiment on psychology—through the evolution of specific psychological mechanisms that have over the millennia contributed to survival and reproduction.

**B. TAKING THE THEME FURTHER**

As just reviewed, social psychologists have devoted extensive research attention to two central issues of the embodiment of cognition: (1) the role of perceptual/motor systems (broadly related to approach and avoidance) in evaluations and (2) the interrelations of emotion and cognition. Although many issues remain to be explored within those domains, in this section we briefly mention other research directions related to embodiment that have scarcely been explored by social psychologists to date.

1. **Role of Perceptual Attributes in Stereotyping**

Recent research by Livingston and Brewer (2002) and Blair et al. (2002) shows that stereotyping is affected by continuously varying perceptual attributes (such as skin tone and facial features) as well as by a target’s category membership. Such findings falsify a model in which perceptual features are used only to access a social category (e.g., African-American or female), which in turn triggers the attribution of category-stereotypic characteristics. Instead, perceptually based processes affect stereotyping beyond the effects of category membership per se. Further investigation of this phenomenon might usefully apply the model developed by Barsalou and his associates (Barsalou, 1999b; Goldstone & Barsalou, 1998) regarding the important role of perception in all kinds of conceptual processing.

2. **Role of Motor Movements in Perception and Cognition**

Two research reports from areas outside social psychology illustrate further directions for exploration of the role of motor processes in perception and cognition, even aside from the approach/avoidance dimension. Bordanitsky and Ranscar (2002) noted that the abstract concept of time can be conceptualized with two different embodied metaphors. A person can be thought of as moving forward through time, or as staying still while time moves toward the person. The investigators noted that a statement like “the meeting was moved forward one day” is ambiguous, with its interpretation depending on the current metaphor (is a planned Tuesday meeting that was “moved forward a day” now on Monday or on Wednesday?). In a series of
studies, they demonstrate that people’s current bodily experience of space and movement (e.g., position in a cafeteria line, imminent departure on a journey) systematically affects their conceptualization of time and hence their interpretation of the ambiguous statement.

In a study by Bekkering and Neggers (2002), participants either pointed at or reached out to grasp target items defined by a conjunction of color and position among an array of distractor items. Because the grasping movement itself depends on position (whereas position is irrelevant to pointing), they predicted that participants would show more sensitivity to this attribute, indicated by fewer position errors in the grasping condition. Their predictions were confirmed. Color errors were equivalent between the conditions, as predicted, because color is relevant to neither pointing nor grasping. Thus, the type of action that is required for a target systematically tunes perceptual attention. Motor planning is intertwined with perception from the very beginning.

These studies simply illustrate some of the ways in which bodily experiences and behaviors influence our perception and conceptualization—beyond the issues of evaluation (and related approach/avoidance actions) and emotion-cognition interactions that social psychologists have studied to date. It would not be surprising if the embodied nature of cognition showed itself in effects of bodily movements and experiences on most or all of the types of behavior in which social psychologists are most centrally interested: in the ways we perceive other people, think about them, categorize them, feel attracted to them, form relationships with them, accept or resist influence from them, and so forth.

III. Cognition is Situated: Emergent from Interaction of Agent and Task and Social Environment

Since the passing of behaviorism, psychology and the cognitive sciences generally have been dominated by mentalist assumptions (Agre, 1997; Clancey, 1997a). Researchers focus on understanding “high-level” processes such as memory, thought, and decision making rather than “peripheral” processes such as perception and motor action. Cognition is considered a form of symbolic computation, with inner processes operating on stored mental representations of knowledge about the self and the world.

Mainstream approaches within social psychology have often shared these presuppositions. Thus, people’s thoughts and actions have been investigated as a function of their mental representations—their attitudes, impressions of other people and stereotypes of social groups, scripts and schemas, and so
on. The processes that operate on these inner representations are also assumed to be inside the head—systematic or heuristic processing of persuasive messages, activation or suppression of stereotypes, attributional inferences, and so forth. Social psychology is centrally concerned with the effects of the social environment on individual representations and processes, of course, but the environment has been conceptualized essentially as providing “inputs” to what remains very much an inner processing story. As Philip Agre has written,

Mentalism provides a simple formula that gives plausible answers to all questions of psychological research: put it in the head. If agents need to think about the world, put analogs of the world in the head. If agents need to figure out what might happen, put simulations of the world in the head. The tacit policy of mentalism, in short, is to reproduce the entire world inside the head. The sophisticated structures and processes [assumed by the mentalist approach] are not geared to living in the world; they are geared to replacing it (1997, p. 51, italics in original).

As part of a rethinking of these standard mentalist assumptions, the SSC approach assumes that social cognition and social action take place within a socially meaningful environment. The defining features or affordances (Gibson, 1966, 1979) of that environment are resources for, and constraints on, cognition. One implication of this point is that fine-grained interaction or coupling between the agent and the environment often obviates the need for detailed inner representations. The mentalist assumption is that we navigate through our social environment by drawing on inner representations such as scripts. We might be assumed to have scripts for eating in a restaurant or playing a baseball game, which specify what actions to perform in what sequence. Despite the familiarity and seemingly obvious intuitive validity of that claim (Schank & Abelson, 1977), a moment’s thought should make it clear that a script cannot possibly suffice to guide meaningful social behaviors. A meal cannot be successfully ordered without monitoring the waiter’s nonverbal signals (such as eye contact) that indicate appropriate conversational turns. Catching a fly ball cannot be done by following a generic “fielder” script, but only by monitoring the path of the ball as one runs to the spot where it can be caught. In other words, we certainly have conceptual knowledge about restaurant meals and baseball games, which we can draw on to comprehend simple story-like texts (which was actually the goal of Schank and Abelson’s [1977] original development of the script concept). But because of the inherently variable nature of the real social world, scripts or other inner representations can never suffice to direct appropriate and adaptive behavior. Behavior emerges from continual sensori-motor interaction with the world.
Summarizing this point, William Clancey holds that

Human behavior is situated because all processes of behaving, including speech, problem-solving, and physical skills, are generated on the spot, not by mechanical application of scripts or rules previously stored in the brain. Knowledge can be represented, but it cannot be exhaustively inventoried by statements of belief or scripts for behaving. Knowledge is a capacity to behave adaptively within an environment; it cannot be reduced to (replaced by) representations of behavior or the environment (1995, p. 229).

The socially situated cognition perspective requires a shift in theoretical focus: explanations of behavior cannot be based solely on the individual’s internal representations, but on the interaction of the individual with the social and physical situation. The idea that behavior flows from the inner states of the individual is deeply embedded in Western culture—not only in current theories of psychology. The image of the autonomous individual, who chooses action based on reasoning about his or her own preferences, attitudes, beliefs, and values, is very difficult to discard for a number of reasons (Clark, 1999a, pp. 16–19; Lakoff & Johnson, 1999, pp. 553–557). However, we must understand that ultimately this is a meta-theoretical assumption, not a scientific theory. If it is considered as the starting point for psychological theory, it has serious limitations.

Simple examples suffice to illustrate what is meant by behavior arising from interaction. Mataric’s (1991) robot, Toto, provides an early and important example in the situated robotics movement (Brooks, 1991). Toto is a small mobile robot with a compass, sonar-based distance sensors, and wheels. Simple logic circuitry creates connections between the sonar sensors and wheel motors. As Toto moves, if the sensed distance to the nearest wall becomes too small, the motor speed changes so Toto veers farther away. Conversely, if too far from the wall the motor speed changes make Toto approach it. The resultant behavior is following the wall around the room, one or two feet away from it. Note that this behavior does not reflect only Toto’s internal mechanisms but also the typical properties of walls (vertically oriented, tall enough, good reflectors of sonar, etc.). Note also that Toto has no explicit inner representation of what a wall is, let alone an explicitly represented goal to follow walls. Rather, the behavior emerges from the interaction between Toto’s specific hard-wired proclivities and the physical properties of walls. No conceptual analysis of the behavior can reasonably give a more central role to the agent’s wiring than to the environmental properties (Agre & Chapman, 1990).

In the situated cognition approach, the environment is a recipient of action as well as a supplier of inputs. In fact, a central insight of situated
cognition is that actions change inputs. As Toto moves, the sensed distance to the wall changes. In a social interaction, a person’s conversational comments shape what the partner says next. The environment is not a passive source of “inputs” but is interactive and responsive to the agent’s actions, in a process of “continuous reciprocal causation” (Clark, 1997). As Maturana and Varela (1987, p. 169) note, if the nature of the organism-environment interaction differs for different activities, there is no fixed set of “inputs” and “outputs” that furnishes a useful description across the board.

