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The Trouble of Thinking
Activation and Application of Stereotypic Beliefs

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ABSTRACT

Two studies investigated the effects of cognitive busyness on the activation and application of stereotypes. In Experiment 1, not-busy subjects who were exposed to an Asian target showed evidence of stereotype activation, but busy subjects (who rehearsed an 8-digit number during their exposure) did not. In Experiment 2, cognitive busyness once again inhibited the activation of stereotypes about Asians. However, when stereotype activation was allowed to occur, busy subjects (who performed a visual search task during their exposure) were more likely to apply these activated stereotypes than were not-busy subjects. Together, these findings suggest that cognitive busyness may decrease the likelihood that a particular stereotype will be activated but increase the likelihood that an activated stereotype will be applied.

> Labels are devices for saving talkative persons the trouble of thinking. (Morley, 1886 , p. 142)

Of all the many observations that writers have made about human prejudice and preconception, one enjoys near-perfect consensus: A stereotype is the sluggard's best friend. As Allport (1954, pp. 20—21) noted:

> We like to solve problems easily. We can do so best if we can fit them rapidly into a satisfactory category and use this category as a means of prejudging the solution.... So long as we can get away with coarse overgeneralizations we tend to do so. Why? Well, it takes less effort, and effort, except in the area of our most intense interests, is disagreeable.

Modern theorists have raised Allport's notion of cognitive economy to the status of a first principle. Stereotypes and preconceptions do not save people the trouble of thinking *en passant,* but rather, as their cardinal function: "The task of category systems is to provide maximum information with the least cognitive effort" (Rosch, 1978 , p. 28). The ability to understand new and unique individuals in terms of old and general beliefs is certainly

among the handiest tools in the social perceiver's kit (e.g., Andersen, Klatzky, & Murray, 1990 ; Hamilton, 1981 ; Hamilton & Trolier, 1986).

Of course, the fact that people may employ such devices does not mean that they must always do so. As Fiske (1989, p. 277) has argued, "The idea that categorization is a natural and adaptive, even dominant, way of understanding other people does not mean that it is the only option available." Indeed, most theories of social inference acknowledge the predominance of stereotypic thinking but also award a significant role to individuating thought (e.g., Bodenhausen & Lichtenstein, 1987 ; Brewer, 1989 ; Fiske & Neuberg, 1990 ; see also Locksley, Hepburn, & Ortiz, 1982). Under some circumstances, then, people do think about others as unique individuals, and contemporary theorists have debated at length about what those circumstances might be.

One such circumstance falls neatly out of Allport's principle of cognitive economy: If a stereotype is, in fact, an energy-saving device, then people should be particularly prone to employ that device when they are short on energy (e.g., Bodenhausen, 1990 ; Bodenhausen & Lichtenstein, 1987 ; Bodenhausen & Wyer, 1985 ; Fiske & Pavelchak, 1986 ; Pratto & Bargh, 1991 ; Rothbart, Fulero, Jensen, Howard, & Birrell, 1978). To the extent that individuals are cognitively busy (i.e., simultaneously involved in several resource-consuming tasks), they should be especially inclined to use stereotypes. This notion makes so much sense, and has been advanced by so many sensible theorists, that it has become a hub of the conventional wisdom. The purpose of the present article is to argue that the state of affairs is not quite so simple: Cognitive busyness may indeed exacerbate the perceiver's tendency to use stereotypes, but it may also abrogate precisely the same tendency.

Activation and Application of Stereotypes

Anyone who has ever lent a socket wrench to a forgetful neighbor knows that a tool is useful only if one can find it. Stereotypes are forms of information and, as such, are thought to be stored in memory in a dormant state until they are activated for use. Many theorists have assumed that the activation of a stereotype is an automatic and inevitable consequence of encountering the object of that stereotype. Thus, for instance, Allport (1954, p. 21) argued that "Every event has certain marks that serve as a cue to bring the category of prejudgment into action.... A person with dark brown skin will activate whatever concept of Negro is dominant in our mind." Brewer (1989) , Devine (1989) , Dovidio, Evans, and Tyler (1986) , and Fiske and Neuberg (1990) have all considered varieties of this argument, which (to strain the metaphor) suggests that stereotypes are tools that jump out of the toolbox when there is a job to be done. In short, stereotypes are forms of information that must be activated before they can be applied to perceptual or judgmental operations, and some theorists have argued that such activation is an inevitable consequence of exposure to the stereotype object.

There is no doubt that some mental operations require very little effort or intent. Word meanings spring to mind when their written referents are encountered (LaBerge & Samuels, 1974 ; Logan, 1980 ; Stroop, 1935); affective responses may overwhelm one

with their speed and intensity (Fazio, Sanbonmatsu, Powell, & Kardes, 1986 ; Zajonc, 1980a); and even complex beliefs about others can be activated without one's awareness (Bargh & Pietromonaco, 1982 ; Brewer, 1989 ; Devine, 1989 ; Lewicki, 1985). Nonetheless, despite the ease with which such phenomena seem to occur, none of these operations is unconditionally automatic in that it can occur in the complete absence of intention, volition, awareness, or processing resources (Bargh, 1989). Indeed, even simple perceptual operations that were once thought to be entirely automatic have been shown to have limiting preconditions (see Kahneman & Treisman, 1984).

In this article we will endorse the view that the automaticity of stereotype activation is also conditional (Bargh, 1989), and that mere exposure to a stereotype object is therefore insufficient to activate the corresponding stereotype. What, then, are the conditions under which meeting "a person with dark brown skin" will activate "whatever concept of Negro is dominant in our mind?" We suggest that the availability of processing resources constitutes one essential precondition for stereotype activation and that, as such, cognitively busy perceivers who encounter a stereotype object may show no evidence of stereotype activation. Because stereotypes must be activated before they can be applied to perception and judgment, such a finding would mean that, contrary to the conventional wisdom, cognitively busy perceivers may occasionally be *less* likely than notbusy perceivers to construe others in stereotypic terms. Experiment 1 was an attempt to show that cognitive busyness can *inhibit* the simple activation of stereotypes, and Experiment 2 was an attempt to show that when stereotypes are activated, cognitive busyness can *facilitate* their application.

