Can Relating the Past Disclose the Future?

Salomon Rettig

Hunter College of CUNY

Studies in social psychology inadvertently call for a subject's reconstruction of past behaviors when using interviews, questionnaires, or personality inventories. Since subjects' past behaviors are unobservables, subjects reconstruct their past retroductively. However, since the behaviors are not perceptually observed, such inquiry is decontextualized and probabilistic. Hence, reconstructions are frequently organized in terms of commonsense plausibility and personal accountability rather than causality. It is proposed that such inquiry may be improved by having subjects not only endorse preformatted material, but also by providing warrants for subjects' endorsements. The provision of warrants has been shown to structure past reality perceptions of laypersons (Rettig, 1990). The provision of warrants not only recontextualizes recall of past behaviors but also discloses historical continuity which, in turn, suggests higher probabilities of future behaviors.

Behaviorism makes its knowledge base more factual by emphasizing the processes of confirmatory evidence (e.g., hypothetico–deductive). The best evidence of the invariant nature of behavior is the requirement that it be predictive. To assure correspondence with substantive reality only perceptually observable behaviors are considered legitimate sources of data. These guiding prerequisites to legitimate psychology have turned prescriptive (Danziger, 1990; Knorr–Cetina, 1981; Mahoney, 1989). However, concerns with autobiographic information call for some modifications of the above guidelines. Autobiographic inquiry addresses historically reconstructed concerns which delve into problems of ontological and semantic meaning (Rettig, 1989). Such reconstruction activates retrieval processes since the behavioral events (as well as their antecedents) have taken place prior to the time of the inquiry. What is required of the subject during the inquiry is to accurately recall them. However, a subject's retrieval of such historical infor-

Requests for reprints should be sent to Salomon Rettig, Ph.D., Department of Psychology, 695 Park Avenue, Hunter College, New York, New York 10021.

mation allows for many possibilities, and is easily influenced by the mode of inquiry, especially by the type of questions asked. This is clearly documented in studies of legal inquiries.

Research on eyewitness' recall of crime or accidents has shown that the questions used by counsel can strikingly affect the witness' reconstruction of past events. Postevent information, whether in the form of questions or alternative presentation: ". . . can become incorporated into the memory, causing alterations or distortions in that memory" (Loftus and Palmer, 1974, p. 589). Frequently the way in which the first question is phrased tends to structure further recall of the event. Finally, the "knew-it-all-along" effect (Wood, 1978), created by the imparting of information that is new, makes it very difficult to restore a juror's earlier state of mind. Even studies of traumatized persons, such as victims of crimes, have shown that as many as 25 percent of people personally victimized by assault, robbery, or burglary in the previous year fail to recall the assault (Greenberg, Wilson, and Mills, 1982).

Reconstruction

The process by which current behaviors are perceptually determined and measured is labelled *constructive* (encoding), and the process by which previous behaviors are retrieved, retroactively organized, and interpreted is referred to as *reconstructive* (Bransford, Barclay, and Franks, 1972). Thus, observing the ongoing responses of a human subject in a laboratory is constructive in the sense that perceptual information as well as its interpretation is guided by theoretical models and the experimental *design* which structured these observations. That is, theory based predictions and preplanning clearly structures the observations along lines of experimental inquiry which make *the behaviors happen* (or not happen) in the laboratory. This design allows for the inductive probability inferences that follow from it. The subsequent statistical analysis is a function of the experimental design and is based on a fairly rigorous scientific logic that includes randomization of observations, replication by means of multiple trials, control groups, and more.

