

MENTAL REPRESENTATIONS OF PERSONS AND PERSONALITY

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The science of personality has long been troubled by the conflict between biosocial and biophysical conceptualizations of its subject matter (Allport, 1937). Empirical work on personality since Allport's time has emphasized the biophysical view. Thus, the traditional psychometric approach to personality has expressed its concern with individual differences in what might be called the Doctrine of Traits (Kihlstrom, 1988), in which persons are viewed as collections of intrapsychic dispositions, analogous to physical characteristics, which give surface behavior a high degree of coherence, stability across time, consistency across situations, and predictability. Still, the Doctrine of Traits has been under attack, off and on, for more than half a century (Hartshorne & May, 1928; Mischel, 1968; Nisbett, 1980; Peterson, 1968). According to its social-psychological critics, the correlations among topographically different behaviors, and among semantically related traits, are too low to provide more than the most abstract coherence: both observed behavior and inferred traits show at best only modest stability over even short periods of time and substantial variability from one situation to another; and the extent to which specific behavior can be predicted from generalized traits is very low, even when behavior is measured in the aggregate. Thus, coherence, stability, consistency, and predictability—the very *raison d'être* for the Doctrine of Traits—appear to be more in the eye of the beholder than in the person beheld.

In this way, the social-psychological critique of the Doctrine of Traits leads naturally to an emphasis on the biosocial rather than biophysical aspects of personality—on *impressions* of personality, rather than personality per se. But, of course, one need not adopt the social-psychological critique of traditional psychometric approaches to personality in order to be interested in how people perceive, remember, and categorize themselves and others. In this chapter, we introduce contemporary research in social cognition which bears directly on the mental representation of other persons and their personalities (for a parallel review of people's mental representations of themselves, see Kihlstrom & Klein, 1994).

I. THE DOMAIN OF SOCIAL COGNITION

Cognitive psychology is concerned with mental representations of the world and the mental processes that operate on these representations in the course of acquiring, manipulating, and utilizing knowledge stored in the mind. Cognitive psychology casts a very broad net; indeed, insofar as psychology is defined as "the science of mental life" (James, 1890/1981, p. 15), the idea of a cognitive psychology is almost redundant. Of course, there was a time when psychology was defined as the science of behavior and psychologists limited their work to tracing the functional relations between environmental stimuli and the organism's muscular and glandular responses to them. Cognitive psychology does not abjure an interest in behavior, but it does assume that a complete understanding of behavior requires an explication of the mental structures and processes that mediate between stimulus and response. Thus behavior is a window on the mind, and the visible expression of mind is intelligent action. Behavior that is not under cognitive control, what might be called reflexive or instinctual, is more properly the province of disciplines such as neuroscience and ethology.

Cognitive approaches to personality, social, and clinical psychology share the assumption that behavior is cognitively mediated—guided by our perceptions of the current situation, memories of similar situations encountered in the past, impressions of ourselves and other people in the current environment, attributions concerning their (and our own) experiences and actions, and other sorts of judgments and inferences that go beyond the information given in the stimulus situation. When we speak of *social* cognition, then, we speak of cognition in the social domain, both elements broadly construed. At one level, the study of social cognition is simply the study of our knowledge of social entities—of ourselves, other people, the situations in which we encounter them, and the interpersonal behaviors which are exchanged in those situations. At another level, it is concerned with the structure of mental representations of these social entities, as they are currently perceived or retrieved from memory, and the ways in which these representations are constructed, reconstructed, and used to guide our experience, thought, and action in social domains.

The formal study of social cognition is only about 50 years old. It had its beginnings in the work of Heider (1944) on phenomenal causality, Asch (1946) on impression formation, and Bruner and Tagiuri (1954) on implicit personality theory. Cognitive concerns are also represented in much of the classic work on cognitive consistency, balance, and dissonance, clinical judgment, and attribution theory produced during the "Golden Years" of experimental social psychology. But the cognitive concerns of social psychology during this period were relatively informal, perhaps because the field of modern cognitive psychology was also in its infancy.

This situation changed radically in the late 1960s, as social psychologists proposed formal models concerning the mental representation of persons and the judgments involved in causal attribution and impression formation. Of particular importance were Rosenberg's spatial models for the representation of persons (e.g., Rosenberg, Nelson, & Vivekananthan, 1968) and N. H. Anderson's (1965) algebraic models for social judgment processes. Through them, social cognition began to make closer contact with the emerging cognitive psychology. The connection has tightened since then, with many psychologists from both sides crossing the border frequently and effortlessly. The result has been that the study of social cognition is characterized by sophisticated concepts, theories, and methodologies, many of which are ripe for application in the fields of personality and clinical psychology.

II. ALTERNATE VIEWS OF SOCIAL COGNITION

At this point in time, several general approaches to social cognition have emerged that are coherent and distinctive enough to stand as identifiable theoretical paradigms (for a fuller discussion, see Hastie, 1983). Each of these differs from the others in terms of the completeness of its account of social cognition, and each offers a different budget of theoretical assets and liabilities.