Experiment 1

Method Overview

Subjects performed a word-fragment completion test while being exposed to either a Caucasian or Asian female assistant. Five of the word fragments could be completed with words that were stereotypically associated with Asians (e.g., POLL___E could be completed as POLITE). All subjects made as many completions as they could in 15 s. Half the subjects performed a resource-consuming rehearsal task during the completion test, and the remaining subjects did not.

Subjects

Seventy-one female students at the University of Texas participated to fulfill a requirement in their introductory psychology course. Only Caucasians who were native speakers of English were eligible to participate.

Procedure

Upon arrival at the laboratory, subjects were greeted by a male experimenter who escorted them to an individual cubicle that was equipped with a video monitor and a tape recorder. The experimenter explained that he was testing the hypothesis that people are

capable of performing two tasks simultaneously as long as the two tasks involve different cerebral hemispheres. Subjects in the *busy* condition were told that they would be asked to perform simultaneously a verbal and a nonverbal task that, according to the experimenter's ostensible hypothesis, would not be mutually debilitating. Subjects in the *not-busy* condition were told that they had been assigned to a control condition and would therefore be performing only the verbal task.

Word-fragment completion test.

The experimenter explained that the verbal task (which all subjects were to perform) required the subject to observe a word fragment (e.g., P___ST) and then to generate its completions (e.g., POST, PAST, and PEST). Subjects were told that they would see a videotape in which a female assistant would hold up a series of cards, on each of which would be printed a fragment. The subject's task was to read the fragment, generate as many completions as possible during the 15 s that the card was being displayed, and state each of these completions aloud into a tape recorder. The word-fragment completion test has been shown to be extremely sensitive to the activation of constructs that have been either recently encountered (Tulving, Schacter, & Stark, 1982) or self-generated (Bassili & Smith, 1986).

The female assistant on the videotape displayed a total of 19 cards, each of which bore one fragment. Of these 19 word-completion trials, 5 were considered critical and 14 were considered fillers. Earlier in the semester, 20 Caucasian students were asked to "list all the words that come quickly to mind when you think about Asian-American students." Of the words generated, eight concepts (i.e., words and their close synonyms) were independently generated by at least 33% of the Caucasian pretest subjects. Each concept was then designated by a single word (e.g., *smart* was the word chosen to designate the concept of intelligence). These eight words were then pretested in a fragment-completion test. Three word fragments were shown to have an exceedingly common stereotypic completion (i.e., a completion that was generated first by virtually all pretest subjects, e.g., QUI___ and QUIET), and these three were eliminated because such word fragments would not discriminate between subjects who had and had not experienced stereotype activation. This left five words that were designated as *stereotypic words.* These five words met three important criteria: (a) They were spontaneously generated by more than 33% of the Caucasian students who thought about Asian-American students; (b) their fragments could easily be completed in more than one way; and (c) the stereotypic completions were no more or less common or frequently occurring than were the other correct completions of the word fragment (*M* word frequencies = 53.6 and 62.0, respectively, $t < 1$, as assessed by Kucera & Francis, 1967). The five fragments and their stereotypic completions were: S___Y (SHY), S___ORT (SHORT), RI___E (RICE), POLI___E (POLITE), and N___P (NIP).

Independent manipulations.

Subjects saw a silent videotape in which a female assistant turned over a series of 19 cards, each of which bore a word fragment. Half the subjects saw a videotape in which

the card-turning assistant was Caucasian, and the remaining subjects saw a videotape in which the assistant was Asian. Neither the Caucasian nor Asian assistant spoke at any time during the videotape and, except for the assistant's ethnicity, the two tapes were identical.

Some subjects were made cognitively busy while they watched the videotape. Prior to the start of the videotape, the experimenter asked subjects in the busy condition to rehearse an eight-digit number while they watched the videotape, whereas subjects in the not-busy condition were not asked to rehearse a number. This and similar rehearsal tasks have been used with excellent results in a number of experiments to deprive subjects of processing resources (e.g., Gilbert, Pelham, & Krull, 1988 , Experiment 1; Gilbert & Osborne, 1989 , Experiments 1—4; Osborne & Gilbert, 1990 , Experiments 1—3; Swann, Hixon, Stein-Seroussi, & Gilbert, 1990 , Experiments 1 and 3). After subjects finished watching the videotape, the experimenter returned to the room and, if the subject had been assigned to the busy condition, asked the subject to report the eight-digit number. Next, subjects completed some filler items and were then asked to report the color of the ink in which the fragments were printed and the race of the female assistant. Finally, subjects were probed for suspicion, thoroughly debriefed, and dismissed.

Results and Discussion Error Rates and Excluded Data

It is difficult to know how to interpret the errors that busy subjects made when reporting the eight-digit number. Large errors may mean that busy subjects were not rehearsing the number (i.e., that they were not, in fact, busy), whereas small errors may mean that busy subjects were rehearsing the number and that this rehearsal was straining their resources. We faced this interpretative dilemma by establishing an a priori cutoff such that subjects who incorrectly reported four or more of the digits were considered to have made large errors and were excluded from the data set. Three of the 37 busy subjects were excluded by this criterion. Of the 32 busy subjects who remained in the data set, 2 made small errors (i.e., they incorrectly reported one or two of the eight digits) and 30 made no errors.

Analysis of Completions

We predicted that not-busy subjects would generate more stereotypic completions when exposed to an Asian than a Caucasian assistant, but that busy subjects would not. The number of stereotypic completions generated by each subject was submitted to a 2 (busyness: busy or not busy) × 2 (race: Caucasian or Asian) analysis of variance (ANOVA) that revealed only the predicted Busyness × Race interaction, F (1, 64) = 4.52, $p < .05$. As Table 1 shows, not-busy subjects were more likely to generate stereotypic completions when exposed to an Asian than a Caucasian assistant, t (32) = 2.46, $p < .05$, but busy subjects were not, t (32) < 1.

