EXHIBIT 37

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CHAPTER 3

Attention and Encoding

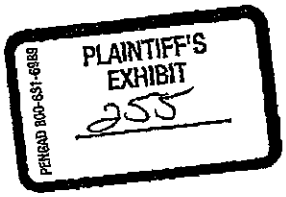
Salience: A Property of Stimuli in Context ◆ Vividness: An Inherent Property of Stimuli ◆ Accessibility: A Property of Categories in Our Heads ◆ Direct Perception: Not Just in Our Heads ◆ Faces: The Focus of Social Attention

A friend of ours was sitting on a bench in a crowded shopping mall when he heard running footsteps behind him. Turning, he saw two Black men being pursued by a White security guard. The first runner was past him in a flash, but he leapt up in time to tackle the second runner, overpowering him. From the ground, the panting Black man angrily announced that he was the store owner. Meanwhile, the thief had escaped. Our friend, who is White and devotes his life to helping the oppressed, was mortified.

For our purposes, this case of mistaken identity illustrates the sometimes tragic consequences of instantaneous social encoding based on interpretations. People rapidly take in other people as stimuli and react to them, so encoding determines much of social interaction as people react immediately in the course of their daily encounters. But what do we notice in the first place?

As artist Frank Stella put it, "what you see is what you see." Attention and encoding are the first steps in mental representation. Before any internal information management can occur, the stimuli outside the person have to be represented in the mind. The name for this general process is *encoding*. Encoding transforms a perceived external stimulus into an internal representation. The encoding process involves considerable cognitive work, which nevertheless can be accomplished with relatively little effort. The instant a stimulus registers on the senses, the process of interpretation begins. Immediately, some details are lost, others altered, and still others may be misperceived. Inferences are stored in memory along with the raw data and may become indistinguishable from them.

Encoding breaks down into several stages useful to social cognition (e.g., Bargh, 1984; Burnstein & Schul, 1982). Most theorists agree that we perform some kind of unconscious, "preattentive analysis" of environmental stimuli, combining features into the objects and events we notice consciously. Once noticed, a stimulus may come into conscious "focal attention" to be identified and



categorized. As "comprehension" occurs, the stimulus is given semantic meaning. Finally, "elaborative reasoning" links the particular stimulus to other knowledge, allowing for complex inferences.

Attention is an integral part of encoding because attention often focuses on what is currently being encoded. If you are thinking about something external, it is at least temporarily represented in your mind. However, attention is not limited to the encoding of external stimuli; whatever occupies consciousness is defined as the focus of attention, as noted in Chapter 2.

Attention can also be occupied by information retrieved from memory. If you are thinking about something you remember, that memory is the focus of your attention. Attention is also occupied by the current contents of the mind (see Chapter 4 discussion of active, working, and short-term memory). People attend to the internal or external stimuli that are in conscious focal awareness.

Whether attention is directed outward toward encoding external objects or inward toward memory, attention is usually seen as having two components: direction (selectivity) and intensity (effort). When you read this book, you are presumably focusing on it rather than on the radio, the conversation in the hall, the itch on your leg, or your love life. Even given your selective focus on this book, you can allocate more or less intense mental effort to it. Attention is the amount of selective cognitive work you do (Kahneman, 1973; Norman, 1976; Posner, 1982).

When people are encoding external stimuli, they do not attend evenly to all aspects of their environment. They watch some things closely and ignore others altogether. Attention affects what enters thought and memory, but conscious attention is not necessary for encoding into memory. Cognitive psychologists distinguished between early and late selective attention (Broadbent, 1958, 1982; Deutsch & Deutsch, 1963); that is, the amount of rudimentary perceptual processing that occurs outside of focused attention. Cognitive neuroscience indicates that even unattended stimuli register on the brain (Kanwisher & Wojciulik, 2000), suggesting that selection for conscious attention occurs later. Moreover, with regard to social cognition, the brain is exquisitely attuned to emphatically social stimuli—namely, faces.

This chapter examines what captures attention in social settings because that affects everything that follows in social interactions. We examine *salience*, the extent to which particular stimuli stand out relative to others in their environment, and *vividness*, which constitutes the inherent attention-getting features of a stimulus regardless of environment. In Chapter 2, we introduced accessibility, which describes how people's attention is primed for categories (or particular interpretations of stimuli) that fit what they have thought about recently or frequently. In this chapter we examine how that most social of stimuli, the face, affects attention.

SALIENCE: A PROPERTY OF STIMULI IN CONTEXT

What captures our attention? Salience, the seemingly trivial factor of attracting attention, although logically irrelevant to most social judgment, can have important effects. Think back to the last time you were the only one of your "kind" in a room full of other people. The striking experience of being a salient social

stimulus is the same. One *feels* conspicuous, that all eyes have a single target, and that one's every move is overinterpreted. As a result, one may feel anxious and concerned about how the interaction is going (Ickes, 1984). Moreover, the mere belief that one is a solo can impair one's ability to take in and remember what people say (Lord & Saenz, 1985; Lord, Saenz, & Godfrey, 1987; Saenz & Lord, 1989) and impair one's performance (Sekaquaptewa & Thompson, 2003). Being a solo more generally depletes a person's ability to self-regulate effectively; symptoms include talking too much, disclosing too much or too little, or being arrogant (Vohs, Baumeister, & Ciarocco, 2005). Research on salience supports the uncomfortable experience of the solo as being a center of attention, as looming larger than life, and as the recipient of extreme reactions (S. E. Taylor, 1981a).

Antecedents of Social Salience

The causes of social salience all depend on the immediate or larger context (McArthur, 1981; S. E. Taylor & Fiske, 1978). Solo status results from immediate perceptual and social novelty: having a novel gender, race, and other visual distinction, such as the only red shirt in a room full of blue ones (e.g., Crocker & McGraw, 1984; Heilman, 1980; Higgins & King, 1981, Study 1; McArthur & Post, 1977; Nesdale, Dharmalingam, & Kerr, 1987; Spangler, Gordon, & Pipkin, 1978).

Another form of salience draws on perceptual features of the stimulus that make it figural in the immediate context. Gestalt psychology predicts that stimuli will be salient if they are bright, complex, changing, moving, or otherwise stand out from their drab background (McArthur & Post, 1977), and they do attract longer gazes (McArthur & Ginsberg, 1981). People also notice the addition of a person to a group more than the removal of the person; addition is more salient than subtraction. Most of us fail to recognize that our absence from the gathering will not be as salient as our presence (Savitsky, Gilovich, Berger, & Medvec, 2003).

In the larger social context, people attend to expectancy-inconsistent information. People are salient if they contradict prior knowledge about them as individuals, as social category members, or as people in general (E. E. Jones & McGillis, 1976). Physically disabled people attract attention in part because they are novel compared to people in general (Langer, Taylor, Fiske, & Chanowitz, 1976).

The latter principle of salience, based on expectations about people in general, has been extended in two ways (S. T. Fiske, 1980). First, extreme social stimuli—being unusual—are more salient than moderate stimuli. For example, people stare at extremely positive social stimuli, such as movie stars, and at extremely negative stimuli, such as traffic accidents. Second, most people expect mildly positive inputs: people are optimistic about life outcomes (Parducci, 1968) and rate other individuals positively (Nilsson & Ekehammar, 1987; Sears, 1983; Sears & Whitney, 1973). Hence, negative social stimuli are more salient than positive ones because they are relatively unexpected.[1] Negative events capture preattentive processing (Pratto & John, 1991). What's more, negative events demand immediate coping in order for the individual to return to normal (S. E. Taylor, 1991).

[1]There are some exceptions as well as other explanations for the typically higher weight of negative information in impressions of likability; see Skowronski and Carlston, 1989, for a review.

Salience also depends partly on perceiver goals. People attend to significant others, those on whom their outcomes depend. If two people are talking and one is your new boss, a prospective date, or a new teammate, you will watch that person more closely (Berscheid, Graziano, Monson, & Dermer, 1976; Erber & Fiske, 1984; Neuberg & Fiske, 1987; Ruscher & Fiske, 1990; S. E. Taylor, 1975).