On the other hand, human subjects responding to a survey, an interview, or a series of questionnaire items on a check list or personality inventory are actually asked to make reconstructive self-observations. Although from the investigator's perspective such questions pertain to the moment the questions are raised, from the subject's perspective such questions frequently pertain to the past. To be able to respond, subjects have to retrieve information from memory. That is true not only because at the moment the questions are raised none of the behaviors are actually taking place, but also because of the generalization of the behavior such questions entail. While such inquiry may not directly use recall or recognition to test for explicit memory, it does tap

implicit memory processes (Roedinger, 1990). Under such conditions subjects' responses tend to be partially *observationally produced*, that is, inferred or interpreted according to semantic meaning, rather than perceptually determined, according to "ear of arrival" (Lachman, Lachman, and Butterfield, 1979). Hence they are not merely a function of copy attributes of the stimuli but are also based on schematic processes. Since the behaviors have taken place in the past, reconstruction informs by collating and organizing observations retroactively.

The question raised here is how can behaviors be measured and/or predicted when the time of their occurrence was in the past? To put it in other words, what is the process that links the current behaviors of human subjects such as placing check marks on a questionnaire or responding to an interviewer's questions, to the past? It would clearly seem that the evidential basis for the linkage of current behaviors to past ones is not the same as that of linking directly observed behaviors (e.g., in the laboratory) to theory. It has been shown, for example, that the reconstruction of past behaviors is a direct function of the delay interval between the occurrence of the original behavior and the time of retrieval (Spiro, 1977). If during this delay the original premises are somehow modified, e.g., by the introduction of changes in thematic context, different inferences are generated during retrieval (Hasher and Griffin, 1978; Spiro, 1977; Sulin and Dooling, 1974). These and earlier findings (e.g., of classic studies on memory [Bartlett, 1932]) clearly illustrate critical differences between constructive observations which can be perceptually verified and reconstructive observations which are very difficult to perceptually verify. In fact, constructive observations may not require a human observer at all. Preference is given to laboratory setups which use instruments for the direct recording of behavioral responses. Under such conditions the observation of behavior is seen to be objectively determined, easily replicable, and requiring fewer assumptions. That, however, is not the case with reconstructive observations of behavior.

Subjects-turned-Observers

In reconstructive research an observer (experimenter, interviewer) asks the subject to respond by turning observer of him/herself. Since the actual past behaviors of the subject are not shown, but are retrieved by the subject, the researcher's measurements are not independent. According to Margenau (1961) such a fusion of an observer with the object of observation constitutes *historical* rather than physical reality. Yet subjects-turned-observers in such inquiries are usually not asked to provide any historical linkage (e.g., antecedents, grounds, rationales) to their responses. Furthermore, since recall of past behaviors is usually fragmented and decontextualized, its measure-

ment can at best provide only probability estimates rather than actual recordings of events.

The above distinction between experimenter and subject-turned-observer is reminiscent of the historical work of Wundt and his attempt to differentiate between introspection (Selbstbeobachtung), the systematic subjective observation of external stimuli, and inner consciousness (innere Wahrnehmung), the intuitive cognizance of subjective events upon contemplation and reflection. The experimental attempt at transforming such inner consciousness into systematic scientific observations made Wundt's pioneering work extremely problematic (Danziger, 1990, p. 35). Wundt eventually turned to experimenting with internal perception only by manipulating external conditions. However, that was not always possible with historical material. Hence Wundt had to exclude certain areas of psychology from his laboratory studies, including social psychology, which he relegated to the domain of Voelkerpsychology, a historical and metaphysical version of cultural psychology.

For the subject-turned-observer there seem to be two realities, the behaviors that actually took place in the past and which cannot be fully reconstituted, and those that are reported. The latter are, of course, internally reconstructed. However, such reconstruction necessarily goes through a filtering process in which the subject-turned-observer's responses take place in the light of current contexts. That is, current behaviors, especially those triggered by the inquiry, serve as initiators and organizers of the recall of past behaviors (Snyder and Uranowitz, 1978).

Plausibility and Accountability

The question is whether the subject-turned-observer uses the same evidential basis as the experimenter when responding to the experimenter oriented, preformatted inquiry? Most subjects serving in human research are not scientifically trained. They respond in personally familiar rather than theoretically guided manners. Hence, their use of evidence differs from scientists (Rettig, 1990). The layperson's schema of evidence, especially evidence pertaining to the past, revolve around notions of commonsense *plausibility* (Nisbet and Wilson, 1977; Reder, 1982, 1987) and *accountability* (Semin and Manstead, 1983; Tetlock and Kim, 1987) rather than causality. Plausibility organizes perceptions of past behavior in terms of their likelihood. Such likelihood is increased if the actors are in control (dispositional attributions), if the behaviors are prevalent (consensual attributions), and/or if they are similar to other frequently observed behaviors (categorical attributions).

