Stereotyping and Impression Formation: How Categorical Thinking Shapes Person Perception

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In everyday life, we are repeatedly confronted with people with whom we must interact. In order to accomplish this goal, however, we must form an impression that captures the other person's characteristics in a coherent and meaningful manner. What is perhaps most remarkable about this process of impression formation is the ease and rapidity with which it is accomplished. Impressions often spring to mind so readily that it seems as though they directly reflect the immediately obvious, objective characteristics of the target person, without any active inferential construction of the impression on our part.

In reality, research on impression formation has revealed a complex series of mental processes that are involved in construing the character of others and the meaning of their behavior. Impression formation begins with the observation of a target person by the social perceiver. This observation leads to the identification and categorization of the target's behavior. Through a process of attribution, this behavioral categorization leads to a characterization or inference about the actor, and these inferences may or may not be moderated by a process of correction in which the perceiver considers other (perhaps situational) factors that might have produced the behavior. Through a process of integration, the various inferences that are drawn about the behavior are combined into a coherent, organized impression of the target.

Consider, for a moment, what kind of impression you may form of the first author's great aunt. She is an elderly woman, short, somewhat overweight, with stooped posture. She walks with a cane, wears thick-rimmed black glasses, and is soft-spoken. She never married, has no children, and has no family in the community in which she lives. She has very little money. Knowing all of this, you would probably expect her to be lonely and unhappy. As it turns out, however, Aunt Gertrude is a very caring, understanding individual who always appears to be satisfied. But how can this be? A brief interaction with Aunt Gertrude may be sufficient to resolve this puzzle. Aunt Gertrude is a Catholic nun who has devoted her life to charity. The immediate visual evidence provided by her nun's habit is all that it would take to enable you to make sense of her various attributes and to form a coherent impression of her. But the story is more complex. Aunt Gertrude loves romance novels, even the very sexy ones, the ones with cover illustrations of handsome men, shirtless and flexing under the adoring gaze of semiclad women. She absolutely devours them (the novels, that is!). How, then, can this revealing bit of information be reconciled with your impression of sweet, chaste, elderly Sister Gertrude?

Stereotypes and efficient person perception

Even simple examples such as the case of Aunt Gertrude underscore the complexity of the task facing social perceivers in considering the overwhelming amount of information that is available in our complex social world. In recognition of this complexity, recent approaches to impression formation have converged on a set of working assumptions, the most basic of which is that perceivers prefer simple, well-structured impressions (Bodenhausen and Macrae, 1994) and that they achieve this coherence by regularly constructing and using categorical representations (such as stereotypes) in their attempts to understand others. By construing others not in terms of their unique constellations of attributes and inclinations but, rather, on the basis of the social categories to which they belong (such as race, age, sex, or occupation), perceivers can make use of the wealth of related stereotype-based mateial that resides in long-term memory. As Gilbert and Hixon (1991: 509) have noted, the ability to understand new and unique individuals in terms of old and general beliefs is among the handiest tools in the social perceiver's kit.

A wealth of research has documented that when a particular categorization is made and associated stereotypes are activated, they influence impressions both directly and indirectly. The direct influences come from the activation of stereotypic beliefs themselves, which may be added (or averaged) into one's general impression of the target. More interesting, however, are the indirect effects that emerge when activated stereotypic concepts influence the selection and interpretation of other available information. Stereotypes appear to direct attention and influence which information gets encoded and how information is interpreted, such that people often notice instances that confirm their existing stereotype-based beliefs (Bodenhausen, 1988; Chapman and Chapman, 1967, 1969; Higgins and Bargh, 1987; Rothbart et al., 1979), interpret ambiguous information as confirming their stereotypes (Darley and Gross, 1983; Duncan, 1976; Jacobs and Eccles, 1992; Jones, 1990), and actively seek information that confirms their view of others (Snyder and Swann, 1978).

The guiding assumption of contemporary models of impression formation, then, is that whenever we encounter someone and categorize him or her as a member of a particular group, stereotypes about this group will exert an influence on the interpretive processes involved in forming an impression of the person (Bodenhausen and Macrae, 1998; Bodenhausen et al., 1997; Brewer, 1988, 1996; Fiske and Neuberg, 1990; Hamilton et al., 1990; Macrae and Bodenhausen, 2000). This categorical thinking is assumed to shape person perception in at least two important ways: categorical thinking enables perceivers, first, to use the activated knowledge structure to guide the processing (for example, encoding or representation) of any target-related information that is encountered and, second, to rely on the contents of the activated knowledge structure (for example, trait and behavioral expectancies) to derive evaluations and impressions of a target. Thus, at the categorization stage, stereotypes are assumed to be activated along with trait representations and situational scripts, enabling assimilative effects on attention and encoding. At the characterization stage, stereotypes are assumed to influence comprehension of the target's actions, producing assimilative influences on behavioral interpretation and inference generation, and permitting the selective processing of expectancy-consistent information. At the correction stage, it is assumed that social perceivers may attempt to take into account how stereotypes might be biasing their overall impressions. At each of these stages, stereotypes can have both facilitative and inhibitory influences on information processing, alternately enhancing or diminishing the stereotypicality of the system's outputs

(Bodenhausen and Macrae, 1998).

Categorization processes in impression formation: stereotype activation

Central to several influential models of person perception is the notion that the stereotypes associated with social categories are automatically activated in the mere presence of a triggering stimulus (e.g., Brewer, 1988; Fiske and Neuberg, 1990). The origins of this notion can be traced to Allport's (1954) seminal writings on the nature of prejudice. The message that Allport forwarded was straightforward and powerful: to simplify the demands of daily interaction, mere exposure of a stimulus target is sufficient to stimulate categorical thinking and promote the emergence of its associated judgmental, memorial, and behavioral products (that is, stereotyped reactions). According to this account, then, categorical thinking is an unavoidable aspect of the person-perception process. Allport's ideas have enjoyed a revival in recent decades, prompted largely by a landmark paper by Devine (1989). Devine proposed that racial stereotypes are indeed activated automatically upon detection of a person's group membership. She argued that because people are inevitably exposed to the cultural transmission of stereotypical ideas during childhood socialization, social-category membership comes to be inextricably associated with stereotypical notions that spring to mind without any conscious intention on the part of the perceiver.

Supporting this reasoning was work reported by Dovidio et al. (1986). In their research, they presented participants with a category label (such as Black or White), followed by a series of adjectives (such as musical or metallic) that were either stereotypical or nonstereotypical with respect to the presented category label. The participants' task was simply to report, as quickly as possible, whether each item could ever be true of the primed category. As expected, participants responded more rapidly when stereotypic rather than nonstereotypical items followed the priming label, suggesting that the categorical representation of the group was activated during the task.

Nonetheless, because the participants' attention was directed toward the category label, this early demonstration failed to provide unequivocal evidence of automatic stereotype activation. However, in a series of more controlled tests of the automatic-activation hypothesis, Devine (1989) demonstrated that even preconscious presentation of racial material was sufficient to prompt the activation of stereotypical concepts. After exposure to preconscious primes pertaining to the category African-American, participants later judged an ambiguous target person in a decidedly stereotypical way. In more recent research, preconscious cues have also been shown to precipitate stereotype activation in the domains of sex, age, and occupation (Bargh, 1999).

Following these initial demonstrations, an abundance of experiments emerged in which researchers measured the accessibility of categorical contents (that is, stereotypic traits) after the presentation of priming stimuli, usually (though not always) verbal labels (such as Asian). These subsequent investigations employed a variety of semantic priming techniques that attempted to obscure or conceal the relationship between the experimental primes and target stimuli. The logic of these studies is straightforward: if perceivers are unable to avoid stereotype activation when the triggering stimuli lie outside awareness or are seemingly irrelevant to the task at hand, then evidence of stereotype activation would corroborate the viewpoint that stereotype activation is unconditionally automatic. As it turns out, the available evidence tends to support this view (Bargh, 1999).

Conditional automaticity in categorization and stereotype activation

But does this really signal that stereotype activation is unconditionally automatic in the sense proposed by Allport (1954)? The answer to this question remained unclear, for at least two reasons. First, many of the social stereotypes that had attracted empirical attention were those linked to group memberships that could be discerned from a rudimentary visual appraisal of a stimulus target: sex, ethnicity, and age group. It seemed quite reasonable that perceivers might automatically categorize others into groups on the basis of these readily discernible visual cues; indeed, they have often been referred to as the Big Three in stereotyping (Fiske, 1998), and research on the white male norm hypothesis and related effects does provide evidence that race and sex categorizations occur quickly and effortlessly (e.g., Stroessner, 1996; Zarate and Smith, 1990). Nonetheless, it was less clear whether categorizations based on less rudimentary cues would also elicit mental activation of the stereotypes associated with the group in question.