Role theory (Sarbin, 1954) is based on a "dramaturgical metaphor" in which actors play out scripts before audiences. From this point of view, personal conduct is governed by social roles imposed by the context in which behavior takes place; socialization involves acquiring a repertoire of roles and understanding the roles required by various situations. In principle, role theory is ultimately a cognitive theory because roles are abstract ideas that an actor must learn in order to behave in conformity with social demands, expectations, and norms. In practice, however, Sarbin and his associates have not explored the sorts of mental structures and processes that are relevant to mainstream cognitive psychology. By focusing its analysis on the situational context in which social roles are enacted (Sarbin, 1982), role theory identifies itself as a version of situationism, and is more sociological than cognitive in its orientation to its subject matter.

The *cognitive algebra* approach is primarily associated with the research of Norman Anderson (1974, 1978, 1981) and his colleagues on the processes whereby information from several sources is integrated into a unitary impression of a single person. Unlike role theory, cognitive algebra provides a complete description of a

cognitive system, including psychophysical relations governing perception, psychomotor laws governing response generation, and a set of cognitive processes that mediate between stimulus and response. These mediating processes consist of algebraic rules for transforming stimulus values (usually according to a weighted averaging rule). A closely related program of research, labeled *social judgment theory* (Arkes & Hammond, 1986; Brunswik, 1956; Hammond, 1955), has also utilized algebraic models based on regression equations to capture the processes employed in social judgment tasks such as psychiatric diagnosis (Brehmer & Joyce, 1988; Slovic & Lichtenstein, 1971).

An alternative *judgment heuristics* approach is represented in the research and theory of Kahneman and Tversky (1974; Kahneman, Slovic, & Tversky, 1982), Nisbett and Ross (1980; Ross, 1977), and a collection of researchers who have studied causal attributions for behavior and predictions of social events (e.g., Heider & Simmel, 1944; Jones, 1979; Jones & Davis, 1965; Kelley, 1967, 1973). While the mental operations of cognitive algebra appear to require considerable effort, judgment heuristics invoke shortcuts that permit efficient judgments under conditions of uncertainty, but increase the likelihood of error. Thus, judgment heuristics account easily for the departures from normative rationality that are so frequently observed in social cognition.

From a bird's eye view, role theory has emphasized the contents of roles and their implications for action, but has neglected the manner in which these might be mentally represented and processed in the mind. The cognitive algebra and judgment heuristics approaches have both emphasized the manner in which information is processed, but have also neglected the manner in which it is represented. A fourth approach, *symbolic information processing theory*, provides a more thorough account of both the representation and the processing components of a complete cognitive theory. The information processing approach dominates the study of nonsocial cognition and provides the framework for the remainder of the present review (for a fuller description, see Hastie, 1986).

A. The Computer Metaphor

The information processing approach is derived from a computer metaphor of the mind and employs computer program simulations which are designed to provide "languages" in which to write cognitive theories. These simulation models are then tested to determine whether they mimic the actual behavior of people.

B. The Architecture of the Mind

Most current versions of the "architecture of cognition" (e.g., J. R. Anderson, 1983) provide for the movement of information "inward" from the sensory registers, "through" short-term memory, "toward" long-term memory, and "back" to short-term memory again. Recently there has been a shift toward a unitary conception of the memory store in which sensory registers are peripheral and a general long-

term store is the locus of thinking in an activated portion described as short-term memory. A variant on this point of view distinguishes between merely active portions of memory and portions of memory that are in dynamic transformation, labeled the working memory.

C. A Taxonomy of Knowledge Structures

A useful conceptual distinction has been borrowed from computer science: *declarative* knowledge consists of general beliefs concerning the nature of the world and specific memories of events that have occurred in one's personal experience; *procedural* knowledge consists of the skills, strategies, and rules with which we manipulate and transform declarative knowledge as well as take action in the world (J. R. Anderson, 1983; Winograd, 1975). Within the domain of declarative knowledge it is common to distinguish between *semantic* knowledge, which comprises abstract, categorical information, perhaps best conceptualized as a combination dictionary and encyclopedia, and *episodic* knowledge, which consists of autobiographical memories of events encoded with reference to the self and experienced within a particular temporal, spatial, emotional, and motivational context (Tulving, 1983).

With respect to social cognition, declarative-semantic knowledge consists of the categories which we use to classify social stimuli—other people, ourselves, interpersonal actions, and the situations in which social interaction takes place. Declarative-episodic social knowledge has sometimes been studied in the form of an individual's memory for other persons, but it is more generally represented by the person's autobiographical memory. Procedural social knowledge consists of the social competencies, strategies, and rules by which we form impressions of others, make causal attributions and other judgments, encode and retrieve social memories, plan and execute social behaviors, and manage other people's impressions of us. At the boundary between declarative and procedural social knowledge are *scripts* for social interactions (Abelson, 1981; Schank & Abelson, 1977). As semantic knowledge structures, scripts are used to help categorize the situations that people find themselves in and to make inferences about what has happened in the past and what will happen in the future; as procedural knowledge structures, they guide the actor's behavior in the situation from start to finish.

