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Stereotypes: Suppression, Forgetting, and False Memory

BY

TADESSE ARAYA



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- I. Araya, T., Akrami, N., Ekehammar, B., & Hedlund, L.-E. (2002). Reducing prejudice through priming of control-related words. *Experimental Psychology*, *49*, 222-227.
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TABLE OF CONTENTS

| | |
|--|----|
| INTRODUCTION | 5 |
| Brief Background | 5 |
| General Aim | 5 |
| Stereotypes and Social Perception | 6 |
| <i>Conceptual Approaches</i> | 6 |
| <i>The Cognitive Approach</i> | 7 |
| <i>Stereotypes and Social Categorization</i> | 8 |
| <i>The Mental Representation of Stereotypes</i> | 9 |
| Stereotypes and Information Processing | 11 |
| <i>Stereotypes and Interpretation</i> | 11 |
| <i>Conditions of Stereotype Use</i> | 12 |
| <i>Automatic Stereotype Activation</i> | 13 |
| Application and Suppression of Activated Stereotypes | 15 |
| <i>Stereotype Application</i> | 15 |
| <i>Stereotype Suppression</i> | 16 |
| Stereotypes and Social Memory | 18 |
| Intentional Forgetting of Stereotypical Information | 20 |
| <i>Directed Forgetting</i> | 20 |
| <i>Forgetting Stereotypically Congruent and Incongruent words</i> | 21 |
| Stereotypes, Forgetting, and False Memory | 25 |
| <i>False Memories</i> | 25 |
| <i>Stereotypes and False Recognition</i> | 28 |
| <i>False Recall of Stereotypes</i> | 30 |
| THE EMPIRICAL STUDIES | 31 |
| General Research Questions | 31 |
| Priming Methodology | 31 |
| Study I. Reducing Prejudice through Priming of Control-related Words | 32 |
| <i>Background</i> | 32 |
| <i>Method</i> | 33 |
| <i>Major findings</i> | 33 |
| <i>Discussion</i> | 36 |
| Study II. Forgetting Congruent & Incongruent Stereotypical Information | 36 |
| <i>Background</i> | 36 |
| <i>Method</i> | 37 |
| <i>Major findings</i> | 38 |
| <i>Discussion</i> | 39 |
| Study III. Remembering Things that Never Occurred: The Effects of | |

| | |
|--|----|
| To-be-forgotten Stereotypical Information | 40 |
| <i>Background</i> | 40 |
| <i>Method</i> | 41 |
| <i>Major findings</i> | 42 |
| <i>Discussion</i> | 43 |
| Study IV. Forgetting-induced False Recall of Stereotypes | 44 |
| <i>Background</i> | 44 |
| <i>Method</i> | 45 |
| <i>Major findings</i> | 47 |
| <i>Discussion</i> | 49 |
| | |
| GENERAL DISCUSSION | 50 |
| The Main Findings | 50 |
| Consequences of Stereotype Control and Suppression | 50 |
| Stereotype-based False Memories | 51 |
| Memory for stereotypically Incongruent Information | 52 |
| Conclusions | 53 |
| Limitation of the Empirical Findings | 54 |
| | |
| REFERENCES | 57 |
| | |
| ACKNOWLEDGMENTS | 69 |

We do not see things as they are; We see things as we are.
The Talmud

INTRODUCTION

Brief Background

As social perceivers, we are confronted with a complex array of social information and yet we have limited cognitive resources to handle it. To successfully negotiate the social world, we are, therefore, doomed to deploy a variety of cognitive techniques that simplify and ease the burdens of information overload and protect us from an inevitable mental collapse (e.g., Bruner, 1957; for a review, see Moskowitz, Skurnik, & Galinsky, 1999). In social perception, an obvious strategy is the use of social categorization or stereotyping, where salient social markers such as age, gender, and race are used to categorize and identify individuals, thereby reducing the complex information into manageable entities (e.g., Allport, 1954; Fiske & Neuberg, 1990; for a review, see Fiske, 1998). These markers can thus facilitate the processing of social information and help us to make judgments or inferences about people in a cognitively economic and efficient way (e.g., Fiske & Neuberg, 1990; Hamilton & Sherman, 1994).

Notwithstanding the functional utility of stereotypes in simplifying and facilitating the processing of complex social information (e.g., Gilbert & Hixon, 1991; Macrae, Milne, & Bodenhausen, 1994b), an extensive body of research has shown that stereotypes often lead to negative evaluation and discriminatory judgments of outgroup members (e.g., Bodenhausen, 1988; Devine, 1989; Bargh, Chen, & Burrows, 1996; for reviews, see Bargh, 1999; Fiske, 1998). Having seen, for example, a male immigrant driving a very expensive car, one is likely to infer that he might have acquired it using suspicious methods such as drug trafficking or other criminal activities. As Bodenhausen (1988) succinctly noted, "...stereotype-based inferences may be used directly as pieces of evidence themselves, without having any additional influence on the processing of other available evidence" (pp. 726-727).

General Aim

The general aim of the present thesis is, therefore, to examine whether the negative impact of stereotypes on, for example, the impression one makes of others can be minimized or controlled.

Moreover, suppose you are a member of jury who is going to decide whether a stereotyped defendant is guilty or not of an alleged crime. As is usual in legal settings, you are likely to listen to, among other things, stereotypically congruent and incongruent information pertaining to the

defendant. Before your decision making, however, for some reason, the judge admonishes you to disregard or forget some of the presented information and base your decision on the rest of the evidence (i.e., the to-be-remembered information) that was presented in the courtroom. How likely is it that you will refrain from using the to-be-disregarded information in your subsequent decision making processes? Suppose, again, that somebody asks you to recollect the information presented during the court session. How accurate will your recollection be?

The present thesis constitutes an attempt to increase our understanding on a) what happens when people are implicitly asked to control or suppress their stereotypic preconceptions, b) the impact of a forget or a remember instruction on the accurate recall of stereotypically congruent and incongruent information, and c) the effect of forget and remember instructions on false memory of nonpresented stereotypical information.

Stereotypes and Social Perception

Conceptual Approaches

Three conceptual approaches to stereotyping and intergroup relations can be gleaned from the available literature on these issues; the *psychodynamic*, the *sociocultural*, and the *cognitive* approaches (Hamilton & Sherman, 1994; for a review, see Duckitt, 1992). The *psychodynamic* approach stresses the importance of motivational and psychological factors that may accrue with the use of stereotypes. Drawing on Freud's psychoanalytic theory, this approach emphasizes the role of defense mechanisms such as projection and displacement of one's psychological tension onto others, and early childhood experience in explaining stereotyping and intergroup relations. The *sociocultural* approach focuses on how beliefs and attitudes toward different social groups develop and are maintained. According to this approach, stereotyping and prejudice are learned and are perpetuated through various socialization processes and experiences. The *cognitive* approach views stereotypes as cognitive structures that contain the summary of the perceivers' knowledge and beliefs of a society its members. It investigates how stereotypes develop, guide information processing, and affects the perception of and attitudes toward members of stereotyped groups (Hamilton & Sherman, 1994; Duckitt, 1992).

In recent years, the cognitive view has been the most preferred approach in studying stereotype formation, function, and processing of information pertaining to stigmatized groups. The present thesis is heavily informed by the various concepts, theories, and research methods of this approach.

The Cognitive Approach

Central to the cognitive perspective is the idea that perceivers use generic knowledge structures or beliefs to navigate through the complex social landscape. These knowledge structures guide the information seeking and acquisition processes and affect how new information is encoded, elaborated, represented, and retrieved from memory, which in turn can have detrimental effects on the behavioral directions of the perceiver (e.g., Hamilton & Sherman, 1994; Hamilton, Sherman, & Ruvolo, 1990).

Although perceivers may actively contribute to the understanding of the important events of their social life, they are often at the mercy of their prior knowledge and expectations. People's attention, for example, is routinely selective (e.g., Allport, 1954; Hamilton & Sherman, 1994). For instance, factors such as the momentary goals and current mood states of the perceiver and the properties of the stimuli, such as salience and self-relevance, can affect one's attention to a stimulus. However, under certain conditions, these factors may nevertheless be subjected to the influence the perceiver's prior expectations (e.g., Fiske, 1998; Hamilton et al., 1990). Existing knowledge structures thus guide the processing of incoming information by directing attention to some aspect of an event while ignoring other aspects of the same event. The attended information can then serve as basis for the various cognitive processes which perceivers may use to interpret or understand events or other people's behaviors (e.g., Hamilton & Sherman, 1994; Hamilton et al., 1990). Further, this information is likely to be interpreted in accordance with preexisting expectations of the perceiver. More important, generic knowledge structures can enable the individuals to go beyond the information given by filling in the "the missing information" of the perceived stimulus (Bruner, 1957; Macrae et al., 1994b; Markus, 1977).

Moreover, prior knowledge structures can determine whether incoming information is encoded more elaborately or not. Previous research indicates that familiar or expectancy confirming information is likely to be processed less elaborately than non-familiar or expectancy disconfirming information. More specifically, perceivers are likely to encode the general theme or the gist of familiar information and ignore its specific details (e.g., Johnston & Hawley, 1994). Thus, existing knowledge structures can inhibit the processing of the perceptual details of expectancy consistent information (von Hippel, Jonides, Hilton, & Narayan, 1993). Rather, the specific details can be reconstructed and filled in later by making inferences from the available knowledge structures (e.g., Bruner, 1957; Koriat, Goldsmith, & Pansky, 2000; Sherman, Lee, Bessenoff, & Frost, 1998).

Preexisting knowledge structures can also affect the retrieval processes. Research evidence attests that expectancy consistent information is more likely to be easily recollected than expectancy inconsistent information, especially when attentional resources are constrained (e.g., Pendry & Macrae, 1994; Stangor & McMillan, 1992). Because of these processes, the mental representation of incoming information may differ from the actual information on which it is based. This, in turn, can lead to memory errors and biases that can have undesired social consequences (e.g., Hamilton & Sherman, 1994; Koriat et al., 2000).

Stereotypes and Social Categorization

From the cognitive perspective, a stereotype can be defined as a) a cognitive structure that contains the perceiver's knowledge, beliefs, and expectancies about a social group and its members, b) an abstract knowledge structure linking a social group to a set of traits and behavioral characteristics, and c) a consensual belief about the characteristics of a group (e.g., Ashmore & Del Boca, 1981; Hamilton & Sherman, 1994; Hamilton et al., 1990).

At the very root of stereotypes lies social categorization. Quite often, perceivers see others not as unique individuals but as members of different groups. Rather, they routinely use salient markers such as age, sex and race to identify and categorize people (e.g., Allport, 1954; Fiske, 1998; Hamilton & Sherman, 1994; Stangor, Lynen, Duan, & Glass, 1992). As such, the categorization process undoubtedly reflects the reality one encounters in every day social life (e.g., Hilton & von Hippel, 1996). However, social categorization can serve as basis for various cognitive processes that can have undesired effects on people's perception of and behavior toward other groups and their members (e.g., Allport, 1954; Hamilton & Sherman, 1994; Fiske, 1998; Tajfel & Turner, 1986).

There are two major views that may account for why social categorization may occur (Hamilton & Sherman, 1994). One view stresses the notion that categorization, as a cognitive mechanism, satisfies the cognitive or informational needs of the perceiver. First, because the perceiver has limited cognitive resources to handle the often complex information one encounters in everyday social life, categorization can provide the quickest and most efficient way of processing this information (e.g., Allport, 1954; Brewer, 1988; Fiske & Neuberg, 1990; Macrae et al., 1994b). Once perceivers categorize or assign a label to a group, they do not have to waste valuable cognitive resources in searching for further information about each member of the group to have an opinion of that group. Rather the category-based information can be readily used to

interpret the behavior of individual members of the group. Thus, once an individual's group membership is recognized, the relevant social category can provide the necessary information needed by the perceiver without wasting additional energy. Accordingly, social categorization can save time and valuable cognitive resources for the perceiver (Hamilton & Sherman, 1994; Fiske & Neuberg, 1990; Macrae et al., 1994b). Secondly, categorization can satisfy the need to understand the social world and predict the behavior of groups and their members. Thus, categorization can serve as a basis for the perceiver's knowledge about different groups and their members and by providing expectancies or predictions of how individual group members are likely to act or behave in different contexts in the future (e.g., Hamilton et al., 1990). Such predictions can, then, furnish the perceiver with the necessary guidelines for future interaction with others and give him/her a sense of control over his/her future outcomes (e.g., Hamilton & Sherman, 1994; Moskowitz et al., 1999).

The second view stresses the motivational roots of categorization. In this view, categorization may derive from people's desire to see themselves positively, which, in turn, may motivate them to see their own group more positively than other groups (e.g., Duckitt, 1992; Tajfel & Turner, 1986). This motivational account of categorization is emphasized by social identity theory (e.g., Tajfel & Turner, 1986). Central to this theory is the contention that an individual's identity and self-esteem is derived from his/her membership in social groups. Because, quite often, people may have strong desires to maintain positive self-regard, they are also likely to hold positive evaluations of their own groups, which, in turn, may lead, through social comparison processes, to view of one's group as superior relative to outgroups. As a result, a person is likely to accentuate the evaluative differences between his/her group and other groups. Thus, according to this theory, people may hold negative beliefs and disparage outgroup members merely to maintain their positive identity or self-regard (e.g., Fein & Spencer, 1997; Tajfel & Turner, 1986).

The Mental Representation of Stereotypes

Extant research on the mental representation of stereotypes has been influenced by the distinction of abstraction-based and exemplar-based representation (e.g., Hamilton & Sherman 1994; Sherman, 1996; Smith & Zarate, 1992). In abstraction-based models of stereotype representation, a generalized conception or abstract summary of the characters of a social group develops as behavioral information of that group is acquired. Through repeated exposures, knowledge about the groups increases and abstract group representation is subsequently formed and stored for future

use. According to this model, once a person has been categorized, the group stereotype is activated and used in forming an impression of that person.