It is worth noting that busyness did not itself impair any obvious aspects of task performance. Busy and not-busy subjects generated an equivalent total number of correct completions across all trials (M s = 41.50 and 41.29, respectively, $t < 1$) and on critical

trials (*M* s = 11.77 and 12.09, respectively, $t < 1$). Busy and not-busy subjects generated equally common or frequently occurring words across all trials (*M* s = 75.17 and 76.52, respectively, $t < 1$) and on critical trials (*M* s = 77.76 and 75.79, respectively, $t < 1$). Finally, busy and not-busy subjects showed equally good recall of the assistant's race (94.1% and 91.2% correct recall, respectively), $? ^2 1 < 1$, and of the color in which the word fragments were printed (58.9% and 61.8% correct recall, respectively), $? ^2 1 < 1$. Taken together, these results suggest that cognitive busyness did not prevent subjects from performing well on the completion task or from noticing the assistant's race, but that it did inhibit the activation of their stereotypes about Asians.

A Caveat

Given that busy subjects were presumably deprived of processing resources, one might expect that they would perform more poorly than not-busy subjects on a variety of indices (e.g., memory for target's race, number of completions, and so on). In fact, they performed just as well as did not-busy subjects on these indices and made few errors on the digit-rehearsal task itself. Some authors have argued that substantial error rates on an overload task are necessary if one is to claim unequivocally that capacity was exceeded (e.g., Kantowitz, 1974). Thus, our data may be seen as suggesting that the busyness manipulation did not, in fact, usurp subjects' processing resources. Is it possible, for example, that busy subjects committed the number to long-term memory prior to the experimental trials and subsequently made fewer stereotypic words for reasons entirely unrelated to resource deprivation?

We think not. Osborne and Gilbert (1990) showed that subjects who were given 20 s to memorize an eight-digit number responded more slowly to probes that occurred over the following 2 min than did subjects who had not been asked to memorize the number. This finding suggests that the typical subject does indeed rehearse the number (rather than merely store it in long-term memory) and that this rehearsal does usurp processing resources. Nonetheless, our interpretation of the results of Experiment 1 would be more convincing if busy subjects had shown minor but ubiquitous errors on the digit-rehearsal task, and future researchers should consider using more demanding manipulations of load to avoid such interpretational difficulties.

Experiment 2

The Sufis teach that "If a pickpocket meets a holy man, he will see only his pockets" (Dass, 1971 , p. 10). The results of Experiment 1 suggest that people can, in fact, be exposed to others about whom they have stereotypic beliefs, and yet show no evidence of stereotype activation. Apparently, busy subjects who encountered an Asian card turner saw only a card turner, and not an Asian.

At first blush, this finding may appear to contradict the doctrine of cognitive economy–namely, that stereotypes ease the task of understanding others and should therefore be most readily employed by those in greatest need of easing. In fact, the contradiction disappears if one distinguishes between the activation and application of information.

Although "activation increases the likelihood of a construct's being used in subsequent judgments" (Higgins, 1989 , p. 78), it does not mandate such use, nor does it determine the precise nature of its use. It is possible for activated information to exert no effect on subsequent judgments or to have a variety of different effects (e.g., contrast versus assimilation; see Lombardi, Higgins, & Bargh, 1987 ; Martin, Seta, & Crelia, 1990 ; Newman & Uleman, 1990). If activation involves finding a tool in the cognitive toolbox, then application involves using that tool to ease the processing of information. We suggest that whereas busyness may *decrease* the likelihood of locating the tool (activation), it may *increase* the likelihood of using the tool once it has been found (application). Experiment 2 was an attempt to demonstrate these effects.

Method Overview

Subjects performed a word-fragment completion test while being exposed to an Asian or Caucasian assistant. Some subjects rehearsed an eight-digit number while they performed the test and others did not. Subjects then attempted to form an impression of the assistant as she described a day in her life. Some subjects performed a visual search task while they listened to this description and others did not. Finally, all subjects reported their impressions of the assistant.

Subjects

One hundred eleven female students at the University of Texas participated to fulfill a requirement in their introductory psychology course. Only Caucasian students who were native speakers of English were eligible to participate.

Procedure

The experiment was composed of two phases: an initial *activation phase* (in which subjects' stereotypes about Asians either were or were not activated) and a subsequent *application phase* (in which subjects were given an opportunity to use their stereotypes during impression formation). The procedures for the activation phase were identical to those in Experiment 1. In brief, subjects performed a word-fragment completion test while either rehearsing or not rehearsing an eight-digit number. The card-turning assistant was, once again, either Asian or Caucasian.

After the activation phase was completed, subjects were told that they would hear an audiorecording of the card-turning assistant as she described a typical day in her life, and that their job was to form an impression of the assistant on the basis of these events. Approximately half the subjects were assigned to be busy during the application phase. These subjects were told that while they listened to the assistant describe a typical day in her life, one of four letters (*R*, *S*, *T*, or *U*) would appear at a random location on the screen. The screen was divided into a 6 × 6 invisible grid, and a letter appeared in one of the 36 sectors on a black background. The letter remained on the screen for 500 ms, disappeared, and was followed between 1,000 and 3,000 ms later by another letter. The sector in which each letter appeared (1 to 36), the identity of each letter (*R* through *U*),

and the delay between letters (1,000 to 3,000 ms) were randomly determined by the roll of a die prior to the experiment.

The subject was instructed to use a hand-held "clicker" with analog readout to count the number of times the letter *T* was immediately followed by the letter *U.* Letters were presented for the entire duration of the assistant's description (approximately 2.6 min), and during that time the target sequence (i.e., *T* —then— *U*) occurred on six occasions. Visual search tasks such as this have been used with excellent results to deprive subjects of processing resources (e.g., Gilbert & Krull, 1988 , Experiments 1 and 2). The remaining subjects were assigned to be not busy during the application phase. These subjects did not perform the visual search task, and the video screen remained black as they listened to the assistant describe a typical day in her life.

