

On-Line and Memory-Based Aspects of Individual and Group Target Judgments

Allen R. McConnell, Steven J. Sherman, and David L. Hamilton

Ss were given instruction sets to induce either on-line or memory-based processing while reading behavioral statements about individual and group targets. Impression-set instructions induced on-line judgments, and comprehensibility-set (comp) instructions induced memory-based judgments regardless of target type. More important, with nondirective instructions (memory set), natural differences in processing information about individuals and groups were observed, with more on-line judgments for individuals. As expected, illusory correlations between minority targets and infrequent behaviors (a memory-based product) emerged with comp instructions (which induced memory-based judgments for both target types) and in the memory-set condition for group targets only. These data provide insights into the differences in impression formation for groups and individuals and furnish direct evidence of the processes responsible for illusory correlations.

One of the major missions of social psychology is to understand how perceivers process information and form judgments about social entities. It is interesting to note, however, that people do not necessarily process information about all social entities in the same manner. For example, it has been shown that people draw different types of attributions when processing information about the self and others (Jones & Nisbett, 1971). In this article we focus on another less-researched distinction where processing may vary on the basis of the type of target (groups vs. individuals).

One of the consistent findings in the person memory literature is that recall of information about individuals is different from the recall of identical information that is applied to groups (Lichtenstein & Srull, 1987; Srull, 1981; Srull, Lichtenstein, & Rothbart, 1985). For example, relative to groups, people recall more information about individuals and, more specifically, more information that is inconsistent with our initial expectancies (for a review, see Srull & Wyer, 1989). Although these differences in memory for individual and group behaviors are well documented in the literature, less is known about how the processes associated with these recall differences influence judgments about individual and group targets. The current study attempts to explore these relations.

Hamilton (1991) proposed that one difference in judgments

of individuals and groups is whether those judgments are on-line or memory-based (Hastie & Park, 1986). When people engage in on-line processing, they form their impression about a target at the time they initially process and encode target-relevant behaviors. Hamilton suggested that expectations of coherence in individual targets (relative to group targets) motivate one to process information on-line in an effort to develop a stable and consistent impression of the person. Such a stable and coherent picture enhances predictability and control.

Thus, if a judgment of the target individual is called for at a later time, a preprocessed impression is available, and perceivers need not rely on a thorough memory search to produce their judgments. Because perceivers are actively integrating target-relevant information, they attempt to reconcile inconsistencies in the target's actions, leading to more associative linkages in memory (Hastie & Park, 1986; Srull & Wyer, 1989). Thus, Hamilton's proposal that perceivers form on-line judgments about individual targets corresponds well with the findings of good recall for individual targets (Lichtenstein & Srull, 1987; Srull et al., 1985).

Other processing outcomes are associated with on-line impressions as well. For example, a primacy effect for recall emerges because early behavioral examples are especially important in forming an impression of the target (Srull & Wyer, 1989). In addition, for impressions formed on-line, memory and judgment will not necessarily be correlated. Because on-line judgments are produced prior to request, they will not be based on memory that is available at the time of judgment (Hastie & Park, 1986; Lichtenstein & Srull, 1987).

On the other hand, Hamilton (1991) proposed that judgments of group targets are more likely to be memory-based (Hastie & Park, 1986). In this case, perceivers do not attempt to form an impression of the target group or reconcile inconsistent behaviors during initial information processing. Rather, they

Allen R. McConnell and Steven J. Sherman, Department of Psychology, Indiana University; David L. Hamilton, Department of Psychology, University of California, Santa Barbara.

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Correspondence concerning this article should be addressed to Steven J. Sherman, Department of Psychology, Indiana University, Bloomington, Indiana 47405.

form a global impression of a group only when they are asked to, and this impression will be based on whatever information is available at the time of judgment. Expectation of target coherence, again, is the main mechanism responsible for this outcome. Individual members of a nondescript group are not expected to behave in consistent ways. For example, some members of a group may be quiet and sensitive, whereas others are loud and boorish. Because of this expectation of variability, perceivers will be less motivated to form an integrated impression of group targets. Moreover, integrating information about a group is likely to be far more complex than is forming an impression of a single individual. In the case of a group, information at both the individual member level and the group level must be considered. For group level information, then, the cognitive resources necessary for thorough on-line information integration may not be available. Thus, both motivational and ability factors render on-line processing less likely for groups than for individuals.

The absence of on-line processing should lead to poorer memory for group targets. Thus, Hamilton's (1991) hypothesis is consistent with findings showing poor overall memory for information about noncohesive groups, indicative of memory-based processing (Hastie & Park, 1986; Lichtenstein & Srull, 1987; Srull et al., 1985). Memory-based impressions are likely to demonstrate other characteristics as well. First, as the name implies, memory-based judgments depend on memory for the relevant information at the time of request. Thus, for memory-based impressions, judgment and memory reports should be correlated, unlike on-line judgments (Hastie & Park, 1986; Lichtenstein & Srull, 1987; Sherman, Zehner, Johnson, & Hirt, 1983). Second, memory-based judgments should produce recency effects for recall because recently encountered behaviors will be the most available items when interitem linkages are not formed during encoding (Lichtenstein & Srull, 1987). Again, this effect is contrary to the results of on-line judgments.

Although memory reports are consistent with Hamilton's (1991) thesis, the implications of these processes for target judgments are less clear. Typically, person memory studies collect only recall measures and do not explore judgments concerning the targets (see Hastie & Park, 1986; Lichtenstein & Srull, 1987, for exceptions). Thus, the relationships among type of target encountered, information-processing mechanism invoked, memory for information, and judgment outcome remain unknown.

One area in the literature where social target judgment outcomes are a primary focus is the illusory correlation paradigm (for reviews see Hamilton & Sherman, 1989; Mullen & Johnson, 1990). In typical illusory correlation studies, subjects read behavioral statements about two groups. Both groups engage in the same proportion of desirable-to-undesirable behaviors (usually 2 to 1), but more information is presented about the majority group than about the minority group. Because of the equal ratios, group membership should not be diagnostic of likability for the groups. However, subjects report liking the majority group more than the minority group.

The prevailing explanation for this finding has been that infrequent information categories are salient, and the distinctiveness (on the basis of infrequency) of minority groups and of

relatively infrequent behaviors (negative) leads to enhanced encoding of these items. Then, at the time of judgment (presumably a memory-based judgment for group targets), these well-encoded behaviors are highly accessible and lead to overestimations of the number of undesirable behaviors performed by members of the minority group.

In support of this process explanation, Stroessner, Hamilton, and Mackie (1992) found that subjects spend more time processing infrequent minority group behaviors than other, more frequently presented behavior categories. This finding suggests that these infrequent behaviors are encoded more extensively. Also, Johnson and Mullen (1994) found that on a target assignment task, subjects respond more quickly to infrequent minority group behaviors than to other behaviors, especially when they make correct responses. This result indicates that the distinctive items are highly accessible at the time of judgment.