In exemplar-based representation, stereotypes do not exist as abstract knowledge structures (e.g., Sherman, 1996; Smith & Zarate, 1992). Rather they are created by activating specific exemplars of a group and summarizing the features of these exemplars. Categorization may occur by comparing a target person with other retrieved exemplars of a given social category that are similar to the person. According to this model, retrieved exemplars are not only used to categorize a target person, they can also be used to process information about that person (e.g., Hamilton & Sherman, 1994).

The important difference between abstraction-based and exemplar-based models is that whereas categorization is central to the abstraction-based models, it is not important in exemplar-based models. Thus, exemplar models of social judgement are solely dependent on a set of activated or retrieved exemplars rather than on the activation abstract knowledge structures as is the case in abstraction models. Accordingly, unlike abstraction-based models, pure exemplar models are flexible and context sensitive. Thus, in exemplar models, stereotypes are constantly changing depending on the target and the set of activated exemplars (e.g., Sherman 1996; Smith & Zarate, 1992).

However, there are some research findings that are incompatible with both models of stereotype representation (e.g., Hamilton & Sherman, 1994; Sherman, 1996). Accordingly, researchers have come to favor a mixed model that includes both abstract knowledge structures (e.g., stereotypes) and specific group exemplars (Hamilton & Sherman, 1994; Sherman, 1996). According to Sherman (1996), perceivers are likely to use their exemplar-based representation if their experience with a specific social category is relatively low or when they have little or no knowledge of the social category. However, at high levels of experience or when knowledge about a social category is high, perceivers are likely to use their abstraction-based representation of that category in making their judgments. Thus, when perceivers encounter a member of a familiar social group (e.g., *immigrants*, *African Americans*), they are likely to use stereotypes associated with that group in interpreting the behavior the target person.

Stereotypes and Information Processing

As already noted, stereotypes are generally understood as beliefs or knowledge structures concerning the characteristics, attributes, and behaviors of outgroup members. As expectancies about different groups and their members, stereotypes, once activated, can affect virtually all aspects of information processing, including attention, interpretation, inference, and retrieval (e.g., Duncan, 1976; Hamilton & Sherman, 1994; Hamilton et al., 1990; Fiske, 1998). Stereotype-based expectancies, for example, can determine the extent to which incoming information is encoded more elaborately or not (e.g., Sherman et al., 1998; Stangor & McMillan, 1992; Srull & Wyer, 1989). Further, stereotyped-based expectancies can permit people to go beyond the information given by filling in the “the missing information” of a target person’s behavior (e.g., Bruner, 1957; Markus, 1977). Stereotypes can also influence the type of information sought about a target and influence the interpretation of a target person’s behavior in confirmatory ways (e.g., Fiedler, Walther, & Nickel, 1999; Trope & Thompson, 1997).

Stereotypes and Interpretation

For various reasons, social behavioral information can often be ambiguous and thus can be open to alternative interpretations. Nevertheless, perceivers must somehow make sense of this information. Not surprisingly, perhaps, under these circumstances, the obvious strategy is to use one’s easily accessible stereotype-based expectancies to interpret the ambiguous information (e.g., Devine, 1989; Higgins & Brendl, 1995; Higgins, Rholes, & Jones, 1977; Srull & Wyer, 1979). An extensive body of research shows that stereotypes, once activated, can become highly accessible in memory and as a result, exert an influence on the interpretation of subsequently encountered behavioral information (Bargh et al., 1996; Darley & Gross, 1983; Devine, 1989; Duncan, 1976; Higgins & Brendl, 1995; Higgins et al., 1977; Perdue & Gurtman, 1990).

Duncan (1976), for example, had European American participants watch a videotape of a dialogue between two men that became more heated and ended up in one shoving the other. Duncan varied the race of the two men such that an African American and a European American shoved each other. Participants interpreted the shoving act as more violent when it was performed by an African American than a European American. Similarly, Darley and Gross (1983) had participants view a videotape of a girl and were asked to evaluate her academic capabilities. One group of participants was led to believe that the child came from high socioeconomic back-

ground whereas the other group was led to believe that the child came from a low socioeconomic background. Half of the participants in each experimental condition were shown a second tape segment in which the child responded to achievement test problems. The tape was constructed to be uninformative about the child's abilities. The results showed that those who thought that the child came from a high socioeconomic background rated her abilities markedly above the grade level than those who believed that the child came from a low socioeconomic background.

Stereotypes can also bias the attributions that perceivers may make for expectancy consistent and inconsistent behaviors. Research indicates that behavioral information that is consistent with the activated stereotypes is likely to be attributed to dispositional factors whereas inconsistent behavior is likely to be interpreted as arising from situational factors (Duncan, 1976; Hamilton & Sherman, 1994; Wittenbrink, Gist, & Hilton, 1997). For example, in the Duncan's (1976) study where participants watched an African American or European American shove an African American or European American, participants attributed the African American's behavior to internal characteristics rather than situational factors whereas the reverse was true when it was performed by European American.

Conditions of Stereotype Use

Several factors may promote the use of stereotypes. As already suggested, stereotypes can be triggered easily in the mere presence of a stereotyped group member. Under such conditions, the perceivers may either allow the activated stereotypes to color their impression of the target person or make a thoughtful impression using the available individuating information, a process that may demand the investment of considerable attentional resources (e.g., Brewer, 1988; Gilbert, 1989).

A considerable body of research evidence attests that the main function of stereotypes is to preserve cognitive resources (e.g., Bodenhausen & Lichtstein, 1987; Macrae et al., 1994b; Stangor & Duan, 1991). As capacity-saving devices, then, stereotypes are likely to be used when the perceivers are in short supply of cognitive resources, are under time pressure, or lack motivation to make a thoughtful and accurate judgment (e.g., Bargh & Pratto, 1991; Gilbert & Hixon, 1991; Fiske & Neuberg, 1990; Macrae, Stangor, & Milne, 1994c).

Kruglanski and Freund (1983), for example, manipulated time pressure and the possibility of public exposure for error. Participants were asked to read an essay that was ostensibly written by a student from a high- or a low-status ethnic group. As expected, the essay was evaluated more favorably when the high-status student supposedly wrote it. However, this effect

was more pronounced when the evaluation was done under time pressure and when the fear of exposure for having made an error was minimal.

Similarly, distinguishing between stereotype activation and application, Gilbert and Hixon (1991) showed that participants whose Asian American stereotypes had been activated initially were more likely to apply the activated stereotypes only when their attentional resources were depleted during the application phase. However, when cognitive capacity was unconstrained during the application phase, they did not form stereotypic impressions.

Furthermore, Bodenhausen (1990) has shown that stereotypes should be used more frequently when people are low in their mental efficiency. People undergo daily variations in their arousal levels that can affect the functional efficiency of working memory. Some may reach their functional peak during the morning (morning people) and some in the evening (night people). Bodenhausen showed that morning people were more likely to stereotype during the evening and night people were likely to use stereotypes in the morning.

Moreover, research shows that certain mood states can decrease processing capacity and motivation and therefore lead to increased reliance on stereotypes in social judgments (e.g., Bodenhausen, 1993; Esses, Haddock, & Zanna, 1993). Bodenhausen (1993) first induced happiness, sadness, or anger and asked participants to read a description of a case, where a student with or without a Hispanic name physically assaulted another person. Participants in happy and angry moods were more likely to find the defendant guilty when he was identified as Hispanic than when he was not.

Automatic Stereotype Activation

With repeated practice, social judgments and evaluations, like other skills, can become automatic in that they can be activated and influence subsequent task performance without perceivers' conscious awareness (e.g., Bargh, 1994; Smith & Lerner, 1986). Devine (1989) has, for example, argued that because of their longer history of activation, stereotypes can be automatically activated in the mere presence of a stereotyped group member.

Devine (1989) subliminally primed her participants with category labels (e.g., *Blacks*) and words that were related to African American stereotypes (e.g., *lazy*). Later in that study, they were asked to form an impression of a target person's behavior. She found that participants primed with the African American stereotypes and related words rated the target behavior more negatively than control participants. Devine argued that these results were due to the activation of an African American stereotype (e.g., *hostility*) in response to the subliminally presented prime words. Further,

she has suggested that although some perceivers may be motivated to refrain from stereotyping (e.g., low-prejudiced individuals), they might be unable to control the activation of stereotypes.

Since Devine's (1989) seminal study, an impressive body of research has clearly established that stereotypes can be activated automatically in the mere presence of a member of stereotyped groups (e.g., Banaji & Greenwald, 1995; Banaji, Hardin, & Rothman, 1993; Fazio, Jackson, Dunton, & Williams, 1995; Perdue & Gurtman, 1990; for a review, see Bargh, 1999). Because, in most of the mentioned studies, the participants had no conscious awareness of the priming stimuli or no awareness of the possible influence of the priming stimuli on their subsequent task performances, these results suggest that stereotype activation might be automatic and uncontrollable and may occur regardless of individual differences in personality, motivation, and social norms (e.g., Bargh, 1999).

However, recent research in this domain has begun to question the contention that stereotype activation is impervious to the perceiver's intention and goals. Rather, stereotype activation may depend on a range of factors such as the availability of cognitive resources (Gilbert & Hixon, 1991), self-image maintenance (Spencer, Fein, Wolfe, & Dunn, 1998), processing objectives (Macrae, Bodenhausen, Milne, Thorn, & Castelli, 1997b), and counter-stereotypic expectancy (Blair & Banaji, 1996; but see Bargh, 1999). Gilbert and Hixon (1991) have, for example, argued that automatic stereotype activation may depend on the availability of attentional resources. In their study, participants were exposed to a videotaped presentation of an Asian American female card turner either under a low or a high cognitive load condition. They were later given a word-fragment completion task. Participants under low cognitive load made more stereotypic word-fragment completions whereas participant under high cognitive load did not produce stereotypic word-fragment completions. Spencer et al. (1998) replicated Gilbert and Hixon's (1991) finding that participants exposed to an Asian American woman did not exhibit stereotype activation when they were cognitively busy. However, when participants received a bogus self-image threatening negative feedback, they displayed stereotype activation although they were cognitively busy. This shows that although stereotype activation might be contingent on the availability of cognitive resources, it can occur even when cognitive resources are constrained.

Further, research shows that stereotype activation may be contingent on people's chronic beliefs about stereotyped groups (Augoustinos, Ahrens, & Innes, 1994; Ekehammar, Akrami, & Araya, in press; Lepore & Brown, 1997; Fazio et al., 1995; Locke, Macleod, & Walker, 1994; Wittenbrink,

Judd, & Park, 1997). Devine (1989) has shown that both low- and high-prejudice people are likely to show stereotype activation during their encounters with stigmatized groups. However, some researchers have contested the veracity of this conclusion (e.g., Lepore & Brown, 1997) whereas others have shown findings that are consistent with that of Devine (e.g., Banaji & Greenwald, 1995; Dunning & Sherman, 1997). Lepore and Brown (1997) and Wittenbrink et al. (1997), for example, have shown that high- and low-prejudice people did indeed differ in their stereotype activation. However, Dunning and Sherman (1997), for example, found gender stereotype activation regardless of the participants' level of sexism.

Thus, although, under certain circumstances, stereotype activation seems to be amenable to the perceiver's control and may be contingent on certain factors, the question whether stereotype activation occurs automatically or not is still open to debate (Bargh, 1999; Macrae & Bodenhausen, 2000).

The Application and Suppression of Activated Stereotypes

Stereotype Application

Fiske and Neuberg (1990) have, for example, argued that there is a continuum of processes involved in the impression formation of other people. At one end, there is the automatic category-based processing where perceivers make their impression of members of stereotyped groups almost entirely based on the group stereotypes. At the other end, there is the slow and controlled attribute-oriented processing where the impression is based largely on individuating information. When perceivers see a person from a stereotyped group performing a certain behavior, they will try to automatically categorize the person in accordance with their knowledge of existing social categories. If the individual's behavior is consistent with the inferences that can be drawn from the category itself then they are likely to make a category-based judgment. However, if the person displays a behavior that violates the category-based expectation, perceivers can have two options. They can make the easy choice and reinterpret the behavioral information to fit with the activated stereotypes or make the hard choice and engage in more effortful processing to make an individuated impression of the person (Brewer, 1988; Fiske, 1989, 1993; Fiske & Neuberg, 1990; Gilbert, 1989). More important, Fiske and Neuberg (1990), for example, have argued that activated stereotypes need not necessarily be applied in the impression formation processes. According to Fiske (1993), the perceiver can be viewed as "a motivated tactician, choosing among a number of possible strategies, depending on current goals" (p. 172). Thus,

people can have a host of factors such as outcome dependency, accuracy motivation, and knowledge of social norms at their disposal that can motivate them to rely less on category-based processing and make attribute-based processing that can curtail application of activated stereotypes (e.g., Fiske & Neuberg, 1990). Thus, there is reason to believe that although stereotype activation might be uncontrollable, perceivers may control application of activated stereotypes (e.g., Devine, 1989; Fiske, 1993; Gilbert & Hixon, 1991).

Stereotype Suppression

Allport (1954) suggested that people might frequently try to suppress their prejudice for a variety of reasons. In accordance with Allport's contention, recent research shows that people are less likely to apply activated stereotypes, for example, when social norms against stereotyping are made salient (e.g., Devine & Monteith, 1999; Plant & Devine, 1998). Moreover, information processing goals such as communication goals (e.g., Sedikides, 1990), outcome dependency and accuracy motivation (Fiske & Neuberg, 1987; Neuberg, 1989; Thomson, Roman, Moskowitz, Chaiken, & Bargh, 1994), and accountability (Tetlock & Kim, 1987) can override the effects of activated stereotypes (for a review, see Devine & Monteith, 1999).