Accountability is a normative process of evaluation and justification which focuses attention on personal causation, intentionality, and a cog-

nizance of how other people would judge the behavior (Tetlock, 1985; Tetlock and Kim, 1987). In view of such normative considerations, reconstructive evidence does not easily separate cognitive (e.g., causal) factors from socially desirable ones. Hence, credible reconstruction cannot entirely escape the current evaluative context of the original behavior; e.g., whether it was justified, successful, or perhaps merely accidental. Such evaluative recontextualization of prior behaviors during the present inquiry takes place because reconstructive observations are largely *decontextualized*. That is, the present contexts, e.g., the interview, survey, or other verbal inquiries, bear little resemblance to the original situations which gave rise to the behaviors. Hence recall of past behaviors is not "contextually basic." It ". . . require(s) the person to have reasons for the belief in order to be in a position to have knowledge. . . . It is not basic in the context" (Annis, 1986, p. 208). Furthermore, the reality of historical material is necessarily a direct function of the veracity of its original context. "The farther something is removed from immediate perception . . . the more dependent is its real character upon the lawfulness of the context in which it appears; it is real if that context is true" (Margenau, 1961, p. 181). Annis as well as Margenau argue here persuasively that all historical knowledge is a function of contextually supportive evidence.

For example, in accordance with the fundamental attribution error of observers (Ross, 1977), which includes subjects-turned-observers (Storm, 1971), it has been shown that past behaviors are seen by a subject as more dispositional and voluntary than originally perceived. Dispositional voluntary conduct is more easily conceded than highly contextualized behavior. Similarly, sanctioned conduct is more easily acknowledged than unwarranted behavior.

These self-enhancing biases are especially susceptible to current contextual influences such as the wording of a question and the presence of examiner or interviewer. Plausibility is also susceptible to such contextual factors because context makes matters more reasonable. In addition to these normative and social influences, internal reconstruction and retrieval also suffer from the common imperfections of memory and recall. Recall is rarely complete and, in addition to selective biases, is altered by "storage" and "filtering" problems (Neisser, 1967). All in all it would appear that the shortcomings of reconstructive evidence do not offer much promise for scientific prediction. That, however, is not necessarily a complete picture of the reconstructive process as evidenced by *retroduction*, the derivation of a hypothesis from data.

Retroduction

There are many instances in the history of science where the reconstructive processing of prior observations has been shown to be extremely valuable, for example, when the results of experiments have shown theoretically

unexpected or anomalous results. Rather then disregard the data researchers attempt to make causal sense of unexpected findings. In doing so scientists resort to retroductive reasoning (Hanson, 1965), a process of inference not unlike that used by a detective or by a physician. According to Hanson, retroduction is an explanatory process whereby known outcomes, e.g., data, are used retroactively to reconstruct theories. Indeed, Hanson argues (too ?) forcefully against all hypothetico-deductive (H–D) reasoning as an accurate account of what scientists actually do. He states that real science *necessarily* operates retroductively,

> There is something wrong with the older accounts [of science]. They are false. Scientists do not always find laws by enumerating and summarizing observables. But this does not strengthen the H–D [hypothetico–deductive] account of the matter as against the inductive view. There is no H–D account of how "sophisticated generalizations" are derived.
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> If the H–D account were construed as a description of scientific practice it would be misleading. Natural scientists do not "start from" hypotheses. They start from data. And even then not from ordinary commonplace data—but from surprizing anomalies. . . . By the time a law gets fixed into an H–D system, the original scientific thinking is over. (Hanson, 1983, pp. 54–55)