D. The Activation of Ideas

A critical issue for research and theory has been to characterize the manner in which each of these structures is located and activated in its appropriate memory. The reigning principle, called "spreading activation," postulates that one activation of one concept in long-term memory, whether by perception or thought, activates closely related concepts according to the degree to which the new concepts share features or associative links to the initial concept. At some point, the idea becomes active enough to be accessed for utilization by the information processing system.

An important corollary to the spreading activation principle is that activation of any concept takes time to decay. If a concept retains an amount of activation, it can be more easily reactivated on a subsequent occasion. This “priming effect” diminishes quickly, but some systems of social nodes (such as personality concepts) have been hypothesized to be permanently activated (Bargh, Bond, Lombardi, & Tota, 1986; Higgins, King, & Mavin, 1982; Markus & Sentis, 1984). Chronic activation explains certain individual differences in sensitivity to types of information or habits in social comparison processes. For example, some perceivers seem to be “tuned to” channels of information about other people that have implications for their intelligence, while others are chronically concerned with attractiveness or with athletic ability.

E. Elementary Information Processes

The information processing approach is based on a reductionist theoretical method that assumes complex performances can be decomposed into a collection of elementary information processes. Thus, a complex achievement like the judgment of an applicant’s suitability for a job or the response to a request for help from an acquaintance can be described ultimately as a chain of elementary processes that operate to activate, store, and transform information. This basic cognitive level is hypothesized to describe a level of organization just above the neural substrate.

F. Control of Thought

Working memory contains representations of a person’s goals, including global goals and current subgoals that have to be achieved on the way to the ultimate goal, which join perceptual inputs as sources of activation of ideas in memory. Presumably there is an executive control structure that allocates priorities among multiple goals, coordinates goals when possible, and attempts to resolve competition among conflicting goals. From the point of view of social cognition, this executive control structure is an important component of the self.

G. Linking Mind and Body

Cognitive neuroscientists are beginning to fulfill some of the promises to link mind and body that were the subject of the earliest philosophical speculations about human psychology. This has led some psychologists to jump to the conclusion that theory at the cognitive level will soon be antiquated and that another level is more suitable closer to if not identical to the physical level of brain modeling. The most popular solution is to propose “neurally inspired” “connectionist” models that are intermediate between the cognitive level (frequently glimpsed through the lens of consciousness) and the neural level studied by anatomists.

III. PERSON PERCEPTION

For much of its early history, social cognition was defined as the study of person perception (Bruner & Tagiuri, 1954). The study of person perception begins with an analogy to the perception of nonsocial objects. The person exists as an object independent of the mind of the social perceiver, and the perceiver's task is to form an internal, mental representation of the person. In the same way that nonsocial perception extracts information from the array of physical energies impinging on sensory surfaces in order to address questions concerning the form, location, and activity of some object, social perception extracts information from the stream of behavior in order to address questions of the thoughts, moods, motives, and traits of other people.

The study of person perception begins with the work of Asch (1946, p. 207), who defined the general problem as follows:

How do we organize the various data of observation into a single, relatively unified, impression? How do our impressions change with time and further experiences with the person? What effects on impressions do other psychological processes, such as needs, expectations, and established interpersonal relations, have?

In order to study this problem, Asch invented the impression-formation paradigm in which a subject is presented with an ensemble of traits describing another person (the target) and is asked to report an impression of the target by completing a free description, adjective checklist, or rating scales. He interpreted his findings (e.g., the discovery of *central traits*) as supporting the view, explicitly derived from Gestalt approaches to nonsocial perception, that the unified impression is greater than the sum of its individual elements.

Asch's experiments largely set the agenda for the next 20 years of research on person perception. For example, N. H. Anderson's (1965, 1974, 1978) work on cognitive algebra analyzed the mathematical rules (e.g., adding vs. averaging) that govern how trait information is combined. Wishner (1960) and Rosenberg et al. (1968) showed that central traits (e.g., Asch's "warm-cold" pair) have high loadings on the superordinate factors that summarize the trait lexicon. A major product of this line of research was the concept of *implicit personality theory* (IPT; for a review, see Schneider, 1970). Bruner and Tagiuri (1954) argued that perception of all kinds goes "beyond the information given" in the stimulus array, and depends on the perceiver's expectations and goals as well as general and specific world knowledge retrieved from memory. Thus, in the case of person perception, it is necessary to understand the "naive, implicit theories of personality" that people reason with, in order to understand how they form impressions of others. For Bruner and Tagiuri, IPT comprises the learned relations among various (biosocial) aspects of personality—relations that might be quite different from those present in actual, empirical (biophysical) database. Cronbach (1955) expanded the concept of IPT to include a list of the important dimensions of personality, estimates of population

means and variances on each of these dimensions, and estimates of the covariances among them.

Later, Rosenberg and his colleagues (Kim & Rosenberg, 1980; Rosenberg & Sedlak, 1972) evaluated a three-factor semantic differential model derived from Osgood's (Osgood, Suci, & Tannenbaum, 1957) connotative theory of meaning, and found that evaluation (social and intellectual) was the only perceptual dimension common to all subjects. More recently, Goldberg (1981) and others have proposed that Norman's (1963) "Big Five" model for the structure of personality (extraversion, agreeableness, conscientiousness, emotional stability, and culturedness) is a universally applicable structure of perceived personality—at least so far as Western, industrialized cultures are concerned.