Thus, about one quarter of the subjects in the experiment were assigned to the *always-busy* condition (they performed a digit rehearsal task during the activation phase and a visual search task during the application phase), one quarter were assigned to the *never-busy* condition (they performed neither the digit rehearsal task nor the visual search task), one quarter were assigned to the *early-busy* condition (they performed a digit rehearsal task during the activation phase but not a visual search task during the application phase), and one quarter were assigned to the *late-busy* condition (they did not perform the digit rehearsal task during the activation phase, but they did perform the visual search task during the application phase). [1]

Dependent Measures

All subjects listened to a female narrator (ostensibly the card-turning assistant) describe a rather mundane series of events (e.g., grocery shopping, meeting her sister's friends, going to a party, doing school work, and so on). After hearing the description, subjects were given 90 s to complete their ratings of the assistant. Subjects rated the assistant on nine trait dimensions: *timid, intelligent, calm, composed, aloof, sociable, friendly, happy,* and *conversational.* These trait terms were either synonyms or antonyms of the eight stereotypic concepts that were generated by at least 33% of the pretest subjects in Experiment 1. The first five of these words were synonyms (and were thus considered typical of Asian-American students) and the last four were antonyms (and were thus considered atypical of Asian-American students). Each trait was presented on an 11-point scale anchored at the end points with the phrases *not a very X person* and *a very X person,* where *X* was replaced by one of the nine trait adjectives.

Next, subjects were given a 13-item recognition memory test. Of these items, 5 were statements taken verbatim from the assistant's description (e.g., "My sister has urged me to talk to my landlord, but I don't want to"). The remaining 8 items were foils that were created by altering key phrases contained in the assistant's actual statements. For example, the assistant actually said, "I live by myself in a small campus apartment," and from that statement a foil item was created that read, "I live in a private campus dormitory." Every effort was made to create foils that could be easily confused with statements that the assistant had actually made; thus, we did not include statements that

were unmistakable departures from the assistant's actual statements (e.g., "I killed a 79-pound lobster with avant garde poetry") and that would therefore have been easily identified as foils. Subjects never saw both an actual statement and a foil taken from the same statement. Finally, subjects were asked to recall the assistant's race and the color of the ink in which the fragments had been printed, and then were probed for suspicion, debriefed, and dismissed.

Results and Discussion Error Rates and Excluded Data

We used the criterion used in Experiment 1 to exclude subjects who made errors when reporting the eight-digit number. Eight of the 111 subjects made large errors (i.e., they incorrectly reported four or more of the eight digits), and these subjects were excluded from the data set. Thirteen subjects made small errors (i.e., they incorrectly reported between one and two of the eight digits), and these subjects were retained in the data set. The remaining subjects made no errors on this task.

In addition, two subjects made large errors when reporting the number of appearances of *T* —then— *U* (i.e., they were incorrect by more than one of the six appearances), and they were excluded from the data set. Three subjects made small errors when reporting the number of appearances of *T* —then— *U,* and these subjects were retained in the data set. The remaining subjects made no errors on this task.

Finally, five subjects confessed to having misunderstood the instructions and one subject identified herself as a nonnative speaker of English. These subjects were excluded from the data set. In summary, the data from 16 of 111 subjects were excluded from all analyses.

Activation Phase

As in Experiment 1, busy and not-busy subjects were exposed to either an Asian or Caucasian assistant while they performed a word-fragment completion test. We predicted that, as in Experiment 1, not-busy subjects would generate more stereotypic completions when exposed to an Asian than a Caucasian assistant, but that busy subjects would not.

The number of stereotypic completions generated by each subject was submitted to a 2 (activation: busy or not busy) × 2 (race: Caucasian or Asian) ANOVA for unequal *N* that revealed a main effect of race, $F(1, 91) = 5.36$, $p = .02$, and the predicted Activation × Race interaction, $F(1, 91) = 7.48$, $p = .007$. As Table 2 shows, Experiment 1 was clearly replicated: Subjects who were not busy during the activation phase were more likely to generate stereotypic completions when exposed to an Asian than a Caucasian assistant, $t(48) = 3.38$, $p < .01$. However, subjects who were busy during the activation phase generated equivalent numbers of stereotypic completions regardless of the race of the assistant to whom they were exposed, $t < 1$.

As in Experiment 1, busyness itself did not alter general task performance in any meaningful way. Subjects who were busy and who were not busy during the activation

phase generated equal numbers of correct completions across all trials (*M* s = 37.73 and 38.14, respectively), *t* < 1, and across critical trials (*M* s = 10.44 and 10.88, respectively), *t* (93) = 1.13, *p* > .27. Busy and not-busy subjects were equally adept at recalling the assistant's race (89% and 80% correct recall, respectively), ? ^{2} 1 = 1.41, *p* = .24 , and at recalling the color in which the fragments were printed (73% and 60% correct recall, respectively), ? ^{2} 1 = 1.88, *p* = .17 . Finally, although busy subjects did make marginally more common words across all trials than did not-busy subjects (*M* s = 76.93 and 71.70, respectively), *t* (93) = 1.59, *p* = .11, the two groups made equally common words on the critical trials (*M* s = 75.49 and 75.64, respectively), *t* < 1.

Application Phase

Subjects' ratings of the assistant on the nine trait dimensions were averaged to create a stereotypic perception index on which larger values indicated a perception of the assistant as possessing more stereotypically Asian traits (e.g., greater timidity, less sociability, and so on). Scores on this index were submitted to a 2 (activation: busy or not busy) × 2 (application: busy or not busy) × 2 (race: Caucasian or Asian) ANOVA that revealed only the predicted three-way interaction, *F* (1, 87) = 4.12, *p* < .05.

As Table 3 shows, subjects who were not busy during the activation phase but who were busy during the application phase (i.e., late-busy subjects) made more stereotypic ratings of the Asian assistant than of the Caucasian assistant, *t* (22) = 4.41, *p* < .001, and this was the only one of the four groups to do so (similar comparisons for the always-busy, never-busy, and early-busy groups did not approach significance, all *t* s < 1). In other words, busyness during the application phase increased subjects' tendency to view the Asian assistant in stereotypic terms, but only if the corresponding stereotypes had been activated in the first phase. Busyness during the application phase had no discernible effect on subjects whose stereotypes were not activated earlier (i.e., always-busy subjects), and stereotype activation had no discernible effect on subjects who were not busy during the application phase (i.e., early-busy subjects). All subjects showed superb memory for the assistant's description, although, as might be expected, subjects who were busy during the application phase showed somewhat poorer memory (mean *d* ' = 2.55) than did subjects who were not (mean *d* ' = 3.97), *t* (93) = 6.55, *p* < .001. [2]

It is interesting to consider the possibility that the three groups of subjects who showed no evidence of stereotype application may have done so for very different reasons. The early-busy and always-busy subjects should not have applied their stereotypes because busyness during the first phase should have kept those stereotypes from being activated. As such, we would not expect (and we did not observe) stereotypic responses from these subjects. Never-busy subjects, on the other hand, should have had their stereotypes activated, and evidence from the word-fragment completion test suggests that they did. Why, then, did these subjects show no evidence of stereotype application?