It was also unclear whether stereotypes were activated automatically by the strict definition of automaticity as involuntary, unintentional, effortless, and unconscious (Bargh, 1989). In fact, under empirical scrutiny, most mental operations fail to satisfy the multiple criteria required to specify a process as exclusively automatic in nature (Bargh, 1990, 1994, 1997; Kahneman and Treisman, 1984; Logan and Cowan, 1984); even prototypic examples of automatic mental processes fail in this respect. As Logan (1989: 70) has remarked, automatic reactions can be modulated by attention and intention; they can be inhibited and suppressed; and they can be coherent and planful. Given this state of affairs, a revised conception of automaticity has emerged in recent years, a conception that emphasizes not the unitary nature of the concept but, rather, the extent to which its various components (that is, awareness, intention, efficiency, and control) are independently implicated in the execution of specific mental operations.

The possibility that stereotype activation is conditionally, rather than unconditionally, automatic has attracted considerable empirical attention in recent years and has engendered heated theoretical debate. Backed by a revised conception of automaticity, researchers have challenged the assumption that stereotypical representations are activated automatically in the presence of a stimulus target. As Bargh (199: 14) has argued, as with all preconscious processes, what determines whether the stereotype becomes automatically activated is whether it has been frequently and consistently active in the past in the presence of relevant social group features. Thus, if there is meaningful variation in the frequency and consistency of people's exposure to stereotypes, there may also be variation in the automatic component of stereotype activation as well. Indeed, this is precisely the message that is beginning to emerge in the literature on the subject.

In one of the earliest challenges to Devine's (1989) argument, Lepore and Brown (1997) demonstrated that people high and low in prejudice respond similarly if stereotypes are activated, but that they respond differently to category activation. Although high- and low-prejudice participants demonstrated equivalent knowledge of the black stereotype and responded to stereotype activation with similarly negative impressions of the target individual, these similarities were not replicated when participants were primed subliminally with the category Black. Following priming of the category label, high-prejudice people exhibited the same negative impression of the target, relative to a control condition; low-prejudice people did not, suggesting that priming Black failed to lead to the activation of the black

stereotype (see also Kawakami et al., 1998; Lepore and Brown, 2002; Locke et al., 1994; Moskowitz et al., 1999). More recently, Livingston and Brewer (2002) reported evidence to suggest that even the presentation of black faces, which are presumably more meaningfully linked to the black stereotype than is the label Black, do not lead inevitably to activation of the black stereotype.

Indeed, a host of variables have been shown to moderate the supposedly automatic nature of stereotype activation. Many of these variables reside within the social perceiver, influencing both the motivation and the ability to override stereotypical responding. Other variables, however, reside outside the perceiver, in the contextual constraints that make stereotypical information more or less relevant to the task at hand. (For a review, see Blair, 2002.)

Cognitive moderators of stereotype activation

In addition to evidence that prejudice level may moderate the automaticity of stereotype activation, other research has suggested that stereotype activation may also be constrained by a number of cognitive, or capacity-related, factors. One such factor is the perceiver's level of attentional resources. Most notably, Gilbert and Hixon (1991) reported evidence to suggest that stereotype activation may not occur when perceivers are resource-depleted. In their experiments, participants viewed a video depicting an Asian woman turning over a series of cards on which word fragments were written. The participants' task was simply to complete each word fragment with the first word that came to mind. The results demonstrated that participants did indeed tend to choose stereotypical word completions for the fragments (for example, rice rather than mice for ice), but only when they had sufficient attentional resources available to do so. Gilbert and Hixon concluded that stereotype activation is only conditionally automatic, in that its occurrence depends on the availability of attentional resources.

Physiological processes may also moderate stereotype activation through their impact on arousal level and resultant information-processing resources. For example, Macrae et al. (2002a; see also Johnston et al., 2003, 2005) recently provided evidence of hormonal influences on social-cognitive functioning. From evidence that women are more attracted to facial symmetry and masculinity during ovulation, Macrae et al. reasoned that women should similarly be sensitive to category-level (that is, stereotypical) information during periods of high conception risk because of the relevance of this information to potential reproductive success. Indeed, they demonstrated that during high conception risk, women categorized male faces more quickly than they categorized female faces (demonstrating hormonally moderated categorization) and classified malestereotypical words more quickly than counterstereotypical words (demonstrating hormonally moderated stereotype activation).

Motivational moderators of stereotype activation

Other research has suggested that stereotype activation may also be constrained by motivational concerns (e.g., Blair, et al. 2004; Hugenberg and Bodenhausen, 2004; Richeson and Trawalter, 2005). Several researchers have sought to demonstrate that perceivers' immediate processing goals may be a more potent determinant of stereotype activation than the availability of attentional resources per se. Spencer et al. (1998), for example, have proposed that sufficiently motivated perceivers might be able to activate social stereotypes even under conditions of resource depletion. That is, they have demonstrated that even resource-depleted perceivers are capable of activating stereotypes if such activation can enhance their feelings of self-worth. Participants who received negative feedback responded more quickly to words denoting evalua-tor-relevant stereotypes than did participants who did not receive negative feedback, even when they were cognitively busy.

Further evidence for goal-directed stereotype activation can be found in a study by Pendry and Macrae (1996), who demonstrated that the extent of stereotype activation is moderated by perceivers' level of involvement with a target. When relatively uninvolving processing objectives are in place (for example, estimating a target's height), stereotype activation typically occurs at the broadest (that is, superordinate) level of categorization. However, when complex interactional goals are operating (for example, accountability and outcome dependence), a target is categorized both in terms of a higher-order representation (for example, woman) and a more differentiated category subtype (for example, business woman). Stereotype activation thus appears to be goal-dependent, with its occurrence contingent on the interplay of both cognitive and motivational forces.

Perceiver goals may also determine the nature of the processing undertaken when a target is encountered, with implications for categorization and thus stereotype activation. Macrae et al. (1997b; see also Wheeler and Fiske, 2005) demonstrated that the encoding operation that is undertaken when a person is encountered is a critical determinant of stereotype activation. Specifically, only the semantic appraisal of a person prompts the relevant categorical knowledge structures; presemantic processing orientations (for example, perceptual goals) are not sufficient to elicit stereotype activation. Thus, participants who judged the animacy of visual targets, determined the presence or absence of a white dot on those targets, or simply reported the detection of the targets were all equally accurate in a subsequent face-recognition task. Nonetheless, only participants who made the semantic (that is, animate-inanimate) judgments displayed stereotype activation.

Contextual moderators of stereotype activation

Stereotype activation is not moderated solely by the contents of the perceiver's mind. Contextual factors also play a role in determining whether stereotypes are activated in the presence of social category members (e.g., Castelli et al., 2004; Plant et al., 2005; Schaller et al., 2003). In particular, the situational context in which category members are encountered provides important input to the categorization process, as was demonstrated recently by Wittenbrink et al. (2001: Experiment 2). They used a sequential priming paradigm (following Fazio et al., 1995) in which participants responded to black and white face primes that were accompanied by positive or negative background scenes (a church interior or a street corner, respectively). The results indicated that in the negative context, black face primes produced disproportionately facilitated responses to negative items, particularly negative stereotypic items. In the positive context, however, there was no evidence of a prejudiced valence bias, suggesting that activation of the negative black stereotype was attenuated by its presentation in a negative-stereotype-incongruent context.

Work by Kurzban et al. (2001) also supports the role of contextual information in determining stereotype activation. Kurzban et al. sought to challenge race as one of the Big Three in social categorization (Fiske, 1998) and to demonstrate that the propensity of social perceivers to categorize according to race is a byproduct of the tendency for race and coalitional friend/enemy status to becorrelated. Kurzban et al. employed the category confusion paradigm (Taylor et al., 1978), asking participants to form impressions of a series of individuals through a set of materials pairing faces (of black and white individuals) with opinions ostensibly expressed by the individuals. In one experiment, the expressed opinions provided cues to coalitions and suggested two allegiances within the set of individuals. In a surprise recall test, participants continued to make more within-race errors than between-race errors, demonstrating a lack of differentiation among blacks and suggesting categorization on the basis of race. However, the same participants also exhibited category confusions on the basis of coalition, albeit less strongly. In a follow-up experiment, physical cues to allegiance were added to the verbal cues; in this case, there was a reversal in the importance of race versus coalition categorization such that race confusions decreased dramatically and coalition confusions increased just as dramatically.