In contrast with these findings for group targets, Sanbonmatsu, Sherman, and Hamilton (1987) found that, with individual targets, the direction of the evaluative bias shifts and a different form of illusory correlation is observed. Specifically, subjects report liking the minority individual more than the majority individual. In accounting for these findings, Sanbonmatsu et al. proposed that the on-line nature of judgments for individual targets leads to liking the minority individual more than the majority individual because attention is focused on this minority person (subjects were instructed to attend to the minority person in particular), and thus subjects become especially aware during the presentation of information that the minority person engages in more desirable than undesirable behaviors. Sanbonmatsu et al., however, did not collect processing data (e.g., free recall, target assignment latencies, and encoding latencies) that would provide direct support for their supposition concerning the different outcomes for group and individual targets.

In another study, Pryor (1986) found that providing impression-set instructions for processing information about group targets in the illusory correlation paradigm eliminated the bias favoring the majority target, but no reversal was observed in the bias between the majority and minority groups. This attenuation of the illusory correlation was presumed to be due to the impression-set instructions inducing on-line processing of the target groups. Thus, on-line processing in the illusory correlation paradigm can eliminate the bias against the minority target (Pryor, 1986) and perhaps even lead to a reversal of illusory correlation bias (Sanbonmatsu et al., 1987).

In the current study, we tested Hamilton's (1991) hypothesis that group and individual targets invoke different information-processing mechanisms. We examined this hypothesis using the illusory correlation paradigm. It was predicted that when subjects process information in a memory-based fashion, there would be an observable bias in favor of the majority target over the minority target. However, when subjects process information in an on-line manner, we should observe either the absence of an evaluative bias (Pryor, 1986) or a preference for the minority target (Sanbonmatsu et al., 1987). Most important, we collect several processing measures that can provide direct evidence for the processes that are responsible for the different judgment outcomes for individual and group targets.

Although there are likely to be natural differences in the processing of individual and group targets, as described earlier, it is also true that these differences are not inevitable. That is, there will be cases when judgments about individuals are memory-based and judgments about groups are formed on-line. For example, if expectations of coherence and consistency are established for a group, on-line processing will be engaged. If expectations of inconsistency and unpredictability are set up for an individual target, on-line processing will not be engaged, and subsequent judgments of that individual will be made in a memory-based fashion.

In addition, different processing objectives can induce either on-line or memory-based judgments, regardless of whether the target is an individual or a group. One way to manipulate subjects' processing objectives is through different instruction sets. Previous person memory studies have used processing instructions to induce either on-line or memory-based judgments. Instructions that ask subjects to form a detailed and integrated impression of a target lead to processing the relevant information in an on-line fashion (Hastie & Park, 1986; Lichtenstein & Srull, 1987). Instructions that ask subjects to judge the grammaticality or some behaviorally unrelated dimension of sentences about a target prevent forming on-line inferences, and therefore subsequent judgments are made in a memory-based manner.

Three kinds of instruction sets have been used to achieve different information-processing objectives. Impression-set (imp-set) instructions (e.g., "form a coherent impression of what the target would be like"; Lichtenstein & Srull, 1987, p. 103) have been used to focus subjects on forming a coherent, on-line impression of social targets. Comprehensibility-set (comp-set) instructions (e.g., "judge how coherently and grammatically the statements were written"; Lichtenstein & Srull, 1987, p. 103) have been used to prevent perceivers from integrating behaviors about social targets on-line into a coherent impression—thereby forcing them to produce memory-based judgments. Finally, memory-set (mem-set) instructions (e.g., "try to memorize the following statements"; Lichtenstein & Srull, 1987, p. 103) prescribe neither on-line nor memory-based judgments. Because memory-set instructions do not explicitly direct the information-processing objectives of perceivers, they are free to process information about social targets in an unconstrained fashion. Under these conditions, the default processing mechanisms for individuals (generally on-line) and groups (generally memory-based) should become especially apparent.

Thus, in this study, we explored both the implications of target type (group vs. individual) and processing goal (imp-, mem-, and comp-set instructions) to observe their implications for information processing (on-line vs. memory-based) and subsequent judgment (strength of illusory correlation). Although we assume that groups and individuals differ in terms of their default information-processing strategies (under the undifferentiated mem-set instructions), we expect to see similarities between group and individual processing when subjects are given strong processing goals (imp- and comp-set instructions). If the expected patterns of memory-based versus on-line judgments are found, we should also observe a relationship between

the type of processing and the strength of illusory correlation observed.

Hypotheses

The present research examined subjects' impressions, judgments, and recall of information concerning majority (high frequency) and minority (low frequency) group and individual targets. The predictions reflect our assumptions regarding whether the judgments were made in an on-line or in a memory-based fashion in the various experimental conditions. In all cases, evidence for on-line judgments would consist of overall high levels of recall of information, a primacy effect in recall, fast retrieval latencies, and a lack of correlation between memory and evaluations. On the other hand, evidence for memory-based judgments would consist of overall poor levels of recall, a recency effect in recall, slower retrieval latencies, and strong correlations between memory and evaluations.

Hypothesis 1

For individual targets, judgments were made in an on-line fashion under imp- and mem-set instructions. Although imp-set instructions should encourage on-line processing for individuals, we also hypothesized that mem-set instructions would lead to similar processing outcomes because expectations about target consistency and cohesiveness and ease of processing with an individual target should lead one, when provided with ambiguous instructions, to process such targets in an on-line fashion. On the other hand, we expected to observe memory-based judgments for individual targets when subjects were supplied with comp-set instructions. In this case, subjects were not able to devote the effort necessary to develop a cohesive and integrative portrait of the individual as they processed the information.

Hypothesis 2

For group targets, judgments were made in a memory-based fashion under mem-set and comp-set instructions. Although comp-set instructions should encourage memory-based judgments, we also hypothesized that mem-set instructions would lead to similar processing for group targets. Because of the difficulty of processing group level information and because expectations about target consistency and cohesiveness should not exist for groups, subjects should, when provided with ambiguous instructions, process groups in a memory-based manner. On the other hand, we expected to observe on-line processing for group targets when subjects were supplied with imp-set instructions. In this case, subjects would be strongly motivated to produce on-line a cohesive and integrative portrait of the group.

In other words, Hypotheses 1 and 2 predicted that under the imp-set instructions, judgments would be made in an on-line fashion for both individual and group targets. Imp-set instructions should encourage the integration of material at presentation so that global impressions would be formed during the encoding of information. In contrast, under the comp-set instructions judgments would be made in a memory-based fashion for both individual and group targets. Comp-set instructions

should draw the subjects' attention away from the attribute implications of the behavioral information and should thus inhibit on-line processing.

Finally, in the mem-set condition, judgments would be made in an on-line fashion for individual targets, but in a memory-based fashion for group targets. Mem-set instructions were ambiguous in terms of the kind of processing required (Hastie & Park, 1986). On one hand, integration of the behavioral information is a reasonable approach to try to organize this information in memory. On the other hand, rote memorization of the facts without integration and without considering the attribute implications of the information is also reasonable. With such open-ended processing instructions, it was predicted that the natural default processing differences for individual versus group targets should emerge. Again, amount and accuracy of recall, serial position effects in recall, speed of recall, and memory-judgment correlation data should provide evidence for these divergent processes.