There are at least two explanations for this finding: The *behavioral suppression account* suggests that stereotype application did, in fact, occur, and the *individuation account* suggests that it did not. First, Devine (1989) has argued that both the activation and the

application of stereotypes are automatic, but that overt responses are not. Although there is now reason to believe that no mental process is unconditionally automatic (Bargh, 1989), Devine's point about the greater controllability of stereotypic behavior is an important one. Individuals may suppress stereotypic responses either because they consider such responses immoral ("It would be wrong to say that the woman is unsociable just because she's Asian") or because they wish to manage their impressions ("If I say the assistant is unsociable, the experimenter will think I'm a bigot"). This suggests that never-busy subjects may well have achieved stereotypic impressions of the assistant, but that the lack of busyness during the application phase allowed them to adjust their responses so as not to be or appear prejudiced.

On the other hand, it is possible that the activated stereotypes of never-busy subjects did not affect their judgments because the surfeit of cognitive resources during the application phase enabled them to individuate (rather than stereotype) the assistant (Fiske & Neuberg, 1990). The principle of cognitive economy suggests that stereotypes are applied in order to ease the burden of information processing, and thus one should not expect to observe such application when the information-processing task is not particularly taxing. Although we cannot determine which of these accounts is correct in the present case, one bit of evidence is suggestive. Two groups of subjects had their stereotypes of Asian-Americans activated (i.e., the never-busy and late-busy subjects who were exposed to an Asian assistant). Of those activated subjects, those who were busy during the application phase (i.e., the late-busy subjects) showed a marginally reliable correlation between the degree of stereotype activation and application, r (9) = .45, p = .08. Those activated subjects who were not busy during the application phase (i.e., the never-busy subjects) showed no such correlation, r (11) = .05, p = .44. If never-busy subjects strategically adjusted their ratings away from the stereotypic pole of the rating scale, one would expect the mean of these ratings to be lowered–but one might also expect the correlation between activation and application to be maintained. And it is not. This one shred of evidence, then, suggests that never-busy subjects may not have applied their activated stereotypes because they did not need to do so. Ultimately, of course, we cannot know whether the never-busy subjects failed to achieve stereotypic impressions (the individuation account) or simply failed to announce them (the behavioral suppression account). This is a perdurable dilemma that even the most inventive students of stereotyping have been unable to resolve (see Jones & Sigall, 1971).

General Discussion

Mental experience seems inexorably to involve the admixture of old and new information. People rely so strongly on prior information to ease the burden of ongoing perception that some of the greatest thinkers (e.g., Kant, 1781/1965) have doubted whether perception could occur otherwise. As Durant (1926, p. 272) wrote in characterizing this idealist position, "The world as we know it is a construction, a finished product, almost–one might say–a manufactured article, to which the mind contributes as much by its moulding forms as the thing contributes by its stimuli." With few exceptions (e.g., Gibson, 1979), most modern psychologists have embraced this constructivist perspective (Neisser, 1976) and have attempted to articulate the

circumstances under which percepts and judgments will be more strongly determined by stimulus properties or by the mind's "moulding forms."

As the quotation that opened this article suggests, psychologists and pundits have generally agreed that it takes more work to individuate a stimulus than to construe it in terms of well-worn knowledge (cf. Britton & Tesser, 1982). Preexisting knowledge is meant to save people "the trouble of thinking" about each new stimulus they encounter, and thus theorists have been quick to assume that circumstances that preclude individuating thought must increase the person's reliance on preexisting knowledge. To the extent that stereotypes function like other forms of preexisting knowledge (e.g., beliefs, constructs, categories, schemas, and scripts), our findings suggest that this assumption is correct–but only in part. People *are* more likely to rely on activated stereotypes when conscious deliberation becomes difficult, but the very conditions that interfere with conscious deliberation may also interfere with the activation of the stereotypes. The metaphorical irony is that just when one needs one's tool most, it may be hardest to find.

Social Interaction and Stereotypy

To speak of stereotypes as tools is to overlook the fact that although they may ease the burden of perception, they may also reduce its accuracy. Stereotypic beliefs about women's roles, for example, may enable one to see correctly that a woman in a dark room is threading a needle rather than tying a fishing lure, but they may also cause one to mistakenly assume that her goal is embroidery rather than cardiac surgery. Although stereotypes are psychologically fundamental, they may also be socially pernicious, and psychologists have long searched for ways to resolve this dilemma. One remedy has been to encourage people to spend the time and effort necessary to individuate others rather than allowing their preconceptions to dominate their judgments (see especially Fiske, 1989). The second remedy has been to increase the accuracy of the preconceptions upon which people rely.

One oft-prescribed means of accomplishing both ends is to foster interaction between persons and the objects of their stereotypes (e.g., Aronson, Blaney, Stephan, Sikes, & Snapp, 1978 ; Brewer & Miller, 1984). When people interact with members of out-groups, two things may happen. First, they may gain information that increases the accuracy of their preconceptions: An unmusical Black, a generous Jew, or a sober Irishman may, at the very least, undermine the certainty with which people embrace such racial caricatures (Taylor, 1981 , pp. 102—103; Weber & Crocker, 1983). Second, social interaction raises the practical cost of inaccurate beliefs (Swann, 1984). It is one thing to misconstrue a famous Black politician or a feminist opinion leader, and quite another to misconstrue one's dentist, student, or daughter-in-law. In other words, people are more accountable for (and thus may craft more carefully) judgments about those with whom they have true and enduring commerce (Tetlock & Kim, 1987).

