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ATTENTIONAL SET AND VERBAL REPORTS ON EVALUATIVE JUDGMENTS

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In Search of Introspection:

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ABSTRACT

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By

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Nisbett and Wilson (1977) have argued that people have no access to cognitive processes, and that verbal reports are generated by implicit causal theories rather than introspection. However, recent social psychological and cognitive theory suggests that people may be able to accurately report on causal stimuli when they process information "mindfully." In order to test this hypothesis, subjects were provided with trait descriptions of thirty-two target persons and were asked to evaluate them. One third of the subjects were instructed to "think out loud" during the task, one third were instructed to carefully attend to the task, and the remaining third were given no special instructions. Verbal reports were provided either immediately or one week later. An additional group of yoked observers provided verbal reports after examining raters' responses to the stimuli. Subjects achieved a significant degree of accuracy. However, these reports did not significantly differ across conditions.

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WE GROW GREEN

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CHAPTER 1

INTRODUCTION

Robert Zajonc (1980) has recently observed that social psychology began invoking cognitive theories long before the information-processing revolution which overtook experimental psychology in the mid-1960's. Festinger's theory of "cognitive dissonance" (1957), Hovland's notion of "counterargumentation" (eg. Hovland, Janis, & Kelley, 1953), and Heider's original work on attribution theory (1957) all serve as reminders that social psychology has been rather cognitive all along. These theories, although phenomenologically rich and vivid, lack the detail and rigor which the information-processing theorists have since developed. Consequently, there has been a growing trend towards the adoption of explicit information-processing models of "social cognition" (eg. Higgins, Herman, & Zanna, 1981).

With this increase in theoretical sophistication and articulation, however, has come a critical posture towards some of the overly simplistic assumptions implicit in traditional cognitive social psychology. For example, Langer (1978) has questioned the image of people as "intuitive scientists" (eg. Kelley, 1967) searching for causes and explanations in order to control their social environment; she argues that, on the contrary, most social behavior is governed by "scripts" (Abelson, 1976) or pre-established sequences of appropriate situational behavior, and that we are therefore "mindless" a great deal of the time. Similarly, Taylor and Fiske (1978) have reviewed a growing body of research suggesting that rather than thoughtfully reflecting on social judgments, we typically respond "off the top of our head." Perhaps the strongest challenges have come from Richard E. Nisbett and his colleagues

(Nisbett & Wilson, 1977; Nisbett & Bellows, 1977; Wilson and Nisbett, 1978; Nisbett & Ross, 1980), who argue that we are not able to introspectively monitor higher-order cognitive processes, and from Daryl Bem (1967, 1972), who argues that cognitive constructs such as attitudes may not even exist until requested.

These critiques contribute much to the development of a more sophisticated understanding of cognitive processes and their impact on social behavior. However, we must avoid "throwing out the baby with the bath-water"; i.e., eliminating the rich phenomenological texture which has characterized our traditional social-psychological theories in an attempt to gain theoretical and methodological rigor. A more fruitful approach would be to determine the necessary and sufficient conditions in which phenomenology plays a role in social cognition (cf. Lieberman, 1979; Vallacher & Wegner, in press). The present thesis is an attempt to elucidate the conditions under which we can accurately introspect and report on higher-order social-cognitive processes. Recent literature on verbal reports on cognitive processes will be reviewed, and then research will be presented testing the hypothesis that accurate verbal reports can be obtained when subjects form social judgments "mindfully."

Nisbett's Challenge to Introspectionism

By 1977, a recurring anomaly in the results of research on cognitive dissonance (e.g., Aronson & Mills, 1959) and attribution theory (e.g., Nisbett & Valins, 1971) threatened to undermine a central assumption of both paradigms, the assumption that cognitive events were mediating the observed changes in behavior. This anomaly was the inability of researchers to obtain spontaneous verbal reports from subjects on these hypothesized cognitive events, verbal reports which the theories'

predictions. Faced with this dilemna, Richard E. Nisbett, an active researcher in attribution theory (e.g., Jones & Nisbett, 1972), and his colleague Timothy D. Wilson proposed three counterintuitive hypotheses which would resolve the anomaly. First, people have little or no direct access to higher-order cognitive processes. Not only can we seldom report on the existence of critical stimuli affecting our cognitive processes; we are often not aware that such processes even took place. Second, when people do report on cognitive processes, their reports are not based upon a recollection of cognitive events but rather upon implicit, a priori theories about the causal factors most likely to have influenced their responses. In doing so, people may adopt a "representativeness" heuristic (Tversky & Kahneman, 1974), selecting as causal those factors which "seem similar" to the response. Third, when verbal reports do correctly correspond to behavioral changes, these reports are not due to introspection, but are simply "good guesses"; correct matches between a priori theories and actual cognitive events. Thus, consistent with Bem's (1972) self-perception theory, Nisbett and Wilson deny actors access to any information which could not be made available to observers given sufficient observation.

In addition to a review of literature considered consistent with these propositions, Nisbett and Wilson (1977) presented the results of several experiments they performed to specifically test them. A brief summary of these experiments will suffice at present. First, they demonstrated numerous failures of subjects to report the effects on their judgments of such influential factors as (1) semantic cuing effects, (2) position effects, (3) "anchoring" effects, and (4) "halo" effects. Second, they demonstrated erroneous reporting by subjects of various

non-influential factors, such as (1) the emotional impact of literary passages, (2) the effects of distraction on reaction to a film, and (3) the effects of reassurance on willingness to take electric shocks. Similar results have been obtained in studies by Nisbett and Bellows (1977), and Wilson, Hull, and Johnson (1981).

Theoretical and Meta-Theoretical Critiques of Nisbett and Wilson

One theoretical weakness with Nisbett and Wilson's thesis is that their reasoning can be interpreted tautologically. For example, Smith and Miller (1978) have suggested that since Nisbett and Wilson regard both correct and incorrect reports as supporting their theory, it cannot be falsified; i.e., "representativeness could come to be defined at least in part by the fact that self-reports are correct" (p. 356). Similarly, Cotton (1980) has warned that a subscription to Nisbett and Wilson's thesis may lead researchers to ignore subjects' verbal reports when they don't support the hypothesis being tested, even when the hypothesis is wrong. These flaws are not fatal to the thesis, but they do suggest the need for strict a priori operationalism in its application.

A metatheoretical problem in Nisbett and Wilson's argument is raised by their use of the word "process." Note that they do not explicitly deny the possibility of introspective access to cognitive "products" or "content"; only cognitive "processes." Smith and Miller (1978) regard this distinction as the creation of another tautology: if a report is accurate, it reports "content," but if it is not, it fails to report "process." "Content" and "process" can thus be defined by whether or not the report was accurate. An exact test of Nisbett and Wilson is difficult because no acceptable definitions of product and process exist: As White (1980) has pointed out, every process can be infinitely broken down into

smaller processes. At an extreme level, social judgments have their origin in the activities of sub-atomic particles, so in a sense, the level of "product" is what we define it (cf. Hempel, 1966). Ultimately, "process" is a theoretical construct and by definition cannot be observed; we can watch an apple fall but we can never "see gravity" (Mandler, 1975).