Hypothesis 3

The direction and extent of illusory correlation in the perception of minority and majority social targets will depend on whether the impressions are formed in an on-line or in a memory-based way. In particular, a perceived (but unwarranted) association between the minority target and the infrequent behavior will be exhibited in conditions where judgments are memory-based: comp set-group target, comp set-individual target, and mem set-group target. When impressions are formed on-line, there will be either no illusory correlation (Pryor, 1986) or an unwarranted association between the minority target and the frequent behavior (Sanbonmatsu et al., 1987). This should occur in the following conditions: imp-set-individual target, imp-set-group target, and mem-set-individual target.

Method

Subjects

One-hundred fifty introductory psychology students at Indiana University participated in return for research experience credit. These subjects were randomly assigned (25 per condition) to a 3 (imp-, mem-, or comp-set instructions) \times 2 (group or individual target type) factorial design.

Stimuli

A list of 36 stimuli was used: 16 majority target desirable (Maj+), 8 majority target undesirable (Maj-), 8 minority target desirable (Min+), and 4 minority target undesirable (Min-). Following Hamilton and Gifford (1976), each stimulus item consisted of a male name, a group designation (either A or B) when applicable, and a behavior. In the group target condition, 36 common male names were randomly paired with 36 behaviors. In the individual target condition, only 2 male names (Jim and Bob) were associated with the behaviors. For example, subjects in a group target condition read "Jim, a member of Group A, visited a sick friend in the hospital." Subjects in the individual target condition, on the other hand, read "Jim visited a sick friend in the hospital." Pilot testing of stimuli ensured that the overall evaluation of both desirable and of undesirable behaviors ascribed to each group or individual was equivalent. Name and target frequency were counterbalanced. This ma-

nipulation produced no effects on any of the dependent measures and thus it is not discussed further.

The 36 stimulus positions were subdivided into nine partitions, each containing four items. Within each presentation, four of the nine partitions contained one item from each of the four stimulus classes (Maj+, Maj-, Min+, and Min-). Thus, all of the Min- items (four) appeared in these four partitions (one Min- in each). The 2nd, 4th, 6th, and 8th partitions served in this role. Within each of these four partitions, the two positive behaviors were rated as equivalent in desirability, as were the two negative behaviors. During presentation, group or individual identification was randomly assigned to both the positive and negative behaviors in these partitions. In the five other partitions, the remaining behavioral categories (Maj+, Maj-, and Min+) were randomly distributed.

Group Versus Individual Instructions

In group target conditions, subjects were told, "The statements you are about to read were drawn from the behaviors of members of two existing groups in the real world. To make things easy, we will label them as Group A and Group B." Subjects in the individual target conditions were told, "The statements you are about to read were drawn from the behaviors of two existing people in the real world named Jim and Bob."¹

Instruction Sets

We used three instruction sets based on modifications of those used by Lichtenstein and Srull (1987).

Imp-set instructions. Following individual and group orientations, subjects in the imp-set condition were told,

As you read these statements, try to FORM A COHERENT IMPRESSION OF WHAT EACH GROUP (PERSON) WOULD BE LIKE. That is, get a good idea of what you think each group (person) is like. Later, we will ask you some questions about the impressions you have formed.

Mem-set instructions. Subjects were told,

The purpose of this study is to see how well you can remember these statements. As you read these statements, try to CONCENTRATE HARD ON REMEMBERING EACH STATEMENT. Later, we will ask you to remember as many of the statements as you can.

Comp-set instructions. Subjects were told,

These statements are being developed for use with children in the fourth grade. Because children have smaller vocabularies and are less familiar with complex sentence constructions, some of these items may not be appropriate for them. As you read these statements, TRY TO ASSESS WHETHER OR NOT A FOURTH GRADE CHILD WOULD HAVE DIFFICULTY COMPREHENDING EACH ONE. Later, we will ask you some questions regarding how well you think children can comprehend them.

Procedure

Subjects were run at individual computer workstations and were randomly assigned to one of the six experimental conditions. After presentation of the instructions, the 36 stimulus items were displayed on the computer monitor for 8 s each. Subjects then completed a 4-min filler

¹ It should be noted that subjects were not told that a particular target (e.g., Group B in Hamilton & Gifford, 1976) was a minority target, or would occur infrequently.

task to eliminate short-term memory effects (Hamilton, Dugan, & Trolier, 1985), and responded to a free recall task, a target assignment task, a frequency-estimation task, and an evaluation of how likable they found each individual or group.

Free recall. Following the filler task, subjects were provided with a blank piece of paper and instructed by the computer to write down as many of the behaviors as they could recall in a 10-min period. If they could not recall a behavior completely, they were encouraged to write down as much of the behavior as they could remember.

Target assignment. The 36 behaviors (without group or individual identification) were then re-presented to subjects in a randomized order. Subjects read each item and indicated, using the keyboard, whether a member of Group A or B (Jim or Bob, for subjects in the individual target conditions) performed the action. In addition to recording the response, the computer also measured its latency.

Frequency estimates. After the target assignment task, subjects were told that the majority target had performed 24 behaviors and were asked to estimate how many of these were undesirable. Next, subjects were told that the minority target had performed 12 behaviors and were asked to estimate how many of these were undesirable.

Likability ratings. Finally, subjects were asked to rate, on a scale ranging from 1 to 10 (where 1 represents strong disliking and 10 represents strong liking), how much they thought they would like members of Group A and Group B (Bob and Jim).

Results

The presentation of results is organized into two sections. First, we examine the experimental conditions for evidence of on-line and memory-based judgments (Hypotheses 1 and 2). Second, we examine the strength and direction of illusory correlation formation (Hypothesis 3). Both presentations rely on multivariate analyses of variance (MANOVAs) followed by specific planned univariate comparisons.

On-Line and Memory-Based Judgments

Overview of measures. Five measures were examined for evidence of on-line versus memory-based judgments: amount of free recall, recall serial position, latency of target assignment responses, accuracy of target assignment responses, and the correlation between the content of free recall and subsequent evaluations of each target. We examined the first four measures using ANOVAs and explored the memory-judgment relationship (the fifth memory measure) using correlational analyses.

For free recall data, two judges, unaware of experimental condition, evaluated subjects' free recall reports using a gist criterion. Interjudge agreement was high (94%). In cases of disagreement, the decision of a third judge, also unaware of experimental condition, determined whether the response met the criterion. The total number of statements correctly recalled (out of 36) served as the free recall dependent measure. A greater amount of recall is indicative of more thorough information integration (i.e., on-line processing). The second dependent measure, the primacy index, was created by subtracting the proportion of behaviors recalled from the last 12 items (the last third) of the presentation from the proportion of behaviors recalled from the first 12 items (the first third). A positive primacy index indicates that a subject recalled more behaviors from the first third of the stimulus presentation relative to the last third of the presentation, and a negative index indicates a

recency effect in recall. A positive primacy index (a primacy effect for recall) indicates greater on-line processing.

Two memory measures were also derived from the target assignment responses. First, a target assignment latency measure was computed on the basis of each subject's mean target assignment response time.² Faster responses were expected for on-line processing (where the additional linkages in memory would produce speedy retrieval). The other dependent measure, target assignment accuracy, reflects the proportion of target assignment responses that was correctly associated with the group or individual target. Because of the more elaborative encoding of on-line processing, we predicted that there should be greater accuracy for target assignment responses in conditions expected to induce on-line processing.