Thus, the theoretical focus must be on the interaction of agent and environment, rather than spotlighting the agent and especially his or her internal representations. This focus denies our natural tendency as observers to attribute behavior, especially goal-directed, adaptive behavior, to inner characteristics (plans, scripts, etc.) of the agent (Heider, 1958). These attributions are common even when the behavior actually emerges from interaction of the agent and the environment. Braitenberg (1984) has furnished compelling illustrations of this fact, by asking readers to imagine simple vehicles constructed of sensors and motors. For example, a vehicle with a light sensor controlling the speed of a motor will move quickly in the vicinity of bright light and slow down or stop in dark areas. Although the vehicle has no goals, emotions, or plans, observers are inclined to say that it “hates” light, “prefers” darkness, and “looks for” dark areas in which to “hide.” In fact, as far back as the 1940s, Heider and Simmel (1944) noted people’s tendencies to attribute goals and desires to even simple geometric shapes shown moving and interacting with each other.

A. SOCIAL PSYCHOLOGICAL CONTRIBUTIONS TO THE THEME

1. Communication as Socially Situated Action

Currently in social psychology, and consistent with the situated cognition perspective, communication is conceptualized as social action and not as the mere transmission of information from a source to a recipient, like a fax machine. There is a long-standing research tradition in social psychology that has shown the adaptive responsiveness of communicative, cognitive, and evaluative processes to the situated properties of communication contexts (Higgins & Semin, 2001).

As summarized below, this research supports four conclusions. First, communicators systematically take into account their audiences and formulate their messages by shaping them to the characteristics of their audience and their situation. The addressee is a full participant in how a message is shaped by the communicator (e.g., Krauss & Fussel, 1996; Zajonc, 1960) and
how the message is delivered (i.e., speech accommodation theory, see Giles and Coupland, 1991). Second, audiences treat communication as social action and do not simply decode the information transmitted in a message. They take the communicator and his or her characteristics into account in deciding why and how a message is formulated. They assume that the communicator shaped the message for the purposes of the audience and adjust their judgments to what they assume the communicator’s true beliefs may be (see Higgins, 1992; Krauss and Fussell, 1996). A third line of research shows how communicators flexibly and strategically use language to influence an audience (e.g., Maass, 1999; Semin et al., 2003; Wigboldus, et al., 2000). The fourth line of research shows that audience responses can influence a communicator himself or herself. Throughout these diverse research lines, the adaptation of communicative acts to the characteristics of the audience, the communicator, and their respective goals is the main theme, attesting to the socially situated nature of human communication.

a. Audience Effects on Communication. When people communicate they do not simply encode some information and then transmit it to a destination. Speakers take into account the social context of their communication when they are modulating a message (Semin, 2000b). The classic study demonstrating this was reported by Zajonc (1960) in what he termed the process of cognitive tuning in communication. This study showed that the communicative role (transmitter vs. recipient) and the purpose of the communication influenced both the perceiver’s cognitive representation and the nature of the communication, showing that both impression formation and message qualities were shaped by the communicative characteristics of the situation (see also Zajonc & Adelman, 1987). This theme is also found in the classic research on “saying is believing” initiated by Higgins and Rholes (1978). In these studies, speakers’ relationships were experimentally shaped to promote positive self-presentation or intimacy to a listener. Interdependence between communicator and recipient influenced not only the message people wrote, but also the communicator’s own beliefs. These and other studies (Higgins & McCann, 1984; Higgins, McCann & Fondacaro, 1982; McCann, Higgins, & Fondacaro, 1991) show that participants distort their messages in a way that is consistent with an audience’s attitudes. Thus, when another person is the topic of their message, speakers encode the same information about that target person differently depending on whether they think the audience likes or dislikes that person. Moreover, their impressions as measured at a later time are evaluatively consistent with the content of their message. Similarly, information that a speaker knows is shared with the audience influences what they include and exclude in their message.

b. Contextual Effects on Message Interpretation. The subtest of cues, if they provide information about a potential audience, can influence supposedly
fundamental and automatic attribution processes, as Norenzayan and Schwarz (1999) have shown. They demonstrated the context sensitivity of the fundamental attribution error by using the subtlest of cues, namely a research letterhead that read either “Institute for Social Research” or “Institute of Personality Research.” Participants gave causal explanations for a mass murder based on a newspaper report. They used more situational explanations and fewer dispositional ones in the former case, whereas the “Personality” context resulted in more dispositional causes: a stronger fundamental attribution error. Norenzayan and Schwarz (1999) suggest that the subtle letterhead manipulation of the communicative context influenced participants’ perceptions of what is epistemically relevant to the researchers. Again, this study shows that processes considered to be as stable, fundamental, and context-free as the fundamental attribution error can be incredibly responsive to subtle aspects of social situations.

c. Communicative Relevance Shapes Messages. Another set of studies show that the communicative relevance of a message contributes to the shape of what people say and think. An early example is a study by Carlsmith, Collins, and Helmreich (1966), which replicated and extended the classic Festinger and Carlsmith (1959) dissonance experiment. In the original experiment participants were paid $1 or $20 to inform a naive subject that a dull task that the participant had just performed was interesting and exciting. As is well known, when these participants are later asked to report how much they liked the dull tasks, participants who were paid $1 reported that they liked it more than those who were paid $20. Carlsmith et al. (1966) replicated this experiment, but asked half of the participants to write an anonymous essay (instead of informing a naive subject) describing the dull tasks as interesting. Only the experimenter would see this essay. While the original dissonance findings were replicated for participants asked to inform a naive subject, the anonymous essay condition yielded liking proportional to the financial incentive. “The response alternatives of the task-liking questions are associated with differentially evaluated situated identity attributions and subjects choose the most favorable one in each condition” (Alexander & Knight, 1971, p. 68). The situated responses when the audience is a naive subject versus an experimenter introduce different communicative relevancies and consequently different cognitive processes and responses to the “liking” variable.

Research by Semin et al. (2003) contrasted the influence on a message of the communicative context with that of psychological processes (expectations). Earlier research (see Maass, 1999) on the Linguistic Intergroup Bias has shown that in intergroup contexts, the linguistic properties of messages vary systematically as a function of cognitive (expectations) or motivational processes (e.g., threat to ingroup identity). The research by Semin et al.
(2003) showed that such systematic variations in the linguistic properties of messages only occur if participants expect that the message has a function (the addressee will actually read it). However, when the message has no communicative function, because participants are told nobody will read it, the message does not show any systematic variation in its linguistic properties. These results suggest that the bias is not due to context-free, automatic inner processes related to invariant linguistic expressions of different types of knowledge. Instead, cognitive and motivational processes are strategic and responsive to social (i.e., communicative) contexts.

d. Speaker Accommodation to Audiences. Several studies have shown that speakers adapt many verbal and nonverbal behaviors (e.g., linguistic, prosodic, nonvocal features including speech rate, pausal phenomena, phonological variants, smiling, gazing) to audience characteristics. For instance, Levin and Lin (1988) have shown how Watergate figure John Dean, when testifying before a U.S. Senate committee, adapted his median word frequency (a sign of formality) by converging to the median word frequency of the respective senators interviewing him. Similarly, Coupland (1984) showed how a travel agent converged phonologically to her individual clients, thus adapting to each client's communicative behaviors. These types of convergence increase perceived attractiveness, perceived supportiveness, and interpersonal involvement (Giles et al., 1987). For instance, Buller and Anne (1988) showed that when slow and fastspeaking participants were addressed at their own rates, they judged such interviewers to be closer and more intimate. Similarly, Putnam and Street (1984) showed that speakers who converge toward their interviewers in terms of speech rate and response latency are reacted to favorably in terms of perceived social attractiveness. More recently, similar behavioral convergences have been observed under the new label of the "Chameleon effect" (Chartrand & Bargh, 1999, see section above).

The communication research has also found that in situations of intergroup conflict, speakers may adopt divergence strategies, accentuating differences in communicative behaviors between self (ingroup) and others (outgroup). These can take very diverse forms (see Coupland & Giles, 1991). For instance, Bourhis et al. (1979), in experimentally controlled neutral and ethnically threatening encounters, have shown that when an outgroup speaker was demeaning toward the ingroup and used a strong outgroup accent, it led to polarization of ratings of ethnic in- and outgroup identity (see also Bourhis & Giles, 1977).

2. Contextual Influences on the Self

Social situations (including psychological experiments) are events in which people (participants and experimenters alike) convey a particular identity by their choice of actions (Goffman, 1959, 1961; Strauss, 1959). Such situated
actions are determined by the demands of a social context, which confers a specific meaning to actions and constrains the way actions express the individual’s identity. Any social situation entails a range of possible identities. The functional role in which participants find themselves in an experimental (or other) context therefore shapes processes of socially situated cognition. “The social context of the situation establishes the relative salience of attribution dimensions for impression formation. This implies that the basic contours of a social situation can be described in terms of the configuration of situated identity dimensions that are important for shaping an actor’s image” (Alexander & Knight, 1971, p. 76).