Such semantic hair-splitting on both sides of the argument indicates the need for a more adequate definition of the question examined by Nisbett and Wilson's experiments. The question is clarified by Nisbett and Ross (1980, p. 218): "Is the actor aware that particular responses are functionally related to particular stimuli or situational factors, however many or complex the links?" They further suggest that the question is only of interest for social psychologists when the functional relationships are "typical of the sorts of 'causes' and 'effects' about which we assume ourselves to be knowledgeable" (Ibid.).

Methodological Critiques of Nisbett and Wilson

Several authors (Smith & Miller, 1978; Ericsson & Simon, 1980; Wright & Rip, 1981) have questioned the appropriateness of the between-subjects design used by Nisbett and Wilson (1977) to test their propositions. It is argued that it is unreasonable to expect subjects to be able to perceive the systematic effects of a variable upon their behavior when they are only exposed to one level of that variable. First of all, between-subjects designs are typically intended to obscure the variables of interest from the subject in a social-psychological experiment. (Consider the elaborate subterfuge of a double-blind experiment using a placebo, for example.) Moreover, even the researcher can only determine the systematic impact of a between-subjects variable

by comparing the different levels of that variable, not by examining a single level.

Nisbett and Ross (1980) argue, however, that the within-subjects design has the disadvantage of making public the additional cues it provides, so that it is not clear whether the subject is reporting introspective knowledge, or knowledge gained from perceiving his or her own behavior. Further, they claim that the between-subjects design more closely approximates normal day-to-day conditions: "We know a warm Belgian psychology instructor or a cold Belgian psychology instructor, not two physically identical Belgian psychology instructors, one of whom is warm and one of whom is cold...life itself has a between design" (p. 220).

In a certain technical sense, Nisbett and Ross are correct: we will never be exposed to two different levels of a single variable at two different points in time with all other variables held constant. But if we are to be that stringent in our criteria for experimentation, it is unlikely that any experiment can qualify. A recognition of this fact is implicit in the common acceptance of the within-subjects design as a research tool; as long as such artifacts as carry-over effects are accounted for, most social psychologists (and journals) recognize their validity.

It has also been suggested that Nisbett and Wilson did not adequately address certain measurement issues inherent in their program of research (Smith & Miller, 1978; White, 1980; Wright & Rip, 1981). For example, they did not control for the possible effects of social desirability, evaluation apprehension, and demand characteristics upon subjects' reports. Subjects should be able to comfortably retrieve and

report on cognitive events; further, if task demands are too great, subjects may simply report a "public" theory because to do so is less taxing. Smith and Miller (1978) and White (1980) have claimed that Nisbett and Wilson did not always ask subjects the exact questions their analyses assumed, and that an adequate test must ensure that subjects are perceiving and answering the question intended by the experimenter. Finally, many authors have criticized the procedure used by Nisbett and his colleagues for analyzing their data (Smith & Miller, 1978; White, 1980; Wright & Rip, 1981). For example, Nisbett and Bellows (1977) performed analyses of variance (ANOVA's) on mean judgment ratings and reports across subjects, a procedure which treats individual differences as error variance, thus ignoring the crucial question of how aware a subject is of how the stimuli influenced his or her own judgment. Indeed, information- processing pioneer Herbert Simon (1976) has claimed that the ANOVA is a "useless" procedure for testing process models of cognition. To illustrate this point, Smith and Miller obtained Nisbett and Bellow's (1977) data and reanalyzed it, comparing each subject's ratings with his/her own reports. They obtained small but significant correlations such that subjects who reported a given item as influential tended to be the same subjects whose judgment ratings actually exceeded the mean on that item.

Recent Empirical Research on Verbal Reports

Several recent studies have been conducted adopting designs and procedures that overcome many of the aforementioned method- ological problems (Weiss & Brown, reported in Nisbett & Ross, 1980; Wright & Rip, 1981; White, 1980). White (1980) presented subjects with a series of thirty-two person-perception tasks in which subjects were asked to rate

their liking for a fictitious person on a 9-point scale after being exposed to four pieces of information about him. Subjects were then asked to rate the effect of each item of information on their judgment. Each item of information represented one level of a four-level factor; each level of a factor was presented with each level of each other factor twice across tasks, but within subjects. Accuracy scores were computed by correlating the within-subject mean actual effects for a factor with the reports by each subject on the perceived influence of that factor, so that accuracy scores were individualized, not aggregated.

In addition, two between-subjects conditions were run: an experimental condition in which subjects completed each report immediately following the judgment to which it refered, and an "actors' control" condition, in which subjects completed their reports on the factors one week after they completed their liking judgments. This latter condition was included to investigate the possible impact of a priori public theories on the reports after the subjects' memory of the judgment process had presumably decayed. White found that the experimental group was significantly more accurate on three of the five traits; furthermore, he demonstrated that an analysis across subjects, like that of Nisbett et al (1977, etc.), eliminated the effects.

Wright and Rip (1981) had 140 high school juniors and their parents rank 32 hypothetical colleges given information on five factors. One factor had four levels, and the other four had three levels, creating a 4 x 3 x 3 x 3 x 3 design, a subset of which was presented within-subjects. After ranking, each family member rated the "desirability" of each level of each factor on a 7-point scale, first based upon their own previous ranking judgments, and then again for their estimation of the ratings of

the other two family members. The estimation ratings for family members were presumed to serve as a good "actor versus observer" test because (1) the observers had also completed the judgment task at the same time, and (2) the observers had a history of observing the actor. Wright and Rip found that self-reports were significantly more accurate than observer-reports, accounting for 40% more variance. They did find a wide range of individual differences in accuracy, however, and a second experiment was performed to attempt to explain some of this "error" variance. Subjects performed a similar judgment task, but after a manipulation which lead some subjects to heavily utilize some factors that subjects otherwise tended to ignore. After the judgment task, subjects were to again report the perceived influence of each level of each factor; in this experiment, however, half of the subjects were given an "impression-management" set in which certain factors were implied to be more normatively important than others. The remaining subjects were given an "accurate retrieval" set. Wright and Rip found that subjects who had heavily utilized "non-normative" factors tended to be less accurate than subjects whose judgment process was consistent with the "normative" set. Subjects in the "accurate retrieval" set condition achieved accuracy not attributable to impression-management, and achieved significantly greater accuracy than observers did.