Salience can hinge on mere physical position, such as seating position in a group; the person directly opposite you should be especially salient because that person dominates your visual field (S. E. Taylor & Fiske, 1975). People expect that those who sit in the professor's line of sight—in the middle of many people—will be leaders (Raghubir & Valenzuela, 2006). Thus, to have maximum impact on a meeting, sit at the head or foot of a long table, or sit in the middle, especially the front, of class; to fade into the background, sit on the sidelines.

In a videotape, increasing or decreasing a person's time on camera has similar effects (Eisen & McArthur, 1979; Storms & Nisbett, 1970), even in a videotaped confession (Lassiter, 2002). Sheer visual exposure even holds for political issues: The amount of time an issue is aired on the evening news affects how much weight people give it in subsequent decisions (Iyengar & Kinder, 1987).

A person can be salient relative to an immediate context, relative to the perceiver's prior knowledge or expectations, or relative to other attentional tasks (Table 3.1). Note that the key word common to all these ways of creating salience is *relative:* stimulus novelty occurs relative to an immediate or broader context, a stimulus is figural relative to other stimuli present, and perceiver perspective is created relative to context. The common element in all these forms of salience is that a stimulus is distinctive in relation to other factors in the perceiver's context.

Consequences of Social Salience

Regardless of the way salience is created, its effects are robust and wide ranging (McArthur, 1981; S. E. Taylor & Fiske, 1978). As suggested by the experience of the solo, salience makes a stimulus larger than life in various judgments.

TABLE 3.1. The Causes of Social Salience

A person can be salient relative to the perceiver's
Immediate context
By being novel (solo person of that race, sex, hair color, shirt color)
By being figural (bright, complex, moving)
Prior knowledge or expectations
By being unusual for that person (e.g., behaving in unexpected ways)
By being unusual for that person's social category (e.g., behaving in out-of-role ways)
By being unusual for people in general (e.g., behaving negatively or extremely)
Other attentional tasks
By being goal relevant (e.g., being a boss, a date)
By dominating the visual field (e.g., sitting at the head of the table, being on camera more than others)
By the perceiver being instructed to observe the person

Prominence shows up most in perceptions of causality. Salient people are seen as especially influential in a given group.

This principle extends to causal analyses of the person's own behavior. Perceptually salient behavior is seen as particularly indicative of the person's underlying disposition and as less under the control of the situation. In both cases, causal attributions follow the focus of attention. Videotaped confessions focused on the suspect make the behavior seem more voluntary and, consequently, the person seems more guilty (Lassiter, 2002).[2]

Salience also exaggerates evaluations in whichever direction they initially tend. If a person is unpleasant, being a solo will cause disproportionate condemnation; similarly, a pleasant solo is exaggeratedly praised (S. E. Taylor, Fiske, Close, Anderson, & Ruderman, 1977). Evaluations can be nudged in one direction or another by prior expectations as well. For example, if a defendant in criminal proceedings is viewed negatively, salience should cause the person to be evaluated especially negatively. On the other hand, if the same person is viewed as a person (a more positive expectation), salience causes an especially positive evaluation (Eisen & McArthur, 1979; cf. McArthur & Solomon, 1978). Salience cuts both ways in evaluations.

If salient stimuli elicit attention, perceived prominence, and extreme evaluations, it would stand to reason that they also should enhance memory. Unfortunately, the data are strikingly uneven. Within social cognition research on salience, the main measure of memory has been people's free recall: Sometimes recall is enhanced and sometimes not (McArthur, 1981; S. E. Taylor & Fiske, 1978).

Although salience does not reliably enhance the quantity of recall, it does increase the organization and consistency of impressions in several ways. The more attention one pays to another person, the more coherent the impression becomes. Attention structures impressions, emphasizing features that fit and adjusting those that do not. For example, the solo student at a faculty meeting is likely to be seen as typical of the student category and as presenting the "students' perspective," whether or not the person truly represents most peers (S. E. Taylor, 1981a). The effects of salience on stereotyping mean that salience combines with prior knowledge to produce polarized evaluations (cf. Nesdale et al., 1987). Consequently, a solo man is perceived to be prominent and therefore a good leader, but a solo woman in an all-male group is perceived to be an intruder and is caused to feel like one (Crocker & McGraw, 1984). Attention (mere thought) brings into line the evaluative components of an impression, which then becomes more extreme, at least under certain conditions (Chaiken & Yates, 1985; Millar & Tesser, 1986b; Tesser, 1978).

We have seen that salience and attention have a variety of effects on judgments. Attention exaggerates evaluations and causal prominence in whatever direction they initially tend. Attention sometimes increases recall and can encourage stereotypic interpretations. How robust and important are these

[2]Because people generally see other people as causal agents (Heider, 1958; E. E. Jones & Nisbett, 1972; L. Ross, 1977), attention normally exaggerates this tendency (S. T. Fiske, Kenny, & Taylor, 1982). However, if a person's passivity is emphasized, attention can exaggerate perceptions of susceptibility to influence as well (Strack, Erber, & Wicklund, 1982). Salience exaggerates causal judgments in the direction implied by prior knowledge.

effects of temporary salience on important social judgments? Efforts to increase importance and to enrich stimulus materials, in fact, enhance salience effects (Eisen & McArthur, 1979; McArthur, 1981; McArthur & Solomon, 1978; Strack, Erber, & Wicklund, 1982; S. E. Taylor, Crocker, Fiske, Sprinzen, & Winkler, 1979), and comparable salience effects occur in real-world organizations (Kanter, 1977; Wolman & Frank, 1975) and even television shows (Raghubir & Valenzuela, 2006).

If salience effects have such impact on significant decisions, it becomes especially important to know how controllable salience effects are. Despite early speculations that salience effects might be automatic (S. E. Taylor & Fiske, 1978), they apparently do not qualify as fully automatic because people sometimes can control them. That is, salience effects can be qualified by some forms of involvement, such as self-interest (Borgida & Howard-Pitney, 1983), although not simply by making the task more important (S. E. Taylor et al., 1979). And salience effects may be qualified by some instructions, such as expecting to "describe each member of the stimulus group" (Oakes & Turner, 1986), which would enhance a person-by-person accuracy goal.

A Closer Look at Salience: What Mediates Its Effects?

Given the range of perceptions and behaviors guided by the seemingly trivial factor of what catches the eye (or ear), why should attention have such pervasive effects on social judgment? Psychologists have proposed several processes to connect differential attention and differential judgments; some of these candidates for mediation (i.e., connection) have been debunked and some supported. Sheer quantity of recall and channel-specific recall do not seem to account for the effects of salience on attributions (quantity: S. T. Fiske, Kenny, & Taylor, 1982, S. E. Taylor & Fiske, 1975; but see Harvey, Yarkin, Lightner, & Town, 1980; E. R. Smith & Miller, 1979; channel-specific: S. T. Fiske et al., 1982; McArthur & Ginsberg, 1981; Robinson & McArthur, 1982; S. E. Taylor et al., 1979, Study 1). The ease or accessibility of recall is one plausible mediator (Pryor & Kriss, 1977; Rholes & Pryor, 1982; see also Higgins & King, 1981). In addition, causally relevant recall, especially memory for dominant behavior and appearance, seems to be enhanced by attention and, in turn, leads to exaggerated attributions. Accordingly, the judgment is in effect being made at encoding, on the basis of information that is doubly salient—salient because the person is salient and salient because the dominant behavior itself is salient (S. T. Fiske et al., 1982).

Conclusion

Salience makes a stimulus stand out relative to other stimuli in that context. Salient stimuli may be novel, figural, expectancy-consistent, extreme, negative, rare, physically prominent, or long in duration. Salience exaggerates attention, perceived prominence, evaluations, and the coherence but not the sheer amount of memory. Salience effects show goal-dependent automaticity in that they typically occur outside awareness but can moderate according to perceiver goals. Salience effects may be mediated by causally relevant recall or its accessibility.