Overall multivariate analysis. To examine the different processing outcomes, we performed a 3 (instruction set: imp, mem, and comp) \times 2 (target type: group and individual) MANOVA on the four memory dependent measures. We predicted a main effect for target type (more on-line processing for individual than group targets) and instruction set (on-line processing for imp-set instructions and memory-based processing for comp-set instructions). However, the key prediction was an interaction between target type and instruction set. Although we expected similar processing outcomes for individual and group targets under imp-set (on-line processing) and comp-set (memory-based processing) instruction sets, we also expected a difference between target types for mem-set instructions.

As predicted, these three effects were observed. The analysis revealed a main effect for instruction set (Wilks's $\lambda = .66$), $F(8, 282) = 8.27$, $p < .001$; target type (Wilks's $\lambda = .70$), $F(4, 141) = 15.05$, $p < .001$; and the key interaction between instruction set and target type (Wilks's $\lambda = .86$), $F(8, 282) = 2.77$, $p < .01$. The individual means for these measures are presented in Table 1.

To explore Hypotheses 1 and 2 more closely and to understand the nature of this interaction, we examined each target type (individual and group) with separate planned comparison analyses.

Individual target analyses. Recall that Hypothesis 1 predicted that memory for individual targets should not differ between imp- and mem-set instructions (where on-line processing should be observed), but both of these conditions should differ from comp-set instructions (where memory-based processing should be observed). To explore this prediction, we examined each of the four memory measures, using planned comparisons to contrast the two conditions expected to produce on-line judgments with the condition expected to produce memory-based judgments. Again, the means for these measures are displayed in Table 1.

The predicted contrast for the number of statements freely recalled was highly significant, $F(1, 73) = 26.15$, $p < .001$, indicating that subjects in the conditions expected to produce on-line judgments clearly recalled more behaviors ($M = 12.54$)

² Subjects whose mean latencies were in excess of three standard deviations from the overall mean were excluded from analyses. As a result, cell sizes were 24 for the imp-set/groups condition, 25 for the imp-set/individuals condition, 22 for the mem-set/groups condition, 25 for the mem-set/individuals condition, 24 for the comp-set/groups condition, and 25 for the comp-set/individuals condition.

Table 1
Free Recall, Primacy Index, Target Assignment Latencies, and Target Assignment Accuracy for the Six Experimental Conditions

| Measure | Groups | | | Individuals | | |
|-----------------------------|--------|------|-------|-------------|-------|-------|
| | Imp | Mem | Comp | Imp | Mem | Comp |
| Free recall | | | | | | |
| <i>M</i> | 10.28 | 9.40 | 5.88 | 12.68 | 12.40 | 7.36 |
| <i>SD</i> | 3.82 | 4.83 | 3.05 | 3.57 | 5.08 | 3.57 |
| Primacy index | | | | | | |
| <i>M</i> | 0.09 | 0.02 | -0.07 | 0.04 | -0.01 | -0.07 |
| <i>SD</i> | 0.20 | 0.20 | 0.16 | 0.19 | 0.19 | 0.19 |
| Target assignment latencies | | | | | | |
| <i>M</i> | 3.42 | 3.52 | 3.18 | 2.64 | 2.89 | 3.21 |
| <i>SD</i> | 1.03 | 1.71 | 1.31 | 0.69 | 0.63 | 0.82 |
| Target assignment accuracy | | | | | | |
| <i>M</i> | 0.58 | 0.57 | 0.54 | 0.76 | 0.72 | 0.56 |
| <i>SD</i> | 0.13 | 0.11 | 0.08 | 0.15 | 0.17 | 0.09 |

Note. Imp = impression set; mem = memory set; comp = comprehensibility set.

than subjects in the condition expected to produce memory-based judgments ($M = 7.36$).

Next, we examined the primacy index (positive scores reflect a primacy effect for recall) in the same planned-contrast fashion. The predicted contrast was marginally significant, $F(1, 73) = 3.07, p < .09$, indicating that subjects in the conditions expected to produce on-line judgments demonstrated a stronger tendency to recall behaviors presented early in the presentation ($M = 0.02$) than subjects in the condition expected to produce memory-based judgments ($M = -0.07$).

For our third comparison, we analyzed the target assignment latencies. As predicted, the contrast was significant, $F(1, 73) = 10.84, p < .01$, revealing that subjects in the conditions expected to produce on-line judgments demonstrated faster target assignment responses ($M = 2.77$) than subjects in the condition expected to produce memory-based judgments ($M = 3.21$).

Finally, we examined the accuracy of target assignments (examining the proportion of hits) in the same planned contrast fashion. Once again, the predicted contrast was highly significant, $F(1, 73) = 29.39, p < .001$, indicating that subjects in the conditions expected to produce on-line judgments demonstrated greater accuracy in target assignments ($M = 0.74$) than subjects in the condition expected to produce memory-based judgments ($M = 0.56$).

In summary, all four memory measures provided strong support for Hypothesis 1 by revealing that subjects who process information about individual targets demonstrate more elaborated (i.e., on-line) processing under imp- and mem-set instructions, but demonstrate less elaborated (i.e., memory-based) processing under comp-set instructions.

Group target analyses. Hypothesis 2 predicted that memory for group targets should not differ between mem- and comp-set instructions (where memory-based processing should be observed), but both of these conditions should differ from imp-set instructions (where on-line processing should be observed). To explore this prediction, we examined the four memory measures, using planned comparisons to contrast the two condi-

tions expected to produce memory-based judgments with the condition expected to produce on-line judgments.

The predicted contrast for total number of statements freely recalled was significant, $F(1, 73) = 7.38, p < .01$, indicating that subjects in the conditions expected to produce memory-based judgments recalled fewer behaviors ($M = 7.64$) than subjects in the condition expected to produce on-line judgments ($M = 10.28$).

Second, we examined the primacy index in the same planned-contrast fashion. Again as predicted, the contrast was significant, $F(1, 73) = 6.91, p < .02$, illustrating that subjects in the conditions expected to produce memory-based judgments demonstrated a stronger tendency to recall behaviors presented later ($M = -0.03$) than subjects in the condition expected to produce on-line judgments ($M = 0.09$).

For target assignment latencies, the predicted contrast was not significant, $F(1, 73) = 0.15, ns$. Similarly, for accuracy of target assignments recall, the contrast was not significant, $F(1, 73) = 1.45, ns$.

In summary, two of the four contrasts were significant. However, the pattern of results do not entirely conform to predictions. Recall that Hypothesis 2 predicted that for group targets, recall under mem- and comp-set instructions should be similar but both should differ from memory under imp-set instructions. As can be seen in Table 1, the mem-set subjects produced recall data that were more similar to imp-set than comp-set subjects.³

Instruction-set analyses. Another way to test the predic-

³ Post hoc comparisons (Duncan's new multiple-range test) were conducted on these memory measures. For group targets, significant differences were observed between imp- and comp-set conditions for amount of free recall and the primacy index. Also, a significant difference was observed between mem- and comp-set conditions for amount of free recall. A similar set of comparisons for individual target subjects revealed that imp- and mem-set subjects differed reliably from the comp-set subjects on overall recall, target assignment latency, and target assignment accuracy. Thus, the former comparisons (i.e., group targets)

tions concerning the processing effects of instruction set and target is to examine the differences between individual and group targets within each instruction set. Recall that group and individual targets should both show similar results under imp-set instructions (due to on-line processing in both cases), similar results under comp-set instructions (due to memory-based processing in both cases), but different results under the nondirective mem-set instructions (due to on-line processing for individual targets and memory-based processing for group targets).