In line with these assumptions, McGuire, McGuire, and Cheever (1986, McGuire & McGuire, 1986) studied self-conceptualizations in contrasting social contexts (school and home) by examining the types of verbs that were used in the spontaneous (oral or written) self-descriptions provided by 7 to 17 year olds. Their analyses of the different narratives led to the conclusion that “even so individualistic and intimate an aspect of social cognition as the phenomenal sense of self takes different forms depending on whether it is evoked in the context of the family or of school, two major social worlds of childhood” (p. 260). For example, the findings showed that the sense of self is more passive in the family context and more dynamic or active in the school context. Furthermore, McGuire’s work shows that self-characteristics that are salient to a person are a function of the distinctiveness of this characteristic in a social context. Basically, this research shows that the types of categories (e.g., those relating to gender, ethnicity) that people deploy in spontaneous self-descriptions depend on the degree to which it is peculiar in one’s situated reference group. Thus, people are significantly more likely to mention their weight, their birthplace, their gender, or ethnic membership if they are heavier than the rest of your reference group, born in an exotic town, or are in a minority in their reference group regarding gender or ethnicity (e.g., McGuire & McGuire, 1980, 1981; McGuire, McGuire, Child, & Fujioka, 1978; McGuire & Padawer-Singer, 1976).

Crocker et al. (1991, Experiment 2) showed the contextual sensitivity of self-esteem by creating a context in which participants who are generally known to be targets of prejudice (black students) received positive or negative feedback from an evaluator on essays they had written. They were much more likely to attribute the feedback (positive or negative) to prejudice when the evaluator could see them (thus identify that the source of the essay was a black person) but not when they could not see them. This pattern did not emerge for white participants, irrespective of whether the evaluator could or could not see them. The theme of the situated impact of feedback on self-esteem is also demonstrated in studies on the self-esteem of overweight women (e.g., Quinn & Crocker, 1999). They are shown to be highly
susceptible to contextually activated (salient) ideologies. In other words, this research line by Crocker and colleagues suggests that the self-esteem of stigmatized individuals is a situated construction rather than an enduring individual facet (Crocker, 1999).

Some social contexts are externally given (e.g., school vs. home contexts, situations entailing communication or no communication, subtle cues such as the letterhead on a questionnaire). Other social contexts are those we create by our own actions as we publicly structure situations. Thus, another way of looking at social context is by considering the impact that our own public behaviors, as self-generated social contexts, have on our evaluations of our selves. There is a substantial research literature showing that externally induced behaviors influence the self concept, suggesting an “internalization” of the overt behavior (e.g., Fazio, Effrein, & Falender, 1981; Jones, Rhodewalt, Berglas, & Skelton, 1981; Markus & Kunda, 1986; Rhodewalt & Agustsdottir, 1986). The prominent explanations for this effect have invoked automatic, context-free cognitive processes, for instance that the self-concept changes “resulted from a change in the accessibility of particular self-conceptions” (Markus & Kunda, 1986, p. 865) that were activated by the self-presentation. Similarly, it has been argued that biased scanning, increasing the cognitive salience of specific traits, is responsible. However, in a series of studies, Tice (1992) showed that identical behaviors are much more likely to impact the self-concept when they are performed in an interpersonal context than when they are performed privately. Thus, when participants were asked to portray behaviors regardless of whether they possessed the trait, they internalized these traits when the self-presentations were highly identifiable but not when in relatively private conditions. This effect was shown not only on self-report measures, but also behavioral ones. These and other studies (e.g., Schlenker, Dlugolecki, & Doherty, 1994) show how the effect of behavior on self-evaluations depends on specific social contexts. The effect cannot be attributed to context-free, automatic inner processes such as an increase in accessibility of traits related to the self-presentation.

3. Contextual Influences on Responses to Others

Social contexts affect not only the self-concept and self-esteem, but also responses to other people and social groups. In particular, social contexts that lead people to think of themselves as members of a particular social group (an in-group)—such as the presence of out-group members or a situation of intergroup conflict—have pervasive effects (Turner et al., 1987). Fellow in-group members are liked, at an automatic or implicit level as well as on explicit self-report ratings (Mullen, Brown, & Smith, 1992;
Perdue, Dovidio, Gurtman, & Tyler, 1990), and as a consequence are treated favorably. In contrast, however, out-group members come to be seen as homogeneous (Linville et al., 1989) and are disliked and behaviorally discriminated against (Billig & Tajfel, 1963; Opotow, 1990). Thus, as shifting social circumstances—changing alliances, newly emerging intergroup conflicts—alter the salient lines of social categorization, entire configurations of judgments and behaviors toward other people will be likely to shift accordingly. Importantly, as a recent review by Blair (2002) has demonstrated, effects of social contexts on responses to other people (including attitudes and stereotypes) extend to implicit measures (response times, priming tasks, IAT measures) as well as explicit (self-report) measures. Social contexts alter our perceptions and reactions to others even at automatic, nonconscious levels, not only in terms of the overt reports that we make.

In addition to shared group memberships or group identification, other types of social contexts affect people’s responses to others. Social power influences many types of processes, including communication (Giles & Wiemann, 1987) and stereotyping (Fiske, 1993); people in positions of power stereotype their subordinates to a greater extent than the reverse. In addition, interdependence, as in close relationships, affects the ways people think about and evaluate their interdependent partners (Murray, Holmes, & Griffin, 1996; Murray et al., 2000). In all these ways, social psychologists have explored how the social ties and connections that link people affect their thoughts, feelings, and evaluations.

4. Situations as Cues for Behaviors

A powerful illustration of the role of the environment in driving action is provided by Gollwitzer (1999). These studies compare participants who form intentions to perform a specific action, either under instructions to think in particular about when and where the action will be done or without such instructions. For example, I might decide that on Election Day I will vote at the local fire station at 5 pm on my way home after work. Participants who form such specific situated intentions actually perform the planned behavior at remarkably higher levels than do participants who form the equivalent intention, but without reference to particular places or times. The difference is that the time and place—situational cues—can assist our memory and turn the behavior into more directly situated action, rather than leaving it to be driven only by relatively abstract inner plan representations. Clancey (1997a, pp. 97–100) analyzes computer interface designs in these terms, discussing the way that items on a screen (e.g., windows) can act as external reminders, or cues to intentions, facilitating the use of the computer system.
5. **Self-Attributions of Agency**

As sense-making and narrative-constructing creatures, we construct rationales and explanations for many things that we observe—especially those such as our own behaviors that is fundamentally important to us. When people introspect or reflect on their own behavior, they are often led to conclude that their inner representations and characteristics—their beliefs, goals, personality traits, values, and so on—are what cause them to behave in the ways that they do. These beliefs about the sources of our own behaviors are powerful and subjectively compelling. Yet, as we have just argued, the causes of behavior more frequently actually reside in the situation rather than within the person. How can we solve this puzzle? Social psychological research dating back to Festinger (1957) and Bem (1967) has demonstrated that our subjective experiences of our inner characteristics are often post-hoc rationalizations for our actions. That is, action comes first, and then through self-perception or dissonance processes, we infer corresponding inner characteristics such as traits, goals, or attitudes. Thus, the intuitive picture of a match between our internal states and our overt behaviors, which naturally seems like the strongest evidence that our behaviors were generated by those states, actually may not demand that conclusion at all (see Wegner & Wheatley, 1999). The observer-inferred (or self-inferred) traits, attitudes, or goals may seem to justify keeping the analytic focus on the individual. But the SSC perspective directs us to consider both the actual causation of the behavior, which may have been induced by specific though subtle environmental stimuli (e.g., Chartrand & Bargh, 1999), and the way the behavior leads to the post-hoc inference of corresponding traits.

6. **What Aspects of Situations Matter?**

As stated previously, cognition and behavior are, from the SSC perspective, caused by social situations in interaction with properties of the person. But the term *situation* is infinitely extensible—what particular aspects of situations are crucial for human social behavior? Social psychologists have much to contribute to answering this question. First, social psychologists have identified a small number of basic social goals and motives (e.g., Stevens & Fiske, 1995) that structure adaptive behaviors in social situations. For example, people seek to maintain self-esteem, to build close bonds of connectedness with others, to predict and control their environment, and so on. Hence, aspects of situations that cue these goals or signal that one or more of the goals are relevant are expected to be particularly influential over thought and behavior. Second, social psychological
research on personal relationships and group processes tells us about additional crucial situational factors. Personal relationships involve processes of commitment and interdependence (e.g., Agnew et al., 1998) and depend in important ways on the partners’ perceptions of each other (e.g., Murray et al., 2000). Group interaction depends on processes of conformity and norm formation (e.g., Sherif, 1936) and on social comparisons with relevant outgroups (e.g., Tajfel et al., 1971). Thus, these bodies of social psychological research translate rather directly into specific predictions about what aspects of situations will matter for social behavior. Cues about the relative status of an out-group, for example, can be expected to affect people’s behaviors when in groups, whereas other aspects of a situation, such as the color of the walls, should not matter in general.