VIVIDNESS: AN INHERENT PROPERTY OF STIMULI

Salience has well-established effects, so its cousin, vividness, would seem obvious. However, whereas salience is determined by the relation of an object to its context, vividness is inherent in a stimulus itself. For example, a plane crash is more salient during peacetime than in the context of wartime carnage. Further, by this logic, a plane crash would be inherently more vivid than a normal flight; a detailed description of a particular accident would be more vivid than the statistics about it; and an accident in your local airport would be more vivid than an accident elsewhere. A stimulus is defined as vivid to the extent that it is "(a) emotionally interesting, (b) concrete and imagery-provoking, and (c) proximate in a sensory, temporal or spatial way" (Nisbett & Ross, 1980, p. 45). Do vivid stimuli have effects similar to those of salient stimuli? Although theory and common sense would suggest that vivid stimuli are especially impactful, research suggests that they are not.

The Case for Vividness Effects

Vividness effects seem commonplace in daily life. Consider two versions of the same sponsor-a-child advertisement, one with a poignant photo and case study, the other with dry statistics. In both cases your conscience gives the same counsel, but the first ad seems more likely to attract your attention initially, to change your attitudes, and to elicit the desired behavior. All this is obvious, and as the idea person in an ad agency, you could have thought up the vivid ad yourself.

Psychological theorists have postulated precisely such vividness effects on several conceptual grounds. Vivid information is predicted to be more persuasive than pallid information of equal or greater validity, first, because vivid information should come to mind more easily (Nisbett & Ross, 1980; Tversky & Kahneman, 1973). Second, vivid information by definition easily provokes internal visual representations, which are especially memorable. Third, vivid information seems to have more emotional impact on the perceiver, which would enhance its impact on judgments. In short, the impact of vivid information on human judgment, especially persuasion, would seem to be self-evident.

Unfortunately, scant empirical evidence supports vividness effects (S. E. Taylor & Thompson, 1982). According to the research, messages that are written in concrete and colorful language are no more likely to change attitudes than are abstract and dry messages. Research shows that messages accompanied by photographs usually have no greater appeal. Similarly, videotaped messages only sometimes have enhanced impact. And finally, direct experience, which would seem the ultimate in vividness, does not necessarily change attitudes more effectively than does secondhand contact.[3] In sum, vividness does not work well empirically, although intuitively it seems as if it should.

The major exception to this pattern of negative results is that individual case histories persuade more effectively than do group statistics. The heartrending story carries more impact than worldwide hunger statistics. For example,

[3]Saying that direct experience may not change attitudes is not the same as denying that direct experience may affect the acquisition of attitudes or the impact of attitudes on behavior; it clearly does both (see Chapters 10 and 15).

an individually identified wrongdoer elicits more anger and therefore more punishment than an otherwise similar but unidentifiable wrongdoer (Small & Lowenstein, 2005). However, this result may not speak to the vividness effect, in part because it concerns identifiability, not vividness per se.

What's more, other vividness research—which manipulates concrete (versus dull) language, photographs (versus none), and videotapes (versus transcripts)—holds most other information constant. However, holding information constant is more problematic when contrasting case history and statistical information. They differ in far too many ways to assume that it is only differences in vividness that cause any differences in their persuasive impact. For example, a case history communicates one particular scenario by which the existing facts could occur: a starving child might survive by selling firewood. Statistics communicate a different sort of information, such as life expectancy averaged over many instances. Hence, information nonequivalency is confounded with (not separable from) vividness. Together with the failure to find effects from other types of vividness, this problem suggests that the information difference and not vividness per se accounts for the fact that case histories are persuasive (S. E. Taylor & Thompson, 1982).[4]

Why Does the Vividness Effect Seem So Plausible?

Apparently, little evidence supports the vividness effect. So what would lead people to the intuitive conclusion that there is a vividness effect? Vividness may have some effects on us that are mistaken for persuasion. For example, we believe that interesting, attention-getting messages are persuasive for other people in general, but we do not rate vivid messages as more personally convincing (R. L. Collins, Taylor, Wood, & Thompson, 1988). People also recall vivid information more easily than pallid information (Lynn, Shavitt, & Ostrom, 1985), but memorability does not explain the persuasion occasionally obtained in vividness studies (Shedler & Manis, 1986; Sherer & Rogers, 1984). Moreover, vivid information may make us more confident in our opinions without changing the actual judgment (N. K. Clark & Rutter, 1985).

Finally, vivid information is entertaining, arousing, and emotional, as in the visual embellishments of rock music videos (Zillmann & Mundorf, 1987). The independence of persuasiveness and entertainment was put well by one of Carl Sagan's colleagues in describing Sagan's "gift for vividness": "Carl is very often right and always interesting. That is in contrast to most academics, who are always right and not very interesting" ("A Gift for Vividness," 1980, p. 68). Vivid communications are frequently perceived as more graphic, more vivid, or more interesting than nonvivid communication in precisely those studies that go on to find no effect on judgments. Thus the entertainment value of vividness does seem to be functionally distinct from its persuasive impact (S. E. Taylor & Wood,

[4]One lingering possibility suggests that vivid information would have its greatest impact after a delay. By this logic, all information is relatively easy to recall immediately after receiving it. After a delay, however, the pallid information's relative weakness allows it to fade, leaving vivid information intact. Although one study has found evidence for this hypothesis (Reyes, Thompson, & Bower, 1980), several others have not, and one (P. Wright & Rip, 1981) found the opposite.

1983). People can mistakenly infer that their attitudes have changed when they have only been entertained or emotionally aroused (R. L. Collins et al., 1988).

Future Directions for Vividness Research

Assuming for a moment that our real-world intuitions are correct and that a vividness effect does exist, it then follows that the attempts to examine it experimentally have been flawed in some important way, or that it does occur, but only under special circumstances that most experiments have so far failed to duplicate. Several principles define the boundaries of the vividness effect (S. E. Taylor & Thompson, 1982). First, many attempts to operationalize vividness confuse vivid messages with vivid presentations. If the message context is too vivid, the gimmicks may draw people's attention away from the message itself (Eagly & Himmelfarb, 1978; Isen & Noonberg, 1979). Recent evidence suggests that vividness that fits the message—as opposed to being incongruent—does enhance processing and persuasion, whereas incongruent, gimmicky vividness undermines it (S. M. Smith & Shaffer, 2000).

Second, some empirical evidence shows that pallid written material conveys more information but that vivid video or live material helps to catch people's attention if they are relatively uninvolved (Chaiken & Eagly, 1976). Video ads do capture people's attention, but they also prompt people to deal mostly with superficial information, such as whether the speaker is good-looking (Chaiken & Eagly, 1983). Vivid information may work on the attentional stage, especially for uninvolved recipients.

If recipients of a message are already highly involved, vividness is not needed to capture attention. Their attention is already captured. What they need are cogent arguments and time to think about them. Written materials allow involved recipients the time to consider the message arguments in detail, which is crucial to persuading such individuals (Petty & Cacioppo, 1979; see also Chapter 10). In this view, vivid ads serve mainly to alert people who are uninvolved, if the vivid material is relevant, but written information persuades people who are involved.

Finally, people differ in their chronic reliance on vivid imagery (Pham, Meyvis, & Zhou, 2001). For vivid imagers, this can exaggerate or attenuate the effects of vividness because they rely less on the information in front of them and rely more on less obvious cues taking off from there.

Conclusion

Vividness is an inherent property of a stimulus. Although vividness effects seem plausible according to both theory and common sense, they appear mostly in contrasting case histories and statistics, which typically confound other kinds of information with the sheer vividness of the presentation. People may be emotionally aroused or entertained by vividness, which is one reason the effects seem plausible. But vivid presentations if irrelevant and gimmicky can actually interfere with persuasion. Future research could focus on relevance, stages of processing, involvement, and individual differences in imagery vividness.