We conducted three one-way MANOVAs for each of the three instruction sets (imp, mem, and comp), using target type as the independent variable and the memory measures as the dependent variables. The MANOVAs detected a significant effect of target type in both the imp-set (Wilks's $\lambda = .54$), $F(4, 45) = 9.59$, $p < .001$, and mem-set conditions (Wilks's $\lambda = .58$), $F(4, 45) = 8.30$, $p < .001$, but not in the comp-set condition (Wilks's $\lambda = .94$), $F(4, 45) = .65$, *ns*.

To explore these effects in more detail, we conducted individual univariate ANOVAs for each of the three instruction sets, using each of the four memory measures (overall recall, primacy index, target assignment latency, and target assignment accuracy) as dependent variables and target type (group vs. individual) as the independent variable. For imp-set subjects, three dependent measures differed significantly as a function of target: overall recall, $F(1, 48) = 5.26$, $p < .03$; target assignment latency, $F(1, 48) = 12.60$, $p < .001$; and target assignment accuracy, $F(1, 48) = 21.23$, $p < .001$. As Table 1 shows, the direction of all three main effects showed more on-line processing for individual targets than for group targets. For mem-set subjects, the same three dependent measures differed significantly as a function of target: overall recall, $F(1, 48) = 4.58$, $p < .04$; target assignment latency, $F(1, 48) = 12.41$, $p < .001$; and target assignment accuracy, $F(1, 48) = 16.69$, $p < .001$. Again, the direction of all three main effects showed more on-line processing for individual targets than for group targets. Finally, all four univariate analyses for comp-set subjects were nonsignificant.⁴

By these comparisons, results from the comp-set instructions fit our predictions—no differences for individual versus group targets, recency in recall, and relatively poor and slow recall. Results in the mem-set instruction condition also fit the directional prediction: a significant difference between group and individual targets with a memory advantage for individual targets, indicating more on-line processing for individual targets. The significant difference between target types in the imp-set condition was not predicted. In general, the strong memory performance for both individual and group targets is indicative of on-line processing, but more so for individuals. Thus, although some degree of on-line processing was induced for group targets, there was still more of this kind of processing for individual targets.

Memory-judgment correlations. Following the methodology of Lichtenstein and Srull (1987), we used all the behaviors recalled by each subject to create an index based on the pretest desirability norms for each item. This index was computed by

summing the pretest ratings for the items each subject recalled about each (minority vs. majority) target and dividing by the total number of items recalled. Two indices were computed (one for the majority target and one for the minority target). The majority target index was correlated with the likability rating for the majority target for each of the six conditions (Target \times Instruction Set). Likewise, the minority target index was correlated with the likability rating for the minority target for each of the six conditions. In addition, Schmidt (1991) suggested that the initial items recalled may influence judgments the most. Thus, in addition to examining all free recall that met gist criterion, we also examined only the first five items that were recorded by the subject (see also, Hastie & Park, 1986). Table 2 displays the zero-order correlations between the free recall index and likability ratings for all items recalled and the first five items listed.

We predicted strong judgment-recall correlations in the conditions designed to elicit memory-based judgments (comp set-group target, comp set-individual target, and mem set-group target). Using all items listed in free recall, the only significant predictor of likability evaluations was the minority individual free recall index in the comp-set condition, $F(1, 23) = 5.38$, $p < .03$.

When considering only the first five items recalled, there were two memory indices that were significant predictors of likability ratings. Again the comp set-individual target recall index for the minority person predicted a significant amount of variance in the evaluation of the minority person, $F(1, 23) = 5.50$, $p < .03$. Also, in the comp set-group target condition, the index for Group B predicted liking for Group B, $F(1, 23) = 4.14$, $p < .06$. Therefore, we found evidence of memory-based judgments only for subjects in the comp-set conditions. This relationship, as predicted, was present for both individual and group targets. However, the relationship between memory and judgment was observed only for minority targets and was absent in the mem-set-group target condition. Consistent with the previous analysis, mem-set instructions do not appear to have induced memory-based processing for group targets.

Summary of memory measure analyses. In summary, we found strong support for our predictions concerning individual targets, but only moderate support for our predictions about group targets. For individual targets, the analyses indicate that subjects' memory (in terms of free recall, target assignment latency, and target assignment accuracy) was superior for imp- and mem-set instructions relative to comp-set instructions. Thus, subjects in the former conditions demonstrated stronger on-line processing than subjects in the latter condition. Also, memory-judgment correlations were observed for minority targets under comp-set instructions, indicative of memory-based processing.

⁴ We examined primacy and recency effects in each of the three instruction-set conditions by comparing the primacy index to zero (equal recall for the first third and last third of the item presentation). As expected, imp-set subjects demonstrated a significant primacy effect ($M = 0.07$), $t(49) = 2.48$, $p < .02$, and comp-set subjects showed a significant recency effect ($M = -0.07$), $t(49) = -2.79$, $p < .01$. Subjects in the mem-set condition, however, showed no evidence of a primacy or recency effect in recall ($M = 0.00$), $t(49) = 0.06$, *ns*.

Table 2
Memory–Judgment (M–J) Correlations for the Six Experimental Conditions

| Measure | Groups | | | Individuals | | |
|--|--------|------|-------|-------------|------|--------|
| | Imp | Mem | Comp | Imp | Mem | Comp |
| M–J correlations using all free recall | | | | | | |
| Majority target | 0.22 | 0.30 | 0.10 | 0.15 | 0.20 | 0.22 |
| Minority target | 0.34 | 0.01 | 0.12 | 0.29 | 0.07 | 0.44** |
| M–J correlations using the first five behaviors recalled | | | | | | |
| Majority target | 0.21 | 0.01 | 0.09 | 0.05 | 0.06 | 0.20 |
| Minority target | 0.19 | 0.07 | 0.39* | 0.06 | 0.04 | 0.44** |

Note. M–J correlations using all free recall refers to correlations using all free recall behaviors as predictors of evaluation. M–J correlations using the first five behaviors recalled refers to correlations using only the first five behaviors listed in free recall. Imp = impression set; mem = memory set; comp = comprehensibility set.
 ** $p < .05$. * $p < .06$.

The support for our hypothesis about group targets was mixed. In general, both memory data and memory–judgment data indicated that imp-set instructions induced on-line processing for group targets, whereas comp-set instructions induced memory-based processing. However, inconsistent with predictions, mem-set instructions did not lead to memory-based processing.

Finally, as predicted, we observed more on-line processing for individual than group targets. We had expected this in the mem-set condition, where the undifferentiated processing instructions should have evoked default options for the target types. Interestingly, we also observed more on-line processing for individual targets in the imp-set condition, where strong on-line processing should have been induced for both target types.

