

## Nonconscious Biasing Effects of Single Instances on Subsequent Judgments

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The present research investigated information processing in situations where there is insufficient evidence to make a judgment and no possibility of avoiding a judgment. The research was inspired by the question answering model of Glucksberg and McCloskey (1981), which stated that, if it is important to find an answer to a question, then the failure of a preliminary memory search to find any relevant information leads to additional attempts, that may employ gradually looser criteria of relevance than that used originally. It was hypothesized that the criterion of relevance could finally become loose enough to include a memory representation of a single and not salient instance. The hypothesis was tested in 3 experiments. In Experiment 1 the experience of a single instance was provided to the subjects by means of subliminally exposed words, and the dependent measure was subjects' choice of "better fitting" words. In Experiments 2 and 3 the subjects were provided with single instances by means of a quasi-natural interaction with a person who was similar to 1 of 2 other persons the subjects were subsequently exposed to. The dependent measure was subjects' choice of one of those persons as more friendly, and the choice was made again under quasi-natural conditions. All 3 experiments confirmed the model and indicated that subjects based their judgments on the single instance they were exposed to.

How do people make decisions involving choice when there is no evidence supporting any of the possibilities they must choose among? The simplest answer, and the one consistent with everyday observations, is that in such circumstances their choice is random. When people do not see anything that has forced them to behave in a certain way, they seem to think that nothing has controlled their behavior.

No psychological research seems to contradict directly the possibility of such "random choice" situations. There is evidence, however, suggesting that in many instances a choice might be in fact much less random and more

determined than the choice maker would assume. The present article deals with this very issue.

Recently Glucksberg and McCloskey (1981) investigated how people come to decide that they do not have sufficient evidence for any of the possibilities they have to choose among. The model postulated that answering questions involves a two-stage process:

In the first stage a preliminary memory search is conducted to determine whether anything relevant for answering the question is known. If no relevant information is found, a rapid don't know decision is made. If, however, relevant facts are retrieved, these are examined in detail to determine whether they specify an answer to the question. If the retrieved facts permit an informed answer, such an answer is given. If the retrieved information proves to be insufficient, however, a slow don't know response is made. (p. 321)

In a series of studies, Glucksberg and McCloskey determined that consistent with their model, response latency was considerably longer when the stimulus material the subjects were exposed to prior to answering the questions contained any sort of information relevant to the question than when it contained no such relevant information. It was true even when that relevant information was

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confined to a statement that nothing relevant was known about the issue. For example, a response latency to the question as to whether it was true that "John has a chair" was longer when the subjects had learned that "John has a chair," or "John does not have a chair," and even when they had learned that "It is unknown whether John has a chair," than when they had not learned anything relevant to the relationship between John and a chair (i.e., when they had learned only about somebody else possessing a chair and about John possessing something else).

The authors did not, however, investigate the case in which a "don't know" decision was not possible; they hypothesized only that:

. . . when it is important to find the answer to a question, an initial failure of the retrieved facts to specify an answer may lead to one or more additional attempts to locate relevant information. These new attempts to find relevant information may simply employ a looser criterion for relevance than that used originally. (p. 323)

This hypothesis was supported in a series of unpublished studies<sup>1</sup> in which Glucksberg and McCloskey manipulated the degree of relevance (i.e., degree of overlapping between the sentences from learning phase and questions asked in the testing phase). It appeared that, consistent with the hypothesis of employing a gradually looser criterion of relevance, response latency to a question was a monotonic function of the degree of its relevance to the previous material (the less relevant the question, the longer the response latency).

The major question that arises at this point is, What is the limiting criterion for the relevance of a fact to make that fact capable of influencing a subject's answer? In other words, when does the process of searching for relevant facts terminate (providing the definite answer that absolutely nothing relevant is available and making room for truly random responses)? Theoretically, it might never even happen, because in making the criterion gradually looser, some single and at least slightly relevant fact would finally always be found. However, would a single instance,<sup>2</sup> similar in some respect, be enough?

Research on categorization indicates that people do recall single, specific items or instances and use them to classify novel items (Brooks, 1978; Elio & Anderson, 1981; Medin

& Schaffer, 1978). A number of social cognition theories suggest that in the absence of stronger support, people base their judgments on a single, previously encountered similar event or situation (Abelson, 1976; Nisbett & Ross, 1980; Schank & Abelson, 1977; Wyer & Carlston, 1979). There is also evidence indicating that people transform single social experiences (e.g., a single positive or negative feedback) into information about the importance or general desirability of trait-dimensions (Lewicki 1983, 1984, 1985).

In a series of studies, Read (1983, 1984) has demonstrated that if there is no better support for a judgment, people consciously decide to rely on single instances having even a small degree of similarity to a present situation. In these studies, subjects learned about a number of members of a primitive tribe. Some of them had performed a strange ritual, some of them had not. In the testing phase, subjects had to make predictions whether other members of the tribe (presented by means of short descriptions) would also perform the same ritual. Subjects clearly based their predictions on the similarity between the new individual and a certain, concrete individual who had been observed (in the learning phase) to perform the ritual. These experiments are a clear demonstration of categorical decisions ("Does that individual belong to the category of those who perform the ritual?"), based on single, concrete instances.

There is, however, a problem with these studies that makes the results hard to generalize—namely, the way of providing the subjects with an experience of a single instance was totally explicit, and it served as the only possible basis for the judgment they were subsequently asked to make publicly (not anonymously). Under such conditions, subjects' employment of the single instance in their subsequent judgment can be entirely due to demand characteristics or to similar

<sup>1</sup> S. Glucksberg, personal communication, Warsaw, Poland, June 8, 1984.