Our studies suggest a third way in which social interaction may affect the use of stereotypes. Social interaction is a complex business in which one must consciously

regulate one's own actions at the same time that one draws inferences about others (Gilbert, Krull, & Pelham, 1988). As such, social interaction may cause interactants to become cognitively busy and thus reduce the likelihood that their stereotypes about each other will be activated. A faithful churchgoer who meets a newly arrived Hispanic minister may not experience activation of his or her beliefs about Hispanics, simply because the social demands of the formal encounter may usurp resources that are necessary for the activation of those concepts. Of course, this does not mean that social interaction is a panacea for prejudice. Our results suggest that if stereotypes are activated prior to a resource-consuming social interaction ("Let me take you over and introduce you to Father Gonzales"), then the interactants may be especially likely to view each other in stereotypic terms. In short, the timing of the onset of busyness would appear to be critical in determining if and when social interaction will ameliorate or exacerbate stereotypy.

The Inevitability of Stereotypy

Our findings suggest that the activation of racial stereotypes is not an unconditionally automatic consequence of exposure to a person; rather, a perceiver must have adequate processing resources for such stereotypes to be activated. This finding belies strong claims such as those of Brewer (1989, pp. 5—6) , who suggested:

> The mere presentation of a stimulus person activates certain classification processes...that occur automatically and without conscious intent.... Whenever a novel social object is encountered, an initial identification stage is postulated to precede any conscious, goal-driven information processing...[and this] process is one of "placing" the individual social object along well-established stimulus dimensions such as gender, age, and skin color.

This claim has considerable intuitive appeal. How can one see a young Asian woman and yet fail to categorize her instantly as such? Our studies do not deny that such rapid categorizations can and often do happen; they simply deny that they must happen. Our busy subjects did not experience activation of racial stereotypes about an Asian assistant to whom they were exposed, and although these subjects were able to recall the assistant's race after the experiment was over, they apparently did not categorize her in terms of race during the experiment. And why should they have? During the activation phase, subjects had no reason to form any kind of impression of the Asian assistant, whose minimal role was more akin to that of furniture than to that of an interaction partner. We suspect that, as Brewer claims, the mere presentation of a stimulus person does initiate certain classification processes; however, we do not believe that these classifications are inevitably along certain dimensions or that they are unaffected by the perceiver's goals. In fact, busyness may exert its effect on stereotype activation by causing subjects to classify others only along those dimensions that are directly relevant to their current information-processing goals: When the person's race is wholly inconsequential (as it was in our studies), busy perceivers may not have the "luxury" of activating preexisting information that is, in fact, irrelevant to their concerns.

Issues such as these may be obscured by studies that do not expose subjects to stereotype objects, but rather, to words that represent those objects. For example, Devine (1989, p. 5) concluded that a "stereotype is automatically activated in the presence of a member (or some symbolic equivalent) of the stereotyped group," and supported this claim with data from several elegant experiments that demonstrate the ease with which words such as *nigger* can activate stereotypes about Blacks and thereby affect judgments about a target whose race is not mentioned. Such studies are in keeping with social psychology's tradition of treating words as the symbolic equivalents of persons–a tradition so widespread that some topics in social psychology are defined almost entirely by subjects' reactions to trait adjectives (e.g., person memory; see Hastie et al., 1980). This methodological approach is quite reasonable when the assumption of symbolic equivalence is true. But there may be times when the assumption is unfounded, and thus times when the study of reactions to words may paint a misleading portrait of psychological processes.

For example, it may be virtually impossible for a literate adult to read the phrase *Black fireman* without experiencing activation of both the racial and occupational constructs (Logan, 1980 ; Stroop, 1935 ; cf. Kahneman & Treisman, 1984), and, in some sense, to do otherwise would be to fail to understand what one has read. Nonetheless, it may be entirely possible for a literate adult to encounter a Black fireman and, given the appropriate information-processing goal (e.g., to find quickly someone who will enter a burning building to save a child), to construe the Black fireman only in terms of his occupation (see Taylor, 1981). Because words and phrases contain implicit categorizations of the objects they describe, they effectively demand that associates of these categories be activated. As Zarate and Smith (1990, p. 162) noted: "Linguistic descriptions (e.g., 'a black person') force a single categorization, in contrast to a real person, who is not only black but (perhaps) young, male, well-dressed, tall, speaking with a Southern accent, and so on." Our subjects encountered someone who was an Asian and a card turner, and yet they showed no evidence of construing her as an Asian. We would be very surprised to find similar results had subjects instead read the phrase *Asian card turner*.

After appraising the state of research in social cognition, Zajonc (1980b, p. 192) offered this warning: "Because we cannot assume a one-to-one correspondence between language and reality, we may not take it for granted that the same principles of social perception will be generated by studying words as by studying the actual social objects for which these words stand." It is in this spirit that we offer a revision of the Sufi teaching: When a pickpocket reads the words *holy man*, he will probably think of a great deal more than pockets–and in so doing, he will reveal little about how pickpockets construe holy men in their day-to-day lives. If we really want to know how persons think about persons, we may have to introduce our subjects to some.

References

Allport, G. W. (1954). *The nature of prejudice*. (New York: Addison Wesley)