In summary, the general thrust of many diverse studies is to show that environmental contexts—and particularly features of the communication context, including the relationship of the individual to partners, communicators, audiences, or fellow group members—are among the most important regulators of cognition and action. Human beings are capable of detached (“off-line,” nonsituated) cognition, contemplating situations that occurred long ago, imagining fictional or artistically constructed worlds, or planning for distant future events (Wilson, 2002). When we exercise these abilities, immediate social environments have less of a hold on our thinking (although we would not expect their effects to totally vanish). In most everyday situations, socially situated action emerges from the interaction of the agent and the environment and demonstrates an exquisite sensitivity to the relational and motivational implications of the environment. These studies’ demonstrations of context sensitivity contradict the notion that mental processes, such as the fundamental attribution error or attitude change through dissonance reduction, are invariant properties of our perceptual or cognitive systems. Instead, these processes are found to depend on specific features of the social environment (Carlsmith et al., 1966; Norenzayan & Schwarz, 1999), suggesting that they emerge as a function of the relational and communicative context of action.

**B. TAKING THE THEME FURTHER**

As the above review shows, social psychologists have developed several bodies of research and theory that are highly relevant to the assumptions of the situated cognition perspective. Yet in some ways, social psychology as a field has not fully adopted the assumptions of this emerging perspective. This section lists several ways in which some common assumptions demand rethinking.
1. Conceptual Knowledge is Situation Specific

If cognition and action depend on the details of specific situations, it follows that conceptual knowledge should not be represented in abstract, situation-free form but instead should be organized in terms of specific situations. This implies that conceptual knowledge takes different forms in different situations, consistent with the picture of situated cognition. Yeh and Barsalou (2000) have summarized a variety of evidence supporting this assumption. For example, people recall lists of words better in the same situation (e.g., the same physical room) in which they previously studied them than they do in different situations. Words also can be recognized better when they are presented in the same sentence context at test as at study. People can verify that specific properties are true of an object or concept much faster when the properties are relevant to the situation in which the object is presented than in a situation that makes the property irrelevant. Yeh and Barsalou (2000) summarize these and other forms of evidence for the idea that the agent’s current situation activates related conceptual knowledge, at the same time as concepts activate related situational information. Active conceptual knowledge always takes situation-specific forms. The authors argue that these aspects of situated cognition are highly functional, on the basis that using situations during conceptual processing is likely to improve prediction of the environment. This is because concepts are likely to continue to be relevant in situations where they were relevant on past occasions.

In contrast, social psychologists have often assumed that inner representations are abstract and context free—stored as prototypes, schemas, or rules, divorced from the specifics of the situations in which the knowledge was acquired and used.

2. Methodological Implication: Study How People Use Environments to Support Social Behavior

Because the environment can be part of our cognitive processes, it is natural to assume that we learn to actively manage the environment to ease memory or processing loads. As Kirsh (1995) has described, we do exactly this. We remind ourselves to buy more laundry detergent by putting the empty detergent box near the door so we will notice it when we go out. We physically cover up or hide things that represent tasks that cannot be done yet, avoiding distraction. We leave tools and materials where we can readily find them again. We physically group together a number of similar small items (e.g., pencils and pens) rather than leaving them individually scattered about, so that they are more readily perceptually locatable and identifiable.
All these and other tricks let us use our environment to offload memory (e.g., we do not have to recall information that is right in front of us) and choice (e.g., we do not have to decide what to do next if materials for the next task are right on top), saving cognitive resources.

The SSC approach prompts seeking explanations of behavior in such interactions between an agent’s “inner machinery” and aspects of the environment. Research using this approach assumes that “machinery and dynamics [i.e., behavior patterns] constrain one another: only certain kinds of machinery can participate in given kinds of dynamics in a certain environment. For example, an agent that always puts its tools back where they belong may need simpler means of finding those tools than an agent that leaves them lying about” (Agre, 1997, p. 62). Given this conceptualization, the principle of “machinery parsimony” becomes a key methodological guideline: “postulate the simplest machinery that is consistent with the known dynamics” (p. 62). This principle leads directly to a research focus on the ways that environments provide useful resources (supports, scaffolding) that can simplify an agent’s tasks. “Far from the Cartesian ideal of detached contemplation, real agents lean on the world. The world is its own best representation and its own best simulation” (Clark, 1997, p. 63, italics in original).

For example, social psychologists have often uncritically adopted the mentalist assumption that routine behaviors such as eating in a fast-food restaurant are driven by internal representations or “scripts” (Schank & Abelson, 1977). Considering the potential supports for behavior provided by the environment opens a profoundly different alternative viewpoint. The next time you are in a fast-food restaurant, notice that there are signs saying “Order Here.” Lines of customers may be waiting to be served. The cashier will ask, “May I take your order?” and at a later time state, “That will be $3.47, please.” In other words, simple language skills and a few general-purpose algorithms (stand at the end of a line; pay when asked for money) would suffice to guide one through the restaurant behavior. No overall script knowledge is necessary because of the plentiful environmental supports. Thus, one specific direction for research opened up by the socially situated cognition perspective is investigation of the ways social and physical environments support social behaviors that had been traditionally attributed to inner processes and representations.

3. Methodological Implication: Study Social Behavior in Context

If human behavior is sensitive to social situations and contexts, it follows that the situation cannot be ignored when social behavior is being studied. Sometimes the social psychological laboratory is regarded as a sterile, virtually
context-free setting for studying behavior, and thus superior to other more specific and limiting contexts (such as organizations or other field settings). In our view, this is a mistake. The laboratory is a social situation, and thus many aspects of it (such as the communicative relationships between experimenters and participants) affect participants’ responses, just as they do in any social situation. As noted earlier, for example, the fundamental attribution error may be specific to contexts that suggest that the experimenter is interested in personal dispositions as potential attributional responses (Norenzayan & Schwarz, 1999; Schwarz, 1994, 2000). Theoretically informed assumptions about socially situated action invite us to rethink experimental contexts, the goals of participants in our experiments, and the stimulus materials we use.

The true strength of the laboratory is not its supposed insulation of behavior from context effects, but its flexibility in allowing experimenters to construct very different types of contexts, suited to test different types of theoretical hypotheses. But a methodological implication of this way of thinking is that laboratory researchers should be mindful of the contexts and situations they are creating. The social context of the psychological experiment was a major concern of the field once before, in the 1960s and early ’70s. The focus was on demonstrating the contribution of unintended factors such as “demand characteristics,” or participants’ understandings of the communicative and other goals of the researcher, to experimental outcomes (Orne, 1962; Rosenthal & Rosnow, 1969; inter alia). This entire debate addressed, in our terms, the socially situated nature of experimentation. The lack of understanding (at that time) of the socially situated nature of cognitive and behavioral processes made it possible for these sources of variance to remain unnoticed. Such factors include the types of demands that are conveyed implicitly to participants, the influence of experimenter’s expectancies on outcomes, and the participant’s role (e.g., of being a good “subject”).

There is another way in which contexts have been overlooked and neglected in our methodological practice. Self-report measures are a mainstay of social psychological research, and they often ignore context by asking people (for example) to report their attitudes toward various objects without any context being specified, or to report their standing on various broad personality traits or affective states, again without context. Thus, a participant might be asked to indicate how favorably he or she evaluates Asians, or to state to what extent he or she is generally honest or happy. Although such measures are so often used and familiar that it may be difficult to see the problem, in fact by failing to specify a context they require the participant to develop one on his or her own. Should Asians be evaluated in the context of competitors for a limited number of jobs, for example? However, self-report
questionnaires need not ask general, context-free questions. We could ask participants specifically how they evaluate Asians as potential job competitors, how honest they are with close family members, or how happy they are when engaging in leisure activities. Or we could use experience-sampling methodology, beeping participants at selected times and asking them to report how happy they are at the moment, or how honest they were in their most recent social interaction. Or we could use scenario methodologies, describing specific situations and asking people to indicate how they would evaluate a social group member in that situation, or how honest or happy they would be.

Such methodologies seem to be required to assess theories that emphasize the role of context in people’s thoughts, feelings, and behaviors. Reliance on general self-report questions that ask people to make summary judgments without specifying context does not simplify theory by ignoring an irrelevant but complicating factor. Rather, such reliance may complicate theory by introducing arbitrary variation as different participants select different contexts to anchor the questions and give them meaning, as well as by denying researchers the opportunity to systematically investigate the consequences of varying contexts on whatever is being measured.