The emphasis in retroductive reasoning is on (post hoc) *explanation*. Explanation is a concept that is difficult to define in terms of deductive logic. It appears to be as follows. An unexpected findings occurs, a finding which does not follow either from previously obtained data or from a body theory. The finding is not accidental but robust. While the finding does not follow from the theory, it is explainable by means of a differently constructed hypothesis. Hence, there is good reason to believe that the reconstructed hypothesis is true. Instead of preserving the original hypothesis (and dis-counting the findings) an attempt is made to substitute a revised rationale for an event that *has happened*, namely an anomalous finding. Here the explica-tory quality of an hypothesis rather than its verification or falsification is paramount. According to Hanson the validity of explication in retroductive reconstruction relies heavily on intuition, for example the brilliant intuitions of the geniuses of modern science (Galileo, Kepler). These eminent scientists repeatedly examined the available data, their own as well as those of others, before making their revolutionary discoveries.

For example, it was Kepler's brilliant intuition which led to the elliptical theory of planetary motion. Following repeated examination of the then available data of Tycho, this extraordinary inference negated earlier theories of circularity as well as other mistaken hypotheses of Kepler himself (e.g., the oviform theory of planetary motion). Similar accounts of retroductive rea-soning have been offered for the scientific breakthrough of Galileo (Hanson, 1965) and the "intuitive leap" of Einstein (Holton, 1979).

While retroductive inference is clearly a reconstructive process, its major weakness is that the explanation offered may not be the only one that explains the data. In contrast to the hypothetico–deductive method *it does not provide for a simple way of eliminating incorrect explanations*. Hence, retroductive reconstruction necessarily requires further corroborative evidence. The inspired retroductively constructed hypotheses of the geniuses of modern science were subsequently put to further empirical tests of prediction— their theories have been confirmed. However, verification via prediction is usually not obtained for interviews or personality tests. Such inquiry is ordinarily not concerned with reconstruction of the past. Hence, the question remains to what extent such retroactively timed inquiry can by itself confirm or disconfirm a behavioral hypothesis.

Despite the severe shortcomings of reconstructive (and retroductive) inquiry, behavioral science engages in such post-hoc inquiry because it has to if it wishes to understand contemporary behaviors. What is clear, though, is that such inquiry is not readily given to the empirical guidelines of behaviorism and the experimental laboratory. It is suggested here that even though such self-observations are not perceptually verifiable, they can inform about future behaviors if their retrieval is accompanied by attempts at recontextualization. Such recontextualization can sometimes be achieved by the elicitation of *evidentials*.

Evidentials

It is proposed that a partial recontextualization of past behaviors is achievable by asking subjects to respond (to the preformatted questions of an interview or a questionnaire) not only in terms of agreement and disagreement, but also by providing warrants for their endorsements. Warrants are vouchers which are cited to substantiate factual assertions. Factual statements accompanied by warrants are termed evidentials and have been shown to causally structure perceptions of past reality by laypersons (Rettig, 1990). When subjects substantiate their assertions and endorsements through warrants, they tend to provide a context for the original behaviors. Such context is embedded in the type of warrants (e.g., specific situations, incidents, or other circumstances) cited to document their endorsements. According to the noted historian Dray (1957), providing reasons for past events *is the only adequate way to reconstruct history* (assuming historical figures behave rationally).

At issue in the citation of warrants, of course, is the connection between factual assertions and warrants. Do the warrants justify the assertions by a citation of perceptual evidence or are they merely a way of making an endorsement plausible, justifiable, and/or acceptable (Chisholm, 1982). Are the warrants offered by the subjects realistic explanations of their past behav-

ior and therefore may serve as prognosticators of future behavior, or are they merely ad hoc rationalizations?