These studies by White (1980) and Wright and Rip (1981) would appear to indicate that with the use of more appropriate methodology, Nisbett and Wilson's thesis is simply wrong. Evidence from Weiss and Brown (reported in Nisbett & Ross, 1980), and Wilson, Laser, and Stone (1982), however, indicates that such a conclusion would be premature. Weiss and Brown had female subjects report the quality of their mood and the state

of several factors which might conceivably influence it (eg. day of the week, the weather, etc.) every day for two months. At the end of this two month period, they completed a final questionnaire assessing their perceptions of the relative impact of the different factors on their mood. Weiss and Brown performed a multiple regression on the data in order to obtain objective weights of the impact of each factor on the subjects' mood. They compared these weights to the "subjective" weights derived from the post-experimental questionnaire and found large discrepancies. Furthermore, a group of "observers" yielded almost identical subjective weights. One flaw in this procedure was that they asked subjects for causal reports in a correlational design. However, Wilson, et al. (1982) recently replicated their results by using a similar procedure but soliticiting reports on "predictors" of mood. Both studies used a within-subjects design with individualized, not aggregated, analyses and supported Nisbett and Wilson's (1977) thesis, contrary to White (1980) and Wright and Rip (1981).

The reason for this discrepancy is not readily apparent, but a review of a recent information-processing model by Ericsson and Simon (1980) may help to clarify it.

Ericsson and Simon's (1980) Information-Processing Model

Ericsson and Simon's model is basically consistent with previous information-processing models (eg. Newell & Simon, 1972) but it is specifically oriented to addressing the issue of verbal reports on cognitive events. While a thorough review of the model is beyond the scope of this thesis, its central tenets can be briefly summarized. First, information that has recently been processed is kept in short-term memory (STM), where it is available for further processing. According to

Ericsson and Simon (see also Payne, Braunstein, & Carroll, 1978; Webber & Rich, 1981), when asked to "think aloud," the subject can externalize this information. They refer to this procedure as "concurrent" reporting. However, STM has only limited capacity, and as new information enters STM, previously stored information is either transferred to long-term memory (LTM), or is not stored at all. Therefore, after passage of time, information can only be reported if it has been stored in LTM and then retrieved to STM for the report, a process Ericsson and Simon call "retrospective" reporting.

Ericsson and Simon further distinguish three different levels of verbalization. Level 1 verbalization is direct; information is reproduced in the form it appeared during processing. According to Ericsson and Simon (1980) and Payne, Braunstein and Carroll (1978), this form of verbalization should not alter the information or the cognitive process. Level 2 verbalization requires an intermediary phase of recoding information which was processed in a nonverbal form into verbal code; for example, attempting to describe what a recently-handled pomegranate felt like. Level 2 verbalization has two drawbacks; it slows reporting down, and, as is typically the case when recoding takes place, information is often lost. On the other hand, Ericsson and Simon claim that task performance should not be changed in either structure or course. Finally, level 3 verbalization requires further intermediary processing; scanning, filtering, inference, or generation. One example of level 3 verbalization would be to "describe only those thoughts during task performance that are of an injunctive form." Another example might be an attempt to "verbalize those thoughts during task performance that seem task irrelevant, and do so in a high, squeaky voice." Level 3 verbalization

may alter the ongoing cognitive processes, and, as a result, the task performance as well. This is consistent with attribution research (e.g., Enzle & Shopflocher, 1978) suggesting that direct attributional questions, such as requests for motives or reasons for behavior, may change or even create create cognitive processes that might not otherwise occur. The drawbacks of both level 2 and level 3 processing will be accentuated by tasks that create a "cognitive strain" for subjects in that the verbalization process makes it difficult to perform the task (Ericsson & Simon, 1980; White, 1980).

Because of the limitations on level 2 and level 3 verbalization, Ericsson and Simon (1980) distinguish two important types of query: directed vs. undirected probing. To insure that concurrent reporting does not alter the ongoing cognitive processes, Ericsson and Simon recommend undirected probing; for example, "think out loud" as opposed to "tell me what criteria you are using in your decision process," etc. However, for retrospective reporting, they suggest that more direct probing (eg. "did you use any subgoals? If so, what were they?") may prompt the retrieval of relevant information from LTM; without such prompts, the subject may base the report on information currently available (i.e. the outcome behavior) as opposed to information previously available during performance. Of course, probe decisions must ultimately be dictated by the unique features of the task, and Ericsson and Simon provide a good framework for such decisions.

Having articulated their model for verbal reports, Ericsson and Simon (1980) reviewed the work of Nisbett and Wilson (1977), and found that their results were generally consistent with the model. The inability of subjects to report on cognitive events during judgment tasks

can be explained by Nisbett and Wilson's inappropriate choice of query procedures: a complete reliance upon retrospective probes, most of which were "misdirected." For example:

> With questions like "I noticed that you took more shock than average. Why do you suppose you did? (Nisbett & Wilson, 1977, p. 237)," it is not even clear to us, nor probably to the subjects, that memory for the cognitive processes should be the information source for the answer. If subjects can generate their answers without consulting their memories of the cognitive process...this might often be more efficient than retrieving information from memory. (Ericsson & Simon, 1980, p. 246).

Ericsson and Simon's model can also shed some light on the results of Weiss and Brown (In Nisbett & Ross, 1980), and of Wilson, et al. (1982). Recall that those authors used a within-subjects design and individualized analyses, and found that subjects were unable to report the effects of various potentially influential factors on their mood. However, since their estimates were obtained at the end of a two-month period, it is clear that these reports were extremely retrospective, and hence, following Ericsson and Simon's model, would require a great deal of information "embedded" in LTM, if stored at all. On the other hand, White (1980) found that subjects were more accurate when they reported on the perceived influence of factors immediately following each stimulus presentation than when they gave their reports a week later.

Implications of Ericsson and Simon's Model for the Social Realm.

Ericsson and Simon's model, together with the critical input provided by Smith and Miller (1978), White (1980), and Wright and Rip (1981) would appear to provide an excellent set of guidelines for recognizing the conditions under which veridical data on cognitive events may be obtained. Furthermore, it appears to resolve the counterintuitive

predicament created by Nisbett and Wilson (1977) -- but only in the laboratory. Nisbett's point, that "a subject can be shown to ignore or deny the influence of some factor that was necessary to produce his response in a given situation" (Nisbett & Ross, 1980, p. 218), has nevertheless been made. Ericsson and Simon (1980) provide us with conditions under which this demonstration will occur, and also when it will not necessarily occur, but their model is geared toward the researcher and subject in the laboratory. The studies by Weiss and Brown (in Nisbett & Ross, 1980) and Wilson, et al. (1982) might have yielded different results had they adopted concurrent probing techniques, but they force us to recognize that we might be just as inaccurate as an outside observer when asked to indicate the potent factors influencing our mood over the past two months. In the hectic, mundane, vibrant, neurotic, sexy, ambiguous social world that we "researchers" and our "subjects" live in, what constitutes a "concurrent report" or a "retrospective report"? Without the prodding and probing of an experimenter, when do we attempt to monitor cognitive events? When do we retrieve information on social judgment processes? When do we attempt to ascertain the impact of situational factors upon our behavior?

