SOCIAL FOUNDATIONS OF COGNITION

John M. Levine and Lauren B. Resnick

Learning Research and Development Center, and Department of Psychology, University of Pittsburgh, Pittsburgh, Pennsylvania 15260

E. Tory Higgins

Department of Psychology, Columbia University, New York, NY 10027

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INTRODUCTION

Cognitive psychology has traditionally been a psychology of the individual, seeking to delineate the processes by which individual minds perceive, manipulate, and interpret information. Initially applied to artificial and puzzle-like tasks, cognitive theories have increasingly sought to explain more complex, ill-structured, and “real world” forms of cognitive activity. But even as explanatory ambitions have expanded, the standard metaphors (some treat them as true models) for problem solving and other forms of complex “higher-order” cognitive activity have been the rule-based theories of artificial intelligence in the Newell & Simon (1972) tradition. The rise of blackboard models and connectionist theories (Rumelhart et al. 1986) has provided new and enriching metaphors, such as the “society of mind” (Minsky 1986), but the focus has remained on the individual as a solitary and, for the most part, purely intellectual being. Although cognitive psychology’s increasing engagement with complex tasks has pressed the field toward a consideration of the context of problem solving as an important element in cognition, little attention has been paid to intentions, motivations, social interpretations, or cognitive functioning in interaction with others.

A continuing debate among cognitive psychologists concerns the relative importance of general processes (sometimes called “skills”) versus domain-specific knowledge in generating competent performance. Most now agree that “experts” in a domain are characterized by large pools of quickly accessible and highly specific knowledge, that general skills and domain-specific knowledge can to some degree compensate for one another, and that general skills are “weak” compared to domain-specific knowledge but are nonetheless crucial in allowing for novel performances.

Recognition of the importance of domain-specific knowledge took the cognitive psychologist on a first step toward eventual inclusion of social factors as part of cognition. This first step did not specifically implicate social factors but did highlight how particular, how situated, cognition always is. In practice, what qualifies as domain-specific is extremely dependent on particulars of the situation—what questions are asked in the experiment, for example, and what other information is given. That, in turn, makes it necessary to attend not only to knowledge elements but also to the conditions of their use—the situations in which cognition takes place.

This focus on situations leads the investigator away from the traditional site of cognitive research, the laboratory where a subject works alone at an experimenter-defined task, to various sites familiar to applied psychologists—the family, the classroom, the playground, and the workplace. At each of these
sites one finds a complex social environment containing multiple actors, each with his or her own intentions and interpretations of the situation, who influence one another’s knowledge, opinions, and values, and who interact to produce shared cognitive products. This increased interest in situated, or contextualized, cognition has led cognitive scientists to recognize the importance of relations among cognition, motivation, and broader processes of social influence and engagement. Recent work on such topics as mood and memory (Bower 1981), attribution and memory (e.g. Johnson & Sherman 1990), and transfer of situated learning (Greeno et al 1992) reflects this growing interest in socially situated cognitions.

In this chapter we develop a point of view that treats cognition as a fundamentally social activity. In so doing, we expand and elaborate our previous ideas about “socially shared cognition” (Resnick et al 1991) and the “social science of cognition” (Higgins 1992b). Much of the research we discuss here was conducted by social psychologists, and some of it falls under the heading of “social cognition.” Critics sometimes complain that the field of social cognition is nothing more than “cognitive psychology with social objects.” The implication is that social cognition researchers simply borrow cognitive psychology models originally developed for nonsocial objects and then test their generalizability to social objects. But, as Higgins (1992b) has argued, several cognitive models originated by social psychologists are applicable to cognition in general. These include models of attribution processes, salience effects, knowledge accessibility, and inference and decision making.

Of particular interest in the search for social foundations of cognition is the interface between cognition and motivation (see Higgins & Sorrentino 1990). Cognition as a source of motivation was a fundamental issue in social psychology during the late 1950s and 1960s, as exemplified in various cognitive consistency models (see Abelson et al 1968, for a review) and in the information transmission approach to attitude formation and change (see McGuire 1969). In addition, work by investigators interested in social development (e.g. Dweck & Bempechat 1983; Nicholls 1983) has shown how different self-attributions can motivate different forms of cognitive behavior, demonstrating how motivation can affect the form and substance of cognition as well as the amount of cognitive effort exerted.

Investigators from several disciplines outside psychology are also contributing to our understanding of cognition as a social process. These include anthropologists, who are studying how knowledge and skills are transmitted in traditional cultures and defining the cognitive foundations of cultural differences, and ethnomethodologists, who are investigating the structure of communication and language.

In this chapter, we ignore the boundaries of disciplines and subfields, focusing instead on substantive questions that seem central in understanding cognition as a social process. We are less concerned with evaluating the empirical support for various theories than with presenting ideas that have
heuristic utility for an emerging field of inquiry, and we are illustrative rather than exhaustive in citing relevant research.

We consider five ways in which social factors influence both the content of people’s cognitions and the processes by which cognitive activities proceed. In the first four sections, we focus primarily on how individual cognition is affected by social factors. Here our emphasis is on “social action” in Max Weber’s (1967) sense, namely that the meaning people assign to events is transformed because their actions take others into account. In the fifth section, the cognitive and the social are fused. There we challenge the assumption that cognition is exclusively an individual act, clearly distinguishable from external social processes that may influence it. We explore the proposition that the social and the cognitive are more intimately intertwined than psychologists have typically assumed and that much thinking must be understood as a form of social interaction. In so doing, we review work that treats the social unit (i.e. the dyad or group), rather than the individual, as the focus of analysis.