IV. Cognition is Distributed Spatially and Temporally Across Tools, People, and Groups

The fourth major theme of the SSC approach is that cognition is distributed. Cognition not only takes place within individual brains, but also makes use of tools and other artifacts, aspects of the environment, other people, and groups. Indeed, the social psychologist Thomas M. Ostrom argued in 1984 that all cognition is inherently social, thus challenging a purely individual-centered view of information processing. The evolution of human society in general and individual functioning in society cannot be understood properly unless we conceive of knowledge as a cumulative process that is distributed and preserved by diverse means. Such means include physical tools (such as compasses, hammers, and calculators), the structuring of the physical environment (road signs, the architecture of restaurants, and post offices), and the distribution of knowledge across people and groups (car mechanics, navigators, programmers). Of course, for agents to be able to “lean on the world” (Clark, 1997), they must be able to access, coordinate, and synchronize distributed knowledge to solve specific problems. This means that agents have to have access to shared or common knowledge and to tools (e.g., language) that enable “social coupling”
(Semin, 2000a). This is not a mere passive uptake of knowledge but a two-way interaction, either between agents or between an agent and the physical environment or physical tools. These constitute some of the central themes addressed in this section.

A paradigm example of distributed cognition is Hutchins’ (1995b) analysis of “how a cockpit remembers its speeds.” The cockpit is that of a commercial airliner, and the speeds that need to be remembered are those at which specific types of flight maneuvers can take place (e.g., flaps can be extended). The relevant memory system includes the pilot and copilot, who maintain a division of labor between them (one performing the demanding task of flying the airplane on a runway approach, the other calling out relevant speeds). The memory system goes beyond these two interacting individuals to include external mechanical memory aids as well, such as movable indicators (“speed bugs”) that mark specific zones on the face of an air-speed indicator on the control panel. Hutchins persuasively shows that all of these elements can be usefully analyzed as a single memory system—that the cockpit (not the pilot) remembers his speeds. The idea that cognitive processes such as memory can extend outside the head may seem odd if one holds to a definition of the “cognitive” that draws the line a priori and says that only brains can take part in cognitive processes. Yet such a definition is problematic. By focusing only on unaided brains (i.e., ruling out external artifacts like a calculator), it rules out language too—also an artifact. In fact, this definition of cognition is even more restrictive than a definition that equates cognition with information processing; certainly other things besides brains (e.g., calculators and computers) can process information. The situated cognition perspective does not state that brains are irrelevant, but holds that cognition as preparation for adaptive action emerges from the interaction of brains, bodies, and the world (Clark, 1999b).

There are numerous examples of the way agents “lean on the world” to simplify their inner processing requirements. Most have been investigated by cognitive scientists and others outside of social psychology. These examples include the distribution of complex tasks across group members (Hutchins, 1995a), the fact that direct observation can often usefully replace complicated deductions (Brooks, 1991; Kirsch, 1995), the provision by cultures of linguistic and representative schemes that support complex forms of cognition (Latour, 1986), and the ways common artifacts (pencils, forks, scissors) provide readily perceptible cues to their functions (affordances; see Agre, 1997, p. 225). In social psychology, study of the distributed nature of cognition has focused on how cognition extends outside the isolated individual and includes people or groups. Complementarily, there is a long-standing social psychological interest in the socially shared nature of knowledge. We turn first to these domains.
A. SOCIAL PSYCHOLOGICAL CONTRIBUTIONS TO THE THEME

Social psychology has made substantial contributions toward understanding the socially distributed nature of knowledge, by elucidating how cognition is distributed over individuals and groups and how it is possible for people to lean on such social resources. Moreover, the issue of how distributed knowledge is accessed and used has also been a focus. Recent years have seen increasingly articulated social psychological analyses of what it means for cognition to be social, distributed, and shared (Caporael, 1997; Levine, Resnick, & Higgins, 1993; Resnick, Levine, & Teasley, 1991; Schwartz, 1996) and what group cognition may entail (Kerr et al., 2000; Ruscher & Duval, 1998; Tindale & Kameda, 2000; see for a general review: Thompson & Fine, 1999). Some of these concerns have been of long-standing interest in social psychology. For instance, the issue of how socially shared reality emerges in social interaction has long been at the core of social psychology (e.g., Asch, 1955; Festinger, 1950; Sherif, 1936), continuing to today (e.g., Hardin & Higgins, 1996). There is a growing acknowledgement across these diverse theorists of the importance of understanding what it means for human interaction to form a common reality. Nevertheless, these approaches still remain “an orientation or perspective” (Thompson and Fine, 1999, p. 280) rather than an integrated theory with a body of systematic empirical results.

Social psychological contributions cluster around two broad subjects: (1) that cognition is socially distributed and preserved and (2) that cognition is socially shared. These two subjects are complementary. Although it may be self-evident that knowledge is distributed, it is equally important to understand how distributed knowledge is coordinated and used. Knowledge distributed across multiple individuals has to be somehow synchronized or linked to be used. Socially shared cognition provides the means to couple distributed knowledge to implement situated action, such as the cooperative activities of a group of experts (e.g., a heart surgery team). The following sections presents these twin themes: the socially distributed nature of cognition and socially shared cognition.

1. Cognition is Socially Distributed and Preserved

Many important tasks are difficult, time consuming, or even impossible for unaided individuals. In such cases, we lean on knowledge that exceeds the capacities of the individual. This gives rise to a number of complex problems that we solve by means of distinctive tools (artifacts). For instance, we have compasses, computers, and calculators. As discussed later, these
tools allow us to solve problems without having to fully apprehend the knowledge that has gone into their production. All we need to know is the causal relationship between the tool and the goal we wish to achieve.

For tasks that exceed the capabilities of an individual, we can use the concerted action of a number of individuals—as in performing heart surgery or navigating a large vessel. In such instances, we lean on others to solve problems. The ways in which such tasks are performed show a number of distinctive characteristics. Obviously, complex tasks that supersede individual capabilities mean that each individual in such groups or teams possesses unique and specialized knowledge. We do not need to know anything about the specialized knowledge that the other members of the team possess. However, we need to coordinate this socially distributed knowledge to execute complex tasks efficiently and effectively. Although each team member does not need to know the specialized knowledge that is distributed, it is essential for the execution of the task that each has shared knowledge by means of which it is possible to deploy specialized knowledge. Shared knowledge is therefore akin to knowing the causal relationship between a tool and the goal that has to be achieved by the use of that tool, rather than knowing the knowledge that has gone into the shaping of that tool. For instance, a heart surgery team consists of diverse experts (the surgeon, the anesthetist, etc.), each with his or her specialist and unshared knowledge bases relevant to the performance of the operation. Yet, the team also shares knowledge about their joint activity, as well as how to coordinate and synchronize such activity. Thus, while some knowledge is distributed across diverse individuals to constitute the scaffold for joint action, other types of knowledge (when to do what, the general purpose, etc.) must be shared to coordinate and synchronize the sequential execution of diverse tasks.

Interpersonal communication is of the essence for a smooth and relatively flawless execution of joint action. Cooperating individuals must frequently exchange requests, instructions, corrections, and so on to ascertain that the activities are coordinated and matched. Thus communication provides the means by which the progress of the task and the coordination of actions are kept in constant check and the sharedness of joint reality monitored. A further feature of shared knowledge is time. Because the performance of shared tasks always has a sequentially organized structure, the coordination of the activities of a number of people takes place over a temporal horizon.

One example of socially distributed cognition is carefully analyzed in Hutchins’ work (1995a) on a task that exceeds the capabilities of an individual: navigating a large Navy ship. The task is cyclical and involves processing complex, socially distributed information. It is performed by several individuals who play discrete roles (reading a timepiece, identifying a landmark, communicating a bearing, etc.) and using physical and computational tools
charts, protractors, compasses, etc.). The task is accomplished by a sequence of actions that occur as different individuals coordinate their activities and draw on each other’s specialized information to establish knowledge that supersedes each individual’s unique knowledge. In all these cases (heart surgery or navigating a large vessel), the human organism interacts with external entities (other people or physical objects) to perform a task. If the task is a cognitive one (navigation, decision making, heart surgery), then we can say that cognitive processes “extend out beyond the individual” in the sense that the causal role played by aspects of the external environment are fully equal to the causal role played by the agent’s internal states and processes. “Remove the external component and the system’s behavioral competence will drop, just as it would if we removed part of its brain” (Clark & Chalmers, 1995, p. 4).

The manner in which people provide external scaffolds for each other has been investigated in Wegner’s (1995) work on transactive memory systems. This work shows how memory becomes progressively specialized, socially shared, indexed, and complementary in interdependent groups. When interdependent individuals (e.g., a couple) communicate with each other and share information, they coordinate their respective memory expertise that gives rise to a qualitatively different memory system. Individuals can refer to information stored by another person as a type of external memory. Put another way, the cognitive powers of the individual mind are enhanced by socially available and accessible scaffolds. One has access to the information available in another “system” (i.e., individual memory) by knowing that the other has the relevant item and by addressing that individual to retrieve it. Thus, this interdependent system is able to supply a more elaborate memory than that of any individual member (Wegner, 1995). Transactive memory is a system that is irreducible, operates at the group level, and depends on a distribution of specializations within this system, as in the case of partners (Wegner, 1995).