<sup>2</sup> Obviously, there are cases in which single instances are highly relevant, namely questions about a single, concrete fact (e.g., "Did you see Jim last night?"). Our reasoning, however, pertains to categorical decisions, and for such decisions a single instance is minimally relevant.

phenomena. For example, the effects could be due to subjects' motivation to show to the experimenter that they listened carefully to the stimulus material, or that they were able to discover in the stimulus material even such a nonsalient cue as the single instance indicating how to respond.<sup>3</sup>

One possible way to provide subjects with an experience of a single instance and not make the situation open to demand characteristics is to present the single instance by means of subliminal exposure. If a word is exposed briefly (e.g., 30 ms) and masked immediately by a pattern mask, it is inaccessible to a subject's conscious awareness. There is, however, convincing and replicated evidence indicating that those stimuli are processed and memorized by the subject (cf. Fowler, Wolford, Slade, & Tassinary, 1981; Marcel, 1983). This method of providing subjects with an experience of a single instance was employed in a recent series of experiments by Lewicki. The first of these studies (Lewicki, in press) was not designed to examine the influence of a single instance on subjects' judgments according to the subjects' final responses but instead to explore the nature of the memory process involved in such a hypothetical influence and to test the experimental paradigm. Therefore, it will be presented only briefly as an introduction to the next experiment, which investigated the judgments themselves.

In the learning phase subjects were subliminally exposed<sup>4</sup> to a set of adjective-noun pairs that could be considered single instances (e.g., *a big tree*). In the testing phase (separated by a 5-min distractor task), the subjects were asked questions that were either relevant (e.g., "Are trees small or big?") or irrelevant (e.g., "Are trees young or old?") to the single instances they were exposed to in the learning phase. The subliminally exposed sets of adjective-noun pairs were different in different experimental groups, so, the same questions that were relevant for one group were irrelevant for the other group. On the basis of the Glucksberg and McCloskey model (1981), it was hypothesized that if the memory representation of a single instance encountered in the learning phase was considered relevant to the question, response latency to that question should be longer (as compared to irrelevant

question), because the second stage of memory search would be involved, that is, the memory representation of that single instance would be "examined in detail to determine whether (. . .) [it] specifies an answer to the question" (p. 321).

It should be noted that although this experiment was not designed to verify Glucksberg and McCloskey's entire model (1981), it was related to their reasoning in two ways: First, it was based on a direct implication of the model, saying that existence of a memory trace that is relevant to a given question makes the response latency to that question longer. This implication provides a sensitive general method of testing whether a given memory trace exists and whether it is considered relevant to a given question.<sup>5</sup> The second relation of that experiment to Glucksberg and McCloskey's reasoning was that the experiment explored a possible consequence of their hypothesis concerning the process of making the criterion for relevance gradually looser (in the course of an unsuccessful memory search and the necessity of providing an informed response). The study tested whether a memory trace of a single instance (an adjective-noun pair) would be considered relevant to the categorical decision, and whether it would produce response time effects predicted by Glucksberg and McCloskey's model.

The results were consistent with expectations. Response latencies to the questions that were relevant to adjective-noun pairs (presented subliminally in the learning phase) were reliably longer than response latencies to irrelevant questions.

The most important theoretical implication of these results was that the experience of the

<sup>3</sup> There is one more series of studies on analogical reasoning reported recently (Gilovich, 1981) that is less open to demand characteristics. As Read (1983, 1984) pointed out, however, it seems that in these experiments subjects were relying on some kind of preexisting, stereotypic knowledge rather than on analogy to a concrete instance.

<sup>4</sup> The details of the particular method of presentation employed are described in context of Experiment 1, where exactly the same method of presentation was used.

<sup>5</sup> This implication is consistent with the spreading activation model of J. R. Anderson (1983) and has been empirically confirmed before (e.g., King & Anderson, 1976).

single instance ("a big tree") was represented in memory in a form that was considered (by the subsequent memory search processes) relevant to categorical decisions ("Are trees small or big?"). It is clearly implied by these data that there was an attempt made to read and evaluate in detail the representation of the single experience when it was relevant (longer reaction time), and that such an attempt was not made (or it was given up sooner) when the representation was irrelevant (shorter reaction time). It should also be noted that these results could not be attributed to some long lasting priming effects (or increased category accessibility effects, Higgins & King, 1981), nor to perceptual enhancement (Jacoby, 1983; Jacoby & Dallas, 1981), because these phenomena would result in shorter (instead of longer) response latencies for previously activated categories.

Although these data supported the expectancy that the process of making a criterion of relevance gradually looser (as hypothesized by Guckenberg and McCloskey), might finally go so far as to make an attempt to read (or examine in detail) a memory representation of a single instance, it is in no way implied by the data that the results of that observed reading or examining the memory representation of the single instance would influence the final response. It might be that examining the memory representation of the single instance would always lead to the conclusion that it is incapable of specifying any informed response. If such were the case, the experience of a single instance would not influence the categorical decision.

The specific design of the above experiment, however, did not allow examination of potential biasing effects of such a memory representation of a single instance on subsequent judgments. (This was because two answers in the testing questions did not have an equal probability of being chosen in non-experimental conditions; for example, more subjects chose "big tree" than "small tree.") The experiment that is to be reported now was designed to allow for the examination of such biasing effects.

### Experiment 1

#### Method

*Overview.* The method employed was basically similar to the above mentioned; however, not response latencies

but, rather the responses themselves were of interest here. Thus, on the basis of an extensive pilot study, the crucial questions (i.e., the ones presented in the set of test questions) were designed so that both possible answers were equally probable in the nonexperimental conditions, as far as stereotyping and reasoning were concerned. Two example questions are, "Is a tree old or big?" or "Is a word long or short?" For each question, half of the subjects had been subliminally exposed to the noun accompanied by one of the two adjectives, and the other half had been exposed to the other adjective. In such circumstances each question was, as a whole, equally relevant for the subjects in all conditions, and thus no response latency effects were expected. However, the two alternative adjectives were hypothesized to be not equally relevant, and the subjects' choice of one of them was expected to depend on condition.

