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SAVINGS IN RELEARNING THROUGH EXPOSURE TO SAME-GROUP EXEMPLARS

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ABSTRACT

Exemplar theory (Smith & Zárate, 1992) states that the use of stereotypes and group-level knowledge can be explained without the use of group-level mental representations. To explore this claim, this investigation attempted to show that a single association between a trait and a member of a social group would make it easier to form a later association between that trait and a different member of the same social group. Two experiments were conducted using Carlston and Skowronski's (1994) savings in relearning paradigm. The first experiment, using targets said to attend two different colleges, replicated the basic savings effect but failed to find any influence of group membership. The second experiment, using targets of different gender, also replicated the basic savings effect and additionally found some evidence for a group membership effect.

INTRODUCTION

In any given field there are a small number of basic questions that motivate much of the research. In social psychology, one of the most influential has been "How do people identify and make sense of other people that they meet?" Research has helped us create a general answer to this question: upon meeting someone, people first consider the available perceptual cues. These cues, however, only provide the most basic information. To develop a complete social impression, people use their past experience to make inferences about characteristics that can not be directly perceived. Researchers in person memory have attempted to understand the nature of these inferences, as well as how they are generated. Several investigators have developed models to explain how social information is represented in memory, and how it is accessed to make inferences (Brewer, 1988; Fiske & Neuberg, 1990; Smith & Zarate, 1992). This article presents

two experiments conducted in an attempt to find support for one in particular, Smith and Zárate's (1992) exemplar model of memory.

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According to this model, memory consists of a large number of stored representations called exemplars. Each exemplar contains the memory of a single specific experience. People are assumed to store every significant event in their lives as a separate exemplar. Exemplars are complex representations that may contain not only a physical representation of the target, but also trait inferences, emotional responses, and behavioral patterns (e.g., Carlston, 1994). All exemplars are kept distinct in memory, so that the addition of new information does not modify the content of previously learned exemplars. Newer exemplars can, however, interfere with accessing older exemplars (e.g., Postman & Phillips, 1965).

It is not assumed that these representations necessarily capture perfect images of their targets. Any biases possessed by perceivers will influence the content of their exemplars. For example, it has been shown that stereotypes can have strong effects on judgment by affecting the perception of behaviors (Duncan, 1976) and personal characteristics (Darley & Gross, 1983). Someone with strong negative feelings about African-Americans observing such a target perform a neutral behavior might give the behavior a negative interpretation. Their memory representation of that experience would contain the African-American target performing a negative behavior. Exemplar representations capture the experience as perceived and will therefore contain all this inferred (and possibly incorrect) information in addition to the actual observed scene.

To create an inference in Smith & Zárate's (1992) model, the target of the judgment is first compared to the exemplars in memory. Each exemplar then contributes some information to the inference based upon how well it matches the stimulus (e.g., Hintzman, 1986). This comparison process is not necessarily conscious and intentional. It could be the emergent property of a memory architecture (e.g., a connectionist network - see Smith and DeCoster, 1998, for an example) and be unavailable to scrutiny. Regardless of the implementation, exemplars that are similar to the stimulus have stronger influences on the inference than those that are dissimilar.

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One of the ramifications of this structure is that social group membership, an important determinant of mental structure in many other theories of person memory (e.g., Brewer, 1988; Fiske and Neuberg, 1990), has no effect on the structure of memories in exemplar theory. Exemplars of people of the same race, for example, are kept just as separate and distinct as exemplars of people of different races. This is not to say that group membership has no influence on inferences. Social group membership acts as a cue in determining the similarity of exemplars. Additionally, Smith and Zárate's (1992) model proposes that not all stimulus dimensions are given the same attention when evaluating exemplars. Important dimensions, such as race and gender, are given greater weight when determining the similarity of two exemplars than less integral features, such as the colors of people's clothing. Individuals sharing a common race are perceived as more similar than individuals sharing more trivial features, allowing exemplar

models to account for the presence of stereotypes. Targets' social group memberships can therefore strongly affect the impressions made of them without requiring any special categorization processes.