**MERE PRESENCE OF OTHERS**

The most rudimentary way in which social factors influence cognition is via the simple presence of other people. Even when their responses are neither observed nor cognitively represented and there is no opportunity for interaction, the fact that others are physically present can affect a person’s cognitive activity, sometimes facilitating and sometimes impeding it.

**Social Facilitation**

Two of the earliest experiments in social psychology (Triplett 1898; Meumann 1904, cited by Cottrell 1972) demonstrated that the presence of either co-actors or a passive audience can enhance performance. These social-facilitation effects elicited a good deal of research attention, but by the early 1960s a confusing picture had emerged. Some studies confirmed that the mere presence of others enhanced performance; others found that passive audiences and co-actors impeded performance.

Zajonc (1965) imposed order on these findings by arguing that the mere presence of others is a source of general arousal. This arousal increases the likelihood that dominant responses will be emitted, which in turn facilitates performance on tasks that require familiar responses and impairs performance on tasks that require novel responses. Evidence that audiences hinder performance when new responses must be learned but help performance after these responses have been acquired (e.g. Hunt & Hillery 1973) is consistent with Zajonc’s position.

According to Zajonc’s view, the presence of others is likely to elicit accessible cognitions (e.g. common word associations to verbal stimuli), which in turn facilitate performance when these cognitions are correct for the task at
hand and impair performance when they are incorrect (cf. Matlin & Zajonc 1968). For example, Schmitt et al. (1986) had subjects type their own names, either as they normally appear (a simple task) or backwards with ascending numbers interspersed among the letters (a difficult task). In the “alone” condition, subjects worked by themselves; in the “mere presence” condition, they worked in a room with another person who wore a blindfold and earphones. Performance times were faster for the simple task and slower for the difficult task in the mere presence than in the alone condition.

Baron (1986) has proposed an alternative to Zajonc’s drive theory based on the idea that the presence of others is a distraction, which leads to attentional conflict. This conflict produces cognitive overload and selective focusing of attention, which causes either performance decrements or increments, depending on the information-processing demands of the task (e.g. Groff et al. 1983). (See Geen 1989, for a review of attentional explanations for the effects of others’ presence.)

Yet another explanation of social facilitation is that the presence of an audience causes people to focus attention on the self (Duval & Wicklund 1972; Wicklund 1975). This in turn leads to thoughts about discrepancies between the actual self and the ideal self. Such “objective self-awareness” can be thought of as a form of “metacognition” (Brown et al. 1983). (See also Schon 1983 on reflection on one’s own cognitive work.) Although metacognitive theories typically stress the enhancing effects of being aware of one’s cognitive processes, objective self-awareness can either enhance (e.g. Wicklund & Duval 1971) or depress (e.g. Liebling & Shaver 1973) task performance, depending on how it affects motivation and attention (see also Gibbons 1990; Scheier & Carver 1988).

**Social Loafing**

Fifteen years after Tripplett’s paper on social facilitation, Ringelmann (1913, summarized by Kravitz & Martin 1986) presented evidence that people working together did not perform as well as expected on the basis of their individual performances. One explanation for this reduced performance is “cooperation loss” due to group members’ interfering with one another’s responses. Subsequent studies eliminated coordination loss as an explanation of reduced group performance by having members work alone but leading them to believe that others were simultaneously working on the same task and that the outputs of all members would be combined. Results indicated that, in this “pseudogroup” situation, individuals expended less effort when they thought they were working in a group than when they thought they were working alone. This decreased effort, labeled “social loafing” (Latane et al. 1979), has proven to be a robust phenomenon, occurring on cognitive tasks, such as evaluating written materials and brainstorming (see Harkins & Petty 1983), as well as physical tasks.
Although the belief that others are working on the same task can decrease effort, social loafing is not inevitable. Loafing can be reduced or eliminated by increasing the identifiability and uniqueness of members’ task contributions (e.g., Harkins & Petty 1982), the ease of evaluating those contributions (e.g., Harkins & Szymanski 1989), and members’ accountability (e.g., Weldon & Gargano 1988). In Weldon & Gargano’s study, subjects who performed a multiattribute judgment task were led to believe that (a) they either did or did not share responsibility for their performance (i.e., their output would or would not be combined with that of several others) and (b) they either were or were not accountable for their individual performance (i.e., the experimenter would or would not contact them to learn more about their evaluations). Mathematical models of subjects’ judgments indicated that subjects in the shared responsibility/no-accountability condition used less complex judgment strategies than did those working alone. However, this social loafing was reduced when subjects in the shared-responsibility condition felt accountable for their performance. The positive impact of accountability on motivation in groups is also evident in work on cooperative learning (Bossert 1988; Slavin 1983).

Crowding

Another type of mere presence that can influence individual cognitive activity is crowding. Here, the issue is not simply that other people are physically present or even that large numbers of others are present. Instead, crowding involves the subjective sense that “too many” people are occupying a given physical space (Stokols 1972). The perception of crowding is itself socially determined, as indicated by cultural differences in how people perceive and use space (Hall 1966). Crowded situations have several aversive properties, including uncertainty, loss of control, cognitive overload, and behavioral constraints (Paulus & Nagar 1989). It is not surprising, then, that crowding impairs performance, particularly on complex tasks (Baum & Paulus 1987). For example, Paulus et al (1976) found that various ways of producing crowding led to performance decrements on a multiple-level maze task. In addition, crowding may elicit particular types of thoughts and judgments, including perceptions of helplessness, attributions about the behaviors of others, and ideas about how to cope with or escape from the unpleasant situation, which may be distracting and thereby inhibit cognitive performance (cf Baum & Gatchel 1981; Schmidt & Keating 1979; Worchel & Teddlie 1976).