ACCESSIBILITY: A PROPERTY OF CATEGORIES IN OUR HEADS

So far we have discussed contextual salience and inherently vivid stimuli. A third predictor of attention is accessibility of categories, which depends mainly on priming. As noted in the discussion of automaticity in Chapter 2, priming describes the effects of prior context on the interpretation of new information. We also saw that priming can influence cognition, affect, and behavior. This chapter focuses on the cognitive mechanism of priming—namely, accessibility—and how it determines attention, encoding, and, ultimately, mental representation. Accessibility concerns the fact that recently and frequently activated ideas come to mind more easily than ideas that have not been activated. Many years ago, Jerome Bruner (1957, 1958) pointed out that much social information is inherently ambiguous, so social perception is heavily influenced by the *accessibility* of relevant categories: those easily activated given the perceiver's current goals, needs, and expectations.[5] Priming occurs when knowledge is activated (becomes accessible) and is applicable to currently attended stimuli.

Situational Accessibility Effects

Every charity has a newsletter, or so it seems. Why? Presumably, those who run the charity want to stay on your mind. Being constantly reminded of pollution, disease, violence, or the local arts council creates a context for interpreting events. In effect, the newsletter primes the issue, keeping it accessible in your mind and presumably when you interpret the urgency of various charitable causes.

Accessibility also applies for interpreting people. Exposing people to positive or negative trait terms (e.g., adventurous versus reckless) causes people soon afterward to interpret ambiguous behavior (e.g., shooting rapids in a canoe) as correspondingly positive or negative because of the meaning that had been primed (e.g., Bargh, Bond, Lombardi, & Tota, 1986; Higgins, Rholes, & Jones, 1977; Srull & Wyer, 1979; for a review, see Higgins, 1996).

Accessibility effects are strongest, as in this example, when relevant meanings as well as positive or negative valences are primed. That is, the ambiguous behavior is more likely to be seen as reckless when *relevant* negative concepts, compared to irrelevant ones, have been primed. Moreover, experimenters construct the priming and stimulus contexts such that participants do not consciously connect the two. In priming studies, participants must not think that the primed interpretation comes to mind because it was previously provided to them (i.e., accessible due to the primed construct); instead, participants must think the primed construct comes to mind because of the stimulus itself. Because they do not consciously link prime and stimulus, primed participants cannot be merely responding because of what they think the experimenters want

[5]The terms *accessibility* and *availability* have been used in two contradictory ways. We use *accessibility* to mean ease of recall and *availability* to denote whether the information has been stored at all (Higgins & Bargh, 1987, footnote 1; Tulving & Pearlstone, 1966). Note, however, that this is inconsistent with the Tversky-Kahneman usage of availability to mean ease of bringing information to mind (see Chapter 7). In this chapter, accessibility refers to the readiness with which stored knowledge can be used.

them to do (i.e., due to experimental "demand"). The apparent independence of the prime and the stimulus also means that participants have no particularly rational reason to be using the prime in their interpretation of the stimulus. As we saw when first introducing the concept, priming can operate automatically, without one's conscious awareness of the initial prime (Bargh et al., 1986; Bargh & Pietromonaco, 1982).

Accessibility is not limited to trait concepts. Other socially significant concepts can be primed. For example, several studies suggest that racial categories can be primed in an apparently spontaneous fashion (Devine, 1989; Dovidio, Evans, & Tyler, 1986; Gaertner & McLaughlin, 1983); when White participants see words related to African Americans, even presented below the threshold for conscious recognition, they subsequently respond faster to stereotype-related words and evaluate an ambiguous (race unspecified) person as more hostile, consistent with the idea that their racial categories have been primed. On a more overt level, overhearing an ethnic slur can exaggerate White people's negative evaluations of a poor performance by a Black person (Greenberg & Pyszczynski, 1985), perhaps through priming. Police officers and probation officers subliminally primed with Black, race-related words then interpreted a hypothetical adolescent, race unspecified, as having a worse personality, more culpability, expected recidivism, and harsher punishment (Graham & Lowery, 2004).

Similarly, other studies hint that various gender-role stereotypes are subject to priming. For example, men who had just viewed a pornographic film went on to respond more stereotypically to a woman they encountered in an apparently unrelated context: their behavior was judged to be more sexually motivated, and later they initially remembered mainly her physical features rather than the interview. But these results held only for gender-schematic men for whom gender role is likely to be especially accessible (McKenzie-Mohr & Zanna, 1990). Relatedly, women primed with family terms remember more accurately and judge more confidently the goals of a wife/mother target person compared to a career woman target or compared to neutrally primed participants (Trzebinski & Richards, 1986; cf. Trzebinski, 1985). And rock music videos that are gender-role stereotypic seem to prime stereotypic interpretations of men's and women's interactions (Hansen & Hansen, 1988b).

A variety of other stimulus interpretations also result from accessibility: person categories, as a function of unconscious affective primes (Niedenthal & Cantor, 1986); reported anxiety, as a function of unconscious threatening and violent primes (Robles, Smith, Carver, & Wellens, 1987); arousal and reported mood, as a function of self-discrepancies from standards (Higgins, Bond, Klein, & Strauman, 1986; Strauman & Higgins, 1987); good–bad judgments of affectively loaded words, as a function of unconscious evaluatively polarized primes (Greenwald, Klinger, & Liu, 1989); perceptions of whether an ambiguous adult–child interaction is a kidnapping, as a function of prior exposure to a missing child poster (K. James, 1986); reported life satisfaction, as a function of relevant prior questions (Strack, Martin, & Schwarz, 1988); judged desirability of national policies, again as a function of relevant prior questions (Tourangeau, Rasinski, Bradburn, & D'Andrade, 1989); and aggressive content in stories, as a function of heat (Rule, Taylor, & Dobbs, 1987). All kinds of responses, from temporary states to initial judgments to seemingly well-established opinions, change with accessibility due to situational primes.

Priming subsequently has long-term as well as short-term consequences. The initial priming of a stimulus can affect its ratings as much as a week later when it is no longer in that context (Higgins & King, 1981; Higgins et al., 1977; Sinclair, Mark, & Shotland, 1987; Srull & Wyer, 1980). This is an important point: A transitory and perhaps arbitrary juxtaposition of prime and stimulus can affect the way that stimulus is encoded permanently. If a stimulus potentially can be encoded as fitting one of several alternative categories, short-term priming may determine which category applies in the long run.

Moreover, accessibility affects important social behavior. Chapter 2 described studies priming race-hostility and elderly-slowness (Bargh, Chen, & Burrows, 1996), as well as professor-intelligence and transportation-biking (Aarts & Dijksterhuis, 2000). Earlier examples include participants primed by moderately hostile categories of then-famous people (rock singer Alice Cooper, Indiana coach Bobby Knight) in one context. Participants next rated an ambiguous partner as more hostile and behaved in a more hostile, competitive manner toward their partner, in line with the categories that had been primed (Herr, 1986). In another study, participants encountered competition-related words at a level below the threshold for conscious recognition; primed participants then played more competitively if they were relatively competitive people. In effect, the primes activated their competitive personalities (Neuberg, 1988). Moreover, one classic set of research can be further interpreted as consistent with the effects of priming on aggression. When people are angry at someone, the impulse to harm the person is more likely to be carried to action in the presence of aggressive cues. A gun lying on a nearby table provokes aggressive behavior even by other means (Berkowitz, 1974), and priming can explain this.

Accessibility can also affect problem solving and creativity. In one study, participants attempted to solve the following problem: Given a candle, a book of matches, and a box of tacks, how can the candle be attached to the wall so it burns properly and does not drip wax on the floor? Some participants, who had been primed to think of containers as separate from their contents (e.g., tray *and* tomatoes versus tray *of* tomatoes), were able to solve the problem quickly. The configuration (container and contents as separable entities) primed related configurations and facilitated problem solving (Higgins & Chaires, 1980). The solution to the problem, incidentally, is to empty the box of tacks, treating it as a box *and* tacks, and to tack up the box as a platform for the candle.[6]

Assimilation and Contrast

Most of the priming research shows stimuli being assimilated to accessible categories. For example, when participants are primed with positive or negative traits, they often interpret relevant ambiguous behavior in ways that assimilate it to the category, as we have just seen. However, contrast effects have sometimes emerged. That is, when people are blatantly primed with a trait (e.g., foolhardiness), they may instead contrast their judgment of the ambiguous target, judging the fact that Donald wants to sail across the Atlantic in a sailboat as not especially foolhardy and even adventurous. If the prime is blatant enough, people may avoid using it, rating the person in the opposite or contrasting direction. Certain conditions seem to undermine the usual assimilation effects and instead encourage contrast.