Fiske and Neuberg (1987), for example, had participants believe that they would interact and work with a supposed schizophrenic patient on a common task. Participants in one group (the outcome-dependent group) were informed that they would be judged and rewarded on the basis of their common performance with the schizophrenic patient, whereas participants in the other group (the outcome-independent group) were told that individual performance was of primary importance for a potential reward. The results showed that when the participants' outcomes were dependent on the schizophrenic patient, they made a less stereotypic impression of this person. However, when they were outcome independent they formed a more stereotypic impression of the schizophrenic individual. Thompson et al. (1994) primed participants with different trait constructs and asked them to form an impression of an ambiguous behavioral description of a target person. They were then given either high or low motivation to form an accurate impression of the behavior of the target person. Participants with low-accuracy motivation made their impression in accord with the primed trait constructs, showing assimilation effects, whereas those with high-accuracy motivation were not influenced by the trait primes.

Further, people might also refrain from stereotyping as result of a genuine desire to be non-prejudiced. For example, those who embrace egalitarian beliefs, such as low-prejudice people, may consider racial

stereotyping an undesirable activity and try to inhibit the application of their activated stereotypes (e.g., Devine, 1989; Devine & Monteith, 1999; Monteith, 1993). Monteith (1993) has, for example, suggested that people committed to egalitarianism and nonprejudiced standards may experience guilt and compunction when their behavior violates their standards. As a result, they may attempt to reduce this discrepancy and, as a consequence, they can inhibit the application of their activated stereotypes. By identifying situational cues that lead to these feelings of guilt, these people can implement inhibitory mechanisms that suppress activated stereotypes whenever these cues are encountered subsequently (Monteith, 1993; Macrae & Bodenhausen, 2000). If these inhibitory mechanisms are frequently implemented in response to cues that prompt the feelings of guilt, these cues may then automatically activate inhibitory mechanisms that suppress activated stereotypes (Bargh, 1990; Macrae, Bodenhausen, Milne, & Jetten, 1994a). As Macrae et al. (1994a) noted, “If stereotype activation can become routinized, automated, and triggered by external stimulus cues, then there is no compelling reason why stereotype inhibition should not take a similar course” (p. 815).

According to the automotive model (Bargh, 1990, 1997; Chartrand & Bargh, 1996), intentions and behavioral goals can be represented in memory in the same manner as other knowledge structures, such as stereotypes. Central to this model is the contention that intentions and goals, as mental representations, can be automatically activated in the presence of a triggering cue in the environment and then operate unconsciously, affecting subsequent judgments and behaviors. Numerous studies have given credence to this contention (Bargh et al., 1996; Chartrand & Bargh, 1996; Dijksterhuis & van Knippenberg, 1998; Macrae, Bodenhausen, & Milne, 1998).

Hamilton, Katz, and Leirer (1980), for example, showed that recall performance of presented behavioral descriptions was higher when participants were *explicitly* asked to read these behaviors under an impression formation objective than when they were simply asked to memorize them. In an attempt to replicate Hamilton et al.’s findings, Chartrand and Bargh (1996) instead *covertly* primed participants with either an impression formation goal or a memory goal using a scrambled sentence task (see Srull & Wyer, 1979). Consistent with Hamilton et al.’s (1980) findings, their results showed that participants whose impression formation goal was surreptitiously primed recalled significantly more behaviors than the participants in the memorization goal condition.

Similarly, Dijksterhuis and van Knippenberg (1998) have shown that participants primed with the stereotypes of professors or the trait *intelligent*

were more likely to perform better on a general knowledge test than the control participants. Moreover, Macrae et al. (1998) investigated whether perceivers can implement self-regulatory processes and inhibit stereotypic responses without any awareness of the stimulus that instigate these processes. Participants were subliminally primed with either their own surnames (i.e., high-self-focus condition) or with the surnames of other people (low-self-focus condition). Their results showed that participants in the high-self-focus condition displayed less stereotypical conceptions of a target person relative to the participants in the low-self-focus condition. This suggests that self-regulatory mechanisms can be activated automatically in the presence of a contextual cue and then affect subsequent judgments.

Notwithstanding these interesting findings, little is known about other factors that may attenuate or eliminate the impact of activated stereotypes on subsequent judgments. For example, what is the impact of contextual cues that prompt the perceiver to exercise self-control on the activated stereotypes? Accordingly, one of the issues the present thesis examines is whether surreptitiously presented words that are evocative of self-control (e.g., *control*, *self-regulate*) can attenuate the impact of activated stereotypes on subsequent judgments of a target person.

Stereotypes and Social Memory

What perceivers encode and recollect is quite often the result of an interaction between preexisting knowledge structures or expectancies and incoming information (e.g., Koriat et al., 2000; Moskowitz et al., 1999). Thus, generic knowledge structures can affect the processing of incoming information in detrimental ways.

As noted previously, stereotypes, as generic knowledge structures, can lead to preferential encoding of stereotype-congruent as compared to stereotype-incongruent information (e.g., Hamilton & Sherman, 1994; Stangor & Duan, 1991; Taylor & Crocker, 1981). Taylor and Crocker (1981), for example, have suggested that stereotypes can filter out stereotype-incongruent information. This suggests that expectancy-confirming information is likely to be given more attention and encoded elaborately than information that violates the perceiver's expectancy. This, in turn, indicates that the recall of stereotype-congruent information should be better than incongruent information (e.g., Bodenhausen, 1988; Stangor & Ruble, 1989).

Does this show that stereotype-incongruent information is totally ignored or is not encoded at all? Research shows that stereotype-incongruent information may actually be remembered better than the incon-

gruent information (e.g., Hastie & Kumar, 1979; Srull & Wyer, 1989; Stangor & McMillan, 1992). However, this research also suggests that the recall preference for expectancy-incongruent information might be subjected to a number of moderating factors (e.g., Fyock & Stangor, 1994; Stangor & McMillan, 1992).

There is evidence that people spend more time processing incongruent than congruent information (e.g., Stangor & McMillan, 1992; Stern, Marrs, Millar, & Cole, 1984). People also tend to provide more explanations for expectancy-incongruent than for congruent information (e.g., Hastie, 1984; Srull & Wyer, 1989). Thus, stereotype-incongruent information may receive extensive processing during encoding as perceivers try to make sense of the discrepant information and thereby attempt to resolve the inconsistency, resulting in an enhanced recall for the incongruent information (e.g., Srull & Wyer, 1989; Stangor & Duan, 1991). Accordingly, the recall preference for incongruent items may depend on the extra processing time these items receive or the availability of attentional resources that enable such extensive encoding. Thus, it can be expected that when people are unwilling to give extra processing time to the incongruent information or when their cognitive capacity is limited for some reasons, recall advantage for the incongruent information should be reduced (Dijksterhuis & van Knippenberg, 1995; Macrae, Hewstone, & Griffiths, 1993; Pendry & Macrae, 1994; Stangor & Duan, 1991). In contrast, when attentional resources are constrained, recall advantage for stereotypically congruent information is likely to emerge (e.g., Pendry & Macrae, 1994; Stangor & Lichtenstein, 1987).

Stangor and Duan (1991) have, for example, shown that increasing the complexity of presented information, a manipulation that constrains cognitive capacity, decreased the recall advantage of incongruent information. Similarly, Bodenhausen and Lichtenstein (1987) have found a recall advantage of congruent over incongruent information when cognitive capacity was constrained. Further, when there is initially a strong stereotype-based expectancy, recall preference for incongruent information is reduced (e.g., Bodenhausen, 1988; Crocker, Hannah, & Weber, 1983).

Despite these valuable insights, however, little is known about the impact of intentional or motivated forgetting or suppression on the recall of congruent and incongruent stereotypical information.

Intentional Forgetting of Stereotypical Information

Directed Forgetting

Previous research suggests that the intentional regulation of memories is achieved through an active implementation of inhibitory processing mechanisms (Anderson & Bjork, 1994; Dijksterhuis & van Knippenberg, 1996; Geiselman & Bagheri, 1985; Macrae, Bodenhausen, & Milne, 1995). More specifically, when perceivers direct attention to one thing, the processing of information about unattended objects may not be merely suspended but actively inhibited (e.g., Anderson & Spellman, 1995). Macrae et al. (1995) have, for example, shown that upon encountering a person who can be categorized in multiple ways (e.g., a Chinese woman), the activation of one category (e.g., woman) inhibits the other category (Chinese). Further, Dijksterhuis and van Knippenberg (1996) have shown that when a category label was primed, participants showed an enhanced access to stereotype consistent trait concepts but poor access to inconsistent trait concepts as compared to participants for whom the category was not primed. Moreover, numerous studies show that when people are sufficiently motivated or instructed to suppress irrelevant or inappropriate information, they are more likely to activate inhibitory mechanisms that depress the recollection of that information (Bjork & Bjork, 1996; Geiselman & Bagheri, 1985; Macrae, Bodenhausen, Milne, & Ford, 1997a).

Researchers have commonly used the directed-forgetting paradigm to explore how perceivers can intentionally dismiss invalid information from memory. In this paradigm, participants are presented with a set of words and instructions to remember or forget these words. In the word-method of directed forgetting, after studying each target word, they are instructed to either forget or remember the studied item. They are then given recall or recognition tasks. The common finding is that participants recall or recognize more words when they were given a remember than a forget instruction (Basden, Basden, & Gargano, 1993; Bjork & Bjork, 1996; for a review see, Johnson, 1994).

In the list method of directed forgetting, participants are first provided with two lists of words (List 1 and List 2) for study. After the presentation of List 1 words, they are given a mid-list instruction to either forget or remember these words. List 2 words are then presented and all participants are instructed to remember the list words. Finally, participants are asked to recall the studied words including those they were instructed to forget. The common findings in this sort of research is that, first, the recall of the List 1 items is very poor when the participants are instructed to forget than remember these words. Secondly, the recall of the to-be-remembered List 2

items is higher in the forget than in the remember condition (e.g., Basden et al., 1993; Geiselman & Bagheri, 1985; MacLeod, 1999).

The effects in the word method of directed forgetting are interpreted in terms of differential rehearsal whereas in the list method, they are interpreted in terms of retrieval inhibition (Basden et al., 1993; Bjork & Bjork, 1996; for a review, see Johnson, 1994). Because directed forgetting effects are observed for both recall and recognition with the word method, retrieval mechanisms are thought to play a minimum role in this process. Rather, directed forgetting effects may occur because the to-be-remembered words are rehearsed more thoroughly than the to-be-forgotten words during study. However, with the list method, a directed forgetting effect is typically found with recall, but not recognition, indicating that differences in retrieval rather than rehearsal processes may be responsible for this effect (Basden et al., 1993; Johnson, 1994; Geiselman & Bagheri, 1985).

Forgetting Stereotypically Congruent and Incongruent Words

What happens, then, when people are instructed to forget or remember stereotypical information? Macrae et al. (1997a) investigated this issue using the list method of directed forgetting. In that study, half of the participants were first blatantly primed with the category *child abuser* and the other half with a neutral category. They were then given a word-learning task that included two lists. Words in the first list (i.e., List 1), which were presented first, were stereotypically congruent with the activated social category (i.e., *child abuser*) whereas the words in the second list (List 2) were not. After the presentation of List 1 items, participants were given an inter-list instruction to either forget or remember these items. List 2 words were then presented and participants were subsequently given the recall task. The results showed that participants recalled more List 1 items when they were given a remember than a forget instruction regardless of the prime condition. Further, when participants were provided with a forget instruction, the recall of List 2 words was higher than of List 1 words in the neutral but not in the child abuser prime condition.

In light of Macrae et al.'s (1997a) findings, one wonders, and of importance to the present thesis, if stereotypically incongruent information can be forgotten in the same way as stereotypically congruent information? Previous research suggests that an initial encounter with a member of a new social category may attract perceivers' attention because they may have little knowledge about that category member (e.g., Sherman, 1996; Stangor & Ruble, 1989). At this stage, behavioral information of the person may be processed more thoroughly so that perceivers can make a coherent representation of the category member. With the formation of a coherent

representation of the person (i.e., through repeated exposure or practice), less attention is paid to the person's behavioral information (e.g., Ruble & Stangor, 1986; Smith & Lerner, 1986). Thus, a repeated exposure to information about members of outgroups may render this information conceptually fluent. Consequently, the information may demand less processing when it is subsequently encountered (e.g., Sherman et al., 1998; Stangor & Ruble, 1989; Stangor & Duan, 1991). Rather, perceivers may increasingly rely on already existing knowledge structures rather than wasting time in processing the details of this already familiar information (Johnston & Hawley, 1994; Sherman et al., 1998).

Thus, stereotypes, as schematic knowledge structures, can lead to superficial processing of expectancy-congruent information. Because stereotypes can furnish perceivers with appropriate expectancies about the type of information they are likely to encounter next, they are likely to pay less attention and spend less time in processing every detail of expectancy-congruent information. In other words, because of its conceptual fluency, perceivers are likely to encode the gist, but not the perceptual details of stereotypically congruent information. This, in turn, indicates that stereotypes may inhibit the encoding of perceptual details of congruent information. von Hippel et al. (1993), for example, presented one group of participants with an appropriate schema to interpret a series of ambiguous behaviors whereas the other group was not given such a schema. Participants were then given a word-stem completion task that implicitly measured perceptual encoding. The results demonstrated that participants who had the relevant schema that rendered the behaviors interpretable chose fewer words as solutions to the word stems than those with no such schema. Thus, the presence of schema decreased memory for the perceptual details of the information.

In a similar vein, Johnston and Hawley's (1994) mismatch theory suggests that because the mind operates in an already known or familiar environment, it does not waste valuable attentional resources in charting or reaffirming every specific detail of this environment. Instead, when such a familiar situation is encountered, the mind uses existing knowledge structures and initiate conceptual-driven processes that can quickly and efficiently encode the gist or the general meaning of the incoming information. Once the encountered information is fitted to the preexisting conceptual framework, and the gist of the information is extracted, attention to that information is withdrawn. As the result of these processes, attention allocated to the encoding of the unfamiliar stimulus will increase. Thus, when the mind is confronted with a familiar and an unfamiliar stimulus, conceptual-driven processes will ensure the encoding of the gist

of the familiar information whereas data-driven processes will ensure the elaborate encoding of the perceptual details of the unfamiliar information.