Group Composition

A final type of mere presence that can affect individual cognition is group composition—that is, the mix of people who belong to a group. Group composition has been studied for many years, and the relevant literature is extensive (see Moreland & Levine 1992). Group composition can affect several types of social information processing, including stereotype-related memory and judgment, social projection, and the perception that the ingroup is more heteroge-
neous than the outgroup (Higgins & King 1981; Mullen 1991). For example, compared to majority members of groups, “token” and minority members (e.g. women in predominantly male groups) attract more attention from others (Lord & Saenz 1985; Taylor et al 1978) and are more aware of the characteristics that distinguish them from others (Cota & Dion 1986; McGuire & Padawer-Singer 1976; see also Frable et al 1990). This visibility, in turn, can distract token members from their task and thereby interfere with their performance (Lord & Saenz 1985).

SOCIAL ROLES, POSITIONS, AND IDENTITIES

Cognitive activity is strongly affected by how people construe the social situation in which they find themselves. Several lines of research in developmental, educational, and cultural psychology suggest that people whose abilities are assessed in particular situations (e.g. laboratory interviews, standardized tests) often do not demonstrate their full capacities. This may occur because a person’s beliefs about how he or she ought to behave in the situation do not match the expectations of the assessor (e.g. Cole et al 1971; Siegal 1991). Interest in how people’s perceptions of others’ expectations affect their own cognitions and behaviors has a long history in social psychology and sociology.

Social Roles

As defined by Sarbin & Allen (1968), role expectations “are comprised of the rights and privileges, the duties and obligations, of any occupant of a social position in relation to persons occupying other positions in the social structure” (p. 497). When a person adopts a role, his or her behavior is constrained by the expectations associated with the role. In addition, the person’s cognitions are often influenced by these expectations and the role enactments they elicit.

In an early study of the impact of role enactment on cognition, Jones & deCharms (1958) had subjects listen to an interview between a psychologist and an ex-prisoner of war who had signed propaganda statements during captivity. Subjects were assigned different roles vis-à-vis the ex-prisoner (i.e. member of a judicial board of inquiry, member of a medical-psychological board, potential friend). Results indicated that subjects’ attributions of the target’s personality characteristics varied markedly depending on the role they were assigned. More recent studies provide additional evidence for the impact of role enactment on cognitions. For example, Anderson & Pichert (1978) found that subjects’ assignment to the role of home buyer versus burglar influenced their memory for the properties of a house that they read about. And Zukier & Pepitone (1984) found that assignment to the role of scientist versus clinical counselor influenced subjects’ use of base rate information in evaluating a target person.
**Social Positions**

“Social positions” are defined as socially recognized categories of actors. When a positional category is assigned to a person, the individual is expected to possess particular attributes and is responded to on the assumption that he or she has these attributes (see Stryker & Statham 1985). Whereas some social positions are social roles, which involve normative expectations regarding appropriate behavior and sanctions for violating these expectations, other social positions simply involve probabilistic expectancies about how a person “will” (as opposed to “should”) behave. The latter type of social position, like the former type discussed above, can influence cognitive activity.

An interesting consequence of assigning a person to a social position occurs when (a) the individual is assumed to possess certain characteristics that he or she does not possess, (b) others treat the person as though he or she possesses these characteristics, and (c) this treatment causes the person to exhibit the very characteristics he or she was (incorrectly) assumed to possess in the first place. These “self-fulfilling prophecies” (Merton 1957) have at least two kinds of cognitive consequences. First, assigning a person to a social position causes others to have certain cognitions about the person. Second, being treated as though one had a position-related characteristic causes the person to have certain cognitions about himself or herself (e.g. Fazio et al 1981; Snyder & Swann 1978). Both laboratory experiments (e.g. Word et al 1974) and non-laboratory studies (e.g. Rosenthal & Jacobson 1968) have demonstrated the power of self-fulfilling prophecies (see the review by Snyder 1992).

Dispositional inferences (e.g. industrious, aggressive) can also be treated as social positions if these terms are used to identify individuals who share similar characteristics that distinguish them from people in general. These dispositional inferences can have a major impact on subsequent information processing (for reviews, see Higgins & Stangor 1988; Wyer & Srull 1989).

**Social Identities**

As suggested above, people who are assigned to social positions by others sometimes internalize these positional designations and come to view themselves as the others view them (see Stryker & Statham 1985). Such internalized designations are called “social identities.” It is important to note that, although social roles often become social identities, these two types of social positions are conceptually distinct. A person can enact a particular role but not identify with it (e.g. because role performance is forced by external pressure), and a person can identify with a social position (e.g. being short) that does not involve any role responsibilities.

Activation of a social identity can influence both behavior and cognition. For example, Charters & Newcomb (1952) increased the salience of Catholic students’ religious identity by emphasizing the common religious identification of everyone in the room and found that this identity activation caused
students’ opinions to shift toward orthodox Catholic beliefs. Frable et al (1990) found that individuals who have social identities that are statistically rare and socially important (e.g. bisexual, wealthy) are more “mindful” during a dyadic interaction than are their “normal” partners, recalling more detailed information and taking their partner’s perspective. Finally, socially categorizing another person as an ingroup versus an outgroup member can substantially affect how this person is perceived and treated (see, for example, Messick & Mackie 1989; Wilder 1986).

MENTAL REPRESENTATIONS OF OTHERS

In many cases, an individual who is not in the physical presence of others has knowledge about their responses or expects to learn about these responses in the future. These mental representations of others can have important effects on the individual’s cognitions.

Role-Taking

The ability to take the roles of others is critical to effective role enactment (Mead 1934; Sarbin & Allen 1968). Situational role-taking involves “putting yourself in someone else’s shoes” and inferring how you would respond if you were in the other person’s situation. Individual role-taking involves “seeing the world through someone else’s eyes” and inferring how the other person would respond if he or she were in the same situation as you (Higgins 1981b).