A continuing debate concerns the origins of IPT. The question was initially raised by an early study by Passini and Norman (1966), who extracted the same five factors from personality ratings of strangers and of friends. Since the judges could not have known the actual covariation of features in the personalities of the target people, it seemed likely that the perceived correlations, as reflected in the factor structures, were contaminated by the judges' expectations and beliefs. This argument has been made most forcefully by Shweder and D'Andrade (1979; D'Andrade & Shweder, 1987; Shweder, 1982), and has been opposed by Weiss and his colleagues among others (Block, Weiss, & Thorne, 1979; Weiss & Mendelsohn, 1986).

A. The Ecological Approach to Social Perception

Asch (1946) described his stimulus persons in terms of lists of traits. This has the advantage of experimental convenience and mimics the ways in which people describe each other in social interaction (Fiske & Cox, 1979; Peevers & Secord, 1973; Shweder & Bourne, 1981). At the same time, it is clear that people do not really perceive each other as lists of traits (although much "secondhand" information is conveyed indirectly in third-person descriptions of a person; Gilovich, 1987). In the case of direct acquaintances, we perceive the physical characteristics and behaviors of other people. Trait lists may come close to the mental representation of personality stored in memory, but these abstractions are far from the faces, voices, and gestures that make up the actual array of stimulation encountered in the social environment. Accordingly, Ittelson and Slack (1958) raised the concern that analyses of person perception based on the Asch paradigm are incomplete, if not fundamentally misleading. Subsequently, McArthur and Baron (1983; Baron, 1981; Baron & Boudreau, 1987; Zebrowitz, 1990) have argued for an ecological approach to social perception inspired by the work of J. J. Gibson (1966, 1979), who asserted that phenomenal experience is the unmediated, *direct perception* of stimulation, qualitatively the same as perceiving the pitch of sound or the color of light. Ultimately, Gibson proposed that what we really perceive are *affordances*: the functional utilities of objects for organisms with certain action capabilities. In other words, we perceive

the world in terms of the actions that we can take with respect to the objects in the world.

The Gibsonian approach has been applied to various topics in social perception. For example, one interpretation of attribution theory is that the environment supplies all the information needed to render a judgment of causal responsibility—that when the relevant information concerning consensus, consistency, and distinctiveness is available, causality “jumps out” at the perceiver (McArthur & Baron, 1983). While it might seem unlikely that specific neuronal structures have evolved to produce attributions of causality to actors, targets, and contexts, human beings do seem to possess some capacity for picking up the sorts of covariation information that lies at the core of Kelley’s (1967, 1973) ANOVA model of causal attribution. That this apparently cognitive ability is part of our innate biological endowment is suggested by the fact that the ability to process covariations (or conditional probabilities) among environmental events is essential for classical conditioning to occur (Rescorla & Wagner, 1972)—a form of learning that is accessible to all vertebrate, and many invertebrate, organisms (Razran, 1971).

The manner in which perceivers respond to human faces seems to be especially conducive to analysis in terms of Gibsonian direct realism. For example, Ekman and Friesen (1971), following Darwin, have argued for an innate mechanism for perceiving another person’s emotional states by extracting information from his or her face. Similarly, Rosenthal, Hall, DiMatteo, Rogers, and Archer (1979) have summarized the evidence for cross-cultural invariances in the perception of emotion from extralinguistic verbal cues. Age can be accurately perceived from such features as the ratio of head to body length, position of eyes with respect to the top of the head, size of eyes and length of nose and ears, and round versus pointed head shape (Shaw & Pittenger, 1977). Possession of “babyish” features lead adults to be perceived as low in strength and dominance (McArthur, 1982). A broad face or receding hairline increase perceptions of dominance (Keating, Mazur, & Segall, 1981).

Global perceptual properties of the body also seem to support some remarkably subtle conclusions about the person perceived. A number of such studies involve adaptations of the point-light technique of Johanssen (1973), in which target persons are clothed in black leotards to which point-light stimuli have been attached. When targets are photographed against a black background the resulting stimulus gives no clues to body morphology; yet Kozlowski and Cutting (1977) found that subjects were able to reliably discriminate between males and females on the basis of gait.

It is not yet clear how well the direct or ecological approach to perception will succeed, in either social or nonsocial domains. Still the Gibsonian concern with ecological validity is pushing researchers in social cognition to move from sterile stimulus materials such as still photographs, trait lists, and verbal descriptions of behavior to more life-like materials. Even if the direct/realist approach to person perception should prove to be misguided in its rejection of mental structures and

processes, research within this tradition will lead a better description of the stimulus that is represented by internal mental structures and processes.