Some clues to these questions may be provided by research on the "mindfulness/mindlessness" distinction by Ellen Langer (Langer, 1978; Langer, Blank, and Chanowitz, 1978; Chanowitz and Langer, 1980, etc.), and by recent research on "information search" by Kruglanski (1980), Pyszczynski and Greenberg (1981), Swann, Stephenson, and Pittman (1981), and Wong and Weiner (1981). Langer (1978) argues that well-learned sequences of social behavior become automated and form what Abelson (1976; Shank & Abelson, 1977) has termed "scripts" (cf. Neisser, 1976,

pp. 89-93). Scripts then allow us to engage in relatively complex behavior, such as driving a car, typing a letter, ordering food in a restaurant, or even holding a conversation, while remaining "mindless," i.e., while not actively attending to the situation or our behavior.

An early study by Langer, Blank, and Chanowitz (1978) demonstrates this phenomenon while also suggesting factors that can instigate "mindfulness" in day-to-day existence. Experimental confederates approached students waiting to use a copying machine at a university library, and asked to make either five (small favor) or twenty (big favor) copies. Langer et al. created three different reasons for the request by varying its semantic content. One third of the subjects received a "real information" request: "Excuse me, I have five (twenty) pages. May I use the copy machine because I'm in a rush." According to Langer (1978), this request was "script-congruent" because people in our culture have learned to expect to hear an explanation accompanying a request for a favor. A "placebic information" request was presented to another third of the subjects: "Excuse me, I have five (twenty) pages. May I use the Xerox machine because I have to make copies?" This request was designed so as to be redundant with the control request ("Excuse me, I have five (twenty) pages. May I use the Xerox machine?") given to the final third of the subjects, but structurally congruent with the "real information" request, and therefore, structurally congruent with the script.

It was hypothesized that a person who processed the request mindlessly would not notice that the "reason" for the placebic request was not really a justifiable reason at all, and would therefore follow the script and grant the favor. On the other hand, a person who mindfully

processed the script might detect the discrepancy, and subsequently be less likely to comply with it. Langer, et al. found that when the request was small, there was significantly less compliance in the control condition (60%) than in either the placebic or real information conditions (93% and 94%, respectively). However, when the request was large, compliance in the control and placebic conditions was identical (24%) and significantly less than in the real information condition. Langer argues that we process mindfully when a situation is novel or when it is costly not to do so. But when a situation is highly familiar and has a good fit to a well-learned script, we will process "mindlessly" because it requires less effort.

Langer's thesis also receives indirect support from recent research on information search in social situations. It has been demonstrated that individuals will search for social information when unexpected events occur (Pyszczyski & Greenberg, 1981), when frustrated (Wong & Weiner, 1981), and when their experiences are incongruent with their belief systems (Ibid.). This line of theorizing owes much to D. E. Berlyne (e.g., 1960, 1964), who theorized that the acquisition and processing of information are motivated by novelty, "conceptual conflict," and uncertainty.

One link between the mindfulness/mindlessness distinction and Ericsson and Simon's (1980) information-processing model is provided in their discussion of verbal reports on "automatic and controlled processing," a distinction introduced by Shiffrin and Schneider (1977; Schneider & Shiffrin, 1977). Automatic processing occurs when a well-learned sequence of elements in LTM is activated without utilizing STM capacity. Controlled processing, however, requires attention and STM

capacity. This distinction is analogous to the difference between a computer program compiled in machine language and an interactive program run from a terminal. According to Schneider and Shiffrin (1977):

> When an automatic sequence is initiated, its nodes are activated and hence the associative information enters STM. This fact does not, however, mean that the various elements of the automatic process must be available to consciousness or recallable at a later time...unless attention is directed to the process when it occurs or unless the sequence includes an automatic attention-calling response, then the information may be immediately lost from STM, and the subject may be quite unaware that the process took place. (p. 156).

Ericsson and Simon (1980) view this as consistent with their model; information not present in STM simply is not accessible for reporting.

In a sense, Langer's mindfulness/mindlessness distinction may simply be a higher-order analogue of the controlled/ automatic processing distinction. Script-processing is basically automatic and does not require the demands on STM that controlled, mindful processing does. While it is likely that the greater complexity of higher-order processes responsible for social behavior requires more "attention-calling responses" to coordinate subprocesses (cf. Carr, 1979), the net result may be similar: during mindless processing in social situations, information may drift in and out of STM in such a brief period that we are not able to retrieve it moments later if we didn't "catch it the first time."

If Langer is correct in her claim that "people may process only a minimal amount of information to get them through the day" (1978, p. 50), and if the above reasoning is correct, than the results of the Weiss and Brown (in Nisbett & Ross, 1980) and Wilson, et al. (1982) studies make sense: the subjects were most likely processing mindlessly a great deal of the time that potent variables were influencing their mood, and

therefore did not store that information in LTM where it would be available for future reporting. (If you, the scholarly reader, stop this moment and ask yourself "What did I just read? Am I taking full breaths? Am I tensing any muscles? Am I daydreaming?", perhaps you will discover that you have been mindlessly processing this thesis!)

By asking subjects to "think out loud," Ericsson and Simon's (1980) concurrent probe technique may serve as a direct instigation of mindfulness in the laboratory. It allows subjects to report on information while it is still stored in STM, and therefore bypasses the difficulties inherent in retrospective reporting, but it nevertheless creates an intrusion than makes it an unlikely tool for research on social interaction, and bears little or no resemblence to any real life introspective behavior that may be taking place. However, by instigating mindful processing, it may increase the likelihood that subjects will attend to and store causal information for later retrospective reporting.

Statement of Hypotheses

The present thesis suggests that the experience of concurrent reporting will induce mindful processing in subjects, thus enabling them to introspectively monitor their evaluative judgment processes and hence yield more accurate verbal reports. Furthermore, it is predicted that subjects will also mindfully process information if they are forewarned that they will have to do so. Note that Nisbett and his colleagues have neglected to provide such a warning for their subjects. Indirect support for this prediction is provided by a recent study by Kraut and Lewis (1982). These authors forwarned all their subjects that they would be asked to report on factors that might influence their judgments. They found a reliable correlation between actors' subjective influence and

actual influence measures (r = .42), and a weak but reliable correlation after partialling out naive observers' subjective expected influence ratings (r = .15). However, since they did not vary this intervention across subjects, their study can't provide conclusive evidence for its impact. Therefore, the present study will test the following hypotheses:

I. Overall, subjects will provide better than chance accuracy in reporting on the influence of causal factors on their evaluative judgments.