Role-taking ability shows systematic developmental shifts with age (see Flavell et al 1968; Higgins 1981b). As they mature, children become more adept at shifting perspective when asked to process identical input from different viewpoints; older (but not younger) children can represent events differently as a function of the perspective they are asked to adopt (Fefter 1970). Developmental and individual differences in role-taking appear to underlie differences in interpersonal sensitivity, social maturity, and prosocial behavior (Moore & Underwood 1981; Selman 1980).

Reference Groups and Individuals

Individuals’ opinions are often influenced by the assumed opinions of groups they deem important. The critical role that reference groups play in social influence has been recognized for some time (see Singer 1981). A reference group may or may not be a membership group—people are sometimes formal members of groups with which they identify and sometimes not. In addition, people are motivated to meet the standards of some (positive) reference groups and to violate those of other (negative) reference groups. Siegel & Siegel (1957) found that both reference groups and membership groups influenced the authoritarianism of students’ attitudes. And Carver & Humphries (1981) found that students who associated an opinion with a negative reference group
showed less agreement with this position than did students who did not make this association.

Recent research shows that people’s susceptibility to social influence depends on their self-categorization as members of a particular group and their conformity to the norms defining that group (Turner & Oakes 1989). Social influence occurs to the extent that (a) the source and target are perceived by the target as members of the same group (i.e., as sharing the same social identity) and (b) the source’s position is viewed by the target as prototypical of the group’s position. (See also Mackie et al 1992 and Van Knippenberg & Wilke 1992 for work indicating differential cognitive processing of messages from ingroup and outgroup sources.)

People are also influenced by the assumed responses of reference individuals (cf. Elkind 1967). For example, several theorists have argued that social facilitation effects are not due to others’ “mere presence” but rather to anxiety about how the others will evaluate one’s performance (see Geen 1989 for a review of evaluation apprehension and self-presentation theories of social facilitation). And Baldwin et al (1990) have shown that students’ evaluations of their own research ideas can be influenced by evoked representations of approving or disapproving faculty members.

**Social Comparison**

People’s self-perceptions and evaluations are influenced by comparing themselves to others, even when no evaluation by these others is expected. Although knowledge about others’ characteristics and performances is sometimes obtained from direct observation, often this knowledge is acquired from third parties (e.g., newspaper writers, mutual acquaintances). In both cases, comparison targets typically do not intend to influence the observer and may not even know that a comparison is taking place.

Stimulated by Festinger’s classic 1954 paper on social comparison, scores of studies have assessed how self-judgments are affected by comparing one’s own and others’ abilities, opinions, emotions, and outcomes (see, for example, Higgins 1990; Kruglanski & Mayseless 1990; Levine & Moreland 1987; Suls & Wills 1991). Several trends in contemporary social comparison research suggest links between social and cognitive processes. For example, current research demonstrates that social comparison is itself a cognitive process, in which people actively select comparison targets and construct and distort comparison information to serve their goals. Thus, people sometimes imagine comparison targets who do not exist (e.g., hypothetical others who are worse off than they are) and select comparison dimensions that are likely to satisfy their goals (e.g., dimensions on which they are likely to be superior to others) (e.g., Wood & Taylor 1991). In addition, current investigations emphasize the cognitive consequences of receiving information indicating that one is superior or inferior to others. These consequences include changes in outcome
expectations and self-efficacy as well as in achievement striving (e.g. Major et al 1991).

**Anticipated Interactions with Others**

When people expect to interact with others, they often prepare by engaging in various kinds of anticipatory cognitive activity. This anticipatory activity is likely to differ as a function of the kind of interaction that is expected and the presumed nature of the interaction partners. For example, a person may expect only to receive information, only to transmit information, or to both receive and transmit information. Similarly, a person may know nothing about the interaction partner’s position or believe that the partner agrees or disagrees with his or her position. These factors are likely to affect both the amount and type of anticipatory cognitive activity that occurs. Other potentially important determinants of such activity include the person’s goals for the upcoming interaction (cf Kruglanski 1989; Kunda 1990), the type of issue on which communication will occur (cf Laughlin & Ellis 1986), the communication modality that will be used (cf Kiesler et al 1984), and the amount of social support that the person expects to receive either during (cf Doms & Van Avermaet 1985) or outside (cf Miller et al 1991) the interaction.

Expecting to present one’s position to others and/or expecting to learn about their position can affect cognitive activity. Work by Zajonc (1960) on cognitive tuning revealed that persons who expect to transmit information have more organized and polarized cognitive structures than do those who expect to receive information. Studies by Bargh & Schul (1980) and Benware & Deci (1984) indicated that individuals learn material better when they expect to teach it to others than when they do not have this expectation. Tetlock (1992) found that people who feel accountable to significant others for their decisions deal with this accountability in three ways: by saying what the others want to hear, by preemptively criticizing their own ideas, and by generating justifications for their position. These strategies can have important cognitive consequences, including, in the case of preemptive self-criticism, increased cognitive complexity regarding the topic under consideration. Finally, work by Cialdini & Petty (1981), Fitzpatrick & Eagly (1981), and McFarland et al (1984) on anticipatory attitude change revealed that expecting to receive a counterattitudinal message can produce issue-relevant thought as well as opinion change.