[6]This particular study is now interpreted as an instance of "procedural" priming (Higgins, 1989a).

Contrast occurs particularly when consciousness of the priming task is likely to be higher than usual (Martin, 1986). *Consciousness of the prime* is potentially important, for conscious priming appears to be more flexible than unconscious priming. When people are aware of a blatant prime and its potential link to a stimulus, they may resist its all-too-obvious influence or simply see it as too extreme compared to the ambiguous stimulus. In at least some circumstances, only unconscious perception of the prime leads to assimilation of the stimulus to the accessible category; conscious perception of the prime instead can either contrast or assimilate the stimulus to the accessible category (Lombardi, Higgins, & Bargh, 1987; L. S. Newman & Uleman, 1990). Conscious resources allow people to assimilate extreme similarity, but contrast moderate similarity, and ignore utterly different comparisons. Under cognitive load, conscious priming lumps together both extreme and moderate similarity, contrasting only dissimilarity (Stapel & Marx, 2006).

Assimilation and contrast also depend on features of the stimuli involved. As implied by the previous example, degree of *overlap* between the prime and the stimulus is clearly important; similar primes, which tend to increase overlap, are most likely to show assimilation in either conscious or unconscious priming. Contrast effects are obtained when the stimuli do not overlap much with the primed category, as when extreme primes are used (Herr, 1986; Herr, Sherman, & Fazio, 1983).

Stimulus *ambiguity* also matters because an ambiguous stimulus easily assimilates to a prime. Unambiguous stimuli may result in contrast effects (Herr et al., 1983). Presumably, with an unambiguous stimulus, the complete lack of fit between prime and stimulus becomes especially obvious, and perceivers overcompensate, contrasting the two.

Finally, the perceiver's *goal* matters, even with unconscious priming. Failing to see an expected stimulus can cause contrast even at the unconscious level (Stapel & Koomen, 2006). Self-protective motivations matter (Spencer, Fein, Wolfe, Fong, & Dunn, 1998).

These and other factors come together in a selective accessibility model of assimilation and contrast (Mussweiler, 2003). Because the model addresses conscious comparisons rather than automatic ones, it assumes accessibility is more flexible (controllable) and specific to the judgment at hand (rather than general semantic priming). Nevertheless, the model does hinge on accessibility, and it pulls together several useful principles relevant to when assimilation and contrast most likely occur, perhaps extending to both conscious and unconscious accessibility. If similarity testing is the accessible strategy, then people search for similarity, and assimilation results; if difference testing is accessible, then people search for differences, and contrast results. Similarity testing occurs most often; people tend to focus on similarities because they spontaneously make an overall, holistic comparison of a target to the baseline standard. For example, in comparing pineapples and avocadoes, one first decides whether they belong to the same category (fruit), and then assimilates, but if they seem to belong to different categories (sweet versus savory), one contrasts them. In thinking about someone who is neat and tidy, one assimilates to a person of one's own gender and contrasts to someone of the other gender; the mechanism here is accessibility of the standard (Mussweiler & Bodenhausen, 2002). Thus the principles of overlap, ambiguity, and goals that apply to unconscious priming also apply to

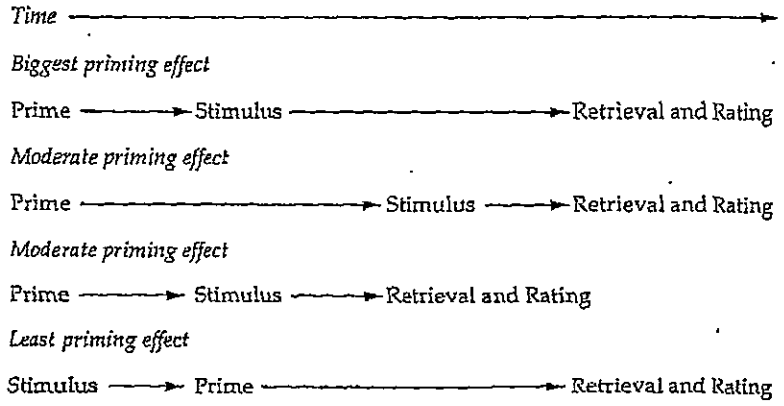


FIGURE 3.1. Priming as a function of timing

conscious comparisons to the extent that both depend on accessibility of similarities versus differences.

Priming at Encoding

Priming operates primarily through accessibility at encoding. Researchers suggest several reasons for this role of encoding. First, priming effects decrease with wider gaps between a prime and a stimulus. The wider gap presumably interferes with encoding the stimulus in terms of the prime (Srull & Wyer, 1979, 1980). When the prime and stimulus do occur in close temporal proximity, the effect depends on the stimulus being encoded together with the prime (Figure 3.1).

A second argument for the importance of encoding in priming comes from research that delays just the rating. Priming effects increase with wider temporal gaps between the already-primed stimulus and rating. As the effect increases with time, details of the original stimulus are lost, and the primed representation becomes relatively more important.

The third argument for encoding is simpler: Presenting primes *after* the stimulus has little or no effect, whereas presenting primes before the stimulus, which allows it to affect encoding, does show effects. This further supports the conclusion that encoding a stimulus in the context of a prime is more important than retrieving it in the context of the prime (Srull & Wyer, 1980).

Finally, prime-relevant information appears to elicit differential attention (S. J. Sherman, Mackie, & Driscoll, 1988). That is, participants do not rate primed dimensions as more important in decision making, but they do recall them better, suggesting that the primed dimension may elicit attention.

Chronic Accessibility

Accessibility can occur because of categories recently primed or categories frequently primed (e.g., Bargh & Pietromonaco, 1982; Bargh et al., 1986; Higgins

et al., 1977, 1982; Srull & Wyer, 1989; Wyer & Srull, 1986). Various models have been proposed to account for these effects, and experiments clarify the models' differences by setting recency and frequency in competition against each other (Higgins, 1989a), as work on chronically primed concepts shows.

Persistent differences in what is primed by one's typical situation may lead to individual differences in what is chronically accessible for different people. As noted in Chapter 2, well-practiced judgments become automatic or *proceduralized*. We all know people who seem to perceive everyone in terms of how smart they are, how trustworthy, or how good-looking. People for whom a particular personality dimension is an easily and typically accessible construct are more likely to remember and describe others in those terms (Higgins & King, 1981). For example, Higgins, King, and Mavin (1982) identified people's most typically accessible personality dimensions by recording the first and most frequent dimensions that arose in their descriptions of themselves and their friends (e.g., intelligent, funny, nice). The dimensions that people spontaneously mention are presumably the ones that come to mind most easily when the environment provides cues that can be interpreted in that way. Dimensions that are frequently accessed or permanently primed may become central aspects of one's personality, and one develops *chronicity* on that dimension.

Moreover, given that chronicity theoretically results from a history of frequent exposure to a category, it should operate as does sheer frequency in situational priming, at least in any particular setting. Comparing the principles of frequency and recency, frequently primed constructs have the advantage in the long run, although recently primed constructs predominate in the short term (Higgins, Bargh, & Lombardi, 1985). Parallel results are obtained for individual differences in chronicity and for recent priming; that is, recently primed categories predominate in the short term, but like frequently primed categories, chronically primed categories also predominate after a delay (Bargh, Lombardi, & Higgins, 1988).

Chronically accessible categories are used efficiently, allowing one to encode relevant information in less time than would someone who is nonchronic on that dimension (Bargh & Thein, 1985). Moreover, chronically accessible categories seem to be used without one's intention (Bargh et al., 1986; Higgins et al., 1982) and even outside one's control (Bargh & Pratto, 1986). As we saw, these characteristics of chronicity qualify it as truly automatic (Bargh, 1984, 1988).