II. Actors who provide concurrent reports will provide more accurate verbal reports than actors in a control condition.

III. Actors who are instructed to attend to the process of reaching their evaluative judgments and forewarned that they will be asked to report on this process (i.e., "Mindful" actors) will provide more accurate verbal reports than actors in a control condition.

In addition to examining the effect of attentional set on subjects' verbal report accuracy, the present study will attempt to demonstrate that actors have introspective access to their judgment formation processes, and that they therefore are able to provide verbal reports with accuracy above and beyond that which can be accounted for by implicit causal theories (cf. Nisbett & Wilson, 1977) and self-perception effects (Bem, 1967). In order to do so, two types of "observers" will be used. First of all, in an attempt to rule out the role of implicit lay theories, half of the actors will be asked to provide retrospective verbal reports a week after they make their evaluative judgments. This procedure was adopted by White (1980), and is based on the assumption that any information obtained by introspection will not be retained for an entire week. Since subjects will be randomly assigned to conditions, there is no reason to expect a preponderance of "correct" implicit lay theories in either the immediate or delayed conditions. Therefore, any

increase in the accuracy of the immediate retrospective reports will rule out the role of these "explanatory systems," suggesting the following hypothesis:

> IV. Actors who provide verbal reports immediately following the evaluative judgments will be more accurate than actors who provide verbal reports a week or more later.

Finally, an additional "observer" condition will be included in order to examine an alternative, "self-perception," explanation for Hypotheses I through IV. This explanation states that actors may be able to provide accurate reports, without any recourse to introspection or implicit causal theories, by simply observing the covariation of their evaluative judments with the stimuli in a repeated-measures design. In an attempt to rule out this possibility, one-third of the subjects will be randomly assigned to a "yoked observer" condition. These subjects will read the same instructions that were presented to the actor to whom they are yoked, examine the same stimuli in the same order, and examine the actor's judgment for each stimulus presentation. Finally, they will be asked to report on the relative influence of the stimulus factors upon the actor. Since these observers will observe the same covariation data as the actor, any increase in accuracy by the actor will provide evidence for the additional impact of introspection. However, observers who are yoked to actors in the concurrent report condition will also hear a tape recording of the actor's "think out loud" data. To the extent that these tapes convey the actor's introspection regarding the formation of evaluative judgments, these yoked observers should also improve in accuracy somewhat. Therefore, the final hypothesis is that:

> V. Actors in the "mindful" condition will provide more accurate verbal reports than those of their yoked observers.

In summary, these hypotheses call for a 3 (Attentional Set: Concurrent Report vs. Mindful vs. Control) X 3 (Actor/Observer Status: Actor/Immediate vs. Actor/Delay vs. Yoked Observer) factorial design.

CHAPTER 2

METHOD

Subjects and design. A 3 (Attentional Set: Concurrent vs. Mindful vs. Control) X 3 (Actor/Observer Status: Actor/Immediate vs. Actor/Delay vs. Yoked Observer) X 2 (Sex of subject) factorial design was employed. One hundred and forty six participants, 65 males and 81 females, were recruited as subjects from Introductory Psychology classes and received extra course credit for their participation. Cell sizes ranged from 5 to 11, with a median cell size of 9 subjects. (See Table 1).

Stimulus materials. The materials and task were similar to those used by White (1980). Subjects were presented with thirty-two brief descriptions of fictitious individuals. Each description contained five pieces of information, representing one level each of the following five dichotomous factors: gender, intelligence, attractiveness, extraversion-introversion, and liberalism-conservatism. Thus, each subject was exposed to every possible combination of the five factors. The order in which these factors were presented was counterbalanced across the descriptions to prevent possible order effects from influencing subjects' responses. For example:

> Joan tends to be conservative in her political attitudes. She is usually introverted. She is considered to be unattractive. She has a high IQ.
>
> Doug has an average IQ. He is considered to be attractive. He tends to be liberal in his political attitudes. He is usually extraverted.

After reading each description, subjects were asked to indicate how much they believed they would like the target person, based solely upon the information given. Subjects made their responses on the following scale:

:1:2:3:4:5:6:7:8:9:

Would like very little | Would neither like nor dislike | Would like a great deal

Procedure. Subjects were scheduled individually for half-hour sessions. Subjects in the Actor/Delay conditions were also scheduled for an additional half-hour session one week after the initial session. Each subject was seated in front of a tape recorder with a built-in microphone on a table. The experimenter then placed a folder in front of the subject and said:

> This folder contains materials you will use during the experiment, including your instructions for the task you will be asked to perform today. I will be in the next room during the experiment, so if you have any questions or would like me to sign your extra-credit card, please come and get me. You may now open the folder and begin reading.

All subjects then opened the folder and read the following cover sheet:

> Thank you for participating in today's research. We are interested in how people form impressions of others given very little information. We believe that an understanding of the impression-formation process may eventually lead to an opportunity for smoother relationships between friends, spouses, families, neighbors, co-workers, and perhaps even nations. Although today's research is just one small step towards such an understanding, we nevertheless believe that it is important and we appreciate your help. However, if you should decide that you are not interested in participating, simply give your experimental credit card to the experimenter and he or she will sign it for you. If you are willing to participate, please turn the page and read and sign the departmental consent form. When you have done so, move on to the page which follows the consent form for further instructions.

After reading and signing the consent form, subjects read the remaining instructions in the folder, which differed for each experimental condition. Subjects in the Actor/Immediate and Actor/Delay conditions read the following:

> Today we will ask you to read thirty-two brief descriptions of individuals approximately eighteen to twenty-two years of age. After reading each description, you will be asked to rate how much you believe you would like this person, given the information available and nothing else. There is no right or wrong answer to this decision; it is a strictly personal and subjective judgment, and research suggests that such ratings vary from individual to individual. Please do not spend more than 30 seconds on each judgment; you will probably find that this is more than enough time. When you have completed all 32 ratings, please inform your experimenter and he or she will give you another brief task to complete.
>
> You will notice a tape recorder and a stack of index cards on the desk. When you have completed reading these instructions, please press the "on" button on the tape recorder. Next, notice that there is a number written on the back of each card. Please read the number of the first card out loud into the microphone and then flip over the card and read the description which is written on it.

The remaining instructions were different for each experimental condition and are described below.

Level of attention manipulations. Subjects in the Concurrent reporting condition then read the following instructions:

> As you examine each description, please "think out loud," verbalizing into the microphone the way in which you use the information in each description to create your "liking" judgment. Later, you will be asked to explain this process.

Subjects in the Mindful condition read the following instructions:

> As you examine each description, please pay careful attention to the way in which you use the information in each description to create your "liking" judgment. Later, you will be asked to explain this process.

Subjects in the Control condition were given no special attentional instructions. All subjects then read the following:

> Then, circle the number which best characterizes your judgment on the appropriate rating scale on the following page, and also read the number you have chosen out loud into the microphone. Then

> repeat the process with the next card until you have made all 32 "liking" judgments. When you are done, or if you have any questions, please inform your experimenter, who will be waiting outside in the hall.