The cognitive impact of anticipated interaction is not restricted to the topic that will be discussed. Several authors have argued that different interaction goals (e.g. accurately assessing a partner’s characteristics versus shaping the partner’s behavior) can affect cognitions about other people (see reviews by Fiske & Neuberg 1990 and Hilton & Darley 1991). And several studies have shown that anticipated interaction can influence information processing about the people with whom one will interact (e.g. Devine et al 1989; Fiske & Von Hendy 1992; Osborne & Gilbert 1992). Devine et al demonstrated that expect-
ing to interact with a target person, compared with not expecting to do so, produces better recall of information about the person, more individuation of the person in memory, and more accurate name-to-item associations for the person.

SOCIAL INTERACTION AND COGNITIVE CHANGE

Two influential thinkers, Mead (1934) and Vygotsky (1978), have proposed that people’s fundamental capacities for thinking, as well as the forms their thinking takes, are created in socially shared cognitive activities. Mead called thought “conversation with the generalized other,” suggesting that private thinking is an internalized version of the process of challenge, justification, and revision of ideas that first occurs during argumentation with others (see Hilton 1991 for a theory of how everyday causal explanations are grounded in conversational processes). Except for those interested in interpersonal communication, Mead has been largely ignored by students of cognition. In contrast, Vygotsky, who had similar ideas about thought as internalization of social practice, has profoundly influenced theories of cognitive development. Even biologically oriented developmental theorists, such as Piaget (1950; see also Gelman & Carey 1991), who attribute cognitive development to children’s private mental work in grappling with the events and objects in their environments, acknowledge that certain kinds of social interactions stimulate mental effort and promote cognitive change. In addition, within social psychology, work on social influence and group participation also stresses the ways cognitive challenges from others can produce elaborations in individual thinking.

Conflict as a Source of Cognitive Growth

A significant body of research suggests that certain forms of interpersonal disagreement can facilitate intellectual development in children (Azmitia & Perlmutter 1989; Garton 1992; Murray 1983; see also Damon & Phelps 1989 on cognitive growth through cognitive collaboration). Much of this research has been conducted by a group of Genevan psychologists influenced by Piagetian theories of cognitive development (see Doise & Mugny 1984; Perret-Clermont & Nicolet 1988). These investigators assume that social interaction can produce intellectual development if socio-cognitive conflict is generated and resolved. Socio-cognitive conflict occurs when individuals have different responses to the same problem and are motivated to achieve a joint solution. The intellectual development produced by socio-cognitive conflict reflects extensive cognitive restructuring rather than mere imitation, as indicated by subjects’ ability to generalize responses from one domain to another, to employ novel arguments that were not mentioned during interaction, and to profit from interaction with peers at the same or lower levels of cognitive development. Evidence suggests that the impact of conflict resolution on intellectual progress is influenced by the intensity and social significance of the
conflict, as well as by whether the conflict is resolved through compliance by one of the participants (De Paolis et al. 1987; Mugny et al. 1984). In addition, the interactants' levels of cognitive development, and their social origin and status, are important (Mackie 1983; Perret-Clermont & Schubauer-Leoni 1981). (For evidence that socio-cognitive conflict does not always function as suggested by Doise and his colleagues, see Roy & Howe 1990 and Tudge 1989.)

Although interpersonal conflict is an important facilitator of cognitive change, such conflict need not involve face-to-face interaction in order to be effective. For example, the large literature on attitude change demonstrates that simply reading or hearing a counterattitudinal message (in the absence of any face-to-face interaction with the communicator) can influence the quantity and quality of individuals' cognitive activity (see Eagly & Chaiken 1984, and Petty & Cacioppo 1986).

**Majority and Minority Influence**

The stimulative effect of interpersonal disagreement on individual mental activity can be seen in research on majority and minority influence. Beginning with Asch (1951), researchers have sought to understand majority influence, or conformity, by clarifying the circumstances under which people who hold a minority position in a group adopt the position held by the majority (see reviews by Allen 1965; Levine & Russo 1987). More recently, beginning with Moscovici (Moscovici & Faucheux 1972), investigators have tried to understand minority influence, or innovation, by clarifying the conditions under which people holding a majority position adopt the minority position (see reviews by Kruglanski & Mackie 1990; Levine 1989; Moscovici 1985).

An important question regarding both conformity and innovation is whether the position change resulting from disagreement represents public agreement (compliance) or private agreement (conversion). Moscovici (1980, 1985) has argued that minorities have their primary impact on conversion, whereas majorities have their primary impact on compliance. Evidence regarding minority influence is consistent with this argument, but data regarding majority influence are not as clear (Maass & Clark 1984; Maass et al. 1987; Mackie 1987).

From the perspective of socially influenced cognition, conversion is more interesting than compliance. As suggested above, conversion is often defined as private movement toward the influence source's position (e.g. agreement with other group members even though they cannot see one's responses). In addition, conversion is sometimes defined as delayed change, which occurs after the influence source is no longer present, and as indirect change, which occurs on related issues that were not mentioned by the source (Moscovici 1980; Mugny 1982; Mugny & Perez 1991). A particularly interesting, though controversial, indication of conversion involves changes in chromatic afterim-
ages following exposure to minority responses suggesting that a stimulus of one color is actually another color (e.g. Moscovici & Personnaz 1986; but see Sorrentino et al 1980). This kind of basic perceptual change, when subjects are unaware of the physical laws relating visual images and afterimages, suggests that social influence may sometimes be powerful enough to affect perceptual processes normally considered to be purely physiological.