Drawing on Johnston and Hawley's (1994) mismatch theory, Sherman et al. (1998) have proposed an encoding flexibility model of stereotype efficiency. According to this model, stereotypes are efficient because they can facilitate, in different ways, the encoding of expectancy-congruent and incongruent information, especially when cognitive capacity is limited. Stereotypes facilitate the encoding of congruent information by furnishing people with interpretative frameworks that may render this information conceptually fluent or familiar. However, the relative ease with which the gist or meaning of the stereotypically congruent information can be encoded suggests that a) the perceptual features of this information are encoded more poorly than the perceptual details of the stereotypically incongruent information (Johnston & Hawley, 1994; von Hippel et al., 1993), and b) more cognitive resources will be available for the processing of the incongruent information (Sherman et al., 1998). Further, when cognitive resources are in plentiful supply the conceptual encoding of stereotypically congruent and incongruent information is roughly the same. However, when cognitive capacity is constrained, the conceptual meaning of the stereotypically incongruent information is less well encoded and understood than the congruent information (Sherman et al., 1998).

The implication of the above reviewed research for every day social information processing is quite straightforward. Consider, for example, a situation where an African American is shoving a European American. Observing this, perceivers holding a stereotype that African Americans are hostile, may construe the event as involving a hostile activity based on the perceptual features of the shove and their stereotype-based expectancy (e.g., Duncan, 1976; von Hippel et al., 1993). However, because the behavior information is congruent with their stereotype-based expectancies and is thus conceptually fluent, they will not encode the details of this information. Rather, perceivers can add or fill in the "missing" information through stereotype-based reconstructive or inferential processes (Bruner, 1957; Markus, 1977). Under these circumstances, they are more likely to encode and remember the gist of the behavioral information (i.e., the African American shoved the European American) consistent with their stereotype-based expectancies (Duncan, 1976; von Hippel et al., 1993). However, memory for the particular details the behavioral information is likely to be lost.

In contrast, a person with no prior knowledge of the stereotypes associated with African Americans would be sensitive to the details and encode them more elaborately (von Hippel et al., 1993). As already noted, people

are more likely to spend much time in processing information that violates their expectancy than when it does not (e.g., Stern et al., 1984; Sherman, 1996; Stangor & McMillan, 1992). Thus, incongruent information is more likely to be processed more elaborately and to have more inter-item linkages in memory than stereotypically congruent information, a process that may enhance the memory of the incongruent information relative to the congruent information (e.g., Srull & Wyer, 1989; Stangor & Ruble, 1989).

Of relevance to the present thesis, therefore, what happens when people are asked to either forget or remember stereotypically incongruent information – an issue that research to date has neglected. Based on the research reviewed above, it can be argued that the effects of a directed-forgetting instruction may depend on whether the information one is admonished to forget or remember is stereotypically congruent or incongruent. As already noted, stereotypically congruent and incongruent information is processed differently. Because of the difference in processing of congruent and incongruent stereotypical information, a directed forgetting instruction may affect this information differentially.

Of importance in the present context is also the observation that directed forgetting instructions can limit the episodic access but leave the semantic activation or the gist of studied words unaffected (Kimball & Bjork, 2002). The absence of directed forgetting effects on implicit memory tests such as word-fragment completion give credence to this observation (Basden et al., 1993; Bjork & Bjork, 1996). Thus, a directed forgetting instruction may not affect the conceptual fluency or semantic activation of stereotypically congruent and incongruent information. Because, when cognitive resources are plenty, the conceptual fluency of congruent and incongruent information is equally strong, people are likely to have equally good conceptual memory for both types of information despite the directed forgetting instructions (Kimball & Bjork, 2002; Sherman et al., 1998). However, these instructions may impede the episodic access of the specific details of the stereotypically congruent and incongruent information differentially. Because, perceivers are less likely to attend to and elaborately encode the details of the stereotypically congruent information, they are more likely to have poor episodic memory for the particular details of this information (Sherman et al., 1998; von Hippel et al., 1993). Because a directed forgetting instruction impedes episodic access to studied items, a forget but not a remember instruction is likely to worsen further the already poor memory of the details of the stereotypically congruent information. Consistent with this line of reasoning, research using the list method of directed forgetting shows that recall for the stereotypically congruent

information is higher under a remember than a forget instruction (Macrae et al., 1997a).

However, when the to-be-forgotten or to-be-remembered information is stereotypically incongruent, a quite different picture is likely to emerge. Because the details of the stereotypically incongruent information are processed elaborately, perceivers are likely to have an excellent episodic memory for the particular details of this information (e.g., Sherman et al., 1998). This process may render the incongruent information difficult to forget as compared to the congruent information. Accordingly, it is possible that directed forgetting instructions might have minimum effects on the recall of stereotypically incongruent information. The present thesis attempted to determine the plausibility of this contention.

Stereotypes, Forgetting, and False Memory

False Memories

As perceivers, we are likely to commit either errors of omission, that is, the tendency to forget information we have encountered previously or errors of commission, that is, falsely remember information which we have not perceived. One of the issues the present thesis addresses is the interplay of the intentional forgetting of stereotypical information and the false or accurate memory of this information.

Previous research has shown that stereotypes can lead to false memories (e.g., Macrae, Schloersheidt, Bodenhausen, & Milne, 2002; Sherman & Bessenoff, 1999; Woll & Graesser, 1982; Tsujimoto, 1978). Consider, for example, that you observe a person from a stigmatized group engaging in an equal number of stereotypically congruent and incongruent behaviors (Sherman et al., 1998). Under this condition, you are likely to encode the gist of the stereotypically congruent behaviors and you are likely to have good conceptual memory but poor perceptual memory for the specific details of these behaviors. In contrast, you will thoroughly process the incongruent behaviors and have excellent memory for the perceptual details of these behaviors. Because real world processing conditions are cognitively demanding, you are likely to have poor conceptual memory for the incongruent behaviors relative to the congruent behaviors. That is, you are less likely to understand the meaning of the incongruent behavioral information (Sherman et al., 1998; von Hippel et al., 1993). Accordingly, because of this difference in the conceptual understanding of the stereotypically congruent and incongruent information, coupled with your poor memory for the details of stereotypically congruent behaviors, you are likely to erroneously believe that you have observed more stereotypically

congruent than incongruent behaviors when in fact you have not. More specifically, you are more likely to falsely recall and recognize more unobserved stereotypically congruent than incongruent or irrelevant behaviors (Sherman & Bessenoff, 1999; Sherman et al., 1998).

A memory distortion of this sort has a venerable history. Bartlett (1932), for example, showed that people who read the American Indian's story *The War of Ghosts* were likely to encode and recollect it in accord with their schema-based expectancy. Because schema-based expectancies facilitate more the encoding of gist than details of the expectancy-congruent information, people erroneously remembered the details of the narrative although they successfully recalled the central theme or gist of the story. Bartlett noted that the details of the story were often distorted or invented. Furthermore, he noted that participants were unable to discriminate between accurately and falsely recollected details of the story.

According to Bartlett, the act of remembering may involve two processes. First, remembering can be characterized as a search for meaning. This suggests that people will actively try to make sense or to render intelligible ambiguous or complex information. This may be achieved using schema-based abstraction or/and integration processes. In the case of abstraction, particular details of information may be lost as they are encoded or assimilated to the preexisting schema representation (e.g., Stangor, & Ruble, 1989; Woll & Graesser, 1982). Because this process involves a reduction of the amount of information that is encoded, it also reduces the amount of subsequently remembered information. In the case of integration, people will try to combine or organize the various details of the information into a single unified schema representation during the encoding processes (Barnsford & Franks, 1971; Loftus, Miller, & Burns, 1978). Accordingly, people may make a memory representation that substantially deviates from the actual contents of the perceived information. This in turn can lead to a false remembrance of information that was never seen (for a review, see Koriat et al., 2000).

Secondly, the act of remembering may involve active reconstruction processes (see Koriat et al., 2000). During remembering, people may use some of the accessible details of the information and combine them with their generic schematic representation of the information "to essentially fabricate what might have happened" (Alba & Hasher, 1983, p. 204; cited in Koriat et al., 2000). Accordingly, people may confuse the original sources of the information and, consequently, they may falsely remember unobserved details of the story (e.g., Johnson, Hashtroudi, & Lindsay, 1993; Koriat et al., 2000).

In recent years, there has been a resurgence in the interest of false memories that was spurred by Roediger and McDermott's (1995) revival of Deese's (1959) classic study on false recall. Deese (1959) presented participants with lists consisting of words that were semantically associated with nonpresented critical words. For example, for the critical word, *needle*, the presented list consisted of words such as *thread*, *pin*, *eye*, *sewing* and *sharp*. When participants were asked to recall the presented words, they falsely recalled the nonpresented word, *needle*, as having been among the presented words. Using this paradigm, Roediger and McDermott (1995) subsequently replicated and extended Deese's result. In one experiment, they presented participants with six of Deese's (1959) original lists, that were supposed to elicit high rates of false recall, to study. Participants were then given a recognition test consisting of studied words, nonstudied related words (i.e., critical lures), and nonstudied unrelated words, that was followed by a remember/know judgment task (Tulving, 1985). In the remember/know judgment task, participants were asked to indicate whether they specifically remembered a word as having been among the studied words or merely knew that the word had been among the studied words. Roediger and McDermott (1995) found that participants recognized significantly more words that were strongly related than unrelated to the studied words. Interestingly, the critical lures were recognized at rates that were comparable to the hit rates of the studied words. Moreover, in the remember/know judgment task, participants indicated that they remembered the falsely recognized nonpresented words as having been presented during the study session.

Numerous recent studies using this paradigm, known as the Deese-Roediger-McDermott (DRM) paradigm, have demonstrated the pervasiveness of false memory effects for both recall and recognition of nonstudied information (Gallo, Roberts, & Seamon, 1997; Lenton, Blair, & Hastie, 2001; McDermott & Watson, 2001; Roediger, Watson, & McDermott, 2001; Seamon, Chun, & Gallo, 1998; Thapar & McDermott, 2001; Robinson & Roediger, 1997; Watson, & McDermott, 2001). Recently, Lenton et al. (2001) extended the use of the DRM paradigm to the realm of stereotypes and they found, for example, that exposure to lists consisting of stereotypically consistent female roles or male traits resulted in an increase in the false recognition of both stereotypically consistent roles and traits.

Presumably, the presentation of lists of words in the DRM paradigm may intentionally or automatically activate other nonpresented words (i.e., critical words) that are strongly related to the presented list words through the spreading of activation (Collin & Loftus, 1975; Roediger & McDermott, 1995; Roediger et al., 2001; Underwood 1965). The spread of

activation is likely to prime the associated but nonpresented words, making them highly accessible in memory, which, in turn, may lead to the false recognition and recall of nonpresented words. Thus, if the spread of activation in the associative network is particularly strong, then an increasing number of nonpresented words will be falsely recognized and recalled (McDermott & Watson, 2001; Roediger et al., 2001).

Another explanation that has been proposed to account for false memory effects within the DRM paradigm is the Fuzzy-trace theory. This theory asserts that judgments are based on verbatim (i.e., memory for specific details) or gist traces (memory for general meaning) that are stored separately in memory during the encoding phase (e.g., Brainerd & Reyna, 1998). According to this theory, accurate recall or recognition of studied words is mainly driven by verbatim traces whereas false recall or recognition is based on gist traces. When verbatim traces are not available, participants can falsely recognize a nonpresented item by its familiarity because of its high consistency with the gist of the studied words. Similarly, when direct access to the verbatim traces is not possible during recall, for example, due to a directed forgetting instruction (Kimball & Bjork, 2002), people may engage in gist-based reconstructive processes and as a result, they may falsely recall thematically related but nonpresented words (Seamon, Luo, Shulman, Toner, & Caglar, 2002).

Stereotypes and False Recognition

Stereotypes, such as immigrant and gender stereotypes, consist of a set of attributes or components. Because of their longer history of use in everyday social interaction, these attributes or components are strongly associated with each other and with the organizing stereotypic schema (e.g., Deaux & Lewis, 1984; Devine, 1989). Accordingly, a stereotypic schema is likely to contain strong and interrelated stereotypic descriptors that are strongly attached to the stereotypic schema and to each other (e.g., Deaux & Lewis, 1984).

As already noted, stereotypes can provide a basis for generating inferences about unseen or unobserved aspects of a stereotypic schema, enabling the perceivers to go beyond the information given (e.g., Bruner, 1957; Deaux & Lewis, 1984; Markus, 1977). Deaux and Lewis (1984), for example, have shown that information about one particular component of a stereotype can generate inferences about other associated components of the stereotype. Moreover, previous research has shown that the activation of a stereotype can lead to the activation of other semantically or evaluatively related words (Devine, 1989; Dijksterhuis & van Knippen-

berg, 1996; Dovidio, Evans, & Tyler, 1986; Perdue & Gurtman, 1990; Macrae et al., 1994c).

Accordingly, like DRM lists, studying a list of strongly associated stereotype descriptors, for example, may intentionally or automatically activate other nonpresented stereotypic attributes that are strongly related to the studied list words or the associated stereotypic label through the spreading activation mechanism (Collins & Loftus, 1975; Devine, 1989; Dijksterhuis & van Knippenberg, 1996; Dovidio et al., 1986; Perdue & Gurtman, 1990; Roediger & McDermott, 1995; Underwood, 1965). Consequently, these activated but nonpresented stereotypic attributes may be encoded during the study along with the actually presented stereotypic words (Robinson & Roediger, 1997; Roediger & McDermott, 1995; Underwood, 1965). This process is likely to increase the familiarity or the conceptual fluency of the nonpresented stereotypic attributes, resulting in higher false recognition for these items as compared to the stereotype-unrelated items (e.g. Lenton et al., 2001; Macrae et al., 2002; Roediger & McDermott, 1995; Roediger et al., 2001).