Assume that a subject had no prior preferences for choosing either of the two adjectives as fitting the noun better and thus that a preliminary memory search for evidence capable of specifying the answer would fail to find sufficient support for either of the two possibilities. It was hypothesized that, if a "don't know" response was not available to the respondent, the criterion of relevance would be gradually loosened up to the point at which a single instance encountered recently would become sufficient to specify the answer. Although the specific process of loosening of relevance criteria (hypothesized by Glucksberg and McCloskey, 1981) was not examined in the experiment, the possible final consequence of that process was tested.

*Subjects.* Eighty undergraduates (men and women) from the University of Warsaw participated in the study for course credit.

*Procedure.* Subjects participated individually. Stimuli were presented on a 12-inch cathode-ray tube (CRT) under control of a computer that also registered subjects' responses and response times. The location of the chair was fixed, and when a subject sat straight in the chair the center of the CRT was about 55-cm distant from the subject's eyes. All words were in capital letters .7 cm high and they appeared as black on white; the level of illumination of the white background was kept constant and equal to 4.0 lx.

The first part of the experiment was aimed at making a subject familiar with reading from the CRT. Several instructions and questions were exposed on the CRT (such as whether a subject was comfortable in the chair, or whether the letters were sharp), and a subject had to choose his or her answer by pressing the left or the right button on a control box. The subjects were instructed to use the index finger of their dominant hand. The format of the subsequent questions also was explained, and a subject was told that he or she would be asked to choose the one out of two adjectives which, according to his or her "feelings, would fit better with the noun." The subjects were asked to decide as quickly, yet accurately, as possible. Then the exposure of the questions began.

A noun was centered 2 cm above the middle of the screen and the two adjectives were located on one line, 4 cm below the noun, at the same distance from the middle, and about 7 cm distant one from each other. A subject's response (i.e., pressing either the left or the right button) terminated exposure of the question. There were 2.0- to 3.7-s intervals between the presentations, during which the display was blank. Their lengths were randomly

generated but their sequence was the same for all subjects. Approximately in the middle of each interval an adjective-noun pair was subliminally exposed, and subjects could experience it as a very brief disturbance on the screen. Those stimuli were presented in the middle of the CRT for 30 ms and were immediately masked by a string of Xs, of the same length as the words, which remained on the screen for 50 ms.

A total of 24 questions was presented and 4 adjective-noun pairs were subliminally exposed. These were located after the 4th, 5th, 6th, and 7th questions. After all of the remaining questions, brief stimuli were also presented and masked in the same way, but they consisted of two strings of *A* and *B* letters simulating an adjective-noun pair. After the 18th question, there was an approximately 3-min distractor task designed to interfere with subjects' short-term memory. Several long questions, having different formats, appeared on the CRT (such as whether the subject was tired, or what was his or her estimate, in minutes, of the time the experiment had taken up to that moment). The last 4 questions, out of the remaining set of 6, were the testing questions, which corresponded to the manipulated 4 adjective-noun pairs.

*Stimulus material.* The crucial adjective-noun pairs were chosen based on a pilot study in which 98 undergraduates answered, "based on their feelings" 24 questions of the form "Is *x*, *y*, or *z*?", where *x* was a noun and *y* and *z* were adjectives that seemed to fit the noun equally well. Four questions, that provided closest to a 50-50 rate of response were chosen as the crucial ones for the experiment: "flower-pot [small/big]", "tree [old/big]", "word [long/short]", and "down [white/light]". For none of them was the deviation from the even distribution of responses higher than 5%. The remaining 20 questions served in the experiment as noncrucial questions.

The design and the order of questions was the same for all subjects, and the order of the subliminally presented nouns (in the adjective-noun pairs) was the same and corresponded to the order of the crucial questions. That is, each brief exposure was separated from its corresponding question by the same number of other questions (i.e., 14 questions plus the distractor questions). The experimental conditions were created by an arrangement of the adjectives accompanying the nouns in the subliminally exposed adjective-noun pairs. There were 16 possible arrangements (permutations), and 5 subjects were exposed to each of them. That way, half of the subjects were exposed to each of two adjectives relevant to a given noun; those halves, however, consisted of different subjects for each noun.

*Pilot study.* It seemed improbable that the subjects were able to consciously recognize the meaning of words exposed for as brief a time as 30 ms and immediately masked; such exposure was probably for most subjects even below the detection-level stimulus-onset asynchronies (i.e., below the threshold for determining whether a word or a blank was exposed, Marcel, 1983). An additional pilot study was conducted, however, to test for any potential idiosyncrasies of the apparatus employed that could make the stimuli easier to recognize.

Thirty undergraduates were tested with exactly the same procedure, except that they were told that during the intervals separating the exposures of the questions, adjective-noun pairs would be exposed very briefly and that the subjects' task was to recognize them. To avoid the potential effect of *setting the subjects for being unable*

*to recognize the words*, it was explained to them that the words were recognizable. They were also asked "to guess, in case of being uncertain." The subjects received no immediate feedback (from the experimenter) after their guesses.

None of the subjects responded accurately to any of the stimuli. For the vast majority of presentations the participants claimed that they had no idea what it was and thus, that they were unable to guess. It should be also noted that their guesses were about equally frequent in the cases when the real words were exposed and in the cases when the stimuli were in fact the strings of *A* and *B* letters.

## Results

Separate analyses performed for each of the four crucial questions revealed that for each of them the majority of subjects had chosen the adjective to which they had been subliminally exposed. The effect, however, was significant only for "flowerpot [small/big]",  $V^2(1, N = 80) = 6.79$ ,<sup>6</sup>  $p < .005$  and for "word [long/short]",  $V^2(1, N = 80) = 3.24$ ,  $p < .05$ . For the two remaining questions there were only tendencies in the predicted direction ( $.10 < p < .25$ ).