In this framework a single exemplar can have a significant influence on an inference if the context of the exemplar is similar enough to the inferential situation. As mentioned above, generating an inference involves combining information from numerous exemplars based on how each compares to the current situation. While we would expect that most inferences are based on the combination of many exemplars, the model allows that a single, highly similar exemplar could dominate the inference. The current research explores how singular experiences affect the inferences people make about members of social groups. Bodenhausen and his colleagues (Bodenhausen, Schwarz, Bless, & Wänke, 1995) have already found that exposure to information about specific successful, well-liked African-Americans raises people's estimates of the pervasiveness of discrimination. This article expands on this earlier work by attempting to show that a single experience with a target person belonging to a social group can affect later impressions made of other group members.

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We suspected that single exemplars would have very subtle influences on the perceptions of groups, so we sought a methodology that was relatively sensitive to influences on person memory. Carlston and Skowronski's (1994) extension of Ebbinghaus's (1885/1964) savings in relearning paradigm appeared to fit this bill. In their study, Carlston and Skowronski (1994) first had research participants examine a number of personal reports. The reports each contained a photograph and a behavioral statement supposedly drawn from a questionnaire the target had completed asking about life events. The statements were actually written by the researchers, and were each designed to imply a specific personality trait. After a delay, participants performed a memory test, where they had to memorize a number of photograph/trait word pairings. Some photographs in the memory test had also appeared earlier in the student reports. Different types of trait words were paired with these photographs to see how participants' earlier experiences with the reports would influence their ability to learn traits paired with the photographs. In some cases the trait word was implied in the report that had been associated with the photograph, in some cases the trait was implied in a report associated with a different photograph, and in others the trait word was novel. The authors found that participants were most successful at memorizing a photograph/trait word pair when the two had been previously associated in the student reports. Additionally, words that had been associated with other photographs from the reports were no easier to memorize than novel words, showing that the results were not merely caused by an increased familiarity with words from the reports. This demonstrated that the trait terms implied by the behavioral statements were directly associated with the individuals performing the actions, lending support to the automaticity of trait inferences. As in earlier studies (Titchener, 1923; Burt, 1941), Carlston and Skowronski (1994) found the benefit of relearning to be quite persistent, reporting significant savings even when there was a delay of one week between the initial exposure and the memorization task.

Within the savings in relearning methodology, exemplar theory would predict that exposure to a single exemplar belonging to a specific social group should make the impression of that social

group more consistent with the exemplar. Since social group membership itself is one basis for similarity, we would expect that the exemplar should be retrieved when perceivers form later impressions of members of the same social group. Should this methodology be sufficiently powerful, we would expect to find savings in learning a photo-trait pairing when the pairing had been previously established with another member of the same social group.

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EXPERIMENT 1

In relation to the general hypothesis that experience with one member of a social group can influence the impressions made of other members, the first experiment was designed to test whether there is a significant savings in learning an association between a trait and a member of a social group when the trait had been previously associated with another member of the group.

Method

Research participants: A total of 62 participants was drawn from introductory psychology classes at Purdue University. Students participated in partial fulfillment of course requirements.

Design: This experiment was conducted in a 4 (relearning match) X 4 (stimulus booklet) mixed factorial design. The four conditions of word match, manipulated within subjects, are exact match, group match, group unrelated, and group mismatch. Each condition of stimulus booklet represented a different pairing of photos with the conditions. Each photo was paired with each condition once throughout the booklets.

Procedure: The experiment was conducted in two sessions. Up to four participants were run at a single time. During the first session, participants first received an experimental description explaining that they were participating in an investigation of the consequences of making social impressions. Research participants were then told to examine 16 different personal reports and to try to generate an impression of each person. The students in the photos were all said to attend one of two small colleges, labeled Tysley College and Hill College. Students said to attend the same college had similar visual backgrounds in the photographs. Each report contained a photograph, a college label, and a statement ostensibly extracted from a self-description.