IV. PERSON CONCEPTS

Forming mental representations of persons and other social stimuli is fundamentally a problem of perception, and, as Bruner (1957) noted, every act of perception is an act of categorization. We naturally sort stimuli into equivalence classes based on similarity of features, attributes, or properties, forming concepts—mental representations of categories of objects. The concepts that we use to guide social perception are basic components in the repertoire of social intelligence: they form the background against which we organize and make sense of our social world (Cantor & Kihlstrom, 1987, 1989; Kihlstrom & Cantor, 1989; Lingle, Altom, & Medin, 1984). They are also the cognitive basis for consistency in social behavior: people respond in a roughly equivalent fashion to persons, situations, and behaviors which belong to the same category. Thus, we cannot understand a person's social behavior unless we understand the person's repertoire of social concepts and how they are formed, organized, and used. As Kelly (1955, 1963) noted, individual differences in social behavior may arise from individual differences in the categories used to construe social objects and events.

There appear to be at least four major types of social categories. (1) Categories of *persons* are labeled by nouns that designate types of people—extraverts and neurotics, jocks and nerds, preppies and yuppies; there are also categories of social roles, such as parent, lover, teacher, and doctor. (2) Categories of *actions* are labeled by adjectives that designate qualities of behavior, for example, extraverted, agreeable, conscientious, emotionally stable, intelligent, cultured, or open. (3) Categories of *situations* are labeled by nouns designating the types of situations in which social behavior is displayed, for example, weddings, funerals, seminars, cocktail parties, interviews, and bar-mitzvahs. (4) Viewed as declarative knowledge structures, *scripts* are also concept-like, in that they contain bundles of features that various specific instances of a class of interactions have in common.

Although the content of social categories may differ from one individual or culture to another, the structure of these categories is probably pretty much the same for everyone (for comprehensive coverage, see E. E. Smith & Medin, 1981). Over the past two decades, the classical view of category structure, dominant from the time of Aristotle, has been replaced by a probabilistic or prototype view. This view, in turn, has been challenged by a new *exemplar* view of categorization. As an example of the difference among these views, consider Kant's (1798/1978) fourfold taxonomy of temperamental types: melancholic, choleric, sanguine, and phlegmatic. Kant described the melancholic individual as anxious, worried, unhappy, suspicious, serious, and thoughtful, and the phlegmatic individual as reasonable, high-principled, controlled, persistent, steadfast, and calm. Thus, under the classical view, all melancholics possess each of certain features in common, and any individual

who possesses the entire set of features was thereby classified as a melancholic as opposed to a phlegmatic type of person. While such a scheme might fairly represent ideal personality types, they might not prove useful in the actual business of classifying people. For example, what would we do with Bob, who is anxious and worried but not serious and thoughtful? Or Tom, who is anxious and worried, serious and thoughtful, but also controlled and persistent? Proper-set definitions of categories seem to leave no room for the partial and combined expression of personality types (see Achenbach, 1980, for a related, empirically based critique of traditional psychodiagnostic categories). Probabilistic approaches solve this problem by classifying individuals in terms of the central tendencies of their traits. Bob would be labeled as melancholic if he displayed some critical number of central features of melancholia, even if he did not possess all of them and even if he possessed a few features normally associated with phlegmatics; alternatively, Tom would be labeled as melancholic if the average value of his melancholic traits were higher than that of his phlegmatic traits. Under the exemplar view, by contrast, Bob and Tom would be compared to specific individuals who exemplify melancholia or phlegmatics, as opposed to summary prototypes. If Bob resembles Dave, and Dave has been labeled as a melancholic, then Bob will also be classified as a melancholic; if Tom does not resemble any known melancholic, then he will escape this particular label.

An extremely interesting application of probabilistic, fuzzy-set approaches to categorization has been in the area of psychiatric diagnosis (Cantor & Genero, 1986; Cantor, Smith, French, & Mezzich, 1980). Psychiatric diagnoses traditionally have been construed in terms of the classical view of categorization; a diagnostic category must be defined by the singly necessary and jointly sufficient features that define a *proper set*. In contrast, Cantor and her colleagues have argued cogently that the diagnostic categories are *fuzzy sets* of features that are correlated with, but not singly necessary or jointly sufficient for, category membership. The principal result of this situation is considerable heterogeneity among category members, such that they are related by family resemblance more than any set of common defining features. This probabilistic point of view was implicitly adopted in the 1987 revision of the Diagnostic and Statistical Manual of Mental Disorders, and is maintained in the fourth edition (American Psychiatric Association, 1994).

Certainly the probabilistic view has dominated studies of social categorization (Lingle et al., 1984). For example, Cantor and her colleagues (Cantor & Genero, 1986; Cantor & Mischel, 1979; Cantor, Mischel, & Schwartz, 1982; Genero & Cantor, 1987; Niedenthal & Cantor, 1984) performed seminal research on the role of feature list prototypes in the categorization of persons into types (see also Brown, 1980). Hampson (1982), Buss and Craik (1983), and John, Hampson, and Goldberg (1989) have offered similar analyses of the classification of specific behaviors by traits. By and large, this research has shown that our concepts of persons and their behaviors are organized probabilistically as fuzzy sets, imperfectly nested, heterogeneous, and summarized by category prototypes. However, there has been little research testing alternatives within the probabilistic view, and even less attention given to comparing the prototype view with the exemplar view.