In another examination of how factors outside the perceiver affect stereotype activation, Macrae et al. (2002b) adopted a functionalist approach and speculated that the direction of the target's eye gaze would moderate stereotype activation. They reasoned that eye gaze acted as a cue through which perceivers could assess the relevance of the target, such that eye gaze directed toward the perceiver would be particularly relevant and would impel the perceiver to discern the intentions of the target. Importantly, assessing these intentions would be facilitated to the extent that any relevant information could be accessed, and categorical (that is, stereotypical) information could provide intention-relevant information. Indeed, their research demonstrated that gender categorization was faster for directgaze faces than for faces with averted gaze or faces with closed eyes. Furthermore, lexical decisions were faster when gender stereotypical words were preceded by directgaze faces than by laterally averted faces or faces with closed eyes, suggesting that gaze direction moderates both person categorization and stereotype activation. Other evidence also supports the role of target characteristics (e.g., Blair et al., 2002, 2004; Hugenberg and Bodenhausen, 2004; Locke et al., 2005; Maddox, 2004; Maddox and Gray, 2002).

Categorization and stereotype activation: the case of multiply categorizable targets

But what of social categorization in the real world, where category labels are not provided by an experimenter or where the target's identity reflects multiple category memberships? Upon encountering an individual, perceivers must make their own categorization, a categorization that can take many forms depending on the behaviors or features to which the social perceiver attends. Stereotypes will not influence thought or action if they are not activated, and they will not be activated if the target's membership in a stereotyped group is not detected, as may be the case when the target belongs to several groups (for example, gender, ethnic, occupational, and so on).

How does the mind deal with the problem of multiple category memberships? One possibility is that the target will be classified in all possible ways and that each of the applicable stereotypes will be activated simultaneously. Perhaps, then, all of the stereotypes that happen to be associated with these various categorizations will be activated, and from this assortment of associations the perceiver will attempt to produce a meaningful, coherent, and well-structured impression of the target. One recent model (Kunda and Thagard, 1996) suggests that these disparate categorizations, and indeed anything else that is known about the target (that is, individuating information) will be activated simultaneously and will mutually constrain each other's meanings, eventually converging on a summary impression that can best accommodate the various elements composing one's knowledge of the target. When perceivers encounter a multiply categorizable target, all applicable categories are believed to be activated in parallel and a competition for mental dominance then ensues. Contextual salience (e.g., Biernat and Vescio, 1993), chronic and temporary category accessibility (e.g., Smith et al., 1996), comparative and normative fit (Oakes et al., 1991), and temporary goal states (e.g., Pendry and Macrae, 1996) are all factors that are likely to confer an activation advantage to particular categories in such a competition.

This task could be daunting and counterproductive, however. Almost inevitably, some elements of the available information will work against these goals of simplicity and coherence, either by conflicting with other information (for example, the nun known to have taken the vow of chastity, but who was observed to spend many hours reading racy romance novels) or by distracting the perceiver from whatever dominant themes might emerge in her impressions (for example, the nun who displayed behaviors consistent with kindness and charity, but who was also seen to perform an interpretive belly dance). In light of this, recent approaches assume that the process of information selection in impression formation involves not only the facilitation of some information, but also the inhibition of interfering or irrelevant information. In this variation of the parallel-constraint-satisfaction view, mutual constraint refers not only to the contextualization of an attribute's meaning, given other known attributes, but also (under some circumstances) to the active inhibition of some attributes by others. That is, category selection is assumed to be facilitated through the implementation of basic inhibitory processes, such that potentially distracting categorizations are removed from the cognitive landscape through a process of spreading inhibition. The result is an impression that is coherent and straightforward, undiluted by distracting and complicating elements.

Evidence for inhibitory processes in stereotype activation comes from Macrae et al. (1995; see also Dunn and Spellman, 2003). The studies involved the video presentation of an Asian woman who could be categorized in two salient ways (that is, on the basis of sex or ethnicity). In one study, prior to viewing the video and judging its edit quality, participants underwent a parafoveal priming manipulation in which either the category woman, the category Chinese, or no category was activated. After viewing the video, participants performed an allegedly unrelated lexical decision task in which the critical trials included words that were stereotypical of either women or Asians. With the control condition as a baseline, the data showed evidence of both activation of the primed stereotype and inhibition of the nonprimed stereotype: when the category woman had been primed, participants were both significantly faster to verify stereotypical associates of woman and significantly slower to verify stereotypical associates of Asian than controls. Conversely, when the category Chinese had been primed, participants were both significantly faster to verify stereotypic associates of Chinese and significantly slower to verify stereotypical associates of woman than controls. This basic pattern was replicated in a second experiment in which the salience of the particular categorization was manipulated with contextual cues rather than the parafoveal priming manipulation. (For evidence against category dominance, see Stroessner, 1996; Weeks and Lupfer 2004.)

Interestingly, perceivers' motivational states also seem to play an influential role in the active inhibition of competing social categories (e.g., Kunda et al., 2002). In a provocative demonstration, Sinclair and Kunda (1999; see also Kunda and Sinclair, 1999) demonstrated that after participants received favorable feedback from a black doctor, associates of the category black became significantly less

accessible, while associates of the category doctor became significantly more accessible. In other words, when motivated to view the black doctor as competent, participants inhibited the category black and activated the category doctor. They did just the reverse, however, when the black doctor provided negative feedback and they were thus motivated to view him unfavorably, activating the category black and inhibiting the category doctor. Interestingly, a final experiment demonstrated that the tendency to inhibit the black stereotype following positive feedback was present only among high-prejudiced participants, who presumably had more reason than low-prejudice participants to avoid thinking positively of blacks. Motivational factors therefore appear to be as important in the inhibition as in the activation of stereotypes.

Characterization processes in impression formation: stereotype application

Given the challenges of monitoring a multiplicity of information in the social environment, perceivers may need to be selective in allocating attention. In addition to the problem of allocating limited attentional resources to the range of environmental stimuli available (either in the context or in the multiply categorizable target herself), perceivers are also confronted with the task of disambiguating the stimuli to which they attend. Human behavior is often complex and ambiguous and, therefore, open to multiple plausible interpretations. Stereotypical expectancies provide one way of selecting among competing interpretations and, in so doing, have a number of intriguing effects.

Not surprisingly, when all one knows about an individual is that he or she belongs to a particular social category, the stereotype associated with that category can determine the perceiver's impression of that individual. Thus, a person described only by a male name may, when no other information is available, be viewed as more likely than a person described only by a female name to be characterized by a host of traits associated with masculinity (Heilman, 1984; Locksley et al., 1980). Students described by only their academic majors may be expected to behave differently in ways that are consistent with the stereotypes about their majors (Nisbett et al., 1981). Blacks portrayed only in photographs may be viewed as more superstitious, lazy, emotional, untidy, and immoral than whites portrayed in photographs (Secord et al., 1956).

Stereotypes also appear to influence the perceiver's interpretation of behavior (e.g., Cameron and Trope, 2004; Jones and Kaplan, 2003; Maass et al., 2005; Ottati et al., 2005). When a person known to belong to a particular social category performs an ambiguous behavior, the stereotype associated with that category influences the apparent meaning of the behavior. Thus, a shove may be viewed as more violent when performed by a black individual than by a white individual (Duncan, 1976; Sagar and Schofield, 1980), a mixed performance on an academic test may be considered better when performed by a child of a higher rather than lower socioeconomic background (Darley and Gross, 1983), and the behavior hit someone who annoyed him or her may be interpreted as punched an adult when performed by a construction worker but as spanked a child when performed by a housewife (Kunda and Sherman-Williams, 1993). More recently, D'Agostino (2000) demonstrated that exposure to ambiguous sentences such as some felt that the politician's statements were untrue led participants later to manifest stereotypical (for example, politician-lied) than nonstereotypical (politician-erred) recall errors, suggesting that stereotypes had influenced the construal of the behaviors.

Stereotypes also influence the meaning that a perceiver assigns to a particular trait. When a trait is used to describe a member of a stereotyped group, its meaning can be influenced by the group's stereotype. That is, the same trait can imply different behaviors when applied to members of different groups. Kunda et al. (1995) found that perceivers rated lawyers and construction workers as equally aggressive but nevertheless held very different expectations about their likely aggressive behaviors: lawyers were viewed as more likely to argue and complain and less likely to punch and yell insults than were construction workers.

Several studies suggest that the assimilative effects of stereotyping extend even to situations in which apparently irrelevant information is available to supplement category membership information (e.g., Hilton and Fein, 1989; Krueger and Rothbart, 1988; Locksley et al., 1980; Raskinski et al., 1985). Darley and Gross (1983), for example, demonstrated that a child was viewed as possessing better liberal arts skills, cognitive ability, and emotional maturity when she was viewed on a brief video in a context implying high, rather than low, socioeconomic background (without the video evidence, however, these differential evaluations of the child did not emerge). Thus, ample evidence has accrued to demonstrate the effects of stereotypes on social judgment (e.g., Biernat et al., 1991; Duncan, 1976; Kunda and Sherman-Williams, 1993; Sagar and Schofield, 1980; Vallone et al., 1985). Similar outcomes have been observed in the context of jury decision-making (e.g., Bodenhausen and Wyer, 1985), and job-applicant evaluation studies (e.g., Heilman, 1984).