The relationship between assertion and warrant cannot be directly verified. Yet careful inquiry, guided specifically by the elicitation of evidentials, can add to the veracity of the endorsements if the warrants cited are seen as samples having different degrees of causal relevance. It should be possible to obtain a sampling distribution of relations between an assertion or an endorsement and the warrant cited for such endorsement, arranged according to some criteria of causal order such as temporality, consistency, and generalizability. For example, in one of our comparative studies of graduate and undergraduate students about how they came to know something for certain, warrants ranged in probity value from intuition, faith, and positive thinking all the way to scientific evidence which included documentation, multiple sources of information, and use of controls. There was little overlap between first and second year undergraduate students and graduate students in the probity values of the warrants cited (Rettig, 1990, pp. 10–11). The probity value of different warrants is not easily quantifiable, but could, in part, be based on relative frequencies across different samples of behavior.

While the shortcomings of filtering, relative frequency, and indirect verification of warrants constitute important arguments against all forms of historical knowledge, they are not arguments against the relevance of historical context. Human subjects do maintain historical and semantic continuity between their explanations of the past and the actual past which shapes their current accounts. In addition, the elicitation of reason-giving explanations by subjects tends to broaden investigators' understanding of them and enrich the inquiry (Miller, 1987).

For example, in our studies of discursive evidentials in free conversations it was found that there is a difference in the warrants cited when substantiating socially desirable behaviors (e.g., faith in God or consensually validated trait attributions) as compared with socially undesirable ones (e.g., homicide, gossip, and racism). The warrants for religious faith and consensually derived trait attributions were often confined to the declaration of a singular warrant (e.g., "I felt the existence of God *in my heart*"). No further warrants were cited in a spontaneous conversation of three college students, all agreeing that evolution is a form of religion (Rettig, 1990, pp. 119–127). On the other hand, for example, a free-flowing discourse on the part of three people (a father, mother, and daughter) on the Levin–Chambers murder case, elicited many different warrants, including dispositional, circumstantial, and happenstantial ones (Rettig, 1989, 1990). The latter citation of warrants was geared to substantiate the reconstruction of a particularly violent and seemingly irrational form of behavior (a homicide) that had actually taken place and that had been widely reported in the media. Similar massive citation of war-

rants occurred in relation to other socially undesirable conduct, including racism and gossip. These findings are in accord with the "double standard" hypothesis of evidence (Lieberman, 1992) that ". . . evidence in support of an 'undesired' conclusion is subjected to much tougher standards than evidence supporting other conclusions" (p. 1). The warrants issued relied heavily on internal causality such as intentions, dispositions, and personal history rather than on external factors (e.g., circumstances, other people, the system). The citation of warrants for unacceptable behaviors also produced intense emotional arousal and were often repetitious, and more designed to bolster one's own position then to document a perception (Rettig, 1989, 1990).

The research cited above probed subjects' reports of their own past conduct as well as that of others. Problems of self-enhancement and rationalization are somewhat less problematic when accounting for the behavior of others. Nevertheless, in both types of reports subjects spontaneously resorted to personal recollections to evoke warrants which supported their claims of what presumably had taken place.

Statistical Considerations

It may also be advisable to examine the statistical processes on which reconstructive inquiry is based. Probability distributions based on Fisher statistics (Anova, Manova), which are widely used in studies of personality and social psychology, presume randomized samples from uncorrelated populations and the testing for the null hypothesis (Cohen, 1990). This process is clearly not justified with reconstructive observations since they constitute probabilistic events. Probable events are not like regular physical quantities because their relation to observation are *irreversible* (Eddington, 1967, p. 91; Margenau, 1961, p. 166). While the probability distribution of an event can predict observations (within certain limits), its observation cannot confirm or disconfirm a prediction. It is this irreversibility which presumably has led Margenau (1961) to argue that probability events constitute historical, not physical reality. Probability of historical knowledge is not so much flawed as it is uncertain information. Such uncertainty, according to Heisenberg (1958), argues for causality as potentiality rather than actuality.

Bayesian or decision making statistics can be considered more appropriate for the assessment of historical information in that its inferences are based on the probability that an observed event *may have been* the outcome of one or more mutually exclusive antecedents (Howson and Urbach, 1989; Miller, 1987). The question under consideration with reconstructive data is how to modify a