Other social psychological research examining how distributed knowledge is used has been conducted with decision-making groups. This research has predominantly used groups of individuals who are not explicitly differentiated in terms of their knowledge or expertise. (It is important to note that this stands in contrast to the groups involved in navigating a large vessel or performing heart surgery, where individuals are socially differentiated and marked for their expert roles.) In undifferentiated groups the coordination of available expertise (distributed knowledge) has been repeatedly shown not to be efficient, due to a phenomenon known as the common knowledge effect (Gigone & Hastie, 1993, 1997; Tindale & Sheffey, 2002). These studies show that if an item of decision-making information is widely shared prior to group discussion, then this shared information has a greater impact on the
group judgment. These and other types of studies show that under specific circumstances groups do not effectively share all the information relevant to solving a problem (see also Stasser, 1992; 1999; Stasser & Stewart, 1992).

2. Socially Shared Nature of Cognition

Deploying knowledge that is distributed across the members of a group or a team requires coordination or synchronization through “social coupling” in a two-way interaction (Semin, 2000a). Social coupling is achieved by means of communication, involving the use of diverse social conventions and in particular the use of language. Communication constitutes purposeful social interaction, takes place in a social context, and is regulated by social rules and conventions (e.g., regarding language use) that are deployed to establish a shared reality and to attain individual goals (e.g., Austin, 1962; Grice, 1975; Higgins, 1981, 1992; Krauss & Fussell, 1996; Searle, 1969). Synchronization between speaker and addressee requires conventions to regulate the sequential flow of conversation. Conversationalists concurrently access a set of tacit conventions or maxims. These maxims are derived from the unspoken principle of cooperation, by means of which intended meaning is achieved in communication (Grice, 1975, 1978). The roles of speaker and addressee reverse in a turn-taking process regulated by conversational conventions signaling turns (Sacks, Schegloff, & Jefferson, 1974). These are but some of the conventions that contribute to establishing socially shared meanings or realities. These conventions have evolved to regulate the speaker–addressee relationship.

A substantial amount of social psychological research addresses how social coupling and shared reality are achieved. The synchronization of conversation between speaker and addressee involves monitoring the perspective of the addressee (e.g., Fussell & Krauss, 1989a,b, 1991; Krauss & Fussell, 1988; Shober, 1998), which influences how a message is shaped. Studies by Krauss and colleagues (e.g., Fussell & Krauss, 1989a,b) using a referential communication paradigm examine message design as a function of addressee characteristics. These types of studies illustrate how perspective taking influences the linguistic features of messages and how these in turn influence communicative accuracy. Considerable groundwork is necessary to achieve intersubjectivity (Rommetweit, 1974; Schütz, 1962). One of the ways in which this is accomplished is by monitoring whether or not common ground is established with the addressee (e.g., Clark & Shober, 1992; Clark, Schreuder, & Buttrick, 1983). To this end a number of typically linguistic strategies are used to coordinate joint reference to objects and events in a communicative setting (e.g., Clark, 1992, 1996; Krauss & Fussell, 1996).
Language is the main vehicle in the coordination and synchronization of two-way interaction. Language is distinctive in that it constitutes a stable type of knowledge that is shared by all to establish an intersubjective (Schütz, 1962) or shared reality. Whereas meaning is initially unshared and subjective, word meanings, syntactic rules, and conversational conventions must be shared to create an “objective” or intersubjective reality (Rommetweit, 1974; Schütz, 1962) without which communication could not be accomplished. In order to be able to communicate an intention, experience, idea, wish, or desire, I must access a medium that is “objective,” namely shared and detached from each and every person. In Vygotski’s terms: “In order to transmit some experience or content of consciousness to another person, there is no other path than to ascribe the content to a known class, to a known group of phenomena, and as we know this necessarily requires generalization. Thus, it turns out that social interaction necessarily presupposes generalization and the development of word meaning, i.e., generalization becomes possible with the development of social interaction” (Vygotski, 1956/1987, pp. 48–49). As a whole, communication involves drawing on shared resources thereby enabling the coordination and synchronization of those processes by which it is possible to share or pool knowledge distributed across members of a group or a team or to convey potentially novel and unique meanings (Semin, 1995, 1996).

Finally, for recurrent social or task situations (e.g., navigating a large vessel or performing heart surgery) participants have a representation of the overall cycle of activities to be performed, including the respective distributed roles and temporal ordering constraints for role-related activities. Such generalized knowledge, which has a managerial function, does not require detailed knowledge possessed by the respective specialists in a team or group. We do not need to know the workings of the post office to use it effectively to send a letter to its destination, and the post office does not need to know the specific purpose behind our letter. Nevertheless, our roles are coupled to achieve the aim of delivering the letter at the designated address by means of diverse environmental markers/devices (see next section for detail), such as post boxes in public places, our representation of the postal system and its general function, and so forth.

Many important tasks also have external agents who maintain the representation of an overall cycle of activities. These agents (captains, managers) may have no specialized function within the task, but may be responsible for coordinating distributed knowledge by prompting individual actors when necessary to perform the right act at the right moment, and so forth. Thus, diverse means are available to coordinate cognition that is distributed across agents. These range from socially shared representations (Moscovici, 1984) of specific situations (e.g., navigating a large vessel) to socially designated
roles for diverse agents, including that of a master of ceremonies (captain or manager) who oversees the coordination of the diverse situated actions. Finally, there is extensive corrective communication to steer the course of jointly created public knowledge in the right direction (Hutchins, 1995a).

B. TAKING THE THEME FURTHER

Social psychological exploration of the socially distributed nature of cognition can be advanced by incorporating additional features of distributed cognition. Cognition makes use of tools and other aspects of the individual’s environment, aside from people and groups. Moreover, to lean on people and groups, tools (e.g., language) are also needed to coordinate and synchronize social interaction. Precisely how this is achieved has not been addressed extensively within social psychology. Despite the considerable interest in socially shared cognition (e.g., Resnick, Levine & Teasley, 1991) and shared realities (Hardin & Higgins, 1996; Higgins, 1992), the ways they are established and the purposes they serve is not addressed, nor is there any consideration of the use of tools (e.g., language) by means of which individual behaviors are coordinated and synchronized. This, in fact, is a general issue for this emerging field. For instance, Caporael (1997) notes that: “The role of artifacts in distributed cognition and shared reality has not received much attention in social psychology” (p. 290). As she further notes, “Hardin and Higgins (1996) made virtually no mention of the role of artifacts in constituting socially shared reality” (p. 290).

As a conceptual approach to these issues, consider that tools, in A. Clark’s (1997) terms, provide scaffolds for cognitive activity. For instance, to multiply two five-digit numbers, which most of us would not be able to perform mentally, we use paper and pencil as tools. Such tools provide scaffolds by downloading knowledge and releasing cognitive space for the performance of other practical tasks (see also Vygotsky, 1978). Scaffolds can take different forms. The availability of practical tools such as hammers, scissors, and drills, provide mechanical scaffolds to achieve solutions, which would otherwise be difficult if not impossible (e.g., by using a stone instead of a hammer). Language as a tool fulfills the same function. Take, for instance, a task-oriented group, such as the crew of a ship (cf. Hutchins, 1995a). The synchronized and coordinated communication between the different crew members is intended to structure collective action such that a constantly monitored and publicly shared cognitive state is achieved. The socially distributed knowledge between crew members in its public coordination, as well as physical tools such as charts and compasses, in which knowledge is literally embodied, become scaffolds for the successful navigation of a ship.
Thus, when cognitive activities are distributed across space, but also in any simple communication, language becomes an indispensable resource to structure a recipient’s cognitive properties (Semin, 2000a). This section considers issues that remain wide open for social psychological investigation, regarding the nature and cognitive properties of tools and of language.

1. Properties of Tools

Tools provide a clear illustration of the distributed nature of cognition. Tools include not only physical tools (like scissors or hammers) but also what we might call computational artifacts (computers, calculators, maps, and charts), and communicative tools (language, symbolic notation for music or math). What is the significance of tools, and the ways they ease and enable cognition, in the context of socially situated cognition? The evolution of human society as it is known today is based on the invention of tools that extend our sensorimotor and cognitive abilities (Preston, 1998). It is impossible to think of current human existence without the aid of tools.

Tools are products of complex cognitive efforts to find adaptive solutions to problems. They emerge historically as standardized solutions to recurring problems, such as driving a nail into hard material, navigating a vessel over open water, or transmitting ideas or requests to other people.