As in the case of stereotype activation, stereotype-application effects are moderated by a host of cognitive variables. Some conditions that exacerbate the impact of stereotypical knowledge on judgment and memory include mental busyness (e.g., Macrae et al., 1993; Pendry and Macrae, 1994), task complexity (e.g., Bodenhausen and Lichtenstein, 1987), information overload (e.g., Pratto and Bargh, 1991; Rothbart et al., 1978), time pressure (e.g., Kruglanski and Freund, 1983), and low levels of cir cadian arousal (Bodenhausen, 1990).

Affect and stereotype application

In general, the cognitive moderators just discussed appear to confer greater importance to the activated stereotypical concepts in social judgment by undermining more evidence-based processing of the stimulus field. The impact of stereotypes on judgment and memory is also exacerbated by certain emotional states (for a review, see Bodenhausen et al., 2001). Initially, this work focused on valence-based mood effects in which the focal comparisons were on the differential effects of negative versus neutral versus positive affective states. An implicit assumption of this approach was the notion that different types of affect within a particular valence (for example, anger, sadness, and fear) produce functionally equivalent effects. Intuitively, one might expect to find that negative moods of any sort would be likely to promote greater use of negative stereotypes, whereas positive moods would have the opposite tendency. These common-sense intuitions, however, have proved to be incorrect.

In general, positive moods appear to increase reliance on heuristics and generic knowledge structures (e.g., Bless et al., 1996a; Isen and Daubman, 1984; Isen and Means, 1983; Ottati et al., 1997; Schwarz et al., 1991; Worth and Mackie, 1987). In contrast, sadness seems to be associated with the avoidance or minimization of the use of heuristics, schemas, and other simplified processing strategies (e.g., Bless et al., 1990; Weary and Gannon, 1996). These findings clearly imply that happiness will likely be associated with greater reliance on stereotypes, whereas sadness may be associated with reduced reliance on them.

Much evidence supports this expectation. In general, category information has been found to exert a stronger effect on the judgments of happy than sad or neutral perceivers in several studies (e.g., Abele et al., 1998; Bless et al., 1996c; Blessum et al., 1998). Bodenhausen et al. (1994a) reported several experiments in which individuals in a positive mood were more likely than their neutral-mood counterparts to judge individual targets in ways that were stereotypic of their social groups. Park and Banaji (2000) showed that happy people are less likely to discriminate accurately among different members of a stereotyped group. Instead, they tend to set a lower threshold for drawing stereotypical conclusions and, hence, are more likely to remember incorrectly that specific group members possessed stereotypical traits.

The fact that positive moods can increase perceivers' reliance on simplistic social stereotypes seems fairly counterintuitive. Closer examination of the relation between happiness and stereotyping, however, has provided some insight into these findings. Schwarz (1990) and Schwarz and Bless (1991) proposed that happy moods signal that everything is fine and that there is little need for careful analysis of the environment. Consequently, happy perceivers may generally prefer to conserve their mental resources rather than engaging in systematic thinking. This line of argument gains some support from evidence that the superficial forms of thinking observed among happy people can be readily eliminated when the situation provides other bases for effortful processing, such as relevance to personal outcomes (Forgas, 1989), accountability to a third party (Bodenhausen et al., 1994a), or task demands (Martin et al., 1993). Relatedly, Bless and colleagues (Bless and Fiedler, 1995; Bless et al., 1996a, 1996b, 1996c) suggested that happy perceivers are often content to rely on their general knowledge and to use it as a basis for constructive elaboration (Fiedler et al., 1991), but that they are reluctant to do so if it proves to be inadequate to make sense of the target (for example, when the available individuating information is unambiguously counterstereotypical, Bless et al., 1996c).

Greater stereotype application under conditions of positive affect has thus been attributed to distraction, a general lack of epistemic motivation, and a generally greater confidence in generic knowledge structures. Happy people are generally neither unwilling nor unable to engage in systematic thinking. Rather, happy people appear to be flexible in their information-processing strategies. Although often content to rely on efficient, simplified bases for judgment (such as stereotypes), they are quite capable of engaging in more detail-oriented processing if personally involved or otherwise motivated for more systematic thinking, or if simplified processing fails to provide a satisfactory basis for judgment.

With respect to sadness, there is less evidence, but the available studies are generally consistent with the idea that sad perceivers do not rely on generic knowledge (e.g., Edwards and Weary, 1993). Bodenhausen et al. (1994a), for example, demonstrated that sad participants did not differ from neutral participants in their tendency to rely on stereotypes. Park and Banaji (2000) found that sad participants were similar to neutral-mood participants in their sensitivity in distinguishing among category members and that they set a more stringent threshold for drawing stereotypic conclusions than did neutral-mood controls.

Complementing their functional analysis of happy moods, Schwarz (1990) and Schwarz and Bless (1991) argued that sad moods suggest to perceivers that their environment is problematic and thereby promote more detail-oriented, careful thinking. Research by Lambert et al. (1997) shows that the fact that sad perceivers are less likely to rely on stereotypes is attributable to their tendency to engage in stereotype correction. Drawing on Schwarz's (1990) analysis, Lambert et al. argued that sadness should induce perceivers to scrutinize the use of stereotypes in the judgment process. Specifically, they assumed that sad perceivers should use stereotypes only in cases in which their use seemed appropriate to the judgment. They found, for example, that sad perceivers were more likely than controls to correct for negative but not positive stereotypes. Presumably, positive stereotypes were not considered an inappropriate basis for judgment. This kind of finding is consistent with the general idea that sad perceivers are likely to be careful, systematic thinkers (e.g., Schwarz, 1990; Weary, 1990), applying stereotypes only when it seems appropriate to do so; otherwise, they seem to take pains to avoid letting such biases influence their judgments.

Importantly, the effects for sadness do not generalize to other negative moods: compared to neutral-mood controls, heightened stereotyping has been observed among both angry (Bodenhausen et al., 1994a; Keltner et al., 1993) and anxious (Baron et al., 1992; Raghunathan and Pham, 1999) individuals, presumably because the accompanying arousal levels interfere with processing capacity.

Motivation and stereotype application

In addition to the role of cognitive and affective moderators of stereotype application, a variety of motivational states also seem to be important. It is fairly well established that epistemic motivation undermines the use of stereotypes. Holding perceivers accountable for their judgments (e.g., Bodenhausen et al., 1994a), placing perceivers in a position of interdependence with (or dependence on) the target (e.g., Fiske and Depret, 1996), and making the judgment personally relevant or important to the perceiver (e.g., Kruglanski and Freund, 1983) also motivate perceivers to invest more effort in the judgmental process and lead to less stereotypical judgments. Causal uncertainty appears to have similar effects (Weary et al., 2001), as does experiencing a loss of control (Pittman and D'Agostino, 1989) and holding nonprejudiced attitudes (Wyer, 2004).

In contrast, other motivational states such as prescriptive norms (Gill, 2004), prejudice (Hugenberg and Bodenhausen, 2003; Kawakami et al., 2002), and the need for ego defense serve to enhance the use of stereotypes in judgment. Sinclair and Kunda (2000), for example, demonstrated that participants viewed women as less competent than men after receiving negative, but not positive, evaluations from them, suggesting that participants' motivation to protect their self-views led them to use an available stereotype that they would not have used in the absence of this motivation (for similar arguments, see also Fein and Spencer, 1997; Spencer et al., 1998).

Social judgeability concerns also moderate stereotype application: unless perceivers believe there is a legitimate informational basis for a stereotypical judgment (whether or not such a basis exists), they are unlikely to report category-based (that is, stereotypic) assessments. When the only information that is available to perceivers is the target's category membership or when the additional noncategorical information is deemed irrelevant to the judgment, perceivers are reluctant to rely on stereotypes. When additional pseudorelevant or subjectively individuating information is available, however, perceivers do allow stereotypic information to contribute to their judgments. Thus, perceivers render more stereotypical judgments only to the extent that their stereotypes are not perceived as being the main source of information for the judgments and to the extent that they feel entitled to judge the target (e.g., Yzerbyt et al., 1994, 1997, 1998).