Another outstanding issue concerns the nature of natural categories of persons. The question arises of whether there are natural categories of persons that have some degree of universality, regardless of the sociocultural affiliations of perceiver or target. Brown (1980) has proposed that social stereotypes based on race, sex, or nationality may serve the function of basic person categories. Consulting word frequency norms to determine which person categories are most frequently used in everyday discourse, and which might therefore represent the most psychologically salient and general categories, he turned up ethnic stereotypes such as Oriental and Jew, kinship terms such as mother and husband, and terms pertaining to culturally specific professions and social roles (teacher, lieutenant, poet, cook, nurse, etc.). Furthermore, Brown noted that college campuses, with their rich repertoire of labels relating to socioeconomic status (preppie, yuppie), political stance (hippie, eco-freak), and place of residence or voluntary association (Tri-Delt, Skull and Bones) provide another rich set of stereotype-based category labels. However, most of these categories of persons are specific to a particular culture or subculture.

Cantor (e.g., Cantor & Mischel, 1979) took a more theoretical tack and derived type labels, expressed as noun phrases, from Norman's (1963) "Big Five" structure of personality traits. Thus, extraversion was translated into "PR type" and "comic joker," conscientiousness into "religious devotee" and "social activist," and so forth. While Cantor's system has the advantage of a basis in current personality theories, it is not clear that either system captures universal distinctions in dispositions, temperament, emotion, and motivation that are inherent in our categorizations of personality.

Recently, researchers have noted a number of cracks in the empirical facade of the probabilistic prototype and exemplar models and have concluded that people carry more than feature lists around in their heads, and that classification processes involve more than similarity judgments (Medin, Goldstone, & Gentner, 1993). Just what this "What more?" comprises is a very open question, but theoreticians believe that important concepts are associated with common sense premises which serve as an explanatory theory to account for differential weights on features, feature intercorrelations, and the nature of the core features that seem to be the essence of concepts.

V. PERSON MEMORY

Perceptual activity leaves its traces in memory, to be retrieved at a later time and used to guide action. Concepts, with their prototypes, lists of characteristic features, and sets of exemplars, are one way to think about the long-term storage of abstract information about persons and personalities. But much of the social information in our memories is much more concrete. For example, we hold a voluminous store of memories of particular people and their behaviors—a domain known as *person memory* (for reviews, see Hastie & Carlston, 1980; Hastie, Park, & Weber, 1984).

The manner in which a person remembers and thinks about other people is of central importance in theories of personality. Many of the seminal schools of thought concerning the development and dynamics of personality put special emphasis on the person's relations with significant others and the manner in which others are conceptualized and remembered (Munroe, 1955). Even "modern" social learning theories of personality place a special emphasis on role models and vicarious learning and reinforcement processes that depend on the person's memories of other people (Bandura, 1977, 1986; Mischel, 1973). In addition, scientific analyses of clinical assessment methods and most types of psychotherapy require a theoretical understanding of the interviewer's, therapist's, and client's social perception and memory processes.

The earliest information processing theories tended to construe knowledge as represented by a verbal code—lists of features or instances associated with concepts or sentence-like propositional descriptions of objects and events. In the current descendants of these early models, concepts are the basic units from which knowledge structures are built. In the typical representation of an experienced event, nodes representing concepts are linked to other nodes representing the characteristic features of those concepts. Propositions consist of higher order networks built of concept nodes that represent the event in memory. For example, in J. R. Anderson's (1983) HAM and ACT structure system, a proposition consists of links between nodes representing subject and predicate; the predicate, in turn, consists of links representing relation and argument. These terms correspond, roughly, to the subject, verb, and object of seventh grade grammar class diagrams.

Other theorists have favored a dual-coding hypothesis, arguing that knowledge can be represented in an analogue as well as a propositional format. For some time, there was a lively debate among psychologists concerning the comparative merits of single-code and dual-code theories. However, there is now general agreement that information may be stored in the form of meaning-based abstract propositions, or as perception-based spatial images (preserving configural information), or as temporal strings (preserving order and contiguity information). In what follows, however, we focus on verbal representations of persons and personality.

There are various formal models of memory available in the information processing tradition, all variations on the theme of associative networks, and all implemented as computer simulations. Similarly, there are several information processing models of social memory (Hastie & Carlston, 1980; Hastie et al., 1984). Explicit proposals, within the information processing framework, have been made by Hamilton (Hamilton, Katz, & Leirer, 1980), Hastie (1980, 1981, 1988; Hastie & Kumar, 1979), Klein and Loftus (1993), Ostrom (Ostrom, Lingle, Pryor, & Geva, 1980; Ostrom, Pryor, & Simpson, 1981), and Wyer and Srull (1989; Wyer, 1974, 1989; Wyer & Carlston, 1979; Wyer & Gordon, 1984), among others.