Actor-observer manipulations and retrospective reports. After completing the 32 evaluative ratings, subjects in the Actor/ Immediate conditions were given a questionnaire asking them to consider each of the five dichotomous factors that appeared in the stimuli and "rate how influential you believe that characteristic was in contributing to your 'liking' judgment" using the following scale:

: 1 : 2 : 3 : 4 : 5 : 6 : 7 : 8 : 9 :

Not at all influential	Somewhat influential	Extremely influential

Subjects in the Actor/Delay conditions were asked to return a week later to "fill out a brief questionnaire." These subjects were then scheduled for an additional half- hour session for additional extra course credit seven to nine days later. Those that attended the second session then filled out the same retrospective report questionnaire that subjects in the Actor/Immediate conditions were given. Subjects in the Actor/Delay conditions who did not attend the second session were dropped from the study.

The procedure for subjects in the Observer conditions differed somewhat from that detailed above. After reading the cover sheet and reading and signing the consent form, these subjects read the following instructions:

> Recently, we asked a student volunteer to read a series of brief descriptions of other people and then decide how much he or she liked them, based only upon the limited information given. Today, we would like you to read the same instructions that the student read (on the next page), read the same descriptions of other people, and then see

> the "liking" ratings given by that student. Later, we will ask you to fill out a brief questionnaire.
>
> First, we'd like you to read the instructions on the next page. These are the instructions that the student read prior to making the judgments. We only ask you to read them so that you will understand the student's task: YOU WILL NOT BE ASKED TO FOLLOW THE SAME INSTRUCTIONS YOURSELF. YOUR instructions are on the page which follows. Please read the next page, make sure that you understand the task that the student was asked to perform, and then read YOUR instructions on the page which follows. If anything is unclear or confusing, feel free to ask your experimenter questions.

Observer subjects were yoked to subjects in the Actor/Immediate conditions. Thus, they then read the same instructions, either Concurrent report, Mindful, or Control, that the Actor encountered. Then they were told:

> Now that you have read the student's instructions, you will listen to the tape recording of the student reading and rating the cards. Note that the index cards described in the instructions are sitting next to you on the table. These have been arranged in the same order that they were in when the student read them.
>
> When you have completed reading these instructions, please turn the switch for the tape recorder to the "ON" position. You will then hear the student.
>
> When the student reads the number on the back of card, you may flip that card over and read it yourself. After you have read the card, you may listen to the student and read his or her "liking" rating which is circled on the completed response form on the desk. Please DO NOT flip over the next card until you hear the student read its number out.
>
> You may find yourself forming "liking" judgments for the cards. However, YOUR task is simply to observe the student forming his or her own judgments. When you have heard the student rate all 32 cards, please turn off the tape recorder and your experimenter will give you a brief questionnaire to fill out.

Subjects in the Observer conditions then listened to the tape and read the 32 descriptions and accompanying ratings of the Actor to whom

they were yoked. After they had completed this task, they were given a questionnaire that asked them to consider each of the five dichotomous factors and "rate how influential you believe that characteristic was in contributing to the 'liking' judgments you heard and read today" using the same scale used for retrospective reporting by subjects in the Actor/Immediate and Actor/Delay conditions.

Ancilliary dependent measures. After completing the retrospective report scales, all subjects were asked (on the next page of the questionnaire) to "rank the five characteristics in the order which you believe they were influential" in forming the "liking" judgments. Next, every subject was asked to complete the 23-item "Self-Consciousness Scale" (Fenigstein, Scheier, and Buss, 1975.) Subjects were then asked if they believed that they usually knew why they liked someone, and to speculate on the purpose of the research they had just participated in. Finally, subjects in the Actor/Immediate and Actor/Delay conditions were asked to list the kind of thoughts that went throught their mind during the task, to report on the degree of difficulty they encountered in attempting to monitor their judgment formation, and to report whether or not the presence of the tape recorder made them feel self-conscious.

CHAPTER 3

RESULTS

Evaluative judgments. Mean "liking" judgments were computed for each subject and analyzed in a 2 (Sex of Subject) X 3 (Attentional Set) X 3 (Actor/Observer Status) between-subjects analysis of variance. No significant effects were found. The grand mean "liking" judgment was 5.35 (n = 146), falling just above the midpoint on the 9-point scale.

In order to assess the causal impact of the stimulus traits, the evaluative judgments were subjected to a 2 (Gender) X 2 (Intelligence) X 2 (Attractiveness) X 2 (Extraversion/Introversion) X 2 (Liberal/Conservative) X 3 (Attentional Set) repeated measures analysis of variance, with subjects (nested within Attentional Set) as the replication factor. The five stimulus traits were all dichotomous, within-subjects variables, making this analysis extremely sensitive. Because of the enormous number of possible interaction sources, and because the verbal report probes in this study did not allow subjects to report the influence of such interactions, only main effects were considered in this analysis. These effects and their accompanying error terms are presented in Table 2.

As in the previous analysis, no differences in "liking" judgments were found as a function of attentional set, suggesting that neither the concurrent report procedure nor the "mindfulness" instructions interfered with the evaluation process. Three of the five stimulus traits had a significant causal impact on the evaluations, thus meeting the prerequisite for assessing subjects' awareness of causal influences. First, subjects preferred stimulus persons of high intelligence (M = 5.62) to those of average intelligence (M = 5.40), $F(1,135) = 23.72$,

$p < .0005$. Second, they preferred attractive persons ($M = 6.09$) to unattractive persons ($M = 4.93$), $F(1,135) = 202.63$, $p < .0005$. Finally, extraverts ($M = 6.00$) were preferred to introverts ($M = 5.03$), $F(1,135) = 113.76$, $p < .0005$.

Accuracy correlations. Following Kraut and Lewis (1982), accuracy scores were created in the following fashion: First, point-biserial correlations were computed between each dichotomous trait and the 32 "liking" judgments, within subjects. The absolute value of each of these five correlations was used as a measure of the actual influence of that trait on the subject's evaluations. These five "objective influence" measures were then correlated with the five respective subjective influence ratings provided by the subject during the retrospective report. Thus, each subject had an "accuracy correlation" representing their ability to detect the causal impact of the traits. These correlations were then treated as a random dependent variable in a 2 (Sex of Subject) X 3 (Attentional Set) X 3 (Actor/Observer Status) between-subjects omnibus analysis of variance, presented in Table 3. No significant effects were detected.

Cell and marginal mean accuracy scores are presented for the Attentional Set and Actor/Observer Status variables in Table 4. Although no planned comparisons between cell means were reliable, several interesting trends are present. First, subjects were able to provide better greater accuracy than expected by chance, with a total mean accuracy correlation of .35 ($p < .005$), accounting for over twelve per cent of the variance, and supporting Hypothesis I. Consistent with Hypothesis III, actors in the "mindful" condition were more accurate than actors in the control condition, a difference of thirteen points.