Another way in which the opinions of others in a group can influence cognitions is by leading individuals to reinterpret information so as to maintain their original position while still minimizing dissonance with the group’s opinion. For example, Allen & Wilder (1980) had subjects read several statements (e.g. “I would never go out of my way to help another person if it meant giving up some personal pleasure.”) and then give their interpretations of key phrases in each statement (e.g. “go out of my way”). Some subjects subsequently were told that a unanimous group of peers disagreed with their opinions on the statements; other subjects (controls) were not given this information. Allen & Wilder found that the two groups of subjects interpreted the key phrases differently. For example, the phrase “go out of my way” in the above example was interpreted to mean “risk my life” in the unanimous condition and “be inconvenienced” in the control condition. This reinterpretation of a stimulus in order to maintain a position in the face of dissonant information is analogous to the behavior of many science learners when they obtain experimental data that contradict their beliefs. Rather than change their beliefs, they often reinterpret the data or question its correctness (cf Johsua & Dupin 1987; Nissani & Hoefler-Nissani 1992).

Why does exposure to disagreement from others (particularly minorities) produce these cognitive changes? Moscovici (1980, 1985) argues that minorities trigger a “validation” process involving attention to the minority’s position and cognitive activity about this position. Nemeth (1986) asserts that minorities stimulate issue-relevant, divergent thinking, which in turn leads to creative responses (see also Maass et al 1987). Interpersonal disagreement can indeed affect cognitive processes, including attention, convergent and divergent thought, and memory (e.g. Nemeth & Kwan 1987; Nemeth et al 1990). Nemeth & Kwan asked subjects to name words embedded in letter strings and informed them that either a majority or a minority of other group members adopted a nonobvious, or dissenting, strategy (i.e. reading the letters backward). When subsequently asked to form all the words they could from several letter strings, subjects exposed to minority dissent used more strategies (forward, backward, mixed) and therefore detected more words than did subjects exposed to majority dissent. These results suggest that a minority can sometimes stimulate more “advanced” cognitive responses than those exhibited in its own behavior. We saw similar effects in the work on socio-cognitive conflict discussed above.
**Group Decision Making**

Most studies of majority and minority influence do not involve explicit pressure on group members to reach a joint decision. However, such pressure is a defining characteristic of research on group decision making. Although the goal of group decision making is to arrive at a consensual judgment superior to the judgments of individual members, participation in this collective activity can have important cognitive consequences for group members. (We discuss group decision making as a joint cognitive activity below.)

One cognitive consequence for the individual is private opinion change in the direction of the group’s final position (e.g. Sande & Zanna 1987). It is generally assumed that such change is more likely if the person is yielding to “informational” rather than “normative” pressure (Deutsch & Gerard 1955). In their work on mock jury deliberations, Stasser & Davis (1981) concluded that changes in members’ (private) certainty levels were primarily attributable to informational influence, whereas changes in their (public) verdict preferences were due to normative as well as informational influence (see Stasser et al 1989 for a discussion of consensus models and group decision making). Kaplan (1987) has discussed several variables that increase the probability of informational influence (and hence private opinion change) during group decision making. These include an intellectual (factual) issue, private responses, and desire to obtain a correct decision. Although the cognitive mechanisms underlying normative and informational influence are not well understood, the power of informational influence to produce private opinion change may be due, at least in part, to the validation process that Moscovici believes is responsible for conversion to minority opinions.

Other research suggests that engaging in group decision making can lead individuals to adopt the problem-solving strategies that the group used. For example, Laughlin and his colleagues (e.g. Laughlin & Ellis 1986) have demonstrated specific group-to-individual transfer on the same type of problem that the group worked on, whereas Stasson et al (1991) have demonstrated general transfer on different but related problems. And people who work together to resolve “judgment policy” conflicts (regarding how probabilistic cues should be weighted and combined in making inferential judgments) and who receive feedback regarding the correct answer show convergence in their judgment policies, although disagreements often continue because of inconsistent application of these policies (Brehmer 1984; Cook & Hammond 1982).

**COGNITION AS COLLABORATION**

Outside the laboratory and the school, cognition is almost always collaborative (Resnick 1987). At work and in civic and personal life, each person’s ability to function successfully depends upon coordinated cognitive interactions with others, and the cognitive “products” that emerge from these interactions can-
not be attributed to single individuals. In studying joint cognition, it is critical to examine both the process and outcomes of cognitive collaboration, treating the group or the dyad, rather than the individual, as the primary unit of analysis.

**Development of Shared Cognitions in Groups**

Coordinated cognitive activity depends upon *intersubjectivity* (Ickes et al 1990; Rommetveit 1979)—that is, a shared understanding of what is being discussed or worked on. Intersubjectivity, although an intuitively appealing concept, is difficult to operationalize. Its presence is typically inferred from successful coordination of activity by dyad or group members, rather than from direct measurement. Some research, however, has explicitly examined the extent to which shared cognitions are developed by group members.

A classic example is Sherif’s (1935) research on norm formation in groups. Sherif investigated how people come to share common perceptions of an ambiguous perceptual stimulus, namely the apparent movement of a stationary point of light in an otherwise dark room (the *autokinetic effect*). The judgments of individual group members converged until a shared estimate of the light’s direction and distance of movement was attained, and this socially developed norm continued to influence members’ judgments when they later responded alone. Subsequent work has indicated that, once established, such a norm is often maintained over several “generations” during which old members gradually leave the group and new members join (Jacobs & Campbell 1961; Weick & Gilfillan 1971). Going beyond perceptual norms, a large body of work indicates that a group’s efforts to transmit its norms are particularly strong when newcomers are involved (Levine & Moreland 1991; Moreland & Levine 1989). Groups are highly motivated to provide newcomers with the knowledge, ability, and motivation they will need to play the role of full member (e.g. Van Maanen & Schein 1979; Wanous 1980). Newcomers are typically receptive to these influence attempts because they feel a strong need to learn what is expected of them (e.g. Louis 1980; Van Maanen 1977).