Finally, implicit theories of personality influence stereotype application: people who hold an entity theory of human nature (and believe that traits are fixed and enduring) are more likely to render stereotypical judgments than are people who hold an incremental theory (and believe that traits are malleable, Levy and Dweck, 1999; Levy et al., 1998; see Bastian and Haslam, 2006, for an alternative perspective). Theories about particular stereotypes also have implications for the construal of social information. In three studies, Wittenbrink et al. (1997; see also Wittenbrink et al., 1998) demonstrated that specific causal assumptions about the underlying socioeconomic disadvantage among African-Americans (as either personal or structural) influenced participants' construal of causality in a situation that involved a black target and that interfering with participants' ability to integrate the available information into a coherent representation on encoding reduced substantially the stereotyping effects. In a trial simulation, ascriptions of personal (rather than structural) causality of black disadvantage led to more guilty verdicts, longer sentencing recommendations, and more stereotypical trait ratings of the black defendant but only when participants were able to integrate the presented information.

Processes in stereotype application

An expansive literature has thus confirmed Walter Lippmann's (1922) suggestion that stereotype application is likely to occur when a perceiver lacks the motivation, time, or cognitive capacity to think deeply (and accurately) about others. The general pattern is that judgment becomes more stereotypical when either motivation or capacity is depleted, as long as there is not a demonstrably poor fit between the stereotypical expectations and the available target information. But what is the mechanism or process underlying these effects? Certainly, much of the evidence reviewed here suggests that interpretation is biased in the direction of the available stereotype. However, work by Bodenhausen (1988) has demonstrated that selective processing also contributes to the apparent assimilative effects of stereotype activation. In a series of studies, Bodenhausen compared biased interpretation and selective processing accounts of stereotyping. The biased interpretation account implies that the activation of a stereotype may lead perceivers to interpret all newly encountered information in a more stereotypical manner than they otherwise would. The selective processing account, however, implies that the activation of a stereotype may lead to differential processing of newly encountered evidence, favoring information that is consistent (rather than inconsistent) with the implications of the stereotype.

In the context of a mock-jury decision-making task, participants read booklets containing information extracted from a hypothetical criminal trial in which the defendant was identified, either at the beginning or end of the transcript, as either Hispanic or ethnically nondescript. After considering the evidence, participants made judgments about the defendant's guilt and rated the relevance of each piece of evidence. After an intervening task, a surprise recall test was administered. Consistent with both the selective processing and the biased interpretation accounts, the results indicated that participants viewed the defendant as more likely to be guilty if he could be stereotyped. Results from the evidence-rating task indicated that participants viewed the evidence as more unfavorable when the defendant was Hispanic than when he was ethnically nondescript. This effect was not contingent on whether the stereotype was activated before or after the evidence was read, however, suggesting that biased interpretation of information as it is encountered could not account for the pattern of guilt judgments. Crucially, participants exhibited preferential recall of incriminating versus exculpating evidence but only when the stereotype was activated before the evidence was considered, consistent with the selective processing account. A second experiment confirmed the superiority of the selective-processing account over the interpretation account by providing evidence that a manipulation preventing selective processing also eliminated biases in judgment and recall.

Processes underlying the functional efficiency of stereotype application

Together, this abundance of research findings is suggestive of the basic benefits that a perceiver can accrue from the application of categorical thinking, especially during times of cognitive duress. Categorical thinking enables rapid inference generation and the efficient deployment of limited processes resources. But how is this efficiency achieved, and through which processing operations is it realized? According to the encoding flexibility model of Sherman et al. (1998), categorical thinking is efficient because it facilitates the encoding of both stereotype-consistent and stereotype-inconsistent information, particularly when processing resources are limited. Following the activation of a categorical knowledge structure, expected material can be processed in a conceptually fluent manner, even when a perceiver's capacity is low. Any spare processing resources can therefore be directed toward unexpected material, material that is especially difficult to process and comprehend under conditions of attentional depletion. This encoding flexibility is functional because it promotes both stability and plasticity: categorical thinking allows expected information to be easily understood, thereby enabling perceivers to be alert to surprising events and facilitating the execution of an appropriate response.

The benefits of categorical thinking are thus twofold: first, expected material is processed in a relatively effortless manner; second, residual resources are redirected to any unexpected information that is present, enabling perceivers to process (and remember) this potentially important material. Indeed, Macrae et al. (1994c) demonstrated that category activation enables rapid and efficient processing of stereotypical information, relative to nonstereotypical information, and provided some evidence that the efficiency of stereotypes allowed perceivers to devote more attention to other tasks. Macrae et al. (1994b) similarly provided evidence that stereotypes function as resource-saving devices. In three experiments, they demonstrated that participants who were given concurrent goals of forming an impression of a target and completing an unrelated (and stereotype-irrelevant) task performed better on the concurrent task when a stereotype was available to facilitate the impression-formation task than when it was not. Sherman et al. (1998) extended these findings to demonstrate that the efficiency conferred by stereotypes facilitates the processing not only of stereotype-irrelevant information, but also stereotype-inconsistent information (see also Sherman et al., 2003, 2004, 2005; Sherman and Frost, 2000; von Hippel et al., 1993, 1995; Wigboldus et al., 2004).

If both stereotypical and counterstereotypical information is encountered, which kind of information will dominate the perceiver's reactions? In the domain of memory, at least, it is clear that counter stereotypical information is most likely to dominate subsequent processing, particularly during impression formation (see Stangor and McMillan, 1992, for a meta-analysis, and Ehrenberg and Klauer, 2005, for a multinomial model). This is a benefit of the cognitive system: an ability to deal with the unexpected is conducive to successful social interaction (when Sister Gertrude is observed with one of her romance novels, successful social interaction entails not displaying shock or disapproval). Recognizing the inconsistency confronting them in such instances, social perceivers need to make sense of the situation by resolving the inconsistency between prior expectancies and current actualities. In other words, they must individuate the target, organizing their memories around the individual's personal identity rather than in terms of his or her group membership.

But how exactly do perceivers do this? Recent research has speculated that these two crucial processes in person perception (that is, inconsistency resolution and individuation) come under the purview of executive cognitive functioning, a raft of higher-order cognitive operations that are involved in the planning, execution, and regulation of behavior (Macrae et al., 1999b; Payne, 2005). Indeed, Macrae et al. (1999b) have demonstrated that under conditions of executive impairment, perceivers' recollective preference for unexpected information is eliminated, such that they are no longer able to organize their memories of others in an individuated manner, and they were unable to identify the source of their recollections, particularly when these recollections were counterstereotypical in implication. When attentional depletion did not obstruct executive functioning, however, none of these effects emerged. These findings are theoretically noteworthy because they confirm that it is not attentional depletion per se that obstructs inconsistency resolution and individuation; rather, it is executive dysfunction.

Mather et al. (1999) have also linked stereotyping to executive function, demonstrating that stereotype-related source confusions among elderly participants were correlated with processes based in brain regions typically associated with executive functioning. The finding that elderly perceivers are more prone to false stereotypical memories than are younger participants, and that this effect is mediated by executive function, was recently corroborated by Macrae et al. (2002d). This research demonstrated that when social perceivers remembered information that they never encountered, the information was more likely to be stereotype-consistent than inconsistent in nature. Importantly, results demonstrated that, among younger participants, this bias in recognition memory was exacerbated by executive dysfunction, leading them to exhibit similar memory confusions to those exhibited by older participants (for similar analyses, see Lenton et al., 2001; Sherman and Bessenoff, 1999).

Recently, von Hippel et al. (2000) have linked these memory failures among the elderly to a failure in inhibitory processes, also purportedly governed by executive function. Indeed, Dijksterhuis and van Knippenberg (1996) have provided evidence to suggest that efficient stereotype application does involve both facilitative and inhibitory processes. Specifically, when stereotypical attributes associated with a particular category become activated, it appears that stereotype-inconsistent attributes are actively inhibited. In one study, participants were primed either with a soccer hooligan stereotype or no stereotype and then completed an ostensibly unrelated lexical decision task. In line with previous demonstrations, primed participants were significantly faster to verify stereotype-consistent words, relative to controls. Of greater interest, however, primed participants were also significantly slower to verify stereotype-inconsistent words than were controls. This pattern was replicated in two additional experiments using different procedures to assess trait accessibility. Thus, it appears that once specific stereotypes are activated, they inhibit the processing of inconsistent data (see also Dijksterhuis and van Knippenberg, 1995; van Knippenberg and Dijksterhuis, 1996; Wigboldus et al., 2003).

The application-memory relation, however, is not invariant. Research by Macrae et al. (2002c), for example, suggests that stereotypes do prompt facilitated processing of consistent information and inhibit processing of inconsistent information but that the extent of these effects depends on the strength of association between the categorical cue and its stereotypic associates. More specifically, Macrae et al. conducted research in which strength of association, as reflected in participants' subjective estimates of cue stereotypicality, was manipulated. These studies employed forenames as categorical cues; these names differed in the degree to which they were gender-typed (for example, sarah is a more familiar female name than is Glenda). A semantic priming study demonstrated that, overall, participants responded more quickly to a stereotype-consistent target (for example, cosmetics) and less quickly to a stereotype-inconsistent target word (for example, hockey) when the target word was preceded by a gender-typed rather than neutral prime. Notably, however, the facilitation and inhibition effects were somewhat stronger when the primes were strongly, rather than weakly, associated gender-typed forenames. This demonstration underscores a further aspect of stereotype accessibility: not only are stereotypes only conditionally automatic, but they also vary in the extent to which they are activated by categorical cues, with resulting implications for the processing of consistent versus inconsistent information (for earlier evidence that exemplar typicality moderates stereotype activation, see Macrae et al., 1999a).