Evaluative Judgments

Overview of measures. Three dependent measures were examined for evidence of illusory correlation formation: likability ratings, frequency estimates, and target assignments. An index for each measure was computed to indicate the bias in evaluations between majority and minority targets. A likability index was constructed by subtracting the liking for the minority target from the liking for the majority target. Thus, a positive likability index reflects a traditional illusory correlation (i.e., a bias favoring the majority target). For frequency estimates, an index was computed that subtracted the proportion of positive behaviors estimated for the minority group from the proportion of positive behaviors estimated for the majority group. In other words, a positive frequency estimate index reflects a traditional illusory correlation (i.e., reporting that the majority target engages in proportionately more desirable behaviors than the minority target). Finally, a target assignment index was created by subtracting the proportion of negative behaviors ascribed to the majority target from the proportion of positive behaviors assigned to the majority target. Once again, a positive target assignment index reflects a traditional illusory correlation (i.e., assigning relatively more positive behaviors to the majority target than to the minority target).

As with the memory measures, we analyzed the illusory cor-

relation indices using a MANOVA and planned comparison ANOVA approach. Following the MANOVA, we examined the evidence for different evaluative outcomes for individual and group targets in accord with Hypothesis 3, using separate planned comparison strategies for each target type.

Overall multivariate analysis. We performed a 3 (instruction set: imp, mem, and comp) \times 2 (target type: group and individual) MANOVA on the three illusory correlation indices. This analysis revealed a main effect for instruction set (Wilks's $\lambda = .87$), $F(6, 284) = 3.33$, $p < .01$, and a marginal main effect for target type (Wilks's $\lambda = .95$), $F(3, 142) = 2.49$, $p < .07$. As Table 3 illustrates, subjects showed the greatest amount of illusory correlation (regardless of target) under comp-set instructions and greater illusory correlation (i.e., a bias favoring majority targets) for group targets (relative to individual targets).

Although the hypothesized Instruction Set \times Target interaction was not significant, the pattern of data for all three indicators of target evaluation was in the predicted direction. That is, illusory correlations favoring the majority group were always strongest in the conditions where memory-based processing was predicted (group mem-set, group comp-set, and individual comp-set). To explore Hypothesis 3 more closely, we examined each target type (individual and group) in isolation, using separate planned comparison analyses.

Individual target analyses. Hypothesis 3 predicted an attenuated illusory correlation for individual targets under imp- and mem-set instructions (where on-line judgments should occur), but a strong illusory correlation for subjects under comp-set instructions (where memory-based judgments should lead to the illusory correlation). To explore this prediction, we examined each of the three illusory correlation indices in a planned comparison fashion.

When examining the likability index (where a positive bias indicates preferring the majority target over the minority target), the predicted contrast was marginally significant, $F(1, 73) = 3.43$, $p < .07$, indicating that subjects in the conditions expected to produce on-line judgments demonstrated an attenuated (or reversed) illusory correlation ($M = -0.36$) relative to

Table 3
*Likability, Frequency Estimates, and Target Assignment Indices
 for the Six Experimental Conditions*

| Measure | Groups | | | Individuals | | |
|--------------------------|--------|------|------|-------------|------|------|
| | Imp | Mem | Comp | Imp | Mem | Comp |
| Likability index | | | | | | |
| <i>M</i> | -0.20 | 1.80 | 2.36 | -0.80 | 0.08 | 0.96 |
| <i>SD</i> | 2.90 | 2.94 | 2.64 | 2.20 | 2.53 | 3.76 |
| Frequency estimate index | | | | | | |
| <i>M</i> | 0.07 | 0.14 | 0.14 | 0.01 | 0.02 | 0.09 |
| <i>SD</i> | 0.23 | 0.24 | 0.31 | 0.01 | 0.02 | 0.09 |
| Target assignment index | | | | | | |
| <i>M</i> | -0.05 | 0.14 | 0.21 | -0.06 | 0.00 | 0.05 |
| <i>SD</i> | 0.36 | 0.32 | 0.36 | 0.16 | 0.21 | 0.37 |

Note. For all three indices, positive numbers reflect a favorable bias toward the majority target (i.e., a memory-based illusory correlation) and negative numbers reflect a favorable bias toward the minority target. Imp = impression set; mem = memory set; comp = comprehensibility set.

subjects in the condition expected to produce memory-based judgments (who demonstrated a bias in the direction of the typical illusory correlation; $M = 0.96$). Planned comparisons for the frequency estimate bias and target assignment bias indices were in the predicted directions, but neither contrast achieved significance ($F_s < 1.6$, $p_s > .20$). In summary, although all three indices were in the predicted direction, the individual target illusory correlation indices offer only partial support for Hypothesis 3.

Group target analyses. Hypothesis 3 predicted that strong illusory correlations should be observed in both the mem- and comp-set instructions where memory-based judgments should be evident (which would be evidenced by positive indices), whereas imp-set instructions should not demonstrate the illusory correlation effect because of strong on-line processing. Thus, we compared the mem- and comp-set conditions with the imp-set condition in a planned comparison fashion.

As predicted, the contrast for the likability index was highly significant, $F(1, 73) = 10.80$, $p < .01$, indicating that subjects in the conditions expected to produce memory-based judgments demonstrated a strong bias against the minority group ($M = 2.08$), whereas subjects in the condition expected to produce on-line judgments did not demonstrate the bias against the minority group ($M = -0.20$).

Next, we analyzed the frequency estimate index in the same planned comparison fashion. Although the means were in the expected direction ($M = 0.14$ for mem- and comp-set instructions; $M = 0.07$ for imp-set instructions), the contrast did not achieve significance, $F(1, 73) = 1.14$, *ns*.

Finally, we compared the target assignment bias index in a similar planned contrast. As expected, this contrast was significant, $F(1, 73) = 6.66$, $p < .02$, indicating that subjects who were in the mem- and comp-set conditions showed a greater bias in assigning negative behaviors to the minority group ($M = 0.18$) than subjects in the imp-set condition ($M = -0.05$).

In summary, the likability and target assignment analyses provided good support for Hypothesis 3. Specifically, a bias against the minority group was observed in conditions expected to produce memory-based judgments (mem- and comp-set in-

structions), whereas the bias was attenuated under conditions designed to induce on-line judgments (imp-set instructions).

Instruction-set analyses. Recall that groups and individuals should both show comparable degrees of illusory correlation under imp-set (i.e., no illusory correlation) and comp-set instructions (i.e., a strong illusory correlation) and different degrees of illusory correlation (strong illusory correlations for group targets, but no illusory correlations for individual targets) under the ambiguous mem-set instructions.

We conducted a one-way MANOVA for each of the three instruction sets (imp, mem, and comp), using target type (group vs. individual) as the independent variable and the evaluative measures (likability, frequency estimate, and target assignment indices) as the dependent variables. The MANOVAs detected no significant effects across the three instruction sets. Univariate ANOVAs for each of the three instruction sets, using each of the three evaluative measures as dependent variables and target type as the independent variable, revealed two effects, both in the key mem-set condition. Specifically, a main effect of target type was observed for the likability index, $F(1, 48) = 4.91$, $p < .04$, and target assignment index, $F(1, 48) = 3.32$, $p < .08$. Both of these effects showed that, with ambiguous mem-set instructions, illusory correlations were stronger for group targets than for individual targets.