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In reality, the photographs were all taken at Penn State University to ensure that the targets were unknown to the participants. The photographs were all of white males to reduce hypothesis guessing related to racial or gender issues. The two colleges, serving as membership groups, were fictitious. The personal descriptions, drawn from Carlston & Skowronski (1994), were designed so that each implied a specific character trait.

The student reports were provided in two envelopes, each containing members of the same college. Participants were told that the reports were kept separated because there were significant differences between the colleges and that the experimenters wanted to control the source of the

reports. Participants received a list indicating the order that they should go through the reports. The order was randomly generated for each participant. In actuality, the reports were separated to make the membership group of each report more salient. Research participants were instructed to read through each report and to generate a vivid mental image of what they believed the target person was like in real life. They were told that they could take as long as they liked to read the reports. If they asked, participants were told that they did not have to memorize the photos or the descriptions. After examining a total of 16 reports, eight from each college, the participants were dismissed from the session.

At the second session two days later, participants were told that they would then perform a person memory task using materials similar to those they saw in the first session. They received a booklet containing 32 pages, each pairing a photograph with a trait term. Sixteen of the photographs were the same as those they saw in the first session and sixteen were new. The order of presentation was determined randomly for each book. The participants were then told to review the pairings for as long as they needed to memorize which photograph went with each trait. None of the photographs were given any group labels. Four of the first session photographs were each paired with the trait word implied by the statement originally paired with the photograph, four were paired with a trait word associated with another member of the same group, four were paired with a trait word associated with a member of the opposite group, and four were paired with a novel trait word. Each of the 16 new photographs was paired with a trait word unrelated to those implied by the statements in the first session.

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Participants then completed several filler tasks taking a total of approximately twenty minutes. They then performed a cued recall task where they saw a photograph and were asked to supply the trait word associated with it during the second session. The recall task only contained the critical photographs seen in both sessions. Participants were given as much time as they needed to complete the recall task. Afterwards, they completed a post experimental questionnaire to check for hypothesis guessing. Finally participants were debriefed and released from the experiment.

Results

While some participants reported that they did try to memorize the materials contained in the first session reports, indicating that they were aware that they were participating in an experiment on memory, none made any mention of the two social groups in the post experimental questionnaire. This provides evidence that the participants were unaware of the experimental hypothesis and that the observed results were not influenced by participants' motivations.

The results, broken down by the relearning match condition, are provided in table 1.

Table 1. Experiment 1 Results by Relearning Match Condition

	Exact Match	Group Match	Unrelated	Group Mismatch
% Correct	0.746	0.661	0.657	0.678
SD	0.436	0.474	0.476	0.469

Participants were significantly more successful at memorizing words in the exact match condition than in the unrelated control condition ($F [1, 245] = 7.52, p < .007$). However, memory for words in the group match condition or in the group mismatch condition was not significantly different from memory of words in the unrelated control condition ($F [1, 245] = .02, p > .9$, and $F [1, 245] = .39, p > .5$, respectively).

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It is not necessarily clear that the unrelated condition is the proper control because the traits used in this case were completely novel. It might be more appropriate to compare the participants' performance on exact and group match items to their performance on group mismatch items, which should be equally familiar. Making these comparisons, we find that the accuracy in the exact match condition is significantly greater ($F [1, 245] = 4.49, p < .04$) while accuracy in the group match condition is not significantly different ($F [1, 245] = .25, p > .6$) from that of the group mismatch condition. There were no significant influences of booklet.

Discussion

While these results successfully replicate the basic finding that trait words previously associated with a stimulus are later easier to memorize with that same stimulus (Carlston & Skowronski, 1994), they fail to support the major experimental hypothesis that participants should show a facilitation in memorizing trait terms associated with members of the same social group as the original stimulus. It seems unlikely that the lack of significance for our group match condition was due to a misapplication of the methodology because of the strong significance of the basic savings effect. This leaves two possible conclusions: either knowledge of one group member has no influence on other group members, or else the effect of such knowledge is too small to be detected using this application of the savings methodology. The second experiment of this thesis was designed to explore these possibilities.