Can, then, the instruction to forget or remember stereotypical words attenuate the false memory for these words? Research has shown that an attempt to intentionally suppress an unwanted thought may instead repeatedly prime the unwanted thought, resulting in an increased preoccupation with the very thought one wants to banish from memory (Macrae et al., 1994a, 1997a; Wegner, 1994). Macrae et al. (1997a) have suggested that because both mental control and intentional forgetting involve the use of a single inhibitory mechanism to suppress unwanted thoughts or recollections, they are functionally and operationally equivalent and may lead to similar effects. Accordingly, as in mental control, it is fair to assume that trying to intentionally forget stereotypical information may repeatedly prime the to-be-forgotten information, increasing the proliferation of this information in memory (Macrae et al., 1994a, 1997a).

Macrae et al. (1994a), for example, presented participants with a photograph of a skinhead and asked them to write a passage detailing a typical day in the life of the target person with either a stereotype suppression or no suppression instructions. They then performed a lexical-decision task involving skinhead-related words (i.e., stereotypical words), distracter words, and nonwords. The results showed that participants' lexical-decision times were faster for skinhead-related words than the distracter words, suggesting that stereotype suppression can lead to an increased accessibility of the suppressed stereotype and its related concepts.

Thus, it is reasonable to assume that, in contrast to a remember instruction, a forget instruction is likely to increase the accessibility of the

to-be-forgotten stereotypical words (Macrae et al., 1994a, 1997). Because the associated but nonpresented stereotypic words are likely to be activated and encoded together with the to-be-forgotten stereotypic words, a forget instruction may have similar effects on these words. It seems reasonable to assume that a forget but not a remember instruction might also increase the accessibility of the nonpresented stereotypical words in memory.

Drawing on this reasoning, it seems reasonable to argue that whereas the hyperaccessibility of the to-be-forgotten words may or may not increase the recognition accuracy of these words, the hyperaccessibility of the nonpresented words may enhance the familiarity of these words which, in turn, is likely to increase the number of these words that are falsely recognized as having been presented (e.g., Macrae et al., 2002; Roediger & McDermott, 1995). The present thesis examined the plausibility of this hypothesis.

False Recall of Stereotypes

Previous research attests that directed forgetting instructions can inhibit the recall of studied words (for a review, see Johnson, 1994). As already noted, with the list method, a directed forgetting effect is typically found with recall, but not recognition, suggesting that differences in retrieval rather than rehearsal process may be responsible for this effect. Thus, the mechanism that is responsible for these directed forgetting effects with the list method of directed forgetting is retrieval inhibition (e.g., Bjork & Bjork, 1996). When participants are instructed to forget studied words, an inhibitory process is initiated that suppress the retrieval of the to-be-forgotten words. Thus, because the activated nonstudied stereotypes are likely to be encoded together with the studied stereotypes (McDermott & Watson, 2001; Roediger et al., 2001; Underwood, 1965), the nonstudied stereotypes are likely to be subjected to retrieval inhibition by a forget instruction in the same manner as the studied to-be-forgotten stereotypes. Consequently, participants should show lower false recall rates under a forget than a remember instruction. Of relevance to the present thesis is also whether the hypothesized false recall can be enhanced by cognitive capacity manipulations that previous research has shown to reliably increase more the use of generic knowledge structures rather than item-specific or individuating information (e.g., Macrae et al., 1993; Stangor & McMillan, 1992). The present thesis attempts to shed light on these issues.

THE EMPIRICAL STUDIES

General Research Questions

The present thesis includes four empirical studies that address the various consequences that may ensue when perceivers attempt to control or forget activated stereotypes. More specifically, it attempts to shed light on the following issues:

1. Can incidentally presented words that are related to control or self-control (e.g., control, self-regulate) reduce the impact of activated stereotypes on the impression formation of a target person (Paper I)?
2. What is the impact of a directed forgetting instruction on the recall of stereotypically congruent and incongruent information (Paper II)?
3. What is the effect of a directed forgetting instruction on the false recognition and recall of stereotypical information (Papers III & IV)?

Priming Methodology

As a proxy for features in the social context, several priming techniques have been utilized in the present thesis. In Study I, for example, participants completed the Modern Racial Prejudice Scale (Akrami, Ekehammar, & Araya, 2000) to prime immigrant stereotypes (see Bargh & Chartrand, 2000) and the Scramble Sentence Task (Srull & Wyer, 1979) to prime words that were related to control or self-regulation. In the Scramble Sentence Task, participants are given, usually, a four- to six-words sentence (e.g., *controlled his book anger he*) and asked to build a grammatically correct sentence by unscrambling these words (e.g., *He controlled his anger*). This task is widely used to prime various stimuli nonconsciously (e.g., Chartrand & Bargh, 1996).

Another nonconscious priming method is priming without awareness, which was used in Study II of the present thesis (see Bargh & Chartrand, 2000). This procedure involves the presentation of the priming stimulus within the parafoveal field (2-6° of the visual field) for brief time duration (e.g., 12 ms) followed by a pattern mask that is structurally similar to the prime words (e.g., Chartrand & Bargh, 1996). The brief exposure duration, the immediate masking, and the parafoveal positioning of the photographs are supposed to diminish participants' awareness of the priming stimuli (for details, see Bargh & Chartrand, 2000).

To activate immigrant stereotypes, in Study III and IV, participants were asked to name the three largest immigrant groups in Sweden and write down their opinion about these groups. This procedure has been success-

fully used to activate stereotypes associated with different marked groups (e.g., Macrae et al., 1997a).

A widely used method for assessing the impact of activated constructs on judgments or evaluation is a method used by Srull and Wyer (1979; see also Higgins et al., 1977). In this procedure, participants are first primed with, for example, stereotypical or other trait words and they are then asked to read an ambiguous behavioral description, known as the Donald paragraph, and form an impression of Donald as part of an ostensibly unrelated experiment (e.g., Devine, 1989). The initial exposure to the stereotypical or other trait words is assumed to activate relevant or applicable constructs that will subsequently affect the impression of Donald (e.g., Devine, 1989; Higgins et al., 1977). In Study I, the effects of control-related primes on subsequent judgments was examined using the Donald paragraph.

Study I: Reducing Prejudice through Priming of Control-related Words

Background

An impressive body of research has shown that stereotypes can be triggered automatically and affect subsequent judgments (e.g., Devine, 1989; Perdue & Gurtman, 1990). Several research findings, however, indicate that activated stereotypes may not be used to make judgments about members of stigmatized groups (e.g., Sedikides, 1990). These research findings suggest that momentary goals or intentions such as, for example, accuracy motivation and communication goals may moderate the application of activated stereotypes (see Devine & Monteith, 1999).

Bargh's (1990, 1997) automotive model suggests that intentions and behavioral goals can be automatically activated in the presence of a triggering cue and operate without the perceiver's awareness, influencing his/her subsequent judgment and behavior. Consistent with the automotive model, several studies show that contextual cues can prompt perceivers to implement inhibitory mechanisms that suppress the application of activated stereotypes (e.g. Macrae et al., 1998).

Based on the automotive model, we hypothesized that participants surreptitiously primed with words that are related to or are evocative of self-regulation or control can diminish the impact of activated stereotypes on participants' judgments of a target person. More specifically, we anticipated that participants primed with control-related words should make a more positive impression of a target person than those primed with neutral words.

Method

Experiment 1. Forty-six voluntary students from various departments of Uppsala University (18 men and 28 women), with a mean age of 28 years, participated in the experiment. The experiment had a 2 (Prime words: control-related vs. neutral) one-factor design.

To activate immigrant stereotypes (e.g., *hostile, unfriendly, unreliable*; see Akrami, Ekehammar, & Araya, 2002), participants were first primed with the social category, *immigrant*. This was achieved by letting participants answer the Modern Racial Prejudice Scale (Akrami et al., 2000) that measures prejudice toward immigrants. The scale includes items such as “*There have been enough programs designed to create jobs for immigrants*” and “*Immigrants are getting too demanding in their push for equal rights*”. They were then primed with either words related to control and self-control (e.g., *regulate, control*) or neutral words (e.g., *elephant, weather*), using a scrambled-sentence task (Srull & Wyer, 1979). Thus, participants in the control-related-words condition (the experimental group) unscrambled sentences containing words that were related to self-control whereas the other half (the control group) unscrambled sentences containing neutral words. Participants were then asked to read a paragraph containing an ambiguous behavioral description, known as the Donald paragraph, and form an impression of the target person. This paragraph is a widely used method for assessing automatic stereotype activation and prejudice (e.g., Devine, 1989).

Experiment 2. Fifty-two voluntary students from various departments of Uppsala University (22 men and 30 women), with a mean age of 25 years, participated in the experiment. A 2 (Prime words: control-related vs. neutral) one-factor design was employed. The stimuli and the procedure were the same as in Experiment 1. In Experiment 2, however, participants did not complete the Modern Racial Prejudice Scale (Akrami et al., 2000). Thus, in this experiment, no immigrant stereotypes were activated initially.

Experiment 3. Sixty-nine voluntary students from various departments of Stockholm University (31 men and 38 women), with a mean age of 23 years, participated in the experiment. Experiment 3 had a 2 (Stereotype: activation vs. no activation) \times 2 (Prime words: control-related vs. neutral) factorial design. Participants were randomly assigned to one of the treatment conditions. The stimulus material and the priming procedure were the same as in Experiment 1 and 2.

Major findings

Experiment 1. Based on the data from the impression formation task, a negativity index was formed by reversing the coding of the positive

adjectives and taking the mean rating across all adjectives. To increase the reliability of this index, an item analysis was conducted and on this basis, one adjective (*interesting*) was excluded from this index. The internal-consistency reliability of the negativity index was found to be satisfactory.

As hypothesized, a 2 (Prime words: control-related vs. neutral) one-factor ANOVA using the negativity index as dependent measure showed that participants primed with the neutral words ($M = 6.84$) made a significantly ($p = .015$) more negative impression of the target person than the participants primed with the control-related words ($M = 6.04$).

The participants' Modern Racial Prejudice scores were analyzed to rule out the possibility that the obtained results could be due to initial differences in prejudice level between the groups. The results showed no significant differences between the groups.

Because Experiment 1 did not include a condition with no-stereotype activation, alternative explanations to the obtained result are possible. Therefore, we conducted a follow-up experiment in accord with Experiment 1 where, however, no immigrant stereotypes were activated (i.e., participants did not answer the immigrant prejudice scale at the beginning of the experimental session). Instead, participants directly unscrambled sentences containing words that were related to self-control whereas the other half (the control group) unscrambled sentences containing neutral words. In this case, with no immigrant stereotypes activated, we anticipated that there would be no differences in negativity between the control-related-words and neutral-words conditions.

Experiment 2. As in Experiment 1, a negativity index was formed by reversing the coding of the positive adjectives and taking the mean rating across all adjectives. After conducting an item analysis, the same adjective as above (*interesting*) was excluded from this index to increase reliability. The internal-consistency reliability of the negativity index based on the remaining adjectives was found to be satisfactory.

As anticipated, a 2 (Prime words: control-related vs. neutral) one-factor ANOVA using the negativity index as dependent measure showed no significant ($F < 1$) effect of treatment condition. Thus, when no immigrant stereotypes were activated, there were no differences between participants' judgments in the neutral and control-related conditions.

Taken together, the results of Experiment 1 and 2 suggest that covertly primed words related to self-control can substantially decrease the expression of activated stereotypes on participants' evaluations or judgments of a target person. Further, when stereotypes were not activated (Experiment 2), there were no effects of control-related primes on the participants' evaluations of the target person.

However, a major flaw of Experiment 1 and 2 was that there was no strict random assignment of participants to the stereotype-activation and no-stereotype-activation conditions. Thus, no definite conclusion can be drawn from the two studies. Experiment 3 was, therefore, designed to remedy this flaw.

Experiment 3. As previously, a negativity index was formed by reversing the coding of the positive adjectives and taking the mean rating across all adjectives. After conducting an item analysis, the same adjective as in Experiment 1 and 2 (*interesting*) was excluded from this index to increase reliability. The internal-consistency reliability of the negativity index based on the remaining adjectives was found to be satisfactory.

A 2 (Stereotype: activation vs. no activation) \times 2 (Prime words: control-related vs. neutral) ANOVA using the negativity index as dependent measure yielded a significant main effect of Stereotype ($p = .000$) and Prime words ($p = .003$), and a significant Stereotype \times Prime words interaction ($p = .03$).

In the stereotype activation condition, a planned comparison revealed, as anticipated, a significant effect ($p = .000$) of the prime words. The participants primed with the neutral words ($M = 7.05$) made a more negative impression of the target person than those primed with the control-related words ($M = 5.78$). However, in the no-stereotype-activation condition, the analysis showed no significant effect ($F < 1$) of the prime words. Thus, participants primed with neutral words made similar judgments as those primed with control-related words (see Figure 1).

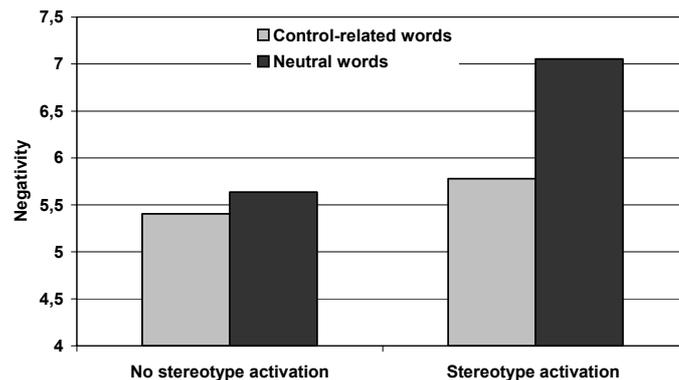


Figure 1. Mean negativity scores as a function of stereotype activation and prime words.

As in Experiment 1, we analyzed the participants' Modern Racial Prejudice scores to rule out the possibility that the obtained results in the stereotype-activation condition could be due to initial differences in

prejudice level between the groups. The result showed a non-significant difference between the groups ($F < 1$).