Evidence is emerging to suggest that the differential possessing of consistent and inconsistent information is also moderated by a host of individual difference variables. Individuals high in need of closure, for example, recall (Dijksterhuis et al., 1996) and draw more trait inferences from (Maass et al., 2005) stereotype-consistent versus stereotype-inconsistent information than do individuals low in need of closure, leading them to judge target groups in a more stereotypical fashion. Need for cognition has also been shown to moderate stereotypical memory and judgment (Crawford and Skowronski, 1998), such that cognitively active individuals display enhanced memory for stereotype-consistent information but less evidence of stereotypical judgment than do cognitively lazy individuals.

Motivational factors also appear to play a role. In particular, perceiver power leads to differential attention to stereotype-consistent and inconsistent information, reflecting the differential concerns of the parties involved in the power relationship. More specifically, powerful perceivers attend to the stereotype-consistent (especially negative) attributes of the powerless, presumably to justify the power inequity, whereas powerless perceivers attend to the stereotype-inconsistent attributes of the powerful, presumably to enhance their perceptions of control (Rodriguez-Bailon et al., 2000). Related research has suggested that the stereotyping patterns of the powerful have two bases: a lack of perceived dependence on the powerless, which allows the powerful to ignore the stereotype-inconsistent attributes of the powerless; and a motivation for continued control, which allows them to attend to system-justifying, stereotype-consistent attributes (Goodwin et al., 1998, 2000). Target power also has implications for stereotype application (Sekaquaptewa and Espinoza, 2004).

Just as there are situations in which stereotype activation is likely to have a greater impact on construal processes, there may be a variety of circumstances under which the activation of stereotypical beliefs has little if any impact on construal. One limiting condition on stereotype activation is the presence of target information that is incompatible with stereotypical construals. When the target does not appear to fit the social category well, and this disconfirmatory information is not easily overlooked, he or she may not be subject to stereotypic impressions (for reviews, see Brewer, 1996; Fiske and Neuberg, 1990). Similarly, if diagnostic and nonstereotypical information about a target is readily available and perceivers are motivated and able to process this information, its influence may often dominate construals of the target, thereby minimizing stereotypical influences (for a review, see Kunda and Thagard, 1996). Another set of limiting conditions concerns the ways that perceivers may attempt to compensate for stereotypical biases, often in an explicit effort to avoid unfairly biased or discriminatory responses.

Correction processes in impression formation: stereotype suppression

The activation and application of stereotypes in no way guarantee that impressions and judgments will themselves be stereotypical. There are various reasons why a person might have the goal of avoiding stereotype use. With the rise of liberal democratic values and awareness of civil-rights issues, there has been a dramatic increase in the endorsement of the principle of egalitarianism. This change in the nature of prejudice (or, at least, its expression) has been recognized within several more contemporary models of prejudice, including symbolic racism (Kinder and Sears, 1981), aversive racism (Dovidio and Gaertner, 1998; Gaertner and Dovidio, 1986), racial ambivalence (Katz and Hass, 1988; Katz et al., 1986), and ambivalent sexism (Glick and Fiske, 1996, 2001). Although these models differ in several respects (for example, in terms of whether perceivers have access to their true attitudes), they all acknowledge that perceivers may attempt to prevent the expression of categorical thinking, either because legal sanctions may follow or because stereotyping violates their personal standards of fairness and equality. Whether the motivation arises from societal or personal sources, there may be many conditions in which perceivers desire to avoid the influence of activated stereotypes on their evaluations of others.

The most influential research program investigating the motivation to avoid stereotyping has been conducted by Devine, Monteith, and their associates. Their work proceeds from the assumption that stereotyping is a largely automatic, conditioned process, even in those who deny the veracity of the stereotypes, but that it can be overcome by effortful processes if people are sufficiently motivated. Monteith's (1993) analysis of the self-regulation of stereotyping suggests that when people are committed to egalitarian, nonprejudiced standards and their behavior appears to violate these standards, they experience guilt and compunction and direct their efforts toward reducing this discrepancy (see also Czopp et al., 2006; Peruche and Plant, 2006).

When people become cognizant of the potential for stereotypical bias in their reactions to others, a variety of regulatory procedures can be used. One possible strategy, for instance, is simply to make direct adjustments to social judgments in the direction opposite to that of the presumed bias. More ambitious, however, are self-regulatory strategies whereby perceivers actively attempt to prevent stereotypical thoughts from ever entering into their deliberations. Perceivers may attempt, for instance, to forget the stereotypical information that they believe confronts them. An example of this process comes from research using the directed-forgetting paradigm (Macrae et al., 1997a). In an adaptation of the procedure, participants who had been primed (or not) with a social category were presented with a list of words to learn; this list comprised words that were stereotypical of the social category. At the end of this task, participants were given a second list, comprised of stereotype-irrelevant words. Some participants were instructed that they should learn both lists. Other participants, however, learned that there had been a procedural error and that they should disregard the first list and learn the other.

The results demonstrated that the encoding and retention of stereotypical information are indeed facilitated by stereotype activation, leading to greater difficulty in forgetting the stereotypical materials and interference in remembering the nonstereotypical material. When participants were primed with the category label, they exhibited better recall of stereotypical items (compared to nonprimed participants), regardless of being told to forget them. Moreover, constraining their processing resources further undermined their ability to succeed in their efforts to forget the stereotypical material: contrary to the forgetting instructions, busy, primed participants actually recalled more of the to-be-disregarded stereotypical items than they recalled of the to-be-remembered nonstereotypical items.

These direct attempts at stereotype avoidance implicate the mechanisms of mental control identified by Wegner and his colleagues (e.g., Wegner, 1994; Wegner and Erber, 1992). Their model postulates that the goal of avoiding a certain type of thought (such as a stereotype) is realized by the joint operation of two cognitive processes. The first is a monitoring process that scans the mental environment looking for signs of the unwanted thought. If detected, a second operating process is initiated that directs consciousness away from the unwanted thought by focusing attention on a suitable distracter. Crucially, whereas the monitoring process is assumed to operate in a relatively automatic manner, the operating process is po tulated to be effortful and to require adequate cognitive resources for its successful execution. Thus, detecting the presence of stereotypical ideas is a task that can be accomplished with ease, independently of any other demands that are imposed on a perceiver's processing resources. Replacing these thoughts with suitable distracters, however, is an altogether more demanding affair that can happen only when sufficient attentional resources are available.

One of the ironic aspects of mental control that is specified within this theoretical perspective is that trying to avoid a particular thought may result in its hyperaccessibility. That is, the very act of trying not to think in stereotypical terms may actually increase the extent of stereotype activation. To detect unwanted thoughts, one must keep in mind what it is one is trying to avoid, and so the monitoring process must involve at some level the mental activation of the to-be-avoided material (otherwise there would be no criterion on which to conduct the search of consciousness). Of course, as long as perceivers have adequate resources and consistent motivation, the operating process may be able to keep the focus of attention away from the stereotypical material. But if a perceiver is cognitively busy, distracted, or under time pressure, or, indeed, if the motivation for suppression has been relaxed for any reason, the hyperaccessibility created by suppression efforts may not be checked by the operating process.

Several studies have documented the ironic consequences of stereotype suppression, as manifest in a perceiver's reactions (for example, evaluations, recollections, and behavior) toward stereotyped targets. Macrae et al. (1994a) provided the first demonstrations of stereotype rebound effects in social impressions. In each of a series of studies, participants were asked to view a picture of a target (who, on the basis of visual cues, could easily be categorized as a skinhead) and then write a passage about their impression of him. Half of the participants were instructed further not to rely on stereotypes. Consistent with the view that motivated perceivers with ample processing capacity can successfully regulate their impressions, the passages written by stereotype suppressors were significantly less stereotypical, as rated by independent coders, than those written by control participants. However, the same participants, when later asked to write about a second skinhead (this time without any suppression instructions), produced significantly more stereotypical descriptions of the second target than did control participants. Evidence for the role of stereotype hyperaccessibility came from another experiment (Macrae et al., 1994a: Experiment 3), in which participants completed an ostensibly unrelated lexical decision task following the passage-writing task. Although there was no difference between the control and suppression groups in verifying nonstereotypical words, the suppressors were significantly faster than the control group in verifying the stereotypical words.