Tools ... are feats of centuries of engineering, (and) are not only the products of collective experience and knowledge, they also (preserve and) represent this knowledge. These special tools contained the distilled knowledge about the relation between a task and the best fit between a task or a goal and human propensities (e.g., physical propensities such as moments, handling, and vision. ... Tools have properties that have been engineered to optimize their use in a variety of contexts or practical domains. For instance, in the case of hammers, the tool has a shaft and a peen, a hard, solid head at a right angle to the handle; depending on their functions, hammers can also display other properties. One such property is a claw on the head for extracting nails, which typically appears on carpenter’s hammers. A tool’s properties are distinct from its affordances, the variety of things that one can do with it or its uses. (Semin, 1998, p. 230–231, emphasis in the original)

Tools embody solutions to problems in that their properties emerge adaptively for the specific problem at hand. Tools allow socially situated cognition to take place by delegating processing demands to external aids, scaffolds, and resources. Tools also preserve the functional knowledge that shapes their structure. Thus, while a solution means finding a means to unravel a problem, the means by which this is achieved is also preserved in the tools that are created for the solution. Thus, not only the architecture of
our minds and bodies but also external resources or tools are used by and therefore constrain human cognition.

2. Coupling Humans and Tools

All tools (language, symbolic notation for music or math, scissors, hammers, and pliers, etc.) are designed for the specific problem for which they have been developed. They are practical aids to solve recurrent situated problems. By definition, all types of situated action requires a two-way interface between human embodiment and the nature of the problem, whatever it may be (e.g., cutting a piece of paper neatly, driving a nail into a piece of wood, declaring a contract null and void). Thus, scissors, hammers, pliers, and language have particular forms and properties that emerge for the type of situated problem they have been designed to resolve. They are also adapted to the corresponding parts of the human body. Scissors provide an illustration of this dual adaptation (Clark, 1997; Semin, 2000b). One part of a pair of scissors is optimally suited to the particular anatomical and motoric makeup of the human hand. The other part is perfectly designed for cutting a sheet of paper neatly. The unique quality of such tools is their two-way adaptation. Tools are dually adapted to the constraints of embodiment and to the distinctive features of the object or problem.

The dual adaptation principle, although perhaps more difficult to visualize than with hardware tools, also applies to tools such as language and symbolic systems. For instance, some argue that the reliance in early Greece on the use of ordinary language and an algebra that used letter symbols to represent unknown quantities stunted algebraic development in that civilization (Seanger, 1997). Adaptation of Arabic numerals changed this. “Effective mathematical notation allows a maximum amount of information to be unambiguously displayed in foveal and parafoveal vision” (Seanger, 1997, p. 132). Similarly, musical notation underwent a major change in the eleventh century after its early emergence around the eighth and ninth centuries. “Neurophysiologically, both the new musical and new textual formats presupposed a broad eye-voice span and the extensive use of parafoveal vision in the left visual field to perceive the forms of melody, words, and word groupings” (in Seanger, 1997, p. 141). The shift from scriptura continua (continuous writing without any spacing) to the introduction of differential spacing between the letters in a word and between words during the Renaissance was a crucial technological innovation that was responsible for the emergence of silent reading (Saenger, 1997). This is another instance of how specific tools (writing) are gradually adapted to human processing constraints to facilitate rapid and silent reading, a prototypically cognitive skill.
Because tools are the products of dual adaptation, they carry information about the types of constraints that are introduced by our brain-body make-up. Thus, the shape of a scissors handle is an adaptation to the particular grip that is the most efficient way of distributing pressure by the hand. The particular spacing between letters in a word and between words is informative of the facilitatory link between perceptual processing, reading, and text comprehension. As these examples illustrate, systematic examinations of tool properties can be informative about both psychological and task constraints that have contributed to the shape of the tools in the first place. Moreover, understanding the properties of tools is also highly informative about how the agent is coupled to the problem or task, because the choice of tool is indicative of the type of relationship or interdependence between agent and task. These relationships point to entire research agendas for social psychology. As one example of this type of analysis, research on the linguistic intergroup bias (Douglas & Sutton, 2003; Semin et al., 2003) demonstrates that people’s choice of linguistic forms (as a tool) reflects specific cognitive and motivational processes such as intergroup relations.

3. No Expertise Required for Preserved Knowledge

As users of tools, we do not need to know anything about the knowledge that has gone into the production of the tool. All we need to know is the causal relationship between the tool and the goal we want to achieve. If we want to communicate with a long-lost friend, all we have to do is write a letter and deliver the duly stamped envelope in a mailbox, which will take it to its destination. We do not have to know the machinations of the postal system or the particular person(s) who will be handling our letter. Alternatively, an e-mail is enough. We do not have to know anything about the machinations of our computer or the Internet. Similarly, we do not have to reinvent a hammer or a pair of scissors, or language, syntax, and semantics. In other words, the complex cognitive and practical knowledge that has gone into the production of the tool is downloaded into the tool. The significance of this conclusion is that considerable cognitive load can be avoided or delegated to external devices that are manageable with minimal manipulative skills. At the same time, the very fact that such downloading takes place changes human mental processes. As Vygotsky has argued, the development of such tools changes the structure of social events. “It does this by determining the structure of a new instrumental act just as a technical tool alters the process of natural adaptation by determining the form of labor operations” (Vygotsky, 1978, p. 24).
4. Methodological Corollary: Understand the Properties of Tools

Since tools are used to aid cognition, their properties also constrain and influence cognition. This becomes a key methodological point from the SSC perspective. The primary tool from this viewpoint is, of course, language. Two aspects of language in particular have a great impact on situated cognition: properties of linguistic representations in themselves, and the general conventions of communication.

The SSC perspective holds that cognition is distributed across inner mental processes, the tools by which cognition is implemented (e.g., language), and the environment as a scaffold (e.g., as a memory aid). Therefore properties of those tools may contribute to regularities in observed behavior—regularities that may be mistakenly attributed solely to inner processes. As a central example, the widespread use of textual stimuli for psychological research means that we are perpetually in danger of having our studies identify properties of text and mistakenly interpreting those as properties of mental representations and psychological processes. A typical illustration of this is found in the social psychological research on the causality implicit in interpersonal verbs (Brown & Fish, 1983). The general phenomenon is the following. Take two sentences, which vary only in terms of the verb—namely, “John helped David because he is kind” and “John likes David because he is nice.” The general finding is that the types of verb systematically disambiguate the ambiguous personal pronoun “he” to either the sentence subject (John in sentence 1) or to David (in sentence 2). A large body of social psychological literature (see Semin, 1998, 2001 for reviews) has treated this as a phenomenon that has to be explained in terms of cognitive processes. The simple fact that this phenomenon is a particular cognitive property of interpersonal verbs rather than a specific cognitive process is a much more parsimonious and situated explanation. Conceptually, this explanation implies treating language as a tool with specific properties that is used as a structuring resource for communication purposes, rather than treating language and language-driven processes as purely intraintividual phenomena (Semin, 2000b). In this situated perspective the choice of a particular verb over another becomes informative about how a speaker intends to structure the representation of an event and its reception by a listener.

Another example showing that the properties of language can be mistaken for properties of psychological processes is found in a replication of Asch’s classic impression formation studies (1946). Semin (1989) used a dictionary of synonyms and antonyms to compute the semantic overlap between the different stimulus sets (including warm, cold, polite, blunt) and the response scales used by participants in the studies. By developing an index of the strength of semantic associations between the composite stimulus sets and
the response items, Semin was able to show that the distinctive patterns obtained in actual Asch data could be replicated simply by using a dictionary and no subjects. There was a 90% overlap between the dictionary-derived index and the Asch data. This finding suggests that our studies are often examining regularities of the types of tools that we use, particularly language, rather than regularities related to psychological processes. To put it bluntly, as Clancey (1997a) did: If you give research participants textual stimuli, you should be prepared to find results that suggest they have texts inside their minds.

5. Language as a Tool

Social psychologists might profitably undertake a more systematic examination of the properties of tools or artifacts and the role these tools (language, inter alia) play in the creation of intersubjective reality. Some of the issues raised include examining more specifically collectively shared constructs, such as collective identity or shared world views, that organize (and are organized by) lower-level activity (Caporael, 1997). The social nature of cognition is probably most evident when we use such external resources such as collectively shared constructs, but the point is equally valid when such social structures have been internalized (Vygotsky, 1986). These considerations are very akin to thinking about syntax and language use. Examined more deeply, any use of language has two aspects. One is the communication of meaning and the other is a structure that carries this meaning. Whereas the former is subjective, the latter is intersubjective—for example, in order to be able to convey meaning that is initially unshared or subjective, word meanings, syntactic rules, and the like must be shared. Language use then amounts to drawing on shared structure to convey a potentially novel and unique meaning. Language use not only transmits meaning, but in addition reproduces and reinforces the structure (syntax and semantics).