Further analyses were conducted to examine whether the participants' specific attitudes, as expressed on the Modern Racial Prejudice scale, can predict the impact of control-related primes on the evaluation of the target person. This was intended to examine whether the control-related primes had effects only on those who were positive in their attitudes, that is, those that scored low on the prejudice scale. A one-way ANCOVA with the prejudice scores as a covariate revealed that participants primed with control-related words evaluated the target person more positively ($p = .000$) than those primed with neutral words. Moreover, correlational analyses showed no significant relationship between participants' scores on the prejudice scale and their negativity scores, neither for participants primed with control-related words nor neutral words. Thus, the control-related primes seemed to affect both high- and low-prejudice people in a similar way.

Discussion

As expected, the results showed that participants primed with the control-related words made a less negative impression of the target behavior than the participants primed with the neutral words. This clearly demonstrates that the impact of activated stereotypes can be reduced by covertly presented cues that prompt perceivers to implement self-regulatory processes.

Study II: Forgetting congruent and incongruent stereotypical information

Background

Macrae et al. (1997a) have shown that the recall of stereotypically congruent words is lower when participants are given a forget than a remember instruction. However, do people forget and remember stereotypically congruent or incongruent information in a similar way?

Previous research has indicated that perceivers tend to extract the gist or the general meaning of stereotypically congruent information but they are less likely to encode its specific details. Thus, stereotypically congruent information may get less attention and may be subjected to shallow processing (Sherman et al., 1998; von Hippel et al., 1993). In contrast, the details of stereotypically incongruent information is likely to receive extensive processing and, thus, it is likely to be encoded elaborately (Srull & Wyer, 1989). Accordingly, it is reasonable to assume that this difference in the processing of congruent and incongruent stereotypical information may

moderate directed forgetting effects on this information. Based on this reasoning, we attempted to replicate previous directed forgetting effects for stereotypically congruent information (Macrae et al., 1997a). However, our main aim was to determine whether directed forgetting effects can be found for stereotypically incongruent information.

Method

Experiment 1. Sixty-nine non-psychology Swedish university students (21 men and 48 women) participated in the experiment for pay. The study had a 2 (Prime: immigrant vs. Swedish) \times 2 (Instruction: forget vs. remember) \times 2 (List: list 1 vs. list 2) mixed design, with repeated measures on the last factor. The experiment was divided into three seemingly unrelated phases: a priming phase, a word-learning phase, and a recall task.

The entire experiment was conducted using an Everex Step station II with Nokia 19" 446X pro screen. The monitor was run at a resolution of 1152 x 864 with an 85 Hz screen refresh rate, that is, one screen refresh cycle every 12 ms, which was the exposure time of the prime and the mask. An Authorware 3 program controlled the monitor display.

Twenty immigrant and 20 Swedish male facial photographs were used in the priming phase. One group of the participants was then primed without awareness with immigrant facial photographs and the other group with Swedish facial photographs. In the priming phase, the participant sat facing the monitor at approximately 55 cm. There were 40 presentations for each participant. In each presentation, the prime appeared for 12 ms, in one of the four parafoveal positions (2-6° of the visual field). The primes were positioned between 3.5 and 6.5 cm from the center of the screen. Both the order and the location of the primes were randomized, with the only restriction that the same picture could not appear twice in a row in the same areas. The prime was erased by a pattern mask, also presented for 12 ms, which was in turn replaced by a dot mask that remained on the screen for 2 s. After each presentation, the participant was asked to indicate whether an odd or an even number of dots was presented. The brief prime duration, the immediate masking, and the parafoveal positioning of the photographs were intended to minimize the participants' awareness of the primes.

After the priming phase, participants were given a word-learning task (e.g., Bjork, 1989). In this task, all participants were asked to memorize the first list of 15 words (i.e., List 1) consisting of ten immigrant stereotypes (e.g., *criminal*, *hostile* and *allowances*) and five filler words. The words were presented on the computer screen at the rate of 0.5 s. For participants in the immigrant prime condition, the List 1 words were stereotypically

congruent. However, these words were incongruent for the participants in the Swedish prime condition.

To half of the participants in each prime condition, a written instruction appeared on the computer screen stating that the participants should, regrettably, forget the previously presented items and a new study list (i.e., List 2 or the to-be-remembered items) would soon appear on the screen. The remaining half in the two prime conditions, that is, the remember group, received no such instruction. List 2 items were then presented following the same procedure as before. Ten items in this list consisted of positive adjectives related to stereotypes of Swedes (e.g., *intelligent*, *considerate*, and *industrious*) and five were filler items.

Experiment 2. Fifty-three non-psychology Swedish university students (24 men and 29 women) participated in the experiment for pay. The study had a 2 (Prime: Swedish vs. no prime) \times 2 (Instruction: forget vs. remember) \times 2 (List: list 1 vs. list 2) mixed design, with repeated measures on the last factor. The experiment was divided into three seemingly unrelated phases: a priming phase, a word-learning phase, and a recall task.

Half of the participants were subliminally primed with Swedish photographs and the other half got no such priming. The same photographs as in Experiment 1 were used in the Swedish prime condition. The entire experiment was conducted using the same procedure and apparatus as in Experiment 1.

Major Findings

Experiment 1. After excluding the five filler items from each list, proportions of correctly recalled words were calculated for each participant. These scores were then analyzed using a 2 (Prime: immigrant vs. Swedish) \times 2 (Instruction: remember vs. forget) \times 2 (List: List 1 vs. List 2) ANOVA, with repeated measures on the last factor.

The analysis revealed only a significant ($p = .05$) Prime \times Instruction interaction. As anticipated, for the participants exposed to the *immigrant* primes, a planned comparison showed that the effect of instruction on List 1 words was significant ($p = .03$). Thus, participants recalled more to-be-remembered than to-be-forgotten List 1 words (see Table 1, upper part). For the participants exposed to the *Swedish* primes (i.e., *incongruent condition*), the effect of instruction on the recall of List 1 words was not significant ($p = .53$). Thus, there were no directed forgetting effects on the stereotypically incongruent information.

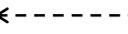
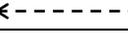
Taken together, the results give initial support for the contention that the differential processing of congruent and incongruent information may moderate directed forgetting effects. In Experiment 2, we further invest-

igate the generality of this finding using Swedish prime and no-prime conditions.

Experiment 2. As in Experiment 1, after excluding the five filler items from each list, proportions of correctly recalled scores were calculated for each participant. Participants recall scores were submitted to a 2 (Prime: Swedish vs. no prime) \times 2 (Instruction: remember vs. forget) \times 2 (List: List 1 vs. List 2) ANOVA, with repeated measures on the last factor.

The analyses showed a main effect of List ($p = .03$) that was qualified by a significant Prime \times Instruction \times List interaction ($p = .01$). The nature of this interaction was further investigated using planned comparisons. For the participants exposed to *Swedish* primes (i.e., incongruent condition), the effect of instruction on the recall of List 1 words was not significant ($p = .83$). Further, there was no significant difference in the recall of List 1 and List 2 words in the forget condition ($p = .23$). Thus, as in Experiment 1, participants' recall performance did not vary as a function of the instruction to forget or remember (see Table 1, lower part). For the participants in the *no-prime* condition (irrelevant words), the analysis showed that participants recalled more List 1 items when they were given a remember than a forget instruction ($p = .01$). Further, in the forget condition, participants recalled more List 2 than List 1 words ($p = .007$).

Table 1. Mean Recall Scores (SDs in Parentheses) as a Function of Prime, Instruction, and List Type in Study 1 and Study 2.

| | Instruction | List 1 - Stereotypes of immigrants | List 2 - Stereotypes of Swedes |
|------------------|-------------|---|---|
| Experiment 1 | | | |
| Immigrant primes | Remember |  .38 (.16) | .33 (.19) |
| | Forget |  .26 (.17) |  .25 (.14) |
| Swedish primes | Remember |  .34 (.17) | .27 (.15) |
| | Forget |  .31 (.14) |  .34 (.15) |
| Experiment 2 | | | |
| No primes | Remember |  .40 (.10) | .32 (.07) |
| | Forget |  .26 (.15) |  .40 (.15) |
| Swedish primes | Remember |  .32 (.17) | .43 (.21) |
| | Forget |  .31 (.10) |  .38 (.09) |

Note. Solid lines denote significant ($p < .05$, at least) comparisons and dotted lines indicate nonsignificant comparisons.

Discussion

The results observed in Experiment 1 and 2 are in line with our contention that the differential processing of stereotypically congruent and incongruent information may moderate directed forgetting effects on this information. For example, the participants exposed to ingroup (i.e.,

Swedish) primes recalled roughly the same number of List 1 words regardless of the instruction condition, suggesting that forgetting stereotypically incongruent information can be a daunting task.

A closer inspection of the means displayed in Table 1 shows that for participants in the *Swedish prime condition* recall performance seems to be higher in Experiment 2 than in Experiment 1 when they were given a remember instruction. This result is difficult to interpret. Two things should be noted, however. First, in Experiment 1 the experimenter was male whereas in Experiment 2, a female experimenter was used. Secondly, the proportion of men and women that participated in the experiments varied highly (21 men and 48 women in Experiment 1 and 24 men and 29 women in Experiment 2). Thus, it is possible that these factors might account for this result, although it is unclear how this might be mediated.

Study III: Remembering Things that Never Occurred: The Effects of To-be-forgotten Stereotypical Information

Background

A stereotype can activate other semantically related concepts (e.g., Devine, 1989; Dovidio et al., 1986). Thus, stereotypes can provide a basis for generating inferences about unobserved aspects of a stereotypic schema (Deaux & Lewis, 1984). Accordingly, studying a list of associated stereotype descriptors may activate other nonpresented stereotypic attributes that are related to the presented list words or an associated stereotypic label through the spreading of activation (e.g., Collins & Loftus, 1975; Roediger & McDermott, 1995). Consequently, these activated but non-presented stereotypic attributes may be encoded during the study along with the actually presented stereotypic words (Roediger & McDermott, 1995; Underwood, 1965). This process is likely to increase the conceptual fluency or familiarity of the nonpresented stereotypic attributes as having been encountered in the past, resulting in higher false recognition rates for these items as compared to nonpresented stereotype-unrelated items (e.g., Macrae et al., 2002).

Previous research indicates that the attempt to intentionally forget stereotypical information may repeatedly prime the to-be-forgotten information, resulting in an enhanced accessibility of this information in memory (Macrae et al., 1994a, 1997a). Thus, a forget instruction, but not a remember instruction, is likely to increase the accessibility of the to-be-forgotten stereotypical words (Macrae et al., 1994a, 1997a). Because the associated nonpresented stereotypic words are likely to be activated and encoded together with the to-be-forgotten stereotypic words during study, a

forget instruction is likely to have similar effects on the nonpresented words. That is, a forget but not a remember instruction might also increase the accessibility of the nonpresented stereotypical words in memory.

Accordingly, we hypothesized that that the false recognition rates for the nonpresented stereotypical words should be higher when participants are instructed to forget the presented stereotypical words as compared to when they are instructed to remember the same words.

Method

Sixty-eight non-psychology Swedish university students (41 women and 27 men), mean age of 26 years, participated in the experiment for pay. The study involved a 2 (Prime: immigrant vs. neutral) \times 2 (Instruction: forget vs. remember) \times 2 (Stimulus type: stereotypical vs. nonstereotypical) design, with repeated measures on the last factor. The participants were randomly assigned to the immigrant and neutral prime condition. Further, within each prime condition, the participants were randomly assigned to the forget or remember instruction conditions.

In the beginning of the experiment, participants in the immigrant prime condition were asked to name the three largest immigrant groups in Sweden and to write down on the provided paper their opinion about these groups. This was intended to activate the stereotypes associated with immigrants and facilitate the encoding of stereotypical words (Macrae et al., 1997a). Participants in the neutral prime condition were asked to name three of the smallest towns in Sweden and indicate their opinion about them on the provided paper.

After the priming part, the participants were given a list consisting of 12 words and were instructed to memorize these words for a later memory test. The list included five items that were strongly associated with the social category, *immigrant* (e.g., *criminal*, *hostile*) and were chosen the basis of previous research (Akrami et al., 2002). The list also included five items that were unrelated to immigrant stereotypes and two neutral items that were used as buffer items at the beginning and the end of the list. The order of presentation of the words was randomized across participants. To ensure that participants did indeed study the words, they were instructed to read each word and rewrite it correctly on space given adjacent to each word.

Participants in the *forget condition* were told, rather apologetically, that they had been mistakenly given a wrong list for study and therefore they should absolutely forget the studied list words and concentrate on the next task. The participants in the remember condition received no such instruction. With the end of the word learning task, participants were given

a distracter task that was intended to reduce short-term memory effects. With the completion of this task, all participants were given a recognition task. In this task, they were given a list consisting of 24 words that included the 12 previously presented words mixed with 12 stereotypically related (e.g., *junkie*, *allowances*) and unrelated new words. Participants were instructed to circle, on the provided paper, those words that they could recognize that they had previously studied, irrespective of the instruction they had been given.

Major findings

The false recognition scores of the nonpresented stereotypical and non-stereotypical items were analyzed using a 2 (Prime: immigrant vs. neutral) \times 2 (Instruction: forget vs. remember) \times 2 (Stimulus type: stereotypical vs. nonstereotypical) ANOVA, with repeated measures on the last factor.

Important for the present hypothesis, the analysis revealed a significant ($p = .01$) Prime \times Instruction \times Stimulus type interaction (see Table 3; Mean recognition hit rates are displayed in Table 2). As hypothesized, planned comparisons showed that participants in the *immigrant prime* condition falsely recognized more nonstudied stereotypical items under a forget ($M = .65$) than a remember ($M = .36$) instruction ($p = .000$). However, for the nonstudied nonstereotypical items, a similar analysis showed no significant ($p = .15$) difference between the remember and forget instructions. For the participants in the *neutral prime* condition, the analysis showed no significant difference ($F < 1$) in the false recognition rate between the remember and forget instructions, neither for the non-studied stereotypical items nor for the nonstudied nonstereotypical items.