In order to estimate the overall effect of the manipulation, the number of responses consistent with the stimuli the subject was exposed to was computed for each subject. The possible range of this index was 0 to 4. The mean for all 80 subjects was 2.70, with a 99% confidence interval of 2.20 to 3.20. That mean was reliably higher than 2.00 (i.e., than the value predicted by  $H_0$ ),  $t(78) = 4.05$ ,  $p < .001$ , which indicated that the manipulation affected subjects' responses by making them consistent with the briefly exposed stimuli.

No response time effects of the manipulation were found, but they were not expected because all questions pertained to relevant data available from the exposure stage.

## Discussion

The results were consistent with expectations. Although the effect was not reliable for each of 4 items, it should be noted that for each of them the direction was consistent

<sup>6</sup>  $V^2$  is a  $\chi^2$  corrected for sample size as recently suggested by Kendall and Stuart (1979), and Rhoades and Overall (1982). All the  $V^2$  analyses reported in this article fit Case II, as discussed by Kendall and Stuart (1979).

with expectations and the overall effect was strong. Thus, these data indicated that a memory representation of a single and not salient instance was powerful enough to bias a perceiver's subsequent judgments in the absence of any better evidence relevant to the issue. Although this experiment did not examine the nature of the retrieval process described in the Glucksberg and McCloskey's model (1981), it confirmed the implication of their hypothesis concerning the loosening of relevance criteria.

An important advantage of the present procedure was that the effect obtained cannot be attributed to demand characteristics or similar phenomena, as might be possible in the case of a more explicit way of providing the subjects with "an experience of a single instance."

The question arises at this point as to what in particular a subject thought or felt while he or she was choosing the answer that was in fact biased by the nonconscious experience of the single instance. The informal postexperimental interviews suggested that the subjects thought that they had responded randomly (some of them even thought that "the task was crazy"). It seems that the respondents had no access to what actually influenced their responses and that the memory representation of the single instance operated on a level not accessible to their awareness. There might be very few nonconscious experiences based on subliminal exposures in real-life settings. It might be thought, on the other hand, that there are numerous such experiences, which are not salient, not well-remembered, and which do not operate entirely on the level of conscious reasoning. The stimuli employed in the above experiment could be thought to be laboratory analogues of such real-life experiences.

The particular way of providing subjects with an experience of a single instance raises the question of generality of the observed "one-case based judgment" phenomenon—namely, the specific adjective-noun pairs presented subliminally in the learning phase, referred to preexisting concepts (well-known words), so, the experience of encountering the single instance consisted in one more exposure to an already well-learned concept. The question arises as to whether the same

effect would be obtained if the single instance would be a completely novel experience.

This distinction seems important because the memory trace of a single instance encoded in the context of a well-learned concept may be different (e.g., better developed and more easily accessible) than the memory trace of a single completely novel instance. The latter one was employed in the next experiment, which was also aimed at testing the hypothesized operation of the one-case based judgment in a situation closer to real life than the one employed in Experiment 1.

## Experiment 2

Assume that a person has to choose 1 of 2 other persons as kinder or friendlier, when he or she has no other information concerning those 2 persons than how they look. (It seems to be a very common real-life situation, for example, when one has to choose one of several bystanders to ask for help). Various social stereotypes and prejudices exist that could guide such a choice. They are not always, however, relevant to the situation, or one might consciously decide not to follow them. What determines a person's choice then?

It might be hypothesized that a memory search for an answer induced by such a situation involves the above discussed process—namely, if the preliminary memory search fails to find any relevant information helpful in making the choice, additional attempts are made, and these employ looser criterion for relevance than that used originally. The criterion is made looser and looser in subsequent attempts, up to the point at which the relevant information is found.<sup>7</sup>

According to this reasoning, memory representations of persons memorized by the choice maker would be scanned in order to find at least one containing information about friendliness and information about appearance relevant somehow to the appearance of 1 of the 2 persons. Finally, a relevant representation may probably always be found, although the criterion of relevance employed

<sup>7</sup> In the above example the criterion of relevance would pertain to being kind and to being physically similar to one of 2 persons one had to choose between.

may be so loose that in no way would one consciously recognize it as a sufficient rationale for the choice.

On the basis of that reasoning, the hypothesis for the next two experiments was that a subject's single experience (relevant to friendliness) with a person even very slightly similar (physically) to one of two choice persons, might affect which of them the subject would choose as friendlier, if no stronger support for his or her choice existed. For example, if a choice maker had at some time had a single, nice experience with a person who resembled in some respect one of the 2 persons he or she had to choose between, this person would have a higher chance to be chosen. That might be the case even if the experience could not provide objectively sufficient support for any choice in that new situation and when the subject thought that his or her choice was completely random.

### Method

*Overview.* This experiment was initially designed only as a pilot study aimed at testing the choice of models for Experiment 3. It has provided, however, strong evidence and, therefore, will be presented in detail.

Participants in a study unrelated to the present problem served as subjects. In this unrelated study each subject took part in a 30-min session in which his or her response times to various questions pertaining to relations between traits were measured (the study involved no experimental manipulation and subjects' activities were almost exactly like those in the experiment by Ebbesen and Allen, 1979).<sup>8</sup> The experimenter (an undergraduate female) was very warm and friendly, and her behavior toward the subjects during the 30-min session was hypothesized to provide them with an experience of meeting a person who had a particular appearance and who was kind. Thus it was expected that if, after having such an experience, subjects had to choose one of two unknown persons as more kind (based only on their appearance), they would be more likely to choose a person who was even slightly similar to the experimenter than the one less similar.

Subjects were shown two photos of young women and asked to choose the one who, according to their "feelings," was kinder and friendlier. The young women displayed in the photos differed in their similarity to the experimenter. Subjects were randomly assigned to two conditions. Half of them were shown the photos and asked for their choice prior to their 30-min contact with the experimenter, and the other half were shown the photos and asked for their choice at the end of the session. It was expected that the latter condition would favor choosing the stimulus person more similar to the experimenter.