The same structure can carry a whole host of communicative contents for a great variety of actors. Although the structure is determinate in terms of its properties (specified by semantic and syntactic rules), its affordances and potential uses are indeterminate (Semin, 1998). The analogy here is between language and speech on the one hand and tool and tool use on the other (Semin, 1996). The tool metaphor in itself is not new (see Vygotski, 1978; Wertsch, 1998), nor is the distinction between language and speech (deSaussure, Mead, Riceour, inter alia). What is new in our proposal is that each and every human communication has two interrelated fundamental features, namely (1) the reproduction of a structure, without which (2) meaning could not be conveyed (Giddens, 1976). Where the tool and tool use analogy falls
short (in particular in the writings of people from the sociocultural school, e.g., Wertsch, 1998) is that while literal tools have a real existence independent of their use, the tools of communication (language) do not have an existence independent of communication. They are reproduced in communication. In terms of social behavior, the fact that I utter a sentence in English contributes to the reproduction of English as a language. This, as Giddens notes (1979), is the unintended consequence of uttering that sentence.

Language is the prime example of a social resource that structures, shapes, and regulates our internal processing. For instance, children “talk” to themselves silently or aloud in ways that improve their self-regulatory abilities and task performance (Clark, 1997). From time to time we all subvocally rehearse verbal self-instructions as we perform tasks that are not yet well learned. “Public speech, inner rehearsal, and the use of written and online texts are all potent tools that reconfigure the shape of computational space. Again and again we trade culturally achieved representation against individual computation. Again and again we use words to focus, clarify, transform, offload, and control our own thinkings. Thus understood, language is not the mere imperfect mirror of our intuitive knowledge. Rather, it is part and parcel of the mechanism of reason itself” (Clark, 1997, p. 207). Language is fundamental to social influence.

6. Reconceptualization of Role of Culture

The SSC approach also offers a principled understanding of the nature of culture and its relations to cognition, an increasingly important area of social psychology (Schwarz, 2000). Culture is not just a body of knowledge that is represented in the environment and learned by an individual. Rather, culture is a body of practices. “The idea that knowledge is a possession of an individual person is as limited as the idea that culture is going to the opera. Culture is pervasive; we are participating in a culture and shaping it by everything we do . . . Knowledge is pervasive in all our capabilities to participate in our society; it is not merely beliefs and theories describing what we do” (Clancey, 1997b, p. 271). This perspective puts culture in its true role as one of the central constraints on situated and adaptive action—and hence gives it a central place in socially situated cognition.

An important defining feature of culture is given by tools and their use. Of course, tools, broadly speaking, are the distinctive feature of humans beings as a species. Importantly, tools carry cultural information and shape the historical and cultural range of things that are possible in socially situated cognition and action. As Tomasello and Rakoczy (2003) note: “. . . such things like languages, symbolic mathematics, and complex social institutions are not individual inventions arising out of humans’ extraordinary individual
brainpower, but rather they are collective cultural products created by many different individuals and groups of individuals over historical time” (p. 121). It is therefore not surprising that cognition is historically, socially, and culturally contextualized in its situated expression. This view is shared in a number of converging schools of thought (e.g., Cole, 1996; Tomasello, 2000; Wertsch, 1998), which owe their intellectual heritage to Vygotsky (1962/1986). To the extent that all action takes place by means of tools that mediate between people, all action is culturally and historically situated. Reversing this line of thought suggests that a proper analysis of tools and their use can provide insights into culture (e.g., Semin & Rubini, 1990; Semin, Görts, Nandram, & Semin-Goossens, 2002).

The SSC approach also leads to entirely different ways of conceptualizing and investigating the age-old problem of the relationship between language and thought and consequently on the influence of cultural differences in lexical and grammatical categories. The classic example is the following question. If two cultures linguistically code the color spectrum differently, do they then perceive and represent colors incommensurably? The classic take on this problem has been an individual-centered one (e.g., Hardin & Banaji, 1993; Hoffman, Lau, & Johnson, 1986; Hunt & Agnoli, 1991). In contrast, a SSC approach to this problem treats lexical and grammatical categories as resources (tools) in a social context. When language is considered as a tool for action, it becomes a structuring resource for communication purposes. This changes the nature of the problem regarding the language-cognition interface dramatically, into one concerning how speakers’ language use influences listeners’ representation of some reality. Language and its use are always intended to influence thought. But the classic individual-centered representational conceptualization of the problem uses a specific methodological angle in which participants are always put into the listeners’ role (and not speakers). Methodologically, both the speaker and listener perspectives need to be taken into account if we are to understand the relationship between language and cognition by highlighting the effects of motivated communication as a structuring resource.

As a methodological corollary, one should seek cultural differences in situated practices, not in mental contents. The implication of this view of culture is that cultural differences are in the first place differences in repertoires of socially situated action, rather than just differences in inner representations. Such an emphasis is clear in the recent work by Hong et al. (2000) on their “dynamic constructivist” approach to culture, which argues that thinking and acting as a member of a given culture is a state rather than a stable trait. And the state is readily affected by the situation. One of the authors of that paper who is Spanish but currently resides in the United States, “often surrounds herself with Spanish music, food, and paintings to
keep alive her Spanish ways of thinking and feeling” (2000, p. 718). Michael Tomasello expresses a similar conclusion: “In cultural learning young children learn to use the tools, artifacts, symbols, and other cognitive amplifiers of their culture” (2000, p. 357). In other words, the focus of research on cultural differences should broaden from differences in mental contents to differences in cultural practices as well as the tools (including symbolic tools such as language) afforded by diverse cultures. Like all tools, culture represents a set of two-way adaptations that both reflect and influence cognition.

V. Summary

This chapter has described four basic themes of the socially situated cognition approach, which we have argued are equally basic to social psychology’s unique conceptual focus as a field. To a large extent, social psychology recognizes that cognition—including the formation of attitudes, stereotypes, person impressions, and other inner representations—is essentially for action. Our field has recognized the importance of embodiment, the role of bodily states (such as emotion and motivation) in cognition and the reciprocal influences between bodily movements and judgments (as when putting on a facial expression resembling a smile causes people to judge that cartoons are especially funny). The situated nature of cognition is also a major theme of social psychology; Asch, Sherif, Milgram, and other researchers intuitively grasped the power of social situations to control action, generating behavior that would not have been predicted from an abstracted (nonsituated) inventory of their participants’ beliefs, values, and attitudes. Finally, the distributed nature of cognition, and the importance of shared reality when people interact in dyads, groups, or larger cultural communities, is also a significant area of ongoing social psychological investigation.

However, despite its general compatibility with social psychological theories and perspectives, the SSC perspective calls for some shifts of conceptual focus and of research methodology for our field. Social psychology has not yet fully appreciated the implications of the shift from computation to biology as a metaphor and framework for understanding cognition (Barsalou, 1999a, p. 77; Caporael, 1997; Fiske, 1992). Psychologists implicitly adopt a computational perspective when they try to explain social behavior (or any other kind) solely on the basis of the agent’s inner representations, processes, beliefs, and goals, through the conceptual lens of information processing. As an alternative, the biological perspective carries the insight that cognition is for action, and that embodiment and the situated nature of adaptive action are crucial constraints. We have noted ways that the four themes of action–orientation,
embodiment, situatedness, and distributed cognition—suggest further areas for conceptual and empirical exploration, areas that are intrinsically social psychological in terms of the definition of our field but that we have barely begun to explore.

These explorations are important, for as we have implied, the field of social psychology can almost be defined as the study of socially situated cognition. Or, in other words, the socially situated cognition perspective selects social psychology as the central standpoint from which the entire body of the cognitive sciences makes conceptual sense. Most if not all of human cognition is social, for we are intrinsically interdependent agents, who rely on other people, use tools such as language, and make use of cognitive abilities shaped through evolution in social contexts (Caporael, 1997). As Clancey (1997a, p. 366) stated, the “overarching content of thought is not scientific models [descriptions, symbolic representations of states of the world], but coordination of an identity” in a social context. Although social psychologists have already investigated much of this territory, we have done so without an overall map. The socially situated cognition perspective can put these seemingly disparate areas of study into conceptual relationship to each other. The approach will also help researchers in adjoining areas—cognitive scientists, cognitive and developmental psychologists, and the like—understand why social psychology is important, even central to the analysis of all human behavior.

Acknowledgments

Supported by grants from the National Institute of Mental Health, No. K02 MH01178; from the National Science Foundation, No. 0091807-BCS; and from the Free University Amsterdam and NWO (Dutch Science Foundation), No. 575-31-008. We thank to Chris Agnew, Ximena Arriaga, Robert Krauss, Diane Mackie, and Laura Sweeney for extensive comments on earlier versions of this paper.

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