Discussion

Processes of Judgment for Individual Versus Group Targets

Two areas of research in social psychology, impression formation for individuals and stereotype development for groups, have constituted important lines of work with regard to the perception of social entities. Both areas have been concerned with the processes by which judgments of social targets form. Yet, surprisingly, these lines of research have gone forward quite independently, and there has been little discussion about the ways in which impression formation of individuals and stereotype development of groups might be similar or different. A primary

goal of the current study was to examine similarities and differences in the way people process information about group versus individual social targets. In particular, we examined the nature of the social target (individual vs. group) and differences in judgments, memory for information, and the processes and outcomes of impression formation for these targets.

Hamilton (1991) suggested that, although the very same mechanisms and processes govern the development of impressions of individual and group social targets, the outcome of those processes might be different for individual and group targets. The key, according to Hamilton, is the set of assumptions of the perceiver regarding the characteristics of the targets. When the target is an individual, perceivers expect unity and coherence in the personality of this person. Behaviors of this individual will be viewed as reflections of an underlying coherence and will be used as a basis for understanding the person's inherent nature. In addition, the integration of information about a single individual is a relatively simple process and requires only modest cognitive resources. Thus, perceivers are likely to process behaviors of an individual in an on-line manner and to try to integrate the information from various behaviors into a single coherent impression.

In the case of groups, however, Hamilton (1991) suggested that perceivers do not hold the same expectations for unity, organization, and consistency. No inherent, dispositional nature of a group is assumed. Moreover, the integration of information about a group is a complex matter. Information about the individual members and about the group as a whole must be considered. Thus, behavioral information concerning various group members is not likely to be integrated in an on-line manner, and judgments about the group will be made in a memory-based manner at the time that such a judgment is required.

These differences in on-line versus memory-based judgments were expected to be exhibited in our recall process measures. On-line processing involves an integration and structuring of the information as it is received. The more that subjects integrate information during its initial presentation, the easier it is to retrieve because of the strength and frequency of the linkages among the different behaviors. Thus, both free recall and target assignment accuracy should be greater when on-line processing is involved. This is consistent with previous evidence that retrieval of social information is a function of the extent to which that information is integrated and organized in memory (e.g., Hamilton, Katz, & Leirer, 1980; Srull & Wyer, 1989). For similar reasons, target assignment latencies should be faster with on-line processing.

On-line impression formation should also lead to primacy in recall. During impression formation, the first items received should be especially important for forming a general, global impression. On the other hand, in the absence of on-line processing, where all items receive equal initial processing, there should be an advantage of recall for the recent items, which have less time to decay from memory.

Finally, as Hastie and Park (1986) and others (Lichtenstein & Srull, 1987; Sherman et al., 1983) have suggested, the correlation between recall and evaluation of the social target should be substantial only in the case of memory-based judgments. For on-line judgments, a global evaluation is formed during initial

reception of the information. Subsequent judgments will rely on this global evaluation rather than on recall and assessment of the original items of behavioral information. Thus, recall of information will not necessarily be correlated with the evaluation of the targets.

How successful was the current study in demonstrating differences in the way in which information about individual versus group targets is processed? Overall, for individual targets there was significantly greater free recall, significantly greater target assignment accuracy, and significantly faster target assignment latencies. All of these differences are indicative of greater on-line processing for individual than for group targets. Only in the case of primacy of recall were the processing results not indicative of greater on-line processing for individual targets.

The clearest place to look for differences in the processing of individual and group social targets is in the mem-set condition, where instructions do not explicitly direct information-processing objectives. In this case, the default mechanisms for forming impressions of individual and group targets should be especially apparent. In the mem-set condition, overall recall, target assignment accuracy, and target assignment latency all indicated significantly more on-line processing in the case of individual targets.

Interestingly, processing differences also emerged under imp-set instructions, instructions that were designed to induce strong on-line processing for both individual and group targets. In this case, overall recall, target assignment accuracy, and target assignment latency again indicated significantly greater on-line processing and integration in the case of individual targets. Comparison of the imp-set condition with the other instructional sets indeed indicated that we were successful in inducing greater on-line processing in the imp-set case for both individual and group targets. And yet, the inherent differences in processing individual and group target information still emerged under these highly directive instructions.

Under comp-set instructions, which were designed to produce strong memory-based processing for impressions of both individual and group targets, no processing differences emerged between these two types of targets. Low overall recall, recency in recall, low target assignment accuracy, and long latency of target assignment were indicative of memory-based processing for both individual and group targets in the comp-set condition. Thus, this highly directive instructional set was successful in minimizing on-line processing for both individual and group targets.

Although these inherent target differences emerged, the results also strongly support a second goal of the study—to show that the type of on-line or memory-based processing for individual and group targets is not fixed. Depending on the nature of the specific individual or group target and the expectation about such targets, different degrees of on-line or memory-based processing are possible. Hamilton (1991) suggested that for groups that are perceived as highly unified and coherent (small, tightly knit groups where the members share common bonds), judgments are likely to be formed on-line rather than in a memory-based manner. For individuals who are unlikely to have an underlying coherent nature (e.g., a mentally unstable

individual who is subject to mood swings), consistency and coherence cannot be assumed, so on-line judgments are less likely, and impression judgments may be memory-based.

Srull and Wyer (1989) offered a similar analysis of impression formation for individual and group targets. They hypothesized that individual and group targets will be subject to the same processes of judgment whenever the group is assumed to have a coherent nature. Cohesive groups will be perceived and cognitively represented in the same way as individuals. That is, behaviors will be encoded according to global trait concepts, and evaluative judgments will be extracted on-line. However, groups that are loose collections of members will be thought about and represented quite differently, and judgments will be made in a memory-based fashion.

In the current study, different degrees of on-line and memory-based processing for both individual and group targets were accomplished not by expectations of coherence but rather by instructional set. Results clearly indicate that instructional set can very much alter the processing of behavioral information for both individual and group targets. This is best seen in a comparison of imp-set and comp-set instructions. For both types of social target, imp-set instructions induced strong on-line processing. This was indicated by better performance in free recall and target assignments, short latencies in target assignments, and primacy in memory. For both types of target, comp-set instructions induced a memory-based processing approach to judgments of both types of target. This was indicated by poorer performance in free recall and target assignments, long latencies in target assignments, and recency in memory. Finally, the results involving recall-judgment correlations supported memory-based processing in the comp-set conditions. The only cases where recall-judgment correlations were significant (indicating memory-based processing) were in the comp-set instruction conditions. The fact that significant recall-judgment correlations were not obtained in every case where we anticipated memory-based judgments may reflect the difficulty of completely eliminating on-line impression formation in the case of social targets (Hastie & Park, 1986).

There is thus strong support for the proposition that our directive instructional sets had their predicted effects. For both individual and group targets, strong or weak on-line processing was achieved by altering the processing goals. What about the key mem-set conditions? What do these results indicate about the processing adopted for individual and group targets? With no strong processing goals induced by this instructional set, it was expected that default differences between individual and group targets would emerge. As we have seen, this prediction was supported. There were significant differences between individual and group targets for three of the four main processing measures in a direction indicating greater on-line processing for individual targets. Furthermore, the results for individual targets in the mem-set condition strongly indicate that, as predicted, on-line processing was adopted in the absence of a directive instructional set. This can be seen by comparing the processing measures for the mem-set and imp-set instructions for individual targets. The results are practically identical in these two conditions across all processing measures, and in each case these results are very different from those of the comp-set condition.