*Subjects.* Eighty undergraduates (40 men and 40 women) from the University of Warsaw agreed to participate in the study. None of the subjects were psychology

majors. Less than 3% of the people being asked to participate refused for any of a variety of reasons.

*Stimulus persons.* The three stimulus persons (i.e., the experimenter and the two models displayed in the photos) were selected from a pool of 20 participants in a seminar in experimental social psychology. Two of them (the experimenter and one of the models) wore glasses, had short hair, and in the opinion of the group had "a similar type of appearance," as compared with the remaining model, who wore no glasses, had long hair, and in the opinion of the group had "a different type of appearance" (see Figure 1). An additional pilot study with 20 subjects (undergraduates), who did not know the 3 stimulus persons, confirmed these opinions. In this study participants were presented with the 3 photos of the stimulus persons (see Figure 1) and asked to point to the one who "seemed to you to be different from the remaining two." All 20 subjects pointed out the stimulus person with long hair and without glasses (Figure 1, panel C).

*Procedure.* Half of the subjects were presented with the photos (9 × 12 cm, see Figure 1, panels B and C) and asked to make their choice, just after entering the lab room. It was explained that collecting these opinions was aimed at choosing one of 2 candidates to be hired as an experimenter in a large research program that required an especially kind and friendly looking experimenter. The subjects made their choices anonymously (i.e., the experimenter did not know them), on a small sheet of paper: They either tore it slightly or not,<sup>9</sup> and they put it into a secret ballot box (there was a separate box for each condition). These conditions for making the choice were expected to free the subjects from the influence of social desirability and similar phenomena (otherwise some subjects could choose the model similar to the experimenter in order to please her).

The rationale presented to the subjects for asking them for their choice seemed to make real sense to the subjects and to be believable. Thus it was expected to lead them to think that asking for their choice was not a psychological test and, moreover, that it provided a means to help one of the candidates. It seemed reasonable to expect that subjects would want to help the one they liked more, that is, the one they actually thought to be more kind and friendly.

The remaining half of the subjects were asked for their choice in the same way but at the end of the 30-min session.

The interaction with the experimenter involved in the session was not very long, because a subject spent most of the time reading stimulus questions from a screen and responding by means of pressing buttons on a control box. The session did involve, however, the presentation of verbal instructions by the experimenter, which took approximately 3 min at the beginning and 2 min in the middle of the session, and answering any possible questions the subjects had (average 2.8 per subject). The subjects

<sup>8</sup> This study is presented in Lewicki, in press.

<sup>9</sup> For half of the subjects from each experimental group, tearing the ballot meant choosing the photo B; for the remaining half it meant choosing the photo C (see Figure 1).

could observe the experimenter during the presentation of the instructions, while asking questions, and during 6 breaks in their responding of approximately 30 s each. The experimenter tried to be very kind and friendly and to make each subject as comfortable with the testing situation as possible.

### Results and Discussion

Of the 40 subjects who were presented with the photos and asked for their choice before the session, 24 chose the stimulus person similar to the experimenter, as compared to 34 subjects in the other group of 40,  $V^2(1, N = 80) = 6.19, p < .02$ . This indicated that the experience with a single person who was kind and friendly affected the tendency to consider the other who looked roughly similar to also be kind and friendly.

No data concerning subjects' conscious motivations while making their choices could be collected in the present experiment. Thus, consciously controlled reliance on the experience with the single, kind and friendly experimenter cannot be ruled out. It might be thought, however, that consciously supporting such a choice on the basis of a single experience was not very probable because it seems objectively irrational.

Even if, however, the subjects, or some of them, consciously based their judgments on that single instance, their decision could be considered natural and representative for their real-life behavior, because it was anonymous (secret ballot) and made real sense to them.

The question arises at this point as to what extent the "mere exposure" effect (Harrison, 1977) could contribute to the results observed. The subjects chose a photo of a person that was similar to the one they had had a good experience with. It might be argued, however, that what they actually did was mostly choosing a person they found more familiar, regardless of the specific experience they had had with the similar experimenter. Although the "mere exposure" effect pertains to preference for the very stimulus that the subject is familiar with and not to a similar stimulus (and model B in Experiment 2 was not that similar to the experimenter, to make the subject think that it was her photo), it was shown in recent experiments by Gordon and Holyoak (1983) that the mere exposure effect may generalize to similar, new stimuli.

Another possible alternative explanation of these results is "priming or category accessibility" effect (Higgins & King, 1981; Srull & Wyer, 1979, 1980). This explanation seems to be more relevant to the results of Experiment 1 because, in that study, the manipulated categories were quite simple. It might be argued, however, that also in Experiment 2 the interaction with the experimenter had activated some complex category that was still accessible at the point of gathering the choice data.

In order to check for these possibilities and to test whether the specificity of a single

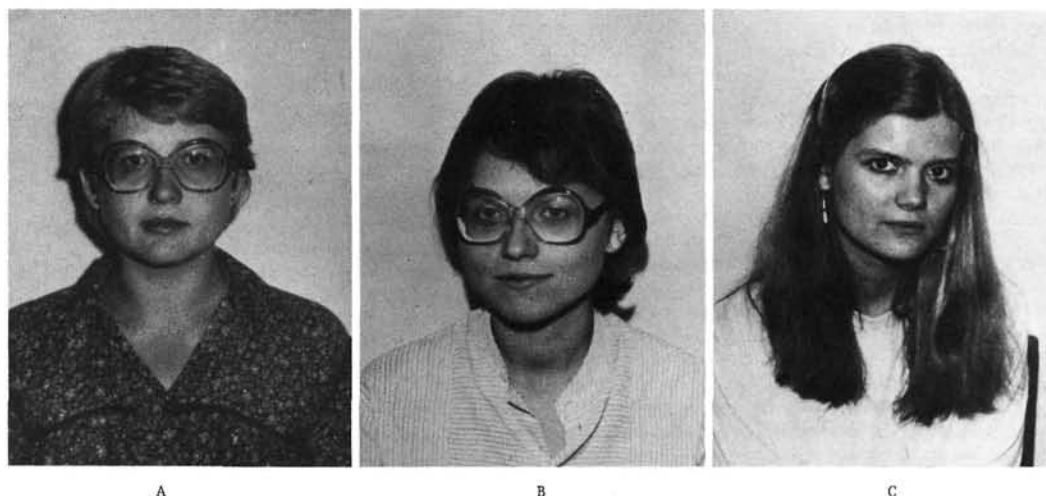


Figure 1. Stimulus persons (Experiment 2 and Experiment 3).