The simplest representational structures that have been proposed for individuals are associative or semantic networks with unlabeled links, which can store varied types of information, including propositions, images, and emotional responses. An

example is given in Figure 1A, where a particular person is represented by node P1, two of his or her traits by nodes T1 and T2, and six of his or her behaviors by nodes B1–B6. Hastie (1980, 1981, 1988), J. R. Anderson (1983; J. R. Anderson & Hastie, 1974), and Srull (1981) have been the primary advocates of these simple network structures. They assume that social memory is organized primarily by persons, who are represented as single nodes in the network. Events are represented by propositions which describe both the event and the context in which the event occurred. Nodes representing events are linked to the nodes representing the subjects of the propositions describing those events. There may also be episodic and semantic links to other events.

In addition to information about specific episodes, nodes representing abstract descriptive information can be linked to the person node. This would occur, for

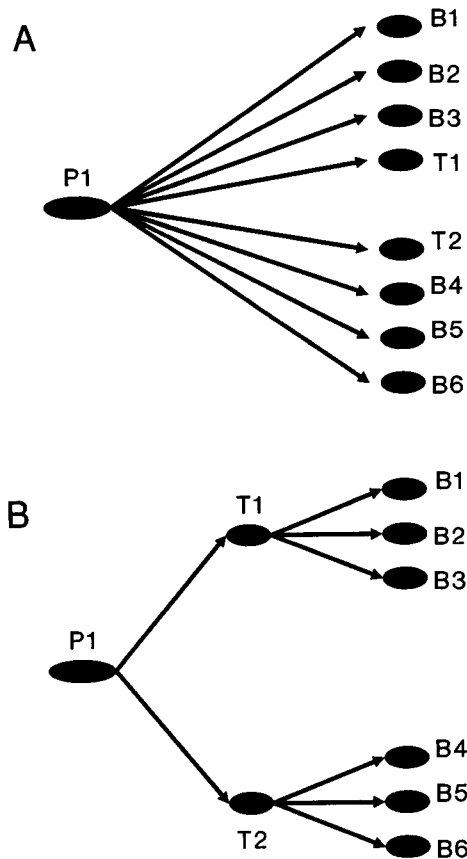


FIGURE 1 Two network representations of memory for a person's traits and behaviors. (A) Trait and behavioral information encoded independently. (B) Behavioral information organized by its trait implications.

example, when the subject forms an impression of a person as talkative or intelligent based on observations of behavior. An inferred abstraction serves as a background for processing new information about the person by providing category-based expectations that are compared with the implications of new experiences. However, research has shown that these abstract inferences are stored independent of the events on which they are based, at least for impressions of casual acquaintances (N. H. Anderson & Hubert, 1963; Hastie & Park, 1986). Furthermore, abstractions about a person like traits affect the encoding of new information because comparisons are made between new information and current salient abstractions. If the new information is surprising in the context of a salient trait (or other abstraction), Hastie (1980, 1981, 1984; Hastie & Kumar, 1979), Srull (1981), and others have hypothesized that it will receive extra attention and processing, and is likely to be associatively linked to other information about the person (Hastie, 1984). However, this on-line trait effect at encoding does *not* guarantee that behavioral information will be clustered in the memory representation “under” the trait attributed to the person (Hastie & Kumar, 1979).

Retrieval of person memory begins by activating the node corresponding to the person, and then activation spreads out along associative pathways emanating from that node. If activation reaches a node representing an event, that event is retrieved, that is, designated as part of working memory. The process continues until task goals are met (e.g., the desired fact has been found) or the process is exhausted (e.g., several attempts to retrieve new information have failed).

This model makes some subtle predictions that have been confirmed empirically. For example, surprising acts tend to be better remembered than expected acts, and a person who performs both expected and surprising acts will be better remembered than one who performs only expected acts. But, the current model is limited in several respects: it utilizes unlabeled, all-or-none links between nodes; search is random and undirected; and judgment is characterized as a simple anchor-and-adjust weighted averaging process. Hastie’s model might be fruitfully complemented by another model, currently being developed by Smith, that also uses the architecture of ACT* production systems to generate inferences based on stored knowledge (E. R. Smith, 1984). The two models, combined and implemented as a computer simulation, would constitute a significant theoretical advance in social cognition.

A closely related structure in the form of a hierarchy with higher level “control elements” associated with traits of the remembered person’s character has been proposed by Cantor and Mischel (1979), Hamilton (1989; Hamilton et al., 1980), Wyer and Gordon (1984), and others. The guiding precept is that the trait terms that are so prominent in people’s spontaneous descriptions of one another (Allport, 1937; Fiske & Cox, 1979; Peevers & Secord, 1973) have a privileged status in social memory representations, serving to organize the other types of information that we have stored about a person (Hamilton, Driscoll, & Worth, 1989). Such a structure is illustrated in Figure 1B, where the trait nodes T1 and T2 fan out from the person

node P1, and representations of events exemplifying these traits (B1–B3, B4–B6) fan out from their respective trait nodes.