These results, however, are based on relatively few studied words (i.e., five stereotypical and five nonstereotypical words per participant). In such conditions, distribution assumptions are likely to be violated, and this can affect the interpretation of obtained results. Accordingly, we reanalyzed the data using the Mann-Whitney U test. We conducted two such tests, one, for the immigrant prime condition and another, for the neutral prime condition. The analysis showed that participants in the *immigrant prime* condition falsely recognized more nonstudied stereotypical items when they were given a forget than a remember instruction ($p = .001$). The analysis revealed no other significant effects.

Signal detection analysis was also conducted using Grier's (1971) formulas to ascertain that these results were not the outcome of the participants' use of a lenient response criterion during the recognition task (Miller & Wolford, 1999). More important for the present purposes, on the

measure of response criterion (B''), the analysis revealed a nonsignificant ($p = .16$) Prime \times Instruction \times Stimulus type interaction (see Table 2).

Discussion

As anticipated, the results showed that participants in the immigrant but not in the neutral prime condition were more likely to falsely recognize nonstudied stereotypical words as studied words under a forget than a remember instruction.

Table 2. Mean Proportion (and SD) of Hit Rates, Sensitivity (A'), and Criterion (B'') as a Function of Prime, Instruction, and Stimulus Type

| Prime | Stimulus type | | | | | |
|-----------------------|---------------|-----------|------------|------------------|-----------|-----------|
| | Stereotypical | | | Nonstereotypical | | |
| | Hits | A' | B'' | Hits | A' | B'' |
| Neutral | | | | | | |
| Forget ($n = 17$) | .33 (.14) | .33 (.48) | .11 (.37) | .39 (.15) | .66 (.14) | .26 (.37) |
| Remember ($n = 16$) | .45 (.20) | .55 (.24) | .13 (.28) | .35 (.27) | .50 (.43) | .21 (.57) |
| Immigrant | | | | | | |
| Forget ($n = 17$) | .67 (.16) | .48 (.25) | -.02 (.12) | .39 (.15) | .75 (.18) | .53 (.47) |
| Remember ($n = 18$) | .44 (.15) | .49 (.37) | .12 (.15) | .35 (.27) | .66 (.22) | .27 (.42) |

Table 3. Mean Proportion (and SD) of Falsely Recognized Nonstudied Words as a Function of Prime, Instruction, and Stimulus Type

| Prime | Stimulus type | |
|-----------------------|---------------|------------------|
| | Stereotypical | Nonstereotypical |
| Neutral | | |
| Forget ($n = 17$) | .37 (.23) | .20 (.12) |
| Remember ($n = 16$) | .36 (.25) | .21 (.17) |
| Immigrant | | |
| Forget ($n = 17$) | .65 (.15) | .13 (.14) |
| Remember ($n = 18$) | .36 (.24) | .20 (.14) |

Previous research has, however, shown that merely priming stereotypes is likely to lead to greater false recognition rates of stereotypic words (e.g., Macrae et al., 2002). However, a glance at the participants' mean false recall scores reveals that this effect failed to emerge in the remember condition. In the present study, no second list was presented after the remember instruction, as is the case in the directed forgetting paradigm,

that may have interfered with the rehearsal of the to-be-remembered words (Kimball & Bjork, 2002), which, in turn, might have led to lower false recognition rates for these words.

The results showed that the participants might not have used a lenient response criterion during the recognition task (Miller & Wolford, 1999). Notwithstanding this finding, the response criterion in itself can be of importance in the realm of stereotyping (Stangor & McMillan, 1992). Stereotypes can provide expectations about what kinds of stereotypical behaviors out-group members are supposed to display (e.g., Hilton & von Hippel, 1996; Stangor & McMillan, 1992). Accordingly, when people ascribe recollected behaviors to a stereotyped individual, stereotype-based expectations can influence response criteria for making a source attribution (Banaji & Greenwald, 1995). Consequently, perceivers may show greater readiness or use a lenient response criteria in attributing expected stereotypic behavior than unexpected behavior (e.g., Banaji & Greenwald, 1995; Sherman & Bessenoff, 1999).

Study IV: Forgetting-induced False Recall of Stereotypes

Background

Previous research has shown that directed forgetting instructions can inhibit the recall of studied words (Macrae et al., 1997a; Bjork & Bjork, 1996). The mechanism that is responsible for these directed forgetting effects is retrieval inhibition (e.g., Bjork & Bjork, 1996). That is, when participants are instructed to forget studied words, an inhibitory process is initiated that suppresses the retrieval of the to-be-forgotten words. Because the activated nonstudied stereotypes are likely to be encoded together with the studied stereotypes (e.g., Roediger et al., 2001; Underwood, 1965), the nonstudied stereotypes may also be subjected to retrieval inhibition by a forget instruction in the same manner as the studied to-be-forgotten stereotypes. Accordingly, we hypothesized that participants should show lower false recall rates when they were provided with a forget than a remember instruction. Experiment 1 tested the plausibility of this hypothesis.

Previous studies have shown that when attentional resources are constrained for various reasons, perceivers are more likely to extensively rely on existing generic knowledge structures in processing expectancy-congruent information (e.g., Macrae et al., 1997a; Sherman & Bessenoff, 1999; Sherman & Frost, 2000). Under these circumstances, they are more likely to use their gist-based knowledge rather than item-specific information in their recollection processes, resulting in an increased false recall of thematically related but nonpresented information (e.g., Brainerd

& Reyna, 1998; Macrae et al., 2002). Additionally, a forget instruction may impair access to item-specific information but is likely to leave the gist-based representation extracted during the study episode unaffected (Kimball & Bjork, 2002). Thus, taken together, a cognitive-load manipulation should increase the incidence of false recall of nonpresented stereotypical information under a forget than a remember instruction. In Experiment 2, we investigated the plausibility of this hypothesis.

Of relevance to the present study is also the observation that intentional forgetting involves the deployment of considerable attentional resources that inhibit the retrieval of the to-be-forgotten words (e.g., Bjork, 1989; Macrae et al., 1997). Accordingly, when attentional resources are constrained, the inhibitory processes that depress the recall of the to-be-forgotten words are less likely to be implemented. Under these circumstances, the intentional forgetting process can be undermined and people may find themselves unable to suppress the expression of highly accessible to-be-forgotten stereotypical information (Macrae et al., 1994, 1997; Wegner, 1994). Thus, when cognitive resources are in short supply, people may, ironically, recollect more to-be-forgotten words than when cognitive resources are in plentiful supply.

Method

Experiment 1. Seventy-eight non-psychology Swedish university students (48 women and 30 men), mean age of 25 years, participated in the experiment as volunteers. The study involved a 2 (Prime: immigrant vs. neutral) \times 2 (Instruction: forget vs. remember) \times 2 (Stimulus type: stereotypical vs. nonstereotypical) design, with repeated measures on the last factor. The participants were randomly assigned to the immigrant and neutral prime condition. Moreover, within each prime condition, the participants were randomly assigned to the forget or remember instruction.

In the priming phase, participants in the immigrant condition were asked to name the three largest immigrant groups in Sweden and to write down on the provided paper their opinion about these groups. This was intended to activate the stereotypes associated with immigrants and to facilitate the encoding of stereotypical words (Macrae et al., 1997a). Participants in the neutral condition were asked to name three of the smallest towns in Sweden and write their opinion about them on the provided paper.

After the priming part, the participants were given a list of 12 words and were instructed to memorize these words for a later memory test. The list included five items that were strongly associated with the social category, *immigrant*, five items that were unrelated to immigrant stereotypes, and two neutral items that were used as buffer items at the beginning and the

end of the list. The order of presentation of the words was randomized across participants. To ensure that participants did indeed study the words, they were instructed to read each word and rewrite it correctly on space given adjacent to each word.

Participants in the *forget condition* were told, rather apologetically, that they had been mistakenly given a wrong list for study and therefore they should absolutely forget the studied list words and to concentrate on the next task. The participants in the remember condition received no such instruction. With the end of the word learning task, participants were then given a distracter task intended to reduce short-term memory effects.

With the completion of this task, all participants were instructed to write, on the provided paper, any word they could remember or recall from the experiment including the words they were admonished to forget (i.e., for those with a forget instruction).

Experiment 2. Sixty-four nonpsychology Swedish university students (37 women and 27 men), mean age of 24 years, participated in the experiment as volunteers. Like Experiment 1, the experiment involved a 2 (Prime: immigrant vs. neutral) \times 2 (Instruction: forget vs. remember) \times 2 (Stimulus type: stereotypical vs. nonstereotypical) factorial design, with repeated measures on the last factor. The participants were randomly assigned to the immigrant and neutral prime condition. Further, within each prime condition, the participants were randomly assigned to the forget or remember instruction.

The stimulus material and the procedure were the same as in Experiment 1, with one main exception. As the participants performed the word-recall task, they were all given a concurrent memory-load task. They were informed that the experiment was concerned with people's ability to do multiple tasks at the same time. Memory load was manipulated by instructing participants to remember an eight-digit number sequence for a letter test (e.g., 8-7-2-0-9-1-5-3). Past research has shown that this task is effective in depleting participants' mental resources (e.g., Gilbert & Hixon, 1991). With the completion of the word recall task, participants were asked to write the number sequence as perfectly as they could at the end of the recall test sheet. Following Gilbert and Hixon's (1991) suggestions, a cutoff point was established such that the data of participants who incorrectly recalled four or more of the number sequence digits were excluded. Five participants made more than four errors and were accordingly replaced.

Major findings

Experiment 1. As a *manipulation check*, to examine if participants had indeed followed the instructions and to see if there were directed forgetting effects, we analyzed the proportions of correctly recalled list words using a 2 (Prime: immigrant vs. neutral) \times 2 (Instruction: forget vs. remember) ANOVA. The analysis revealed a significant main effect of Instruction ($p = .001$) but a nonsignificant ($p = .59$) Prime \times Instruction interaction (see Table 4). Planned comparisons showed that the participants correctly recalled more words when they were provided with a remember than a forget instruction both in the *immigrant prime* ($p = .04$) and the *neutral prime* condition ($p = .01$), thus showing directed forgetting effects.

The *false recall* scores were obtained in the following manner: An item was considered to be falsely recalled if it was a nonstudied but a known immigrant stereotype (see Akrami et al., 2002). The number of falsely recalled words was obtained for each participant by taking words in the test protocol that were either nonstudied stereotypical or non-stereotypical words. The dependent measure of interest was the number of falsely recalled nonpresented stereotypical and nonstereotypical words.

The false recall scores of the nonpresented stereotypical and non-stereotypical items were analyzed using a 2 (Prime: immigrant vs. neutral) \times 2 (Instruction: forget vs. remember) \times 2 (Stimulus type: stereotypical vs. nonstereotypical) ANOVA, with repeated measures on the last factor. The analysis revealed main effects of Prime ($p = .05$) and Stimulus type ($p = .000$). However, and contrary to expectation, the Prime \times Instruction \times Stimulus type interaction was not significant ($p = .84$; see Table 4).

Table 4. *Mean Scores of Falsely Recalled Nonstudied Words as a Function of Prime, Instruction, and Stimulus Type (Experiment 1)*

| Prime | Stimulus type | |
|-----------|---------------|------------------|
| | Stereotypical | Nonstereotypical |
| Neutral | | |
| Forget | 1.37 | .92 |
| Remember | 1.10 | .85 |
| Immigrant | | |
| Forget | 1.63 | 1.00 |
| Remember | 1.40 | 1.05 |

Planned comparisons confirmed this pattern of results. Participants' false recall rates of the *nonstudied stereotypical* words were roughly the same in the immigrant prime condition ($p = .20$) and the neutral prime condition ($p = .27$) regardless of instruction (forget/remember). For the

nonstudied nonstereotypical items, a similar analysis showed no significant differences as well, $F_s < 1$.

Experiment 2. As a *manipulation check*, like in Experiment 1, the proportions of correctly recalled list words were calculated for each participant. To examine if the concurrent memory load task had effect on the correct recall of the studied words, the proportions of correctly recalled list words were submitted to a 2 (Prime: immigrant vs. neutral) \times 2 (Instruction: forget vs. remember) ANOVA. The analysis revealed a significant Prime \times Instruction interaction ($p = .01$; see Table 5). The participants in the *immigrant prime* condition recalled more words when they were provided with a forget than a remember instruction ($p = .005$). However, for the participants in the *neutral prime* condition, there was no significant difference between the two instruction conditions ($p = .49$).

The *false recall* scores (i.e., the number of stereotypical and nonstereotypical words, respectively, that were falsely recalled as studied words) were obtained for each participant using the same procedure as in Experiment 1. The dependent measures of interest were the number of falsely recalled nonpresented stereotypical and nonstereotypical words.

Table 5. *Mean Proportion of Correctly Recalled Words as a Function of Prime and Instruction (Experiment 1 & 2)*

| | Prime | |
|--------------|-----------|---------|
| | Immigrant | Neutral |
| Experiment 1 | | |
| Forget | .34 | .26 |
| Remember | .45 | .41 |
| Experiment 2 | | |
| Forget | .44 | .31 |
| Remember | .29 | .34 |

The false recall scores of the nonpresented stereotypical and nonstereotypical items were analyzed using a 2 (Prime: immigrant vs. neutral) \times 2 (Instruction: forget vs. remember) \times 2 (Stimulus type: stereotypical vs. nonstereotypical) ANOVA, with repeated measures on the last factor. The analysis revealed significant effects of Prime ($p = .003$), Instruction ($p = .03$), Stimulus type ($p = .000$), Prime \times Stimulus type ($p = .03$) and Instruction \times Stimulus type ($p = .01$). However, and more important for the present hypothesis, these effects were qualified by a significant Prime \times Instruction \times Stimulus type interaction ($p = .05$; see Table 6).

Planned comparisons showed that participants in the *immigrant prime* condition falsely recalled ($p = .001$) more *nonstudied stereotypical* items under a forget ($M = 2.40$) than a remember ($M = 1.47$) instruction.

However, for the *nonstudied nonstereotypical* items, a similar analysis showed no significant difference between the instruction conditions ($p = .66$). For the participants in the *neutral prime* condition, the analysis showed no significant difference in the false recall rate between the remember and forget instructions, neither for the nonstudied stereotypical items ($p = .47$) nor for the nonstudied nonstereotypical items ($p = .86$).