experience can influence subsequent judgments, the single experience should be negative and as such it should produce the opposite results to the ones predicted by priming effects or the mere exposure effect. That reasoning suggested the design of the next experiment in which the subjects had to make a real-life decision of choosing (i.e., approaching) one of 2 persons as likely to be more kind and friendly, on the basis of dissimilarity of that person to the one they met previously.

### Experiment 3

#### Method

*Overview.* In the present experiment, subjects were asked to enter a lab room and to approach the 1 of 2 experimenters conducting the experiment there who was currently free. The experimenters were the 2 stimulus persons displayed in the photos employed in Experiment 2 (see Figure 1, panels B and C). They sat at two tables equally distant from the door and both of them were free. Thus, a subject faced a real-life situation of choosing which one out of 2 persons to approach. It was expected, based on common intuition, that subjects would approach the one who looked kinder and friendlier to them.

Prior to this situation of choice, the subjects had a brief interaction with the third experimenter who was roughly similar to one of the models (it was the person who served as experimenter in Experiment 2, see Figure 1, panel A). The interaction had either contained a single unpleasant behavior on the part of this first experimenter or it had not. It was hypothesized that the subjects from the condition involving the unpleasant detail of the first experimenter's behavior would subsequently be more likely to approach the experimenter who was less similar to the first one.

*Subjects.* Forty High school students (40) participated in this study; they were aged 18–19, and there was an equal number of men and women. They were recruited in a way designed to minimize the probability that the subjects knew each other, because it was very important for the present study that the subjects did not know the procedure before entering the lab room. Subjects were randomly assigned to two experimental conditions, separately by sex.

After completing this study with 40 students from a regular high school, the experiment was exactly replicated with 30 students (men, 18–19 years old) from a high school for mechanics.

*Procedure.* The experiment occupied two rooms, which were not adjacent but were located on the same floor. In one of those rooms, a subject met the first experimenter (Figure 1, panel A) and was briefly interviewed. The interview included 3 questions: about their name, about the number of the classroom in which the subject was recruited, and then the question involving the manipulation: "What is your birth order?" Birth order is not a common word, so as expected, none of the subjects felt he or she understood it completely—

each of them asked "Pardon me?", "What do you mean?", "What does it mean 'my birth order?'", or the like. Then, in one condition (which will be referred to as the negative condition) the experimenter replied in a slightly irritated way "Don't you really know the meaning of 'birth order'?" The subject responded that he or she did not know, or was not sure, and then the experimenter explained the meaning of birth order and received the subject's response to the question about birth order. In the neutral condition, the experimenter explained the meaning of birth order just after the subject's first question. The experimenter's response (either neutral or unkind) to the subject's question produced the only difference between the two conditions.<sup>10</sup>

After this short interview, each subject received from the experimenter a small piece of paper with a printed number and was instructed as to the location of the other room in which "the main part of the experiment will take place." The subject was asked to go then to this different room and to "turn in the number to whichever of the two experimenters conducting the experiment there is currently free." The numbers were introduced for two purposes. First, subjects could otherwise suspect that the data collected in the interview had no purpose, because it could not be identified with the subject's performance in the main experiment. The second and more important purpose was to prevent a situation in which the subject enters the room and waits to be asked by one of the experimenters; with the numbers, the first move (i.e., turning in the number) belonged clearly to the subject. Thus, after entering the room the subject understood that he or she had to make an immediate choice.

The second room was approximately 4 × 5 m, and the entrance was located in the middle of the shorter side, opposite to a window (in this sense the room was symmetrical). The two experimenters (Figure 1, panels B and C) sat at small tables 3.5 m distant from the entrance facing the entrance. Each of them was located in half of the cases at the left table and in the other half at the right one. The experimenters never looked at the subject at the moment of his or her entering the room and making the choice. They were writing something in their files and both of them looked busy.

To avoid any possible nonverbal influence from the two experimenters on which one of them would be chosen, they were blind to the sequence of conditions. That is, they never knew the condition a given subject belonged to.

After making their choice the subjects were asked to complete the ostensible main test (choosing the most interesting out of a series of sets of irregular polygons), which took 3–4 min. At the end, each subject was asked to fill out, completely anonymously, a questionnaire concerning his or her "feelings during the experiment."

<sup>10</sup> Actually there was one difference more. Namely, in the negative condition the entire interaction was longer (than in the neutral condition) by the length of the experimenter's unpleasant question and subject's response. As noted earlier, however, if the mere exposure effect was involved in the present situation, it should produce results opposite to those hypothesized.

The experimenter explained "that it is not an integral part of the present experiment, but it helps us to better understand our subjects in general and to make them comfortable during experiments." The questionnaire contained 24 very detailed questions requiring rank ordering numerous possibilities pertaining to all possible phases (and details) of the experiment and designed to make the question about the motivation of the subjects' crucial choice less salient. This particular question was located close to the end of the questionnaire and it read

If your answer to the above [i.e., to the question as to whether any of the experimenters was busy] was *no*, on what did you base your choice of which of them to approach? A. One of them looked slightly more friendly. B. One of them was slightly similar to a certain person I know and I like. C. One of them was slightly similar to a certain person I know and I dislike. D. I usually choose left (or right) in cases like that. E. My choice was completely random. F. One of them was slightly similar to the first experimenter, whom I liked. G. One of them was slightly similar to the first experimenter, whom I disliked. H. One of the experimenters looked at me when I entered the room. I. Other.