Ironic effects of this kind also extend to a perceiver's recollections of stereotyped targets. In another set of studies (Macrae et al., 1996), participants were given an unexpected memory test for the nonstereotypical details of the target description. The results confirmed that following the cessation of a well-intentioned period of suppression, perceivers display a recollective preference (both in recall and recognition) for the stereotypical material they were formerly trying to dismiss, as well as impaired memory for nonstereotypical

information. As is the case with other mental contents, it would appear that an explicit instruction to suppress stereotypes can actually serve to enhance the accessibility of this material in memory, thereby setting the stage for postsuppression rebound effects.

The results of this research also support the assumption that thought suppression is effortful. In the Macrae et al. (1996) studies, participants performed a simultaneous probe reaction task while listening to the audiotape. This task was designed to assess the attentional load imposed by suppression. In the task, participants were to hit the space bar on the computer keyboard every time an illuminated light bulb appeared on the computer screen; the speed of response on this task is an indicator of the amount of free processing resources available. Probe reaction times were significantly longer among suppressors than among control participants, particularly when the amount of stereotypical material to be suppressed was relatively high, suggesting that they were distracted by their thought-control attempts.

Inhibitory efficiency can also be undermined by such diverse factors as depressive affect and the cognitive changes associated with aging (von Hippel et al., 2000). If the inhibitory system is compromised, whatever the reason, the intention to avoid biased judgments and reactions may backfire, producing even more of the unwanted reaction than would otherwise have been the case. Thus, although the road to stereotype avoidance may be paved with good intentions, without consistent motivation and processing capacity, these laudable goals may be unsatisfied and, indeed, even reversed. With stereotypic concepts highly accessible and no operating process in place to direct attention elsewhere, construals of social targets are driven by stereotype-based preconceptions, often to a degree that is greater than if a perceiver had never sought to suppress the stereotype in the first place.

Moderators of stereotype suppression and rebound

Although a compelling phenomenon with important implications, the generality of stereotype rebound has been questioned (for a review, see Monteith et al., 1998a). One limitation of early research on this topic was that it employed stereotypes that perceivers are not highly motivated to avoid (such as skinheads). Thus, the question remained as to whether rebound effects would emerge for groups where there are strong personal or societal prohibitions against stereotyping (for example, African-Americans, women, and homosexuals). As it turns out, the evidence on this issue is equivocal. Evidence that suppression can increase stereotyping for even socially sensitive groups can be garnered from recent work by Sherman et al. (1997) and Wyer et al. (1998). In each of these studies, racial stereotyping was exacerbated following a period of suppression. However, Monteith et al. (1998b) reported evidence that participants with low-prejudice attitudes toward gays were not susceptible to rebound effects (on either overt or covert measures of stereotyping) following a period of suppression. In contrast, suppression did prompt the hyperac cessibility of stereotypes among participants who were prejudiced toward gays. Moreover, recent work reported by Wyer et al. (2000) suggests that people may be more consistent in their efforts to avoid stereotyping highly sensitive social groups. Because consistency of suppression motivation is an important factor in the avoidance of ironic suppression effects, this work does suggest that rebound effects arising from the suspension of suppression motivation may indeed be less likely when a highly sensitive social category is involved.

Ambiguity also surrounds the conditions under which self-regulatory processes are initiated by perceivers. Despite growing interest in the topic of stereotype suppression, surprisingly little is known about how and when inhibitory processes are spontaneously implemented. A characteristic feature of much of the available research on this topic is that the intention to suppress a particular thought or impulse is provided to participants by the experimenter in the form of an explicit instruction not to think about a particular person in a stereotype-based manner. Although such a strategy offers obvious methodological advantages, it does sidestep a number of important theoretical questions, most notably the spontaneity issue. It is one thing to suppress stereotypes in response to an explicit experimental instruction, but it may be an entirely different matter to do so spontaneously.

So when, exactly, does a perceiver attempt to regulate the expression of stereotypical thinking? Insight into the determinants of uninstructed self-censorship can be gleaned from the work of Devine et al. (1991) and Monteith (1993). Monteith, for example, has shown that attempts at self-regulation are implemented when perceivers experience a discrepancy between their internalized standards and actual behavior. When people are committed to egalitarian, nonprejudiced standards and their behavior apparently violates these standards, they feel guilty, experience compunction, become self-focused, and direct their efforts at reducing this discrepancy. That is, having reacted in an ostensibly prejudiced manner, a perceiver implements self-regulatory procedures in an attempt to avoid a potential repetition of the action. Although this idea has yet to be tested directly, it also seems plausible that self-regulation of stereotyping is likely to be moderated in different ways by internal versus external motivation to respond without prejudice (Plant and Devine, 1998; Devine et al., 2002).

But is the commission of a prejudiced action, or, indeed, the belief that such an action has occurred, a necessary precursor of stereotype inhibition? Recent research would tend to suggest not. Wyer et al. (2000) have suggested that any cue that makes salient social norms (personal or societal) against stereotyping is likely to promote the spontaneous suppression of stereotypical thinking. Indeed, heightened self-focus (that is, self-directed attention) appears to be sufficient to trigger the spontaneous suppression of unwanted stereotypic thoughts. A common experimental finding is that when the self becomes the focus of attention, per-ceivers are especially likely to behave in accordance with internalized standards and norms; stereotype suppression has also been shown to operate in such a manner (Macrae et al., 1998). Thus, task context, the presence of others, and current information-processing goals are factors that are likely to moderate stereotype suppression (Wyer et al., 2000). Triggered by situational cues, stereotype suppression does not demand a conscious inhibitory intention on the part of a perceiver.

To date, much of the research on stereotype avoidance paints a picture of self-regulation that is disheartening. Wegner (1994), however, has suggested that mental control can improve with practice, whereby effortful processes gradually become more and more automatized and resource independent. Although little research exists to document this progression through the suppression paradigm, research by Kawakami et al. (2000) demonstrates that practice in negating (that is, saying no to) stereotypes can lead to a subsequent decrease in stereotype accessibility. Although it is worth noting that the mechanism underlying Kawakami et al.'s effects is unknown, in that it remains unclear as to whether the negation training decreases the accessibility of the stereotype or (more likely) increases the accessibility of a non-stereotypical response, it is nonetheless encouraging to note that conscientious social perceivers can learn to control their

stereotypical responding.

Where do we go from here?

A fundamental set of questions in social psychology concerns how, why, and when stereotypes influence people's impressions of others. In this chapter, we have attempted to provide at least a partial account of the facilitative and inhibitory mechanisms associated with stereotyping and the conditions under which they influence each stage of the impression-formation process.

The picture is certainly not complete, however, and there is much to be learned about the intricacies of stereotyping and impression formation. The goal of future research in the field will undoubtedly be the accumulation of more detailed and specific knowledge about the boundary conditions and moderators of the various mechanisms reviewed in this chapter. What we are advocating is an integrative approach to these future investigations, one that encourages multiple levels of analysis and that involves a complete theoretical decomposition of stereotyping and the intergroup context.

Levels of analysis in stereotyping research

In a recent review of the literature on stereotyping, prejudice, and discrimination, Fiske (1998) highlighted two levels of analyses that have been invoked to explain stereotyping and prejudice. As Fiske pointed out, many early approaches adopted either the individual or the society as the appropriate level of analysis, emphasizing personality differences (for example, authoritarianism; Adorno et al., 1950) or structural conditions (for example, intergroup contact; Amir, 1969), respectively, as the roots of prejudice and stereotype endorsement. Both of these levels of analysis yielded data that were compelling and informative regarding the motivational and situational concomitants of intergroup conflict. The advent of the cognitive evolution, however, and the motivated cognition approach that followed, both served to situate stereotyping and prejudice more firmly in the mind of the social perceiver. This newer level of analysis is more dynamic than the earlier approaches, in that it examines processes that vary both within and between individuals can account for the psychological underpinnings of responses arising from social, structural, and personality variables.

We advocate adding another level of analysis to our conceptualizations of categorical thinking and person perception: social neuroscience (Cacioppo and Berntson, 1992, 1996; Ochsner and Lieberman, 2001). Acknowledging the obvious necessity of studying overt behavioral and attitudinal responses to answer questions about complex behavior, we nonetheless believe that a complete understanding of the component processes of stereotyping requires the additional specification of how neural systems are organized. At the very least, social psychological theorizing can benefit from theory and findings from neuropsychology and cognitive neuroscience (e.g., Macrae et al., 2002d; von Hippel et al., 2000; Sanders et al., 2004; Zarate et al., 2000). That is, neuroscience data can provide valuable constraints on theory. The functional organization of the brain can suggest specific processes that are recruited by various social-cognitive activities, and the time course of activation patterns can suggest sequencing of those processes. The story of theoretical progress is always a story of establishing better empirical constraints, and this new level of analysis brings a new set of useful constraints to the table.