Table 6. *Mean Scores of Falsely Recalled Nonstudied Words as a Function of Prime, Instruction, and Stimulus Type (Experiment 2)*

| Prime | Stimulus type | |
|-----------|---------------|------------------|
| | Stereotypical | Nonstereotypical |
| Neutral | | |
| Forget | 1.40 | 1.10 |
| Remember | 1.24 | 1.05 |
| Immigrant | | |
| Forget | 2.40 | 1.13 |
| Remember | 1.47 | 1.24 |

Discussion

Experiment 1. The results showed that a forget instruction substantially reduced the accurate recall of the studied words as compared to the remember instruction. However, these instructions had no effect on the false recall of nonstudied stereotypic words. Thus, retrieval inhibition did not affect the false recall of nonstudied stereotypic words.

Experiment 2. In line with Macrae et al.'s (1997a) finding, the results demonstrated that, when the participants' attentional resources were constrained, they recalled more to-be-forgotten words than to-be-remembered words in the immigrant but not in the neutral prime condition. Similarly, under cognitively demanding task conditions, participants falsely recalled more nonstudied stereotypical words when they were given a forget than a remember instruction.

These results give credence to the contention that the availability of attentional resources during task performance may moderate forgetting-induced false recall of strongly associated but nonstudied stereotypical information. However, because there was no cognitively nonbusy condition in Experiment 2, the observed pattern of results must be interpreted cautiously.

GENERAL DISCUSSION

The Main Findings

The general objective of the present thesis was to examine the effects of goal-directed stereotype suppression and the impact of motivated forgetting a) on the recall of stereotypically incongruent information, and b) on the false recall and recognition of nonpresented stereotypical information.

The three experiments of Study I clearly demonstrated that covertly activated words that implied self-control could attenuate the impact of activated stereotypes on subsequent judgment of a target behavior. This indicates that contextual cues that prompt perceivers to exercise self-control can lead to the inhibition of stereotypes.

In two experiments, Study II showed that stereotypically incongruent information might be difficult to forget as was evidenced by the lack of directed forgetting effects in the recall of this information.

Study III showed that a directed forgetting instruction can dramatically increase the amount of falsely recognized words for nonpresented, stereotypically congruent information. Similarly, Study IV demonstrated that under cognitively demanding conditions, such as those that approximate everyday social information processing conditions, a forget instruction can lead to an enhanced false recall of nonpresented stereotypically congruent information.

Consequences of Stereotype Control and Suppression

One of the major findings of the present thesis is that contextual cues can prompt perceivers to control or suppress the expression of their activated stereotypes. However, research shows that stereotype suppression may have deleterious consequences. Trying to consciously suppress unwanted thoughts, perceivers may instead find themselves increasingly preoccupied with the very thoughts they want to banish from memory (for a review, see Wegner, 1994). The implication of these finding for stereotypical memories is rather straightforward. When perceivers want to consciously suppress or inhibit their negative stereotypes, it may, ironically, result in an increased prevalence of the to-be-suppressed stereotypes in memory, leading to a *rebound* effect.

A number of studies have shown that stereotype suppression can lead to a rebound effect (e.g., Macrae et al., 1994a, 1998; Wyer, Sherman, & Stroessner, 2000). However, research indicates that there might be boundary conditions for the occurrence of stereotype rebound effects

(Devine & Monteith, 1999; Monteith, Spicer, & Tooman, 1998; Wyer et al., 2000). Wyer et al. (2000) have shown that when participants were asked to form an impression of a race-unspecified person, stereotype suppression resulted in a rebound effect. However, when the race of the target person was specified as either African or Asian American, the post-suppression rebound effect failed to emerge, suggesting that perceivers may successfully inhibit socially sensitive stereotypes such as those of African or Asian Americans. Similarly, Monteith et al. (1998) have shown that low-prejudice people may not be prone to stereotype rebound effects. Presumably, these people may routinely engage in stereotype suppression in response to cues in the environment that prompt them to initiate inhibition processes, which may then lead to the successful control of activated stereotypes.

However, the act of suppressing or controlling activated stereotypes is an effortful process and may demand the deployment of considerable attentional resources (e.g., Macrae et al., 1998; Wegner, 1994). Thus, when cognitive resources are in short supply for some reasons, perceivers may find themselves unable to control the accessibility of the suppressed stereotypes. In fact, in their second study, Wyer et al. (2000) found that when participants' cognitive resources were depleted, they made more stereotypic impressions of the second target person despite the fact that the suppressed stereotypes were socially sensitive ones. Similarly, Macrae et al. (1998) showed that when cognitive resources are depleted, spontaneous stereotype suppression can lead to a rebound effect, in which stereotypic responses are substantially increased after a period of suppression.

Thus, given that everyday social information processing occurs under cognitively demanding conditions, there is reason to believe that perceivers are less likely to avoid post-suppression rebound effects.

Stereotype-based False Memories

Previous research has documented the pervasiveness of false memory effects within the DRM paradigm (e.g., Gallo et al., 1997; Lenton et al., 2000). In response to this state of affairs, some researchers have tried to identify factors that may moderate these false memory effects (e.g., Gallo et al., 1997; McDermott & Roediger, 1998; Payne, Elie, Blackwell, & Neuschatz, 1996; Read, 1996). One approach involves the use of explicit forewarning instructions. In this case, participants are informed about the false memory effect in detail before the encoding phase, and they are further instructed to try to avoid making recall and recognition errors. Gallo et al. (1997), for example, investigated whether people can use strategic

monitoring processes to eliminate the false recognition of nonpresented words. In that study, one group of participants got no information about the false recognition effect, a second group was instructed to minimize false alarms, and a third group was forewarned about the false alarms of the non-presented words. The results showed that although forewarning did reduce the false recognition rate for the nonpresented words as compared to the other conditions, it did not eliminate it. Further, participants in the cautious condition showed a lower false recognition rate for the non-presented words as compared to the participants in the uninformed condition, but they still demonstrated a strong false memory effect in that their false alarm rate for the nonpresented words was roughly the same as their hit rate for the studied words.

Read (1996) manipulated encoding instructions by having participants memorize word order or engage in elaborate or maintenance rehearsal as they studied list words. The results showed that participants in all three conditions demonstrated high levels of false recall but the participants who were instructed to focus on word order had the lowest false recall rates.

Another approach involves the repeated presentation of list words both during study and test trials (e.g., McDermott, 1996). The rationale is that such repeated representation would allow participants to learn well the specific words of each list, resulting in an increase in memory accuracy and a decrease in the false memory for nonstudied words. McDermott (1996) gave participants multiple study and recall tests with the same word lists that were presented in either a blocked or a random sequence. The results showed that false recall was higher in the blocked than in the random condition. Nevertheless, both presentation conditions produced substantial false recall rates.

The message that emerges from the reviewed research is quite clear. Although forewarning and multiple study and test trials may attenuate false memory for nonpresented information, they can not eliminate it. This suggests that people may not be successful in their endeavor to suppress their false memories.

Memory for Stereotypically Incongruent Information

The present thesis has also shown that stereotypically incongruent information might be difficult to forget. This is consistent with previous findings that people can remember better expectancy-disconfirming information than information that confirms their expectancies (e.g., Stern et al., 1984; Srull & Wyer, 1989). Given this state of affairs, then, one might expect that stereotypes might soon disappear in face of overwhelming

contradictory evidence. Several reasons speak against this, however (e.g., Hamilton & Sherman, 1994; Fiedler et al., 1999; Pendry & Macrae, 1994).

One possible reason is that stereotypically incongruent information may be forgotten more rapidly than the congruent information (e.g., Fiedler et al., 1999; Graesser, Woll, Kowalski, & Smith, 1980). Further, the amount of expectancy-disconfirming information that is encountered in everyday social interaction may quite often be less than the amount of ambiguous or clearly confirmatory information (Fiedler et al., 1999). As a result, the expectancy-disconfirming information may lose some of its saliency over time and may be less remembered than expectancy-congruent information (Rothbart, 1981; Stangor & McMillan, 1992). Moreover, because of the extra processing that the stereotypically discrepant information gets, it can be assimilated into the stereotypic schema, a process that may alter its meaning or makes it less salient (e.g., Stangor & Ruble, 1989; Woll & Graesser, 1982). Additionally, incongruent information is often explained away as arising from situational rather than dispositional causes (e.g., Hamilton & Sherman, 1994).

As already suggested, memory preferences for stereotype-incongruent information can occur only when people are allowed to process information systematically or when their cognitive capacity is unconstrained (e.g., Macrae et al., 1993; Pendry & Macrae, 1994; Stangor & Duan, 1991). However, in everyday life, perceivers may have neither the inclination nor the cognitive resources necessary to process behavioral information of every stereotyped person they may encounter (e.g., Stangor & McMillan, 1992). Thus, real-world processing conditions may disfavor more the encoding of stereotypically incongruent than congruent information (e.g., Pendry & Macrae, 1994; Stangor & McMillan, 1992). Accordingly, the proclivities of perceivers to use stereotypes as an efficiency-enhancing tool in response to the cognitively demanding conditions of everyday information processing coupled with the fact that real world processing conditions disfavor the encoding of stereotypically incongruent information seem to speak for the continued maintenance of stereotypes (e.g., Stangor & McMillan, 1992).

Conclusions

Consider, again, the you-as-a-member-of-a-jury scenario presented in the introduction of the present thesis. The results of the thesis suggest that you are likely to have good memory for the to-be-forgotten incongruent information. However, because jury deliberation involves the processing of abundant information and thus demands considerable attentional resources

(e.g., Bodenhausen, & Lichtenstein, 1987), you are less likely to understand the meaning of the incongruent information as compared to the congruent information. Consequently, you are likely to erroneously conclude that more stereotypically congruent than incongruent information was presented during the court hearings (Sherman et al., 1998). Moreover, as the result of the forget or disregard instruction, you are likely to falsely recall and recognize more nonpresented stereotypically congruent than irrelevant information. Consequently, the likelihood is higher that you will find the stereotyped defendant guilty of the crime that he might not have committed (Bodenhausen, 1988; Kimball & Bjork, 2002; Sherman & Bessenoff, 1999; Ugweugbu, 1978).

The social implication of the present results is, thus, sobering. Admonishing perceivers to forget or disregard stereotypic information may not be the best strategy to reduce stereotyping or negative evaluations of stereotyped groups. On the contrary, such admonishments may provide a fertile ground for proliferation false memories of stereotypic behaviors that were never performed by members of stigmatized groups (e.g., Kimball & Bjork, 2002; Sherman & Bessenoff, 1999). These stereotype-based mental aberrations may, then, insulate stereotypes from modification and change, resulting in continued negative evaluations and prejudiced responses toward members of outgroups.

Accordingly, a direct manipulation of perceivers' goals or motivations may not lead to enduring changes in intergroup attitudes. Recognizing this fact, recent research has begun to probe other interventions or techniques that lead to more permanent changes in intergroup relations (e.g., Blair, Ma, & Lenton, 2001; Dasgupta & Greenwald, 2001; Rudman, Ashmore, & Gary, 2001; for a review see Blair, 2002). This research shows that engaging in counterstereotypic mental imagery (Blair et al., 2001), enrollment in a prejudice and conflict seminar (Rudman et al., 2001), and changes in the social context (Dasgupta & Greenwald, 2001) can override stereotypic biases. Whether these interventions can lead to enduring changes in intergroup relations or not, can only future research tell.

Limitations of the Empirical Findings

Various factors may limit interpretation and the conclusions that might be drawn from the findings of the present thesis. For example, Study II of the present thesis could have benefited more if the design had been counterbalanced which, in turn, could have eliminated a potential valence/stereotype confounding of List 1 and List 2 words. The purpose was not to make a complete analysis of the issue at hand, however. The aim was rather

to know what happens when perceivers are provided *first* with negative information that is either congruent or incongruent to an activated social category and then asked to either forget or remember this information. This situation, we think, is more common in everyday social life and thus the most ecologically relevant in the present context. Future research may want to replicate the findings of Study II using a counterbalanced design and thereby avoiding the potential flaws of the study.

In Study III and IV, we used a modified directed-forgetting paradigm in that no second list was presented after the forget and remember instruction which is the case in the standard-list method of directed forgetting. Moreover, unlike the usual DRM lists, we used one list of words in the word learning task. Nevertheless, the results are in line with previous research that used the standard directed forgetting and DRM paradigms (see Kimball & Bjork, 2002; Seamon et al., 2002). Thus, although unlikely, these modifications might affect the interpretation the present results. Future research may, therefore, benefit from using the standard directed forgetting and DRM paradigms in replicating the present results.

Moreover, although Study I of the present thesis demonstrated that surreptitiously presented words related to control could attenuate the impact of activated stereotypes, further research is needed to clarify the conditions where controllability of activated stereotypes is possible. More specifically, future research may benefit from directly comparing the effects of implicit and explicit self-control instructions and exploring their relationship with the stereotype rebound effects.

Further, in the present thesis, with the exception of Study II, participants were not probed for any awareness of the priming manipulations or for the possible influence of the priming stimuli on their task performances. However, the obtained results indicate that participants might have had little or no awareness of the priming manipulations and of the potential influence of the primes on their task performances because such awareness would have led to contrast or no effects at all (e.g., Herr, 1986; Martin, 1986).

Several of the findings and conclusions of the present thesis are based on the directed forgetting paradigm. Outside the confines of laboratory rooms, few naturalistic situations may approximate the experimental conditions under which the directed forgetting paradigm was used. For example, in real life, one is rarely asked to learn lists of words or blocked information and then subsequently informed that it was all invalid or wrong and must, therefore, be forgotten. Rather, one expects that people are likely to obey normal conversational norms of accuracy and relevance in communicating with other people (Grice, 1971). Similarly, in Study 1, as a proxy for a real person, the Donald paragraph (Srull & Wyer, 1979) was

used to assess the effects of the control-related words on the activated immigrant stereotypes. Accordingly, such conditions may delimit the external validity the present findings and the conclusion that were drawn from them.

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