One more question was of interest here—namely, subjects rated on a 6-point scale how well they liked the first experimenter (*not friendly* 1 2 3 4 5 6 *friendly*). The subjects then put their filled out questionnaires into a secret ballot-box.

### Results

Frequencies obtained in the first study (with 40 male and female participants) conformed to the predictions. Nine subjects out of 20 in the neutral condition, and 16 subjects out of 20 in the negative condition, approached the experimenter who was dissimilar to the first experimenter (see Figure 1, panel C),  $V^2(1, N = 40) = 5.09, p < .05$ . This result was replicated with the 30 male students from a different high school. In this study 6 subjects out of 15 in the neutral condition, and 12 subjects out of 15 in the negative condition, approached the experimenter who was dissimilar to the first experimenter,  $V^2(1, N = 30) = 4.83, p < .05$ . The aggregated proportions of subjects choosing the dissimilar experimenter in the two studies are 15/35 (42.9%) in the neutral condition, and 28/35 (80.0%) in the negative condition,  $V^2(1, N = 70) = 10.04, p < .001$ .

Mean ranks assigned by the subjects in the questionnaire to each of the listed items associated with the crucial question (i.e., pertaining to the perceived rationale for choosing one of the two experimenters) were computed

separately in each of the two conditions and in each of the four subgroups that is,  $2 \times 2$  (Conditions  $\times$  Possible Choices Made).  $T$  tests revealed no reliable differences. Almost all subjects assigned first rank to the item "My choice was completely random." Surprisingly, however, no systematic difference was revealed between the neutral and negative conditions as far as rating the friendliness of the first experimenter was concerned ( $M = 5.15$  and  $5.19$ , respectively),  $t(58) < 1$ .

### Discussion

The subjects' behavior observed in the above study (and consistently replicated), indicates that such a single instance as one detail of an interaction is capable of influencing one's subsequent behavior. One unfriendly gesture on the part of the first experimenter was capable of producing a tendency to avoid people even roughly similar to her physically. These results cannot be attributed to priming or mere exposure effects.

The surprising lack of difference in subjects' estimated friendliness of the first experimenter could not provide conclusive evidence, because the scale might not be sensitive enough to capture the effect. It suggests, however, that even if such a difference in fact existed, consciously considering the first experimenter as not friendly was neither strong nor well-remembered at the time of questioning the subjects, because due to anonymity of the questionnaire, subjects had no reason to hide their feelings.

The subjects reported that they did not recognize what actually determined their choice (i.e., they thought their choice was completely random). It seems probable that this was in fact the case. The dependent measure employed in this experiment was natural in that it seemed highly improbable that the subjects thought, at the brief moment of deciding which experimenter they should better approach, that their choice was of any importance to the entire study. It was probably not considered by the subjects as a decision very important to them, and they probably did not pay much attention to their choice. They more likely were focused on the nature of the expected tests, which they knew

nothing about, than on the person of the experimenter.

Assume, however, that some subjects paid much attention to this choice and that they consciously employed their experience with the first experimenter (which was not salient, as the questionnaire suggests). It seems that even under such improbable circumstances their decision to base their choice on the single instance can be considered representative of their real-life reasoning. Thus, it is of some value for our main hypothesis, because assuming that the subjects did not discover the nature of the experiment (which may be well-assumed, especially taking into account that the subjects did not know each other and that they had no possibility to communicate), they could not have thought that their decision was of any interest for the experimenters and that it was anything but their own business.

### Conclusions

The present line of experiments provided consistent evidence indicating that in a case in which better support for a judgment is lacking, the memory representation of even a single instance relevant in some respect to the present situation is capable of influencing the final decision. As opposed to the previous research on judgments based on single instances, the effects obtained could not be explained by demand characteristics or social desirability factors. Additionally, Experiments 2 and 3 used more naturalistic stimuli in more naturalistic settings than was the case with previous research, and they expand the demonstration of the phenomenon to the domain of evaluation of others and behavioral choices.

On a more general level, the data suggest that there may be less randomness in human behavior than has been implicitly assumed both in psychology and in common stereotypes, and that many instances of human everyday behavior, usually considered to be random, might have their straightforward justification in some theoretically predictable, although hidden cognitive processes.

The question arises at this point as to the particular form of the memory representation of such a single instance that was found to

be capable of influencing subsequent behavior. Is it represented in memory in the form of an exemplar (Walker, 1975) or in the form of some abstract set of features (Smith, 1978)? Thus, is the cognitive process leading to its influence on the final decision a "rule abstraction mechanism" or an "analogy (similarity to instances) mechanism" (Elio & Anderson, 1981, p. 416)? This problem has to remain open at this point, "since this view [i.e., exemplar model of categorization processes] is quite new and has not been extensively developed" (Smith & Medin, 1981, p. 141).<sup>11</sup> It is worthwhile, however, to note that even if a single instance was memorized not only in some episodic form but also in parallel in some abstract form (e.g., in the form of information about the cooccurrence of a set of features found in a given episode) the results obtained demonstrated that the representation of a single exemplar influenced a categorical decision. In Experiments 2 and 3 that categorical decision pertained to whether the person who looked in a certain way belonged to a category of friendly people. Thus it may be concluded that the present results provide additional support for "what is rapidly becoming a substantial body of evidence for the use of exemplars in categorical decisions" (Smith & Medin, 1981, p. 144).