However, the strong assumption that traits play a central role in memory representations of individuals has met with some opposition. Studies of the spontaneous self-concept find that personality traits play a much smaller role in self-descriptions than they do in descriptions of other people (McGuire & McGuire, 1988). And, from the beginning (Hastie & Kumar, 1979), many person memory studies have not found that recall memory is “clustered” by trait categories. Ostrom and his colleagues (1980, 1981) have proposed a model that relaxes the strong requirement of organization by traits. They hypothesize that memory for events is *usually* organized by persons when the participants are familiar to the subject, but that other “themes” such as temporal sequence, situational context, self-reference, or group membership dominate memory organization when the focal person is unfamiliar or the social goals of the perceiver do not foreground the other person as an individual.

Finally, Wyer and Srull (1989) have proposed a “bin” model, aimed at accounting for the results of impression-formation experiments, that also does not require that person memories be inevitably organized by traits. They simply combined the two basic models, scrambled associative network and trait organized hierarchy, and claimed that both representations are created, often with duplication of the specific information nodes in a dual representational structure. One part of a individual’s representation in memory is hypothesized to be a scrambled collection of behaviors associated with a summary evaluative node, and another separate part is a hierarchical network of behaviors clustered under trait node elements. Long-term person memory is described as a warehouse of content-addressable storage bins, each tagged with the name of the object described by its contents. Within each bin, the contents are organized according to the temporal order in which they were experienced; otherwise, there is no inherent organization of bin contents.

Wyer and Srull (1989) have noted that a major weakness of all of the person memory models derives from the empirical and theoretical focus on information presented in the unnatural form of impression formation stimulus ensembles, rather than more representative social contexts. In everyday life, our experiences seem to be organized into temporally and causally structured episodes. Memory representations for social information organized into autobiographical episodes have been proposed by Kolodner (1984), Pennington and Hastie (1986), Wyer (Fuhrman & Wyer, 1988; Wyer, Shoben, Fuhrman, & Bodenhausen, 1985), and others. These structures are hypothesized to be more complex than simple networks in two regards: the embedded within-episode components organized to reflect our culturally shared expectations about the components of a well-formed episode and the links between episodes are labeled, with access to a link only permitted to memory probes that include the correct “key” features to “open” the link.

VI. PROSPECTS FOR THE INFORMATION PROCESSING APPROACH TO SOCIAL COGNITION

A minimal model for social cognition should include five elements common to all cognitive theories (Hastie & Carlson, 1980): (a) a vocabulary to describe the stimulus; (b) a characterization of the processes by which stimuli are encoded in memory; (c) a description of the encoded mental representation of the stimulus event; (d) a characterization of the processes by which encoded representations are manipulated and transformed in the course of memory and judgment tasks; and (e) a vocabulary to describe the response to the stimulus. Of the four general approaches to social cognition discussed at the outset of this paper, information processing theory comes closest to satisfying these requirements. The information processing approach is general and it should apply to the cognition of almost anything, including entities in the social world such as other people and oneself. However, information processing theory, developed in a nonsocial laboratory domain, should not be applied uncritically, without modification to the social realm (Holyoak & Gordon, 1984; Ostrom, 1984).

One limit on information processing theory derives from its failure to thoroughly address emotional and motivational phenomena in everyday life. There have been preliminary discussions of the manner in which information processing models could handle these "hot" phenomena (Bower, 1981; Clark & Fiske, 1982; Leventhal, 1984; Mandler, 1984; Ortony, Clore, & Collins, 1988; Simon, 1967), but there has been relatively little laboratory research to adequately test theoretical models. We believe that the information processing approach will provide the best medium to develop hypotheses about interpersonal goals and other purposeful social behavior (Schank & Abelson, 1977; Showers & Cantor, 1985). But, again, more remains to be done than has been accomplished.

The information processing approach has not yet provided a full conceptualization of the conscious versus unconscious process distinction nor has it done justice to phenomena associated with unconscious processes that have been revealed through the history of research on personality and psychopathology (but see Kihlstrom, 1987, 1990). There is, of course, a long tradition of research on implicit (subliminal, preconscious) perception and perceptual defense and vigilance, but this activity has made little contact with the concerns of social cognition *per se*. Moreover, the analysis of unconscious phenomena in everyday social interaction is still virtually untouched (Bargh, 1994; Greenwald & Banaji, 1995; Kihlstrom, 1994).

Another challenge that exceeds current information processing treatments arises from the complexity of the social world. The properties of objects studied in experiments on nonsocial cognition tend to be stable over time and across contexts. However, people change considerably from situation to situation and even from moment to moment within a single situation (Mischel, 1968, 1973). This

means that models that have been developed to characterize the formation and maintenance of mental representations of stable (laboratory) entities are bound to provide inadequate accounts of social cognition. A further complexity is introduced by the fact that many of the entities thought about in the social world are also sentient, independent, and likely to react to the belief that they are being thought about. Thus, a complex recursive sequence of inferences occurs when people wonder what other people are thinking about them and anticipate that the other people are wondering whether they are thinking about what the other person is thinking, and so forth. What this means is that theories of social cognition must take into account the representation of representations of representations within a single mind, where each mind is sensitive to other minds around it.

We do not believe that these difficulties imply that we should abandon the information processing approach to social cognition. To the contrary, we believe the information processing approach provides the best hope for a theory that is complex enough to handle emotion, motivation, the unconscious, and recursive self-conscious inferences about persons and personalities.

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