Andersen, S. M., Klatzky, R. L. & Murray, J. (1990). Traits and social stereotypes: Efficiency differences in social information processing. *Journal of Personality and Social Psychology, 59,* 192-201.
Aronson, E., Blaney, N., Stephan, C., Sikes, J. & Snapp, M. (1978). *The jigsaw classroom.* (Beverly Hills, CA: Sage Publications)
Bargh, J. A. (1989). Conditional automaticity: Varieties of automatic influence in social perception and cognition.(In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 3—51). New York: Guilford.)
Bargh, J. A. & Pietromonaco, P. (1982). Automatic information processing and social perception: The influence of trait information presented outside of conscious awareness on impression formation. *Journal of Personality and Social Psychology, 43,* 437-449.
Bassili, J. N. & Smith, M. C. (1986). On the spontaneity of trait attribution: Converging evidence for the role of cognitive strategy. *Journal of Personality and Social Psychology, 50,* 239-245.
Bodenhausen, G. V. (1990). Stereotypes as judgmental heuristics: Evidence of circadian variations in discrimination. *Psychological Science, 1,* 319-322.
Bodenhausen, G. V. & Lichtenstein, M. (1987). Social stereotypes and information-processing strategies: The impact of task complexity. *Journal of Personality and Social Psychology, 52,* 871-880.
Bodenhausen, G. V. & Wyer, R. S. (1985). Effects of stereotypes on decision-making and information-processing strategies. *Journal of Personality and Social Psychology, 48,* 267-282.
Brewer, M. B. (1989). A dual process model of impression formation.(In R. S. Wyer & T. K. Srull (Eds.), *Advances in social cognition* (Vol. 1, pp. 1—36). Hillsdale, NJ: Erlbaum.)
Brewer, M. B. & Miller, N. (1984). Beyond the contact hypothesis: Theoretical perspectives on desegregation.(In M. B. Brewer & N. Miller (Eds.), *Groups in contact: The psychology of desegregation* (pp. 281—302). San Diego, CA: Academic Press.)
Britton, B. K. & Tesser, A. (1982). Effects of prior knowledge on use of cognitive capacity in three complex cognitive tasks. *Journal of Verbal Learning and Verbal Behavior, 21,* 421-436.
Dass, R. (1971). *Be here now.* (New York: Crown)
Devine, P. G. (1989). Stereotypes and prejudice: Their automatic and controlled components. *Journal of Personality and Social Psychology, 56,* 5-18.
Dovidio, J. F., Evans, N. E. & Tyler, R. B. (1986). Racial stereotypes: The contents of their cognitive representations. *Journal of Experimental Social Psychology, 22,* 22-37.
Durant, W. (1926). *The story of philosophy.* (New York: Simon & Schuster)
Fazio, R. H., Sanbonmatsu, D. M., Powell, M. C. & Kardes, F. R. (1986). On the automatic activation of attitudes. *Journal of Personality and Social Psychology, 50,* 229-238.
Fiske, S. T. (1989). Examining the role of intent: Toward understanding its role in stereotyping and prejudice.(In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 253—286). New York: Guilford.)
Fiske, S. T. & Neuberg, S. L. (1990). A continuum model of impression formation, from category-based to individuating processes: Influences of information and motivation on attention and interpretation.(In M. P. Zanna (Ed.), *Advances in experimental social*

psychology (Vol. 23, pp. 1—74). San Diego, CA: Academic Press.)
Fiske, S. T. & Pavelchak, M. (1986). Category-based versus piecemeal-based affective responses: Developments in schema-triggered affect.(In R. M. Sorrentio & E. T. Higgins (Eds.), *Handbook of motivation and cognition* (pp. 167—202). New York: Guilford.)
Gibson, J. J. (1979). *The ecological approach to visual perception.* (Boston: Houghton Mifflin)
Gilbert, D. T. & Krull, D. S. (1988). Seeing less and knowing more: The benefits of perceptual ignorance. *Journal of Personality and Social Psychology, 54*, 193-202.
Gilbert, D. T., Krull, D. S. & Pelham, B. W. (1988). Of thoughts unspoken: Social inference and the self-regulation of behavior. *Journal of Personality and Social Psychology, 55*, 685-694.
Gilbert, D. T. & Osborne, R. E. (1989). Thinking backward: Some curable and incurable consequences of cognitive busyness. *Journal of Personality and Social Psychology, 57*, 940-949.
Gilbert, D. T., Pelham, B. W. & Krull, D. S. (1988). On cognitive busyness: When person perceivers meet persons perceived. *Journal of Personality and Social Psychology, 54*, 733-740.
Hamilton, D. L. (Ed.) (1981). *Cognitive processes in stereotyping and intergroup behavior.* (Hillsdale, NJ: Erlbaum)
Hamilton, D. L. & Trolier, T. K. (1986). Stereotypes and stereotyping: An overview of the cognitive approach.(In J. F. Dovidio & S. L. Gaertner (Eds.), *Prejudice, discrimination, and racism* (pp. 127—163). San Diego, CA: Academic Press.)
Hastie, R., Ostrom, T. M., Ebbesen, E. B., Wyer, R. S., Hamilton, D. L. & Carlston, D. E. (Eds.) (1980). *Person memory: The cognitive basis of social perception.* (Hillsdale, NJ: Erlbaum)
Higgins, E. T. (1989). Knowledge accessibility and activation: Subjectivity and suffering from unconscious sources.(In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 75—123). New York: Guilford.)
Jones, E. E. & Sigall, H. (1971). The bogus pipeline: A new paradigm for measuring affect and attitude. *Psychological Bulletin, 76*, 349-364.
Kahneman, D. & Triesman, A. (1984). Changing views of attention and automaticity.(In R. Parasuraman & D. R. Davies (Eds.), *Varieties of attention* (pp. 29—61). San Diego, CA: Academic Press.)
Kant, I. (1965). *Critique of pure reason* (N. K. Smith, Trans.).(New York: St. Martin's Press. (Original work published 1781)
Kantowitz, B. H. (1974). Double stimulation.(In B. H. Kantowitz (Ed.), *Human information processing: Tutorials in performance and cognition* (pp. 83—132). Hillsdale, NJ: Erlbaum.)
Kucera, H. & Francis, W. N. (1967). *Computational analysis of present-day American English.* (Providence, RI: Brown University Press)
LaBerge, E. J. & Samuels, S. J. (1974). Toward a theory of automatic information processing in reading. *Cognitive Psychology, 6*, 293-323.
Lewicki, P. (1985). Nonconscious biasing effects of single instances on subsequent judgments. *Journal of Personality and Social Psychology, 48*, 563-574.
Locksley, A., Hepburn, C. & Ortiz, V. (1982). Social stereotypes and judgments of individuals: An instance of the base-rate fallacy. *Journal of Experimental Psychology, 18*,