The automatic application of chronically accessible constructs to new information has significant social consequences. For example, the automatic, chronic processing of negative social categories regarding *oneself*—but not others in general—appears to be an important component of depression (Bargh & Tota, 1988). In a meta-analysis, negative self-focus strongly relates to negative affect across both correlational studies and experimental studies that manipulate self-focus and valence of thoughts; positive self-focus reduces negative affect. These results held for depression, not just temporary bad moods; depression was especially related to private self-focus (negativity regarding one's own goals, thoughts, and feelings), whereas anxiety was related to public self-focus (negativity in the impression one makes on others) (Mor & Winquist, 2002). The good news is that these effects are not solely a function of individual differences in chronic accessibility; given that they also differ as a function of context, they potentially can change.

Individual differences in other forms of chronicity also matter interpersonally. For example, gender accessibility exaggerates gender-stereotypic encoding biases (Stangor, 1988). That is, after seeing a series of male- and female-stereotypic behavior performed by men and women equally, gender-accessible participants were especially likely (a) to report stereotype-consistent behaviors (e.g., women doing feminine things) and (b) to mix up the women with each other and the men with each other. Chronic gender-accessibility influences responses to female politicians' ads, especially when they are positive or uninformative (compared to negative ads) (Chang & Hitchon, 2004). Chronicity may also explain a positive side effect of stereotyping. People accustomed to being stereotyped (e.g., African Americans) sometimes show more tolerance for another potentially stereotyped person, presumably because they can see the similarity of their shared experiences, at least if their own victimization is also primed (Galanis & Jones, 1986); chronicity for stereotyping may help explain this phenomenon.

Conclusion

In this section on accessibility's role in attention and encoding, we have seen that accessibility is the mechanism by which priming operates. Situational priming affects the accessibility of a wide range of stimuli: traits, social categories, valence (positivity-negativity), procedures, and behaviors. Accessibility usually causes assimilation of the stimulus to the prime, but it can also cause contrast, depending on consciousness of the prime, stimulus and prime overlap, stimulus ambiguity, and perceiver goals. Accessibility is primarily an encoding effect, influencing interpretations of stimuli as they are noticed and stored. Chronic accessibility affects encoding in similar ways to contextual accessibility; both affect important social behaviors.

DIRECT PERCEPTION: NOT JUST IN OUR HEADS

This chapter opened with an example of a social perceiver unfortunately misperceiving who was chasing whom in a series of three runners. One might argue that the example reflects the automatic activation of stereotypic categorization processes (interpreting the trio as a White police officer chasing two Black suspects), and one might marvel at the complexity of the inferential processes that occurred in the split second before the perceiver responded in such a misguided fashion. Alternatively, one might argue that, for that perceiver, the particular stimulus configuration effectively furnished his response. From this perspective, the perception was direct, from seeing and hearing straight to the intrinsic behavioral possibilities.

Inspired by J. J. Gibson's (1966, 1979) work in object perception, several theorists have suggested that much of the important activity in social understanding occurs immediately during perception (Baron, 1980; Kassin & Baron, 1986; Lowe & Kassin, 1980; McArthur, 1980; McArthur & Baron, 1983; Neisser, 1976, 1980; Weary, Swanson, Harvey, & Yarkin, 1980; Zebrowitz, 1990). This view rejects perception as the result of complex inferential activity, however automated. In particular, the ecological approach emphasizes external stimulus information and the organization inherent in it rather than the organization constructed

or imposed by the perceiver (Zebrowitz, 1990). Organization is "inherent in a stimulus" for a particular perceiver, based on that person's history of perceptual experiences. A particular stimulus *affords* or offers particular behaviors to a perceiver, and the perceiver is reciprocally *attuned* or sensitive to particular stimulus properties. The Gibsonian approach is called *ecological perception* because it emphasizes perceivers interacting with their environments and embedded in their own characteristic niche. Perception is analyzed as adaptive for perceivers; "perceiving is for doing," in this view, so perception will typically be accurate if perceivers are given sufficient information and context.

An Ecological Example of Causal Perception

The Gibsonian perspective suggests, for example, that social interpretations result from segmenting the perceptual field, and that inferences and memory are irrelevant (McArthur, 1980). To illustrate, assume you overhear your neighbors quarreling. She screams at him, and he murmurs in reply; this sequence alternates for some minutes. In relating the incident to your roommate, you describe the woman as causing the argument because each segment of the interaction begins with her salient vocal behavior. Each of her loud comments marks a new perceptual unit that finishes with his soft reply. She shouts, he murmurs. Since responsibility requires temporal precedence, starting each unit with her then irresistibly blames her for the argument (Figure 3.2).

Now replay the fight but assume that you can see what is going on as well as hear it. (Assume further that they both do not turn on you for spying, however scientifically disinterested you might be.) The fight actually commences with him walking into the room and gesturing violently at her. She replies and retreats. He threatens her again, speaking in ominously low tones, and she backs off, arguing defensively. He threatens, and she retreats. The segments now commence each time with his physical gestures and her retreats. His physical gestures are perceptually big relative to her little retreats, in much the same way her shouts were loud compared to his soft murmurs. The units now begin with him: he makes big physical threats, and she makes little movements of retreat. Now the man would be described as causing the argument. Note that this

FIGURE 3.2. Perceptual segmentation of behavioral sequences resulting in different causal judgments

First segmentation of neighbors' quarrel

She	He	She	He	She	He
shouts →	murmurs	shouts →	murmurs	shouts →	murmurs
LOUD →	*soft*	LOUD →	*soft*	LOUD →	*soft*

Second segmentation of neighbors' quarrel

He	She	He	She	He	She
threatens →	retreats	threatens →	retreats	threatens →	retreats
BIG →	*small*	BIG →	*small*	BIG →	*small*

Note: Each vertical rule represents a breakpoint between two perceptual units.

perceptual analysis of responsibility de-emphasizes cognitive activity. The blame judgments are implicit in perception from the outset (McArthur, 1980).

With respect to interpretations, the Gibsonian view would argue that they result from perceptual organization, such as temporal sequence, or the contrast of large to small stimuli, as in our example of the neighbors' fight; the Gibsonian view suggests that inferred blame occurs automatically during the perception of an event, an idea with which others agree (R. C. Sherman & Titus, 1982; E. R. Smith & Miller, 1979).

Perceptual Units

The direct perception analysis is all the more interesting because considerable evidence indicates that inherent perceptual units have important effects on social judgments. This has been shown by researchers who measure perceptual segmentation directly (for a review, see Newtson, Hairfield, Bloomingdale, & Cutino, 1987; for a critique, see Ebbesen, 1980). The technique for measuring perceptual segments or units involves subjects watching a film and pushing a button to indicate the end of each given segment and the beginning of a new one; the button push is taken to indicate what is called a breakpoint between segments. Segments are defined in whatever way seems natural to the individual (Newtson & Enquist, 1976; Newtson, Enquist, & Bois, 1977). The unitizing method (as it is called) is reliable and valid and surprisingly comfortable for participants. People largely agree on the perceptual units in a given scene. For example, if the neighbors' quarrel were shown in a silent film, people would generally agree on the breakpoints.

Unitizing research suggests that the breakpoints between perceptual units have special properties. The breakpoint moments of a film, when shown as a series of stills in isolation from the rest of the film, nonetheless coherently convey the story. Nonbreakpoints (at equivalent intervals) do not adequately summarize the story. Recognition memory for breakpoints is also superior to recognition for nonbreakpoints (see Newtson, 1976). The implication is that behavior is segmented at points of maximal information (Newtson, 1980; but for dissent, see C. E. Cohen & Ebbesen, 1979). Breakpoints occur at peaks of behavioral complexity when many body parts are changing at once (Newtson et al., 1977). That is, one can perceive the core of an action when it is most distinctively changing, so that is seen as a breakpoint. If action slows down to a pause or stops, that is not typically a breakpoint. Moreover, the rise and fall of action complexity follow a wave pattern: when two people are interacting, their actions jointly create a coordinated wave pattern (Newtson et al., 1987). This suggests that basic perceptual-motor configurations could function independently of complex cognitive processes.