Adopting the techniques of neuroscience, such as split-brain studies (e.g., Mason and Macrae, 2004), event-related potentials (ERP; e.g., Ito et al., 2004) and functional magnetic resonance imaging (fMRI) may also provide social psychologists with more sensitive measures of constructs of interest. Examples of how research from neuroscientific methods can inform social psychological investigations of prejudice and stereotyping comes from recent studies using fMRI to examine brain activity in the amygdala. Hart et al. (2000), for example, found that white participants exhibited differential activation in the amygdala in response to white versus black faces such that, over time, amygdalar activation in response to white (in-group) faces was attenuated, whereas amygdalar activation in response to black (out-group) faces showed no change. Research by Phelps et al. (2000) demonstrated further that the extent of amygdalar activation exhibited by white participants viewing black versus white faces correlated with the extent to which these participants manifested implicit bias against black versus white stimuli on an implicit association test (Greenwald et al., 1998). Importantly, this correlation is attenuated when the black faces in question belonged to familiar and positively evaluated black celebrities (Phelps et al., 2000) and when perceivers have alternative processing goals (Wheeler and Fiske, 2005). Interestingly, the amygdala is a subcortical structure known to play a role in nonconscious emotional evaluation and learning, especially with regard to fear and threat (LeDoux, 2000). Although it may come as no surprise that implicit bias would be related to fear or threat appraisals, it is potentially more informative that conscious emotional learning does not necessarily implicate the amygdala; this knowledge, which could not be garnered without neuroscientific evidence and techniques, might be useful for understanding the boundary conditions on conscious strategies for stereotype control. (For a review of the social neuroscience of person construal, see Mitchell et al., 2006.)

Functional analyses of stereotyping and the intergroup context

The use of neuroscientific evidence and techniques is but one avenue for future investigation. Advancing our understanding of the moderators of categorical thinking will also benefit from more careful theoretical decomposition of stereotyping and of the intergroup context itself. In an approach somewhat analogous to the components-of-processing approach to the study of memory (Moskovitch, 1994), in which memory tasks are decomposed into (and subsequently investigated according to) the various processes that are believed to be necessary for successful task completion, we advocate a more thorough analysis of the dynamics of social interaction to include not only an analysis of the social perceiver's expectancies and attitudes, but also analysis of the target of perception and of the context in which categorical thinking occurs.

Indeed, this component-processing approach to categorical thinking is already taking hold in social cognition. As we have already reviewed, research by Wittenbrink et al. (2001), for example, has demonstrated the importance of considering the context in investigations of stereotype activation. Researchers have also begun to acknowledge the complexity of social stimuli, relying less on verbal labels and more on visual stimuli (e.g., Barden et al., 2004; Blair et al., 2002, 2004, 2005; Eberhardt et al., 2004; Hugenberg and Bodenhausen, 2003, 2004; Macrae et al., 2005; 2002; Maddox and Gray, Quinn and Macrae, 2005), in recognition that the mere perception of a stimulus person is not always sufficient to trigger a stereotype (Gilbert and Hixon, 1991; Macrae et al., 1995) and that a stimulus person can inevitably be categorized in many ways (Dunn and Spellman, 2003; Macrae and Bodenhausen, 2000; Macrae et al., 1995; Quinn and

Macrae, 2005; Sinclair and Kunda, 1999; Smith et al., 1996).

What these examples suggest is encouraging: there is an increasing recognition that understanding the complexity of the social landscape is critical to understanding social cognition, and that empirical investigation should be sensitive to these complexities. Even these studies, however, relied on relatively impoverished stimuli and constrained the categorizations and responses that participants were able to make. As a result, the early evidence for category dominance and contextual variation in stereotype activation provides only a hint of how the informational processing unfolds to address the complexity of the social situation.

The issue goes beyond ecological validity. Social categorization develops in the real world, where the target can be viewed in many ways and where the significance of the target to the perceiver depends on a multitude of chronic and current factors. The component-process analysis that we advocate involves a dissection of the entire social interaction, including the significance of the target to the perceiver not only in general but also in the specific context in which the perceiver encounters the target.

This analysis of the entire context of impression formation may provide insight into many questions in social cognition, including the question of how the social perceiver forms an impression of a multiply categorizable target. Exactly how does the social perceiver cope with the multiplicity of identity? How do perceivers select relevant categories when any given target of perception could be categorized in seemingly infinite ways? How, or how efficiently, do perceivers identify the various features of the target and the various features of the context to their basic security and affiliation goals as well as to any other concurrently active epistemic or directional goals? And once these contextual or motivational factors have been identified, how are they evaluated and ranked? Do perceivers routinely categorize people simultaneously along multiple dimensions, or does a single category tend to dominate perceptions in many everyday circumstances, as the early evidence suggests? And when a categorization is made whether the individual is categorized according to one particular group membership or a conjunction of memberships what happens to the information relevant to the nonchosen categorization?

And what of the role of the particular affect that is experienced during the interaction? Does the target or the context have a particular relation to the perceiver (for example, target as friend versus foe, context as familiar versus unfamiliar) that would elicit particular emotions with predictable cognitive and motivational implications for categorization and stereotype activation? Interestingly, analyses of mood and stereotyping have often been characterized by the type of functionalist analysis we advocate, with theory being derived from assumptions about what the particular emotional state in question would signal to the perceiver (e.g., Clore et al., 2001). The role of affect in categorical thinking can be clarified, however, by extending the analysis from incidental to integral affect; that is, from the impact of affective states that arise for reasons having nothing to do with the intergroup context itself to the impact of affective states that are elicited by the group itself and the social situations within which the group is encountered (Bodenhausen, 1993; see also Bodenhausen and Moreno, 2000; Moreno and Bodenhausen, 2001). Would the findings regarding incidental affect generalize to integral affect? Or are there aspects of integral affect that might augment or diminish the impact of stereotypes on social impressions and behavior? It seems reasonable to expect that the emotions that are experienced directly as a result of an intergroup encounter would be more focused than incidental affect would be and, thus, that integral emotion would be more likely to contribute to relevant appraisal and attribution processes. Would these supplemental processes lead simply to differences in the amount of stereotyping that would be observed? Or would the appraisal involve component processes such as the alignment of the affective state with the emotional content of the group stereotype that could change the apparent significance of the affective state and thus the apparent applicability of the stereotype in that context? Investigations of these issues will be important to theoretical progress.

Conclusion

Although the processes involved in person perception may occasionally backfire, in that they sometimes lead to judgmental and memorial biases and errors, they nonetheless provide the social perceiver with a very handy set of tools for the construction of stable person impressions and the efficient navigation of social interaction. Social perceivers, with little or no effort, spontaneously categorize targets according to their social groups (Aunt Gertrude is a Catholic nun), activate relevant group stereotypes (she's chaste and virtuous), and use those stereotypes to provide working impressions of those targets. This sequence, however, is not invariant. As our review suggests, a host of variables chronic and situational, cognitive and motivational affect the output of person perception at all processing stages, alternately augmenting or reducing the stereotypicality of the final judgment (But she's not as proper as I would have expected!). The direction of future research in this area will be to place these various moderators into their functional context, in order to provide a complete account of how the social perceiver manages the myriad goals activated during social interaction.

INTRODUCTION

To engage in successful social interaction, we must form impressions that capture other people's characteristics coherently and meaningfully. What is perhaps most remarkable about this process is the ease with which it is accomplished: Impressions often spring to mind so readily that they seem to directly reflect the immediately obvious, objective characteristics of the target person, without any active inferential construction or bias on our part. In reality, however, research on impression formation has revealed a complex series of mental processes most notably, stereotyping that are involved in construing the character of others and the meaning of their behavior.

SUMMARY

To facilitate social interaction, social perceivers prefer simple, well-structured impressions of others, and they achieve this coherence by regularly using categorical representations (that is, stereotypes) as a basis for their impressions. By construing others not in terms of their unique constellations of attributes and inclinations but, rather, on the basis of the social categories to which they belong (such as race, age, sex, or occupation), perceivers can make use of a wealth of stereotype-based information stored in long-term memory to guide processing and thus forgo the challenge of processing the full complexity of the social world. This chapter reviews the mental processes

(automatic and controlled) that are involved in the categorical construal of others and their behavior, including identification and categorization of the target, reliance on activated stereotypes to guide attention to and comprehension of the target, and attempts to control stereotypes and their influence on impressions and judgment. We review evidence that stereotypes can have both facilitative and inhibitory influences on information processing at each of these stages, alternately enhancing or diminishing the stereotypicality of the system's outputs. In tandem with other cognitive, affective, motivational, and contextual factors, stereotype-based processing facilitates subjectively coherent and meaningful impressions of others.

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