However, contrary to Hypothesis II, actors in the concurrent reporting condition appear to have been somewhat less accurate than actors in the control condition, suggesting that this additional task may have actually interfered with the retrospective reporting process. While the direction of the marginal means is as predicted by Hypotheses IV and V, the differences are slight, providing no support for either hypothesis.

Several additional analyses were conducted using alternative formulations of the accuracy scores. These included analyses of the within-subject correlation between the absolute effect sizes (the difference between the mean ratings for each level of each dichotomous trait) and the subjective influence ratings, the correlation between the objective influence absolute point-biserial correlations and the subjective influence rankings, and the correlation between the absolute effect sizes and subjective influence rankings. These analyses replicated the pattern of accuracy scores in Table 4, and no reliable differences were detected.

Ancilliary analyses. Scores were computed for each subject for the three sub-scales of the Self-Consciousness Scale (Fenigstein, Scheier, and Buss, 1975). These scores were each analyzed in a 2 (Sex of Subject) X 3 (Attentional Set) X 3 (Actor/Observer Status) between-subject analysis of variance. No significant differences were found for the Public and Private Self-Consciousness sub-scales. However, a main effect for Attentional Set was found for the Social Anxiety sub-scale, $F(2,128) = 4.674$, $p < .05$. On a thirty- point scale, concurrent subjects reported the greatest social anxiety ($M = 19.72$), followed by "mindful" subjects ($M = 18.55$), and finally control subjects ($M = 16.87$). Accuracy correlations were therefore subjected to a 2 (Sex of Subject) X 3

(Attentional Set) X 3 (Actor/ Observer Status) analysis of variance using Social Anxiety as a covariate. The only reliable source was the covariate, $F(1,127) = 6.87$, $p = .01$. An additional independent variable, Private Self-Consciousness, was constructed by performing a median split on the Private Self-Consciousness sub-scale; however an analysis of variance of the accuracy correlations yielded no significant effects for this variable.

Actors were asked to rate how difficult it was for them to be aware of how they formed their "liking" judgments. Interestingly, a 2 (Sex of Subject) X 3 (Attentional Set) X 2 (Actor: Immediate vs. Delay) analysis of variance for this question revealed a main effect for Attentional Set, $F(2,88) = 6.39$, $p < .05$. Actors in the concurrent condition reported experiencing the greatest difficulty ($M = 4.41$), followed by "mindful" actors ($M = 5.06$), and finally, control actors ($M = 5.65$).

Actors were also asked whether the presence of the microphone made them feel self-conscious, and whether or not they believed that they usually knew why they liked someone. Analyses of variance conducted for each variable yielded no significant differences between conditions. The mean rating for the latter question was 2.11 (where 1 = "I always know why I like someone"), suggesting that subjects have relatively strong implicit causal theories for this task.

CHAPTER 4

DISCUSSION

The present study was an attempt to demonstrate that actors are capable of introspectively monitoring social judgments, and can provide verbal reports on causal influences with a degree of accuracy greater than can be accounted for by self-perception effects or by simply reporting an implicit causal theory. It was not successful in this attempt. However, it did support Hypothesis I, demonstrating that subjects are able to provide verbal reports of significant accuracy. Furthermore, it replicated evidence reviewed by Ericsson and Simon (1980), demonstrating that the technique of concurrent reporting does not interfere with judgment processes for verbal tasks.

While Hypothesis III was not reliably supported, the pattern of results nevertheless is consistent with the prediction that actors will provide more accurate verbal reports when instructed to pay careful attention to the judgment process and to anticipate reporting on the process retrospectively. However, the opposite trend is indicated for actors who provide concurrent reports during the judgment phase (i.e. "think out loud"), although this pattern is not statistically significant. It appears that this procedure may interfere with the retrospective reporting process. Actors who provided concurrent reports displayed greater "social anxiety" than actors who did not. It is possible that the concurrent report procedure induces sufficient arousal to constrict attention, and thereby reduce the accuracy of the verbal report (cf. Hasher & Zacks, 1979). This possibility is also supported by the fact that these subjects also reported the greatest difficulty in attending to their judgment formation process. An alternative possibility

two. Assuming that actors in the delay condition were not likely to retain information obtained from introspection or the perception of covariation of five dichotomous variables for a full week, they were left with only their implicit causal theory. If these assumptions are true, it appears that these implicit theories were relatively accurate in accounting for this task. In addition, the perception of covariation appears to have played an additional role in this study; observers who heard the concurrent and especially the "mindful" instructions tended to be more accurate, a pattern that would not be predicted by the implicit theory explanation.

However, it is not possible to indicate how many of these three sources enabled the actors to provide significantly accurate immediate retrospective reports. It may be that while actors did indeed introspect on the judgment formation process, it did not allow accuracy greater than that possible using the other two sources. An additional possibility is that observers and actors in the delay condition were able to generate their verbal reports by introspectively monitoring their own reactions to the stimuli. To the extent that these stimuli exerted a similar influence on most of this relatively homogenous sample of subjects, such a process might yield similar reports for actors and observers.

Future research along this vein would do well to select stimuli with known counterintuitive causal effects, to discourage "correct" implicit theories. Moreover, great care should be exercized in constructing introspective probes. More sensitivity can be gained by asking subjects to report on each level of a stimulus factor independently. Finally, multiple measures of both the evaluative judgments and the retrospective reports should be obtained, in order to increase the reliability of these

variables. Attenuation due to poor reliabilty may obscure important trends in the data.

Although beyond the scope of the current study, data analyses did indicate a number of reliable interaction among stimulus traits; for example, the main effect for attractiveness was more polarized for female targets than for male targets, while the pattern was reversed for intelligence. As with other research in this area, the probes adopted in the present study only allowed subjects to report on main effects, thus reducing the subjects' ability to articulate everything that they perceive. In fact, research in this area has tended to assume a general linear process model, which may be quite misleading if subjects form their judgments by using some sort of prototype-matching process (e.g., "this target sounds like a librarian-type; this one sounds like a dumb blonde," etc.). If this is the case, however, it is not clear what form adequate probes might take. One possibility might be to use open-ended probes, and then to develop a coding scheme using independent coders. A more efficient variation of this approach might be to collect concurrent and/or open-ended retro-spective reports in a pilot session, and then use this data to develop a battery of forced-choice probes for use in the experiment itself. Unfortunately, any forced-choice procedure seems to run the risk of providing an insufficient variety of choices to accomodate every response available.

Some Speculation Regarding Introspective Access.