People can use fine-grained units or grosser units, depending on instructions to do so or other goals. For example, people use finer units when their goal is observing nonverbal behavior (Strenta & Kleck, 1984), remembering task behavior (C. E. Cohen & Ebbesen, 1979), and observing individuals within an aggregate of people (Wilder, 1986). People also use finer units when they encounter an unexpected action (Newtson, 1973; Wilder, 1978a, 1986) or a person about whom they have no prior information (Graziano, Moore, & Collins, 1988). Finer levels of perception are associated with measures indicating more information gained:

more confident and differentiated trait inferences, more dispositional attributions (Deaux & Major, 1977; Newtson, 1973; Wilder, 1978a), and better memory for the person observed (Lassiter, 1988; Lassiter, Stone, & Rogers, 1988). Finer unitizing even seems to be associated with greater liking of an otherwise neutral person, perhaps because of an increased sense of familiarity independent of one's improved memory for the finely unitized other (Lassiter, 1988; Lassiter & Stone, 1984). The unitizing research as a whole addresses basic perceptual processes in ongoing interaction, suggesting how information is gained over time and made immediately useful to action.

A Note on Implications for Social Cognition Research

Researchers who support the direct perception or ecological view argue that it directly contradicts the idea that inferences depend on complex cognitive processes. According to this view, cognitive constructs (such as observational goals or category-based expectations) enter into the inference process only to the degree that such factors influence the initial perception of an event as it is directly observed (Enquist, Newtson, & LaCross, 1979; Massad, Hubbard, & Newtson, 1979). Although there is some evidence to the contrary (Vinokur & Ajzen, 1982), the Gibsonian view is a helpful counterpoint to the standard explanations of complex cognitive processes as the only basis for social judgments.

The Gibsonian perspective is a useful antidote to some biases in mainstream research on encoding. Ecological perception recognizes the intrinsic richness of stimulus information and insists that stimuli be ecologically valid: namely, that they occur in multiple sensory modes, that they change and not be utterly static, that they be presented in configuration instead of isolation, and that they be extended in time instead of brief. The Gibsonians' frequent use of naturalistic filmed stimuli illustrates this set of concerns. The ecological approach also emphasizes the adaptive functions of perception, in particular the link between perception and action. Hence, as we will see, it examines why people would develop the perception that baby-faced people need nurturance and protection (namely, that most baby-faced people are in fact babies, whom it is useful for adults to perceive as vulnerable). Moreover, the ecological approach explicitly acknowledges the relationship between the environment and the particular perceiver's goals, capabilities, and history. Although the social cognition literature does this as well, the Gibsonian view emphasizes the environment as full of action possibilities (affordances). Finally, it points to the relevance of cross-cultural, animal, and developmental research for comparative purposes.

In closing, it is probably not useful to pit the ecological approach directly against the cognitive approaches for several reasons. First, each approach is itself a meta-theory, which is not intrinsically falsifiable. At the broadest levels, each can always account for the other's data in perceptual or cognitive terms, respectively. Second, in practice it is difficult to distinguish between perception and cognition. On one hand, perception entails taking in stimulus features in order to respond to the environment, and on the other hand, cognition can entail immediate automatic inferential activity. Whether one labels such processes "cognitive," or sometimes "perceptual" and sometimes "cognitive," depending on their rapidity or accessibility to awareness, is a matter of theoretical preference, and the distinction begins to evaporate. Third, the relative impact of

perceptual and cognitive activity in any one experiment depends on the relative strengths with which each is manipulated, so any empirical "advantage" of one over the other would be a function of the particular experiment's operationalization of the perceptual process or the cognitive process, not reflecting the intrinsic relative power of the two types of process. Finally, some would argue that stimulus variation (what a particular stimulus intrinsically affords) is the mark of the ecological approach, but perceiver variation (cognitive structures that perceivers bring with them) marks the cognitive approach. If so, one is stuck comparing apples and oranges, phenomena on altogether different scales. That is, one can assess how much the stimulus contributes and how much the perceiver contributes, but they cannot be directly compared because they come from separate populations (the population of all social perceivers or all possible stimuli).

In short, the two approaches are complementary, each with its own strengths (R. M. Baron, 1988). The ecological perception approach focuses on what people learn from particular stimulus configurations. The work on causal perception and unitizing the behavior stream (as well as work, to be discussed, on trait inferences from physical cues) illustrate important patterns of social stimuli that perceivers use for adaptive functioning. Social cognition focuses more on the cognitive structures and routines that people use to interpret, elaborate, and construct their memory and judgments. This type of ecological perception attunes the perceiver to what actions the context affords.

FACES: THE FOCUS OF SOCIAL ATTENTION

So far we have seen that people's social attention follows people who are salient in context, vivid case histories instead of abstract statistics, dimensions that have been recently or frequently activated in the past, and action-relevant features of the social environment. All of these attentional phenomena apply to perceptions of objects as well as people, though they have been studied more thoroughly in social than nonsocial cognition. An even more dramatically social driver of attention is another person's face. Faces are intrinsically the focus of attention in any social interaction. We examine how faces direct people's attention elsewhere, some neuroscience of face perception, and the rapid inference of traits from faces.

Gaze: A Cue From Other People

People are acutely attuned to other people's gaze direction. Consider how quickly you notice that someone is staring at you, even out of your peripheral vision. This makes sense, of course: the other person's gaze communicates attention and perhaps intention, so survival dictates being alert to other people's gaze.

Faces with directed (looking at you) as opposed to averted gaze compel attention: people more rapidly categorize them by gender and link them to stereotypic information (Macrae, Hood, Milne, Rowe, & Mason, 2002). Both adults and children more easily recall them (Hood, Macrae, Cole-Davies, & Dias, 2003; Mason, Hood, & Macrae, 2004). Gaze appears primarily as an encoding phenomenon (Hood et al., 2003). All else being equal, people find direct gaze both likable and attractive (Mason, Tatkow, & Macrae, 2005). "Here's looking at

you, kid" can be a compliment, as early film actor Humphrey Bogart knew, but "Whaddaya lookin' at?" can be a response to unwanted and especially provocative attention.

People not only notice people who are looking at them, but people also use another person's averted gaze to guide their own attention. When someone looks away at something else, most people find it hard to resist following the other person's gaze to see what is so interesting. We not only look where other people are looking but also where animals are looking and where arrows point. However, this reflexive shift in our attention is most efficient (rapid) when we take our cues from eyes (Quadflieg, Mason, & Macrae, 2004), consistent with the idea that the eyes are the window, if not to the soul, to intent. Gaze detection implicates neural systems, including the superior temporal sulcus (Hoffman & Haxby, 2000), often implicated in tracking biological movement.

Face Perception

Cognitive neuroscience argues that face perception, a highly developed visual skill, implicates a number of neural systems, some for identifying fixed features of faces, and some for changeable facial expressions (Haxby, Hoffman, & Gobbini, 2000). A face-responsive region, sometimes called the fusiform face area, recognizes invariant features of faces (Kanwisher, McDermott, & Chun, 1997; Kanwisher & Wojciuluk, 2000). A different face-responsive region in the superior temporal sulcus responds to changeable aspects of faces (gaze, noted earlier; expression; and movement). And knowledge about the person constitutes a third set of processes (Bruce & Young, 1986). Face perception is distributed both over the brain and over the time course of perception (Haxby, Gobbini, & Montgomery, 2004). Although some argue that people's responsivity to faces merely reflects practice effects or expertise, much evidence supports the face as a domain of unique neural sensitivity (McKone, Kanwisher, & Duchaine, 2007). The use of all this work by social judgment researchers is just beginning.