For group targets, we had predicted not only that processing would be very different from individual targets in the mem-set condition (which was supported) but also that processing in this condition would be memory-based and thus that the processing results for group targets would be similar for mem-set and comp-set instructions. Both of these instructional sets should have yielded processing results for group targets that were very different from those under imp-set instructions. It is clear that this aspect of our predictions did not emerge. For all processing measures, mem-set results were closer to imp-set results than to comp-set results. In fact, in terms of free recall, mem-set subjects recalled significantly more than did comp-set subjects. In addition, recall-judgment correlations in this condition were small and nonsignificant, again indicating on-line rather than memory-based processing. This set of results thus suggests on-line processing for group targets under mem-set instructions, and the results are not supportive of our prediction that strong memory-based processing would be the default option for group targets under these instructions.

How can these results be explained? Let us keep two things in mind. First, under mem-set instructions, there was clear evidence of a greater degree of on-line processing for individuals than for groups, as indicated by the recall process measures. Second, the processing for group targets was not memory-based in the strong sense. Recall process measures were closer to those seen in imp-set instructions (which were designed to induce on-line processing) than to comp-set instructions (which were designed to induce memory-based processing). In a recent study, McConnell, Sherman, and Hamilton (in press) found no evidence for significant recall-judgment correlations when mem-set instructions were used with group targets. Just as in the current study, then, it appears that on-line processing was engaged under mem-set instructions, even when the target was a nondescript group where little cohesiveness or coherence might be expected. The degree of on-line impression formation may have not resulted in the fully integrated and coherent impression that would be necessary for attenuation of the illusory correlation effect, but it may have involved some partial extraction of trait information. These inferences would lead to enhanced memory performance and would allow a subsequent impression to be formed without the retrieval of the specific behavioral information (and thus the nonsignificant recall-judgment correlations).

This consideration suggests that the distinction between on-line and memory-based judgments is not a simple dichotomy, but may better be thought of as a continuum. Impressions of group targets under mem-set instructions may not be made in a complete and integrated way as information about various group members is presented, but neither are these impressions based solely on the recall of specific items of behavioral information at the time of judgment.

Results in our imp-set conditions further support the conclusion that on-line versus memory-based processing is not an all-or-none proposition. Although imp-set instructions led to increased recall and decreased latency of response for group targets, there was still a difference between group and individual social targets in this condition. Differences in recall were attenuated but not eliminated. Even though subjects were attempting to form organized impressions of both individual and

group targets, they seem to have been more able to achieve coherent and integrated impressions when the target was a single individual. We may succeed in inducing on-line processing for group targets with imp-set instructions, but the level of on-line processing achieved was still less than that for individual targets.

Illusory Correlations

In addition to contributing to an understanding of the distinction between on-line and memory-based judgments of social targets, the results of this experiment also extend our understanding of the processes involved in the illusory correlation phenomenon. In the original demonstration of illusory correlation in the stereotyping of groups (Hamilton & Gifford, 1976), it was proposed that the process underlying this effect entailed memory-based judgments of Groups A and B. That is, at the time that evaluative judgments were called for, subjects presumably retrieved specific behavioral items as a basis for judgment. It was argued that the distinctive items (undesirable Group B behaviors) were most accessible in memory and thus had the greatest weight in impressions of the groups (leading to more negative evaluations of Group B). Our current findings provide the most direct process data to date to illuminate the basis of illusory correlation.

The present study investigated the strength and direction of illusory correlation for both individual and group targets. The clearest place to look for the hypothesized processing differences and thus differences in the extent and direction of illusory correlation is in the mem-set instruction conditions. As expected, under mem-set instructions there was a strong illusory correlation for group targets such that the minority group was perceived more negatively. This illusory correlation emerged for all measures—likability, frequency estimates, and target assignment. In the case of individual targets, this type of illusory correlation clearly did not occur. However, neither was there a significant illusory correlation between the minority individual and the frequent behaviors (although this form of illusory correlation was observed with imp-set instructions).⁵ Across all measures, majority and minority individuals were not perceived differently.

In addition to the strong illusory correlation observed for group targets in the mem-set condition, strong illusory correlations were also evident in two other cases: comp-set instructions for both individual and group targets. With comp-set instructions, the impression measures showed clear evidence of a preference for the majority target, whether individual or group.

Do these illusory correlation results, along with the process measures, support a mechanism of illusory correlation formation that involves memory-based judgments for the targets (Hamilton & Gifford, 1976; Hamilton & Sherman, 1989)? For the comp-set conditions, the answer would appear to be yes. Strong illusory correlations were observed, and the process measures indicated memory-based judgments—weak recall, long recall latencies, recency in recall, and significant recall-judgment correlations.

On the other hand, the results for group targets in the mem-set condition (the typical situation in most research using the illusory correlation paradigm) are not so clear. A strong illusory correlation was observed in this case, but the process data were

not indicative of the kind of memory-based judgments that are proposed by current theory. As we have seen, process measures in this case indicated substantial recall, fast recall, primacy, and no significant recall-judgment correlations. These results are indicative of at least some degree of on-line processing, and this conclusion is further supported by the similarity in process results for the group imp-set and the group mem-set conditions.

These results suggest that traditional illusory-correlation-based stereotypes can and do form in the absence of memory-based impressions. With group targets and mem-set instructions, subjects evidently did not need to rely totally on the retrieval of the specific behavioral information in order to make group judgments. On the other hand, neither did these subjects have already-formed impressions that had been integrated on-line as the behavioral information was received. If that had been the case, illusory correlations would not have emerged (just as they did not emerge with individual targets). We would suggest that, without directive instructions, behavioral information about group members leads to some spontaneous trait extraction (Uleman, 1987). In addition, these trait traces laid down by the behavioral information are at different encoding depths and strengths depending on the distinctiveness of the behavioral information. Thus, traces involving the negative behaviors of the minority group will be the strongest, as suggested by current theory. Thus, the distinctiveness of the original behavioral information would still play a role in the illusory correlation process. However, global trait inferences from the original behaviors and not the behaviors themselves would later be accessed for evaluative judgments. Such a process would allow for enhanced memory due to the partial integration of the behavioral information, but it would also allow for the formation of illusory correlations because of the differential accessibility of the traces.

Admittedly, such an account remains speculative. However, this account is consistent with the current pattern of data. In addition, it supports the notion that the processing of social information cannot be classified simply as either on-line or memory-based. It is likely that some information is extracted on-line as we learn about social targets, but the degree of integration and completeness of that extraction will vary depending on the nature of the target, the motivational state of the subject, and other situational factors. Additional research will be necessary to fully establish the process underlying illusory correlation formation and to understand more completely the nature of group stereotype development and individual impression formation.

⁵ The reason for the failure to replicate the "reverse" illusory correlation obtained in the Sanbonmatsu et al. (1987) study may be that, in the present study, there was a strong tendency to form on-line impressions of both individuals. The only factor that might render the minority individual more salient was his relative infrequency. However, there may have been a strong tendency to form a coherent impression of the majority individual as well. Sanbonmatsu et al. (1987) called special attention to one of the individuals by asking subjects to focus primarily on that person (who was one of five targets). Thus, with special attention given to one of several targets, a reverse illusory correlation emerged. With only two targets and no special instructions to attend to one of them, it appears that on-line processing occurs for both targets.

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