EXPERIMENT 2

If the first experiment failed because the methodology was not sensitive enough to detect the savings in relearning from exposure to same-group exemplars, increasing the strength of this effect might be enough to generate significant results. According to exemplar theory, the more a new experience matches a perceiver's past knowledge, the easier it is for the perceiver to incorporate that new experience into memory. In the first experiment, the level of match was manipulated by a common social group. If the social group was more meaningful and had a more substantial role in participants' impressions, stimuli sharing the social group would be perceived as more similar. One of the major premises of Smith and Zárate's (1992) theory is that people have the ability to pay more attention to certain characteristic dimensions than others. Social

group membership could be more important in some cases than in others, causing differences in the extent to which same-group exemplars are used when creating impressions. The purpose of this experiment was to replicate experiment 1 using more meaningful social groups in an attempt to increase the savings in relearning from exposure to same-group exemplars.

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Specifically, the stimuli in experiment 2 consisted of males and females rather than students of different colleges. Gender groups are among the most primitive and primary categorizations used in social impressions (Fiske, Haslam, & Fiske, 1991; Stangor, Lynch, Duan, & Glass; Brewer, 1988; Smith & Zárate, 1992), and should be more relevant to participants than a fictional college label. The exemplar-based explanation of the savings effect would predict that a prior association between a trait and a member of one gender should make it easier to later memorize that trait with another member of the same gender.

Method

Research participants: A total of 189 participants was drawn from introductory psychology classes at Purdue University. Students participated in partial fulfillment of course requirements.

Design: As in experiment 1, this experiment was conducted in a 4 (relearning match) X 4 (stimulus booklet) mixed factorial design. The four conditions of word match, manipulated within subjects, are exact match, group match, group unrelated, and group mismatch. Each condition of stimulus booklet represented a different pairing of photographs with the conditions. Each photograph was paired with each condition once throughout the booklets.

Procedure: The procedure for this experiment replicated that for experiment 1 with a few exceptions. Half of the stimulus and half of the distractor photographs were of female targets. The backgrounds of the photographs were homogeneous rather than differing between groups. Research participants were simply told that the photographs used in the study were not taken at Purdue (rather than at specific fictional colleges). The reports contained no written information relating to the social group. The reports for male and female targets were stored in a single packet, and participants were told to read them in whatever order they liked. The ordering of stimuli in the test booklets was redetermined randomly.

In general, we removed the aspects of the experiment related to the fictional colleges and added a set of female targets to the stimuli. The presence of pre-existing stereotypes of men and women could be problematic in this study. Therefore the assignment of targets to experimental conditions was counterbalanced across all four books, ensuring that a particularly appropriate or inappropriate pairing would not differentially influence the results.

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Results

We examined the post-experimental questionnaire and, as in the first experiment, found that a number of research participants did try to memorize the descriptions during the first session,

indicating that they were aware that they were participating in an experiment on memory. However, none made any reference to stereotyping or the gender of the photograph targets, so it would appear that the results were unaffected by any type of hypothesis-guessing biases.

The results for all participants, broken down by the relearning match condition, are provided in table 2.

Table 2. Experiment 2 Results by Relearning Match Condition

	Exact Match	Group Match	Unrelated	Group Mismatch
% Correct	0.880	0.784	0.769	0.729
SD	0.326	0.411	0.422	0.445

Participants were significantly more successful at memorizing words in the exact match condition than in the unrelated control condition ($F [1, 753] = 35.22, p < .0001$). Memory for words in the group match condition was not significantly different from memory for words in the unrelated control condition ($F [1, 753] = .72, p > .39$). However, memory for words in the group mismatch condition was significantly worse than memory for words in the unrelated control condition, $F [1, 753] = 4.49, p < .04$). Comparing the first two relearning conditions to the group mismatch condition we find that accuracy is significantly greater in both the exact match condition ($F [1, 753] = 64.87, p < .0001$) and the group match condition ($F [1, 753] = 8.81, p < .003$). The experiment was again conducted using four booklets, each containing a different ordering of the materials. There was no main effect of booklet ($F [3, 181] = 1.30, p > .27$).