23-42.
Logan, G. D. (1980). Attention and automaticity in Stroop and priming tasks: Theory and data. *Cognitive Psychology, 12*, 523-553.
Lombardi, W. J., Higgins, E. T. & Bargh, J. A. (1987). The role of consciousness in priming effects on categorization: Assimilation versus contrast as a function of awareness of the priming task. *Personality and Social Psychology Bulletin, 13*, 411-429.
Martin, L. L., Seta, J. J. & Crelia, R. A. (1990). Assimilation and contrast as a function of people's willingness and ability to expend effort in forming an impression. *Journal of Personality and Social Psychology, 59*, 27-37.
Morley, J. (1886). *Critical miscellanies* (Vol. 1).(London: MacMillan)
Neisser, U. (1976). *Cognition and reality.* (San Francisco: Freeman)
Newman, L. S. & Uleman, J. S. (1990). Assimilation and contrast effects in spontaneous trait inference. *Personality and Social Psychology Bulletin, 16*, 224-240.
Osborne, R. E. & Gilbert, D. T. (1990). *The preoccupational hazards of social life.* (Unpublished manuscript, University of Texas at Austin)
Pratto, F. & Bargh, J. A. (1991). Stereotyping based on apparently individuating information: Trait and global components of sex stereotypes under attention overload. *Journal of Experimental Social Psychology, 27*, 26-47.
Rosch, E. (1978). Principles of categorization.(In E. Rosch & B. B. Lloyd (Eds.), *Cognition and categorization* (pp. 27—48). Hillsdale, NJ: Erlbaum.)
Rothbart, M., Fulero, S., Jensen, C., Howard, J. & Birrell, P. (1978). From individual to group impressions: Availability heuristics in stereotype formation. *Journal of Experimental Social Psychology, 14*, 237-255.
Stroop, J. R. (1935). Studies of interference in serial verbal reactions. *Journal of Experimental Psychology, 18*, 643-662.
Swann, W. B. (1984). Quest for accuracy in person perception: A matter of pragmatics. *Psychological Review, 91*, 457-477.
Swann, W. B., Hixon, J. G., Stein-Seroussi, A. & Gilbert, D. T. (1990). The fleeting gleam of praise: Psychological processes underlying reactions to self-relevant information. *Journal of Personality and Social Psychology, 59*, 17-26.
Taylor, S. E. (1981). A categorization approach to stereotyping.(In D. L. Hamilton (Ed.), *Cognitive processes in stereotyping and intergroup behavior* (pp. 87—114). Hillsdale, NJ: Erlbaum.)
Tetlock, P. E. & Kim, J. I. (1987). Accountability and judgment processes in a personality prediction task. *Journal of Personality and Social Psychology, 52*, 700-709.
Tulving, E., Schacter, D. L. & Stark, H. A. (1982). Priming effects in word-fragment completion are independent of recognition memory. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 8*, 336-342.
Weber, R. & Crocker, J. (1983). Cognitive processes in the revision of stereotypic beliefs. *Journal of Personality and Social Psychology, 45*, 961-977.
Zajonc, R. B. (1980a). Thinking and feeling: Preferences need no inferences. *American Psychologist, 35*, 151-175.
Zajonc, R. B. (1980b). Cognition and social cognition: A historical perspective.(In L. Festinger (Ed.), *Retrospections on social psychology* (pp. 180—204). New York: Oxford University Press.)

Zarate, M. A. & Smith, E. R. (1990). Person categorization and stereotyping. *Social Cognition, 8*, 161-185.

1

Because of an anticipated shortage of subjects in one semester, the critical conditions (always-busy and late-busy) were run prior to the others (never-busy and early-busy). It is very important to note, however, that our predictions involve interactive effects within these conditions rather than main effects across them; as such, none of the predicted effects can be accounted for solely by this breach of random assignment. In addition, the obvious absence of main effects across conditions is an excellent indicator of the equality of the previous and subsequently run groups.

2

It is worth noting that of subjects who were not busy during the activation phase, those who were subsequently assigned to the late-busy condition and those who were subsequently assigned to the never-busy condition did not differ in terms of the number of stereotypic words produced during the word-fragment completion test. That is, the (about to be) late-busy and the (about to be) never-busy subjects made equally few stereotypic words when exposed to a Caucasian assistant (M s = 2.92 and 2.85, respectively, $t < 1$) and equally many stereotypic words when exposed to an Asian assistant (M s = 3.82 and 3.62, respectively, $t < 1$).

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Table 1

Number of Stereotypic Completions in Experiment 1

Assistant's race	Busyness	
	Not busy	Busy
Asian	3.82_a	3.12_b
Caucasian	3.00_b	3.24_b
Difference	0.82	−0.12

Note. $N = 17$ in each cell. Means that do not share a common subscript differ with $p < .05$. Means that share a common subscript do not differ, all ts < 1.

Table 2
Number of Stereotypic Completions in Experiment 2

	Busyness during activation phase			
	Not busy		Busy	
Assistant's race	No. of completions	Cell *n*	No. of completions	Cell *n*
Asian	3.71_a	24	3.09_b	23
Caucasian	2.88_b	26	3.18_b	22
Difference	0.83		−0.09	

Note. Means that do not share a common subscript differ with $p < .05$. Means that share a common subscript do not differ, all $ps > .22$.

Table 3
Ratings of Assistant on Stereotypic Perception Index in Experiment 2

	Always busy		Early busy		Late busy		Never busy	
Condition	Rating	*n*	Rating	*n*	Rating	*n*	Rating	*n*
Assistant's race								
Asian	6.15	13	6.59	10	7.30	11	6.36	13
Caucasian	6.35	12	6.77	10	6.07	13	6.42	13
Difference	−0.20		−0.18		1.23*		−0.06	

Note. Early busy subjects were busy during the activation phase but not during the application phase; late busy subjects were busy during the application phase but not during the activation phase; always busy subjects were busy during both phases; and never busy subjects were busy during neither phase. Larger values indicate perceptions of the assistant as possessing more stereotypically Asian traits. Only differences marked with an asterisk are significant with $p < .05$. For all other differences, $t < 1$. The late busy/Asian cell ($M = 7.30$) differs from all other cells with $p < .05$, except that it differs from the early busy/Caucasian cell ($M = 6.77$) with $p = .11$.