The present experiments merely demonstrated the existence of the hypothesized influence of a single instance on categorical decisions. It seems worthwhile to continue investigating that problem—to replicate the present findings and to extend them by employing various stimulus materials and mediating variables. The importance and generality of the mechanism of (either nonconscious or controlled) reasoning based on a single exemplar may probably go far beyond the case of real-life situations of apparently random choice. Based on the research on the role of exemplars in categorical decisions (Smith & Medin, 1981) and on the present findings, it may be hypothesized that employing cognitive representations of single instances is one of the important basic elements

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<sup>11</sup> Some empirical evidence relevant to this issue can be found in Lewicki (in press, chap. 7).

(or functional units) of human information processing, which is involved in various stages of both generating concrete judgments and acquiring categorical information.

### References

- Abelson, R. P. (1976). Script processing in attitude formation and decision-making. In J. S. Carroll & J. W. Payne (Eds.), *Cognition and social behavior* (pp. 33-45). Hillsdale, NJ: Erlbaum.
- Anderson, J. R. (1983). Retrieval of information from long-term memory. *Science*, 220, 25-30.
- Brooks, L. (1978). Nonanalytic concept formation and memory for instances. In E. Rosch & B. B. Lloyd (Eds.), *Cognition and categorization* (pp. 169-211). Hillsdale, NJ: Erlbaum.
- Ebbesen, E. B., & Allen, R. B. (1979). Cognitive processes in implicit personality trait inferences. *Journal of Personality and Social Psychology*, 37, 471-488.
- Elio, R., & Anderson, J. E. (1981). The effects of category generalizations and instance similarity on schema abstraction. *Journal of Experimental Psychology: Human Learning and Memory*, 7, 397-417.
- Fowler, C. A., Wolford, G., Slade, R., & Tassinari, L. (1981). Lexical access with and without awareness. *Journal of Experimental Psychology: General*, 110, 341-362.
- Gilovich, T. (1981). Seeing the past in the present: The effect of associations to familiar events on judgments and decisions. *Journal of Personality and Social Psychology*, 40, 797-808.
- Glucksberg, S., & McCloskey, M. (1981). Decisions about ignorance: Knowing that you don't know. *Journal of Experimental Psychology: Human Learning and Memory*, 7, 311-325.
- Gordon, P. C., & Holyoak, K. J. (1983). Implicit learning and generalization of the "mere exposure" effect. *Journal of Personality and Social Psychology*, 45, 492-500.
- Harrison, A. A. (1977). Mere exposure. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 10, pp. 39-83). New York: Academic Press.
- Higgins, E. T., & King, G. A. (1981). Accessibility of social constructs: Information processing consequences of individual and contextual variability. In N. Cantor & J. Kihlstrom (Eds.), *Personality, cognition and social interaction* (pp. 69-121). Hillsdale, NJ: Erlbaum.
- Jacoby, L. L. (1983). Perceptual enhancement: Persistent effects of an experience. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 9, 21-38.
- Jacoby, L. L., & Dallas, M. (1981). On the relationship between autobiographical memory and perceptual learning. *Journal of Experimental Psychology: General*, 110, 306-340.
- Kendall, M., & Stuart, A. (1979). *The advanced theory of statistics* (Vol. 2). New York: Hafner.
- King, D. R. W., & Anderson, J. R. (1976). Long-term memory search: An intersecting activation process. *Journal of Verbal Learning and Verbal Behavior*, 15, 587-605.
- Lewicki, P. (1983). Self-image bias in person perception. *Journal of Personality and Social Psychology*, 45, 384-393.
- Lewicki, P. (1984). Self-schema and social information processing. *Journal of Personality and Social Psychology*, 47, 1177-1190.
- Lewicki, P. (1985). *Processing information about covariations that cannot be articulated*. Manuscript submitted for publication.
- Lewicki, P. (in press). *Nonconscious social information processing*. New York: Academic Press.
- Marcel, A. J. (1983). Conscious and unconscious perception: Experiments on visual masking and word recognition. *Cognitive Psychology*, 15, 197-237.
- Medin, D. L., & Schaffer, M. M. (1978). A context theory of classification learning. *Psychological Review*, 85, 207-238.
- Nisbett, R. E., & Ross, L. (1980). *Human inference: Strategies and shortcomings of social judgment*. Englewood Cliffs, NJ: Prentice-Hall.
- Read, S. J. (1983). Once is enough: Causal reasoning from a single instance. *Journal of Personality and Social Psychology*, 45, 323-334.
- Read, S. J. (1984). Analogical reasoning in social judgment: The importance of causal theories. *Journal of Personality and Social Psychology*, 46, 14-25.
- Rhoades, H. M., & Overall, J. E. (1982). A sample size correction for Pearson Chi-square in 2 x 2 contingency tables. *Psychological Bulletin*, 91, 418-423.
- Schank, R., & Abelson, R. P. (1977). *Scripts, plans, goals and understanding*. Hillsdale, NJ: Erlbaum.
- Smith, E. E. (1978). Theories of semantic memory. In W. K. Estes (Ed.), *Handbook of learning and cognitive processes* (Vol. 6, pp. 1-56). Hillsdale, NJ: Erlbaum.
- Smith, E. E., & Medin, D. L. (1981). *Categories and concepts*. Cambridge, MA: Harvard University Press.
- Srull, T. K., & Wyer, R. S., Jr. (1979). The role of category accessibility in the interpretation of information about persons: Some determinants and implications. *Journal of Personality and Social Psychology*, 37, 1660-1672.
- Srull, T. K., & Wyer, R. S., Jr. (1980). Category accessibility and social perception: Some implications for the study of person memory and interpersonal judgments. *Journal of Personality and Social Psychology*, 38, 841-856.
- Walker, J. H. (1975). Real-world variability, reasonableness judgments, and memory representations for concepts. *Journal of Verbal Learning and Verbal Behavior*, 14, 241-252.
- Wyer, R. S., & Carlston, D. E. (1979). *Social cognition, inference, and attribution*. Hillsdale, NJ: Erlbaum.

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