Facial recognition appears to be a global, configural, holistic process that perceptually integrates across the whole rather than a local, feature-oriented process. Indeed, the feature-oriented processing of a face (separate focus on eyes, nose, mouth, chin, etc.) undermines recognition. Verbally describing a bank robber ironically interferes with recognizing him on a later line-up (Schooler & Engstler-Schooler, 1990), apparently because this "verbal overshadowing" invokes a local, feature-by-feature processing orientation (Tanaka & Farah, 1993). A direct manipulation of global versus local (feature) processing orientation respectively enhances or impairs subsequent recognition (Macrae & Lewis, 2002).

Faces are processed globally when people are distinguishing among unique individuals. When people are merely categorizing individuals, treating individuals as more interchangeable, they use single salient cues (e.g., hair) to determine, for example, gender, race, age, and the like. Right hemispheric specialization in global, configural processing facilitates identification and individuation; left hemispheric feature-based processing facilitates categorization (Mason & Macrae, 2004). Similarly, the right hemisphere specializes in individual, person-based learning, whereas the left focuses on group-based learning (Sanders, McClure, & Zárate, 2004). In general, the right hemisphere often

participates in basic perceptual, episodic encoding, and the left in conceptual, abstract processes (Zárate, Sanders, & Garza, 2000) such as categorizing.

According to face-selective neural activations, people identify a face as a face in 100 msec (a tenth of a second) and recognize familiar faces in 170 msec (Liu, Harris, & Kanwisher, 2002). Other data suggest 170 msec for distinguishing faces from nonfaces, then at 250 msec distinguishing own-racial-group members from outgroup members, with differential evaluation kicking in at 520 msec (Ito, Thompson, & Cacioppo, 2004). Still other data suggest racial differentiation as early as 100 msec and gender differentiation as early as 150 msec (Ito & Urland, 2003). As more data accumulate, both the parameters of these kinds of social cognition and the circumstances that speed and slow these processes will be clarified.

In general, categorical information is easier to extract from faces than is individual identity information. When faces are blurry, inverted, or merely glimpsed, people can still readily extract categorical knowledge (Cloutier, Mason, & Macrae, 2005), and they do this unintentionally (Macrae, Quinn, Mason, & Quadflieg, 2005). When people examine faces, they sometimes extract individuating trait information and link it directly to the face. The face-traits links appear in work from both an ecological perception viewpoint and a spontaneous perception viewpoint, as we shall see now.

Baby Faces as Ecological Phenomena

In addition to the social perception work mentioned earlier, research from an ecological perspective examines how people make specific inferences about personality on the basis of physical features and other features intrinsic to the social stimulus configuration. Such appearance-based perceptions are fundamental factors in social perception. For example, old-time gangster movies often featured a ruthless criminal with a name like "Babyface" Norton. What made such figures especially sinister was the contrast between their cherubic features and their villainous behavior. Why do we expect people with baby-faced features to have equally innocent personalities? A series of studies in ecological perception indicates that baby-faced adults are perceived to have more childlike qualities than mature-faced adults; across cultures, people with large eyes, big foreheads, and short features (e.g., snub noses, small chins) are seen as less strong, dominant, and intellectually astute, and as more naive, honest, kind, and warm, regardless of perceived age and attractiveness (Berry & McArthur, 1985; McArthur & Apatow, 1983-84; McArthur & Berry, 1987; see Berry & McArthur, 1986, for a review). Baby-faced adults are less likely to be judged guilty of intentional criminal behavior (hence, the baby-faced gangster is disconcerting), but they are more likely to be judged guilty of crimes involving negligence (Berry & Zebrowitz-McArthur, 1988). Cross culturally, people with childlike voices are also perceived as weaker, less competent, and warmer (Montepare & Zebrowitz-McArthur, 1987). And people with more youthful gaits are perceived to be happier and more powerful, regardless of perceived age and gender (Montepare & Zebrowitz-McArthur, 1988).

The ecological approach argues that these perceptions result from the normal covariation between babylike features and actual age, such that most babyish humans *are* more weak, submissive, intellectually undeveloped, naive, and

innocent precisely because they are very likely to be actual babies. Such perceptions based on babylike features are normally adaptive for species' survival because it is important for adults to nurture and protect the young. Adults are therefore likely to perceive childlike features as needing or affording the behavioral opportunity of caretaking, which fits with perceiving a babylike person as weak. To a properly attuned organism, such perceptions are biologically and socially useful. Consequently, it is not surprising that children as young as 2½ can use baby-face cues to judge age (Montepare & McArthur, 1986).

Spontaneous Trait Inferences From Faces

The attention-grabbing power of faces appears in an early study showing that angry faces "pop-out" of an array of faces, no matter how many other faces are in the crowd; and more so than other incongruent faces (Chapter 2; Hansen & Hansen, 1988a). And angry outgroup faces are especially well encoded (Ackerman et al., 2006). Of course, angry faces are particularly salient given the impact of negative information noted earlier (S. T. Fiske, 1980; Pratto & John, 1991). Even subliminally presented angry or fearful faces activate the brain's early-warning system of the amygdala (Morris, Ohman, & Dolan, 1998; Whalen et al., 1998). But people go beyond immediately reading expressions to immediate inferences of personality traits, perhaps building on the same systems that read facial expression (from an angry expression to a hostile personality). Faces otherwise judged as untrustworthy also activate the amygdala, even when people's alleged task is judging the age of the faces (Winston, Strange, O'Doherty, & Dolan, 2002).

People make spontaneous trait inferences from people's behavior, and they "bind" (link) them directly to the person's face in memory (Carlston & Skowronksi, 1994; Carlston, Skowronksi, & Sparks, 1995; Todorov & Uleman, 2002, 2004) even under rapid presentation and high cognitive load (Todorov & Uleman, 2003). Trait inferences from merely a minimal interaction also bind to the person's face (Todorov, Gobbini, Evans, & Haxby, 2007), even when people are not focused on inferring personality. Moreover, the inferences and activated brain regions are specific (e.g., disgusting faces lead to different inferences and activation of different brain regions than aggressive faces). Similarly, people show different neural responses to trustworthy and untrustworthy faces (Winston et al., 2002) or attractive and unattractive faces (Aharon et al., 2001). Even 100 msec exposures are enough time for people to make trait inferences from faces (Willis & Todorov, 2006) that agree with the judgments of people who have no time constraints.

What is true of strangers is even more true for a person's evaluation of close others. Personally familiar faces activate a distributed network of brain regions—precuneus, superior temporal sulcus, and medial prefrontal cortex—that go beyond the mere memory for the face (Gobbini, Leibenluft, Santiago, & Haxby, 2004).

People's immediate trait inferences from faces can have important consequences: seeing candidates for the Senate for even a second enabled people to make competence judgments that predicted nearly 70% of the elections (Todorov, Mandisodza, Goren, & Hall, 2005). At the other extreme, Black faces that are stereotypically Black are more likely to activate associations of criminality in

people's immediate inferences (Eberhardt, Goff, Purdie, & Davies, 2004). Blacks and even Whites with Afro-typic features receive longer criminal sentences (Blair, Judd, & Chapleau, 2004; Eberhardt, Davies, Purdie-Vanghns, & Johnson, 2006). Faces can be a matter of life and death.

Summary

We now have some answers to what captures our attention. We especially notice what is salient: novel or perceptually figural in context, people or behaviors that are unusual or unexpected, extreme and sometimes negative behavior, and stimuli relevant to our current goals. All such salience subsequently influences our reactions to other people. Our attention may also be captured by vivid stimuli, and often we are entertained, but vivid stimuli do not influence our reactions much except when they are vivid case histories. Our attention also orients us to situationally or personally primed categories. Recently, frequently, and chronically encountered categories are more accessible for use, and they profoundly influence the encoding of stimuli. They are applied to relevant, moderate, ambiguous stimuli, guiding their interpretation and subsequent representation in our heads. Our attention also orients to ecologically relevant features of our social context; that is, features that afford action. Finally, people reflexively orient to people's faces, especially those who are orienting to them. We also look in the direction others gaze when they are looking away. And we immediately infer people's personalities from their faces. In short, we have learned a lot about social attention, which determines what gets encoded into memory, the topic for the next chapter.