To the extent that socially shared cognitions are developed during group interaction, we might expect groups to perform better than individuals on various tasks, including learning and concept attainment, creativity, and problem solving. However, this often is not the case (Hill 1982). In a review of research on individual versus group accuracy in judgment tasks, Hastie (1986) concluded that the relative performance of individuals and groups depends heavily on the task. On numerical estimation tasks, group judgment is slightly superior to the average individual judgment. On other tasks (e.g. logical and mathematical brainteaser problems), group judgment is better than the average individual judgment and worse than the best individual judgment, except on “Eureka” problems, where group performance tends to equal that of the most competent member. These findings suggest that “solution demonstrability” is
the critical determinant of a group's ability to develop an adequate shared representation, with groups performing best when the task has a correct solution that can be readily demonstrated and communicated to members (cf Laughlin & Ellis 1986).

Information exchange is an important determinant of the effectiveness of joint decision making (e.g. Vinokur et al 1985). However, recent work by Stasser (1992) indicates that groups often do not exchange all the information available to their members. Rather than disseminating unshared information, group discussion tends to be dominated by information that members initially share and that supports their initial preferences.

This overreliance on shared information points to the negative consequences of too much intersubjectivity, which can prevent groups from fully exploiting the cognitive resources of their members (cf Levine & Moreland 1991). An extreme example of this phenomenon is "groupthink," which is defined as extreme concurrence-seeking that produces poor group decisions. Janis (1982) argued that factors such as external threat, high group cohesiveness, and directive leadership produce symptoms of groupthink (e.g. illusions of invulnerability, pressure on dissenters), which in turn undermine members' ability to process information and arrive at sound group decisions (see also McCauley 1989). In a similar vein, Hutchins (1991), using connectionist models of group and individual thinking, showed how the initial distribution of information in a group, together with the patterns of communication among members and the decision rules for integrating information, can either exacerbate or ameliorate problems that exist in individual cognitive systems (e.g. confirmation bias) (see also Tindale 1993).

An ostensible outcome of groupthink is the tendency for groups to pursue unduly risky courses of action. Evidence suggests that, at least under certain circumstances, groups do indeed make decisions more extreme than the average of members' initial positions (e.g. Isenber 1986). A popular explanation for these group choice shifts (and for group polarization, or the tendency for individuals' opinions to become more extreme after discussion) is persuasive-arguments theory (Burnstein & Sentis 1981). According to this theory, choice shifts occur when people are exposed to novel and persuasive arguments supporting the side they already favor.

The ways groups develop shared cognitions during interaction have also been examined by Hastie & Pennington (1991) in their studies of jury decision making. They found that jurors' demographic characteristics (e.g. gender, age, socioeconomic status) influenced how much they talked during deliberation, that jurors used various social-influence tactics to reach consensus (e.g. factual arguments, appeals to values, direct rewards and punishments), and that juries tended to use one of two deliberation styles—evidence-driven or verdict-driven—to decide cases. Hastie & Pennington's analysis highlights the need to study how a shared interpretation of events is negotiated among individuals (and factions) who have different views of reality.
Group Memory

As the research on groupthink and confirmation bias suggests, maximum intersubjectivity, with all group members possessing exactly the same knowledge and thinking exactly the same way, often fails to capitalize on the total cognitive resources of the group. To ameliorate this problem, groups often evolve mechanisms for distributing cognitive responsibilities, thereby creating an expanded and more efficient cognitive system. Wegner (1987) has studied transactive memory, which he defines as a shared system for encoding, storing, and retrieving information. This system, which develops when people interact over time, is composed of the memory systems of the individuals in the relationship and the communication processes that link these systems (cf Hutchins 1991). Wegner and his colleagues have pointed out several ways in which transactive memory improves information encoding, storage, and retrieval, but they have also shown that, under certain conditions, it can have detrimental effects. For example, Wegner et al (1991) demonstrated that romantic partners exhibited lower recall than did pairs of strangers when the experimenter imposed a particular memory structure (e.g. one person should remember food items, and the other should remember history items), whereas just the opposite pattern emerged when no memory structure was assigned. Apparently transactive memory systems that develop in ongoing relationships can hinder recall when the partners are forced to adopt a new memory structure.

Memory is social in at least two other senses (cf Middleton & Edwards 1990). First, the content of memory is social to the extent that it refers to one’s past social actions and experiences (e.g. Duck 1982; Messe et al 1981). Second, the process of memory formation is social to the extent that it is based on symbolic communication with other people. Several studies have examined how interaction affects memory in face-to-face groups (e.g. Clark & Stephen- son 1989; Hartwick et al 1982; Vollrath et al 1989). Evidence indicates that three variables play an important role in collaborative recall: the degree of consensus favoring a response alternative, the correctness of the alternative, and members’ confidence in their responses (Hinsz 1990).

Communication and Linguistic Interaction

The relations between cognition and communication are complex (cf Billig 1987; Schwarz & Strack 1991; Zajonc & Adelmann 1987), but there is broad agreement that the conventions of conversation both enable and constrain collaborative thought (cf Vygotsky 1962 and Wertsch 1985). Several investigators have examined how particular features of conversation are used to establish and maintain “common ground” (i.e. to coordinate referential meaning) during communication (see Higgins 1981a). Some of this work involves the ways speakers work together to honor conversation principles of the sort that Grice (1975) proposed. For example, Clark and his colleagues (e.g. Clark...
& Brennan 1991) have argued that grounding activities are determined by the principle of "least collaborative effort" and that these activities change with both the purpose of the conversation (e.g. identify referents vs register verbatim content) and the medium of the conversation (e.g. face-to-face vs electronic mail).

The importance of the communication medium is also being recognized in the growing body of work on distributed cognition and collaborative mental work (e.g. Galegher et al 1990; Resnick et al 1992; Suchman 1987). This work shows that in conversation, talk, like ideas, is produced jointly. Analysis of the linguistic structure of dialogs shows that much of what is said by each speaker is incomplete and relies for coherence on the contributions of others, along with the physical context.