Introspective Schemata. The present thesis has argued that subjects may typically form evaluative judgments in a relatively automatic, "mindless," fashion, and that as a result, they may not attend to the formation process and their verbal reports may not reach their potential

accuracy. This argument presupposses that subjects do not possess or utilize an automatic process, or "schema" (cf. Neisser, 1976) for monitoring such cognitive processes. While I am not aware of any research explicitly examining this issue, my hunch is that this presupposition is probably accurate for most people, if not all of us. A related argument has recently been offered by Sabini and Silver (1981). They argue that even if we have access to such processes, we must understand them if we are to provide accurate reports on them: "Mere access, without criteria of starting and inclusion and knowledge of how to apply them, does not ensure an accurate report" (p. 178). An indirect argument for the evolutionary improbability of "introspective causal schemata" has been offered by Skinner (1966, p. 1207):

> Behavior may have advantages which have played no role in its selection. The converse is also true. Events which follow behavior but are not necessarily produced by it may have a selective effect. All current characteristics of an organism do not necessarily contribute to its survival and procreation, yet they are all nevertheless "selected." Useless structures with associated useless functions are as inevitable as superstitious behavior. Both become more likely as organisms become more sensitive to contingencies.

However, the argument that intropective schemata do not naturally "evolve" does not rule out the possibility that they can be learned and "calibrated" against independent, objective scientific evidence. One strategy for future research might be to train a group of subjects to introspect accurately by providing immediate feedback. Such subjects might eventually be able to provide accurate reports while their attentional capacity is fully occupied with other demands. Of course, such a research program is highly vulnerable to all the methodological pitfalls suffered by the early Structuralist tradition: demand

characteristics, expectancy effects, and alteration of the ongoing cognitive process. Eliminating these problems is by no means a trivial undertaking, but it does not appear to be impossible, and the potential benefits may be great, especially as a means of training important decision-makers such as judges, generals, and doctors.

Hierarchical models of action and action-identification.

Current theorizing regarding cognitive processes (e.g., Miller, Galanter, & Pribram, 1960; Powers, 1980; Shallice, 1978; etc.) suggests that the control of action is organized hierarchically: complex behaviors are the cumulative product of a series of subordinate, molecular acts. This hierarchical structure appears to conform to a principle of "executive ignorance" in which subordinate levels of control operate automatically for well-learned behaviors, as discussed earlier.

Recently, Vallacher and Wegner (in press) have developed a model of action-identification that appears at least roughly isomorphic to the above action-control model. "Action-identification" refers to an individual's phenomenological report of what s/he is doing at any given point in time. According to Vallacher and Wegner, at any moment, an individual has a "prepotent identity," or definition of what they are doing (e.g., "I'm writing my thesis"). However, if requested to do so, individuals are able to provide a multitude of additional identifications for the action, and are able to reliably assign these to superordinate ("I'm trying to please my thesis committee") or subordinate ("I'm pecking at the keys of this word processor") levels of a hierarchy. They postulate three basic principles of such hierarchies:

1. An action is maintained in terms of its prepotent identity.

2. When an action can be identified at both a higher and a lower level, there will be a tendency for the higher level identity to become prepotent.

3. When an action cannot be maintained in terms of its prepotent identity, there will be a tendency for a lower level identity to become prepotent.

Vallacher and Wegner's approach is valuable because it focuses on people's phenomenological experience of a task. To the extent that the action-identification hierarchy and the action-control hierarchy correspond for a given domain, this approach leads to an important implication for research on verbal reports: individuals may not be able to accurate report on a stimulus that influences their behavior at a subordinate level. For example, it is possible that Nisbett and Wilson's subjects identified their task at a relatively high level (e.g., "I want to appear like I'm a confident and intelligent subject") and were therefore less likely to notice details regarding the stimulus materials.

Locke and Pennington (1982) offer a related argument. They offer a taxonomy in which "causes" are either internal or external. They consider "reasons" to be a special type of internal cause, and further distinguish between "situational reasons" and "psychological reasons." They argue that we have privileged access to our reasons, "by definition," and that to the extent that our behavior is driven by our reasons, actors will be capable of providing accurate verbal reports.

These approaches provide a potentially rich source for future research on verbal reports. One strategy would be to assess subjects' action-identities and "reasons" for acting. A careful task analysis might then lead to criteria for predicting which subjects would be most likely to yield accurate reports. An additional strategy might be to disrupt the

performance of a subset of subjects. This may induce a sudden state of "mindfulness" that would enhance their awareness of the impact of causal stimuli upon their behavior.

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TABLES

TABLE 1

Experimental Design and Cell Sizes

	ATTENTIONAL SET					
	CONCURRENT		MINDFUL		CONTROL	
SEX OF SUBJECT:	M	F	M	F	M	F
ACTOR/IMMEDIATE	7	10	8	11	7	10
ACTOR/DELAY	7	10	10	8	6	9
YOKED OBSERVER	5	7	8	8	7	8

TABLE 2

Analysis of Variance: Evaluations by Attentional Set and Stimulus Traits

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO
Attentional Set	8.51	2	4.26	.25
Gender	2.00	1	2.00	1.45
Intelligence	55.26	1	55.26	23.72 *
Attractiveness	1481.74	1	1481.74	202.63 *
Extraversion	1021.60	1	1021.60	113.76 *
Political Ideology	34.80	1	34.80	3.62
Subjects	2284.40	135	2284.40	
Subjects x Gender	185.98	135	1.38	
Subjects x Intelligence	314.48	135	2.33	
Subjects x Attractiveness	987.19	135	7.31	
Subjects x Extraversion	1212.31	135	8.98	
Subjects x Ideology	1297.90	135	9.61	

TABLE 3

Analysis of Variance: Mean Accuracy Correlations by Attentional Set, Actor/Observer Status, and Sex of Subject

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO
Sex of Subject	.431	1	.431	2.30
Attentional Set	.482	2	.241	1.29
Actor/Observer Status	.049	2	.025	0.13
Sex x Attentional Set	.572	2	.286	1.53
Sex x Actor/Observer Status	.203	2	.101	0.54
Attention x Actor/Observer	.463	4	.116	0.62
Sex x Attention x Actor/Observer	.935	4	.234	1.25
Explained	3.137	17	.185	0.99
Residual	23.97	128	.187	
Total	27.11	145	.187	

TABLE 4

Mean Accuracy Correlations by Attentional Set and Actor/Observer Status

	ATTENTIONAL SET			
	CONCURRENT	MINDFUL	CONTROL	
ACTOR/IMMEDIATE	.28	.47 *	.34	.37 ***
	(17)	(19)	(17)	(53)
ACTOR/DELAY	.37	.33	.29	.33 **
	(17)	(18)	(15)	(50)
YOKED OBSERVER	.32	.48 *	.22	.34 *
	(12)	(16)	(15)	(43)
	.32 *	.43 ***	.29 *	.35 ***
	(46)	(53)	(47)	(146)

NOTE: Cell sizes appear in parentheses.

* $p < .05$

** $p < .01$

*** $p < .005$