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It is possible that these results could be influenced by the way that people pay attention to members of different genders (e.g., the outgroup homogeneity effect, Judd & Park, 1988), so the effects of participant and target gender were analyzed. The main effects of participant gender and target gender were nonsignificant ($F [1, 181] = .41, p > .5$; $F [1, 181] = .62, p > .6$, respectively). The interaction of participant sex and target sex, which would indicate an outgroup homogeneity effect, was also nonsignificant ($F [1, 181] = .23, p > .6$).

We also observed the following significant interactions: booklet x relearning match condition ($F [9, 435] = 10.81, p < .0001$), target gender x booklet ($F [3, 181] = 3.12, p < .03$), target gender x relearning match type x booklet ($F [9, 435] = 3.05, p < .002$), and target gender x relearning match type ($F [3, 179] = 2.78, p < .05$). These effects were likely due to the differential memorability of the photographs. Two of the photographs, which happened to rotate through the conditions together, elicited particularly poor performance across all the conditions. The average accuracy of participants memorizing traits with these two photographs was .6217; lower than the average accuracy of the remaining photographs, .8144. This difference is significant ($t [188] = 7.58, p < .0001$), even when applying a Bonferroni correction to the significance level ($.05 / 120 = .0004$).

Discussion

As in the first experiment, participants showed a savings in relearning photograph-trait pairs when the trait was consistent with information previously associated with the photograph. And again, participants failed to show a significant savings in relearning photograph-trait pairs when the trait was consistent with information previously associated with a member of the same social group as the target. While this replicates past research, the lack of a facilitation in relearning information associated with another member of the target's group is inconsistent with the major theoretical hypothesis. Some support for the exemplar-based interpretation of the savings effect, however, may be found in the comparison of the group match to the group-mismatch condition. It is difficult to draw a clear conclusion since the comparisons to the group mismatch and the irrelevant conditions disagree, and yet arguments can be made for either as the appropriate control.

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Tests showed only minimal effects related to participant and target gender. It is interesting that there was not even a significant outgroup homogeneity effect, which originally was a concern. The three significant interactions with target gender are not theoretically interesting and so will not be discussed. They may, however, provide reason to be cautious when interpreting the results.

GENERAL DISCUSSION

While these experiments successfully replicated the principal savings effect, there was no support for savings in relearning through exposure to same-group exemplars. There was, however, some support for the more general exemplar-based explanation of the savings effect in the second experiment, where forming an association between a trait and the member of one gender made it significantly more difficult to later learn an association between that trait and a member of the opposite gender.

There may be a number of reasons for the difficulty in finding categorical effects in this paradigm. One possibility is that there was simply an error in the way that the savings methodology was implemented in these experiments. However, the fact that a significant effect of exact match, equivalent to the basic savings effect, was found in both experiments provides strong evidence against this conclusion. Another possibility is that the common group manipulation failed and research participants simply did not notice the different social groups. The null results from the first experiment may well have been due to this, even though a multitude of procedures was implemented to enhance the salience of the groups. However, it is very unlikely that participants failed to notice that the photograph targets were of different genders in the second experiment, and yet there still was not a significant savings in the group match condition.

Possibly the most likely explanation for the limited results found in this research is that the savings effect for learning associations with same-group exemplars is simply too small to be captured by this methodology. The nonsignificant trends in experiment 2 are fully in line with

the research hypothesis: Exact match > group match > irrelevant > group mismatch. The savings effect for exposure to same-group exemplars may simply be much smaller than the effect for exposure to exact matches. The standard methodology, which was designed to detect the savings in relearning from exposure to exact matches, may be poorly suited to detect the savings in relearning from group matches. Researchers investigating the influence of group-level information on evaluations and judgments of individuals have typically found that its effect is relatively small when compared to the influence of more specific individuating information (Swim, Borgida, Maruyama, & Myers, 1989; Locksley, Hepburn, & Ortiz, 1982; Beckett & Park, 1995). It seems very possible that there might similarly be a large difference between the influence of group- and individual-level information on memory.

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