Taking a sociological perspective on language, ethnomethodologists have argued that language contains specific tools for maintaining social and cognitive coordination, so that it is neither necessary nor desirable for individual contributions to be complete. For example, Schegloff (1991) has shown how conversational "repair" of misperceived utterances maintains both the shared reference and the appropriate social relationship between the conversation partners.

Several investigators have shown that speakers construct their communications to fit the assumed knowledge and social communities of their listeners. According to Krauss & Fussell (1991), communicators use two sources of evidence to construct hypotheses about their shared communicative environments: (a) prior beliefs and expectations about others, based on their personal characteristics and social category memberships; and (b) feedback obtained from direct interaction with others. Higgins and his colleagues (Higgins 1992a) have found that knowledge of the audience's position on an issue affected what the communicator transmitted about this issue, as well as the communicator's subsequent memory for the original information on the issue. Finally, there is evidence that communicators take into account the different knowledge possessed by different audiences by communicating a hidden message to one audience while simultaneously misleading a second audience (Fleming & Darley 1991).

CONCLUSION

Our selective review, drawing on work in social psychology and in several social sciences, documents the many ways the social and the cognitive interpenetrate and interact in human functioning. The last two sections of our review signal most clearly the future of the new field of sociocognition that we believe is emerging. The research discussed there considers social interaction to be a paramount site for the development and practice of cognition. We have distinguished research that treats individual mental activity as the central problem in cognitive research, considering interaction primarily as a stimulus to
that private mental work, from research that treats the interacting group as the
cognitive unit, considering individuals primarily as contributors to the cogni-
tive work of the group. This distinction—between interaction that *stimulates*
cognition and interaction that *constitutes* cognition—may become less crisp as
the field continues to develop.

Although some might claim that the brain as the physical site of mental
processing requires that we treat cognition as a fundamentally individual and
even private activity, we are prepared to argue that all mental activity—from
perceptual recognition to memory to problem solving—involves either repre-
sentations of other people or the use of artifacts and cultural forms that have a
social history. Our attention to linguistic processes in cognitive collaboration
brings into focus the extent to which cultural inheritances shape even individ-
ual cognitive activity (cf Wertsch 1985). The rules of pragmatic discourse (cf
Austin 1962; Grice 1975; Searle 1969) vary from culture to culture, as does the
vocabulary available for expressing ideas. Other inherited tools, such as scien-
tific instruments and theories, also embody accepted ways of thinking (cf
Latour 1987) and thus invisibly shape the course of both individual and group
cognitive activity.

Culture, which includes the ways of thought, tools, and artifacts of a group
of people, is both socially constructed and socially transmitted (Shweder
1991). It carries the past history of a group into the present and therefore
influences how group members understand their social, physical, and spiritual
worlds. This point has been powerfully elaborated by Cole (1988; Laboratory
of Comparative Human Cognition 1983) and others representing what is called
the *sociocultural* perspective on cognition (Greenfield 1984; Lave 1988). A
related idea is Moscovici’s theory of *social representations*, which are mental
schemata or images that people use when making attributions and causal
explanations (see Farr & Moscovici 1984; von Cranach et al 1992). As Potter
& Wetherell (1987) suggest, social representations are “social” in at least three
senses: (a) they originate in social interaction and communication, (b) they
provide a consensual code that facilitates communication, and (c) they provide
a means of distinguishing between social groups.

In the messy “real world” it is difficult to imagine any situation that is
purely cognitive—devoid of emotions, social meanings, social intentions, and
social residues in the form of inherited roles and tools. Indeed, the drive to
understand cognition in everyday use has stimulated the interest of cognitive
psychologists in social processes. Some of the lines of sociocognitive research
and theory discussed in this chapter have begun to penetrate everyday contexts
in another way. Several techniques have been developed to exploit social
relationships as tools for enhancing learning and performance in school and
nonschool settings (see Weinstein 1991). Two important techniques are peer
tutoring (Allen 1976; Cohen et al 1982) and cooperative learning (Bossert
1988; Slavin 1983). Some particularly effective educational interventions have
used structured procedures in which students learn to ask questions and provide explanations in small-group settings (e.g. Palincsar & Brown 1984).

Palincsar & Brown’s work is part of a broader movement to apply Vygotskian and related theories of situated cognition to education (see Brown et al 1989; Lave & Wenger 1991; Newman et al 1989; and Rogoff 1990). Central to all of these efforts is the notion of learning as apprenticeship (cf Collins et al 1989). For example, Rogoff (1990) uses apprenticeship theory in analyzing how children acquire cognitive skills, such as memory and planning, during interactions with adults and peers. Lave (1988) gives less attention to the instructional aspects of interaction and more attention to how apprentices acquire knowledge and skills by actively participating in socially valued production activities with more experienced workers. Her analysis emphasizes the linkages between acquiring cognitive skills and developing an identity as a member of a social community.

This work on situated cognition and education is testimony to how engagement with real-world problems can blur disciplinary boundaries as well as the formerly sharp distinction between cognition and social behavior. This blurring is welcome because of the theoretical advances it allows. Two historical examples illustrate the theoretical benefits of taking social processes seriously in studying cognition: Efforts to account for the role of social factors in recall led to Bartlett’s (1932) theory of reconstructive memory, and work on how social values affect perception led to Bruner’s (1957) concept of accessibility. As the field of sociocognition develops and new conceptions of the relationship between individual and collective cognition emerge, fundamental advances in both social and cognitive sciences are likely.

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See Suls & Wills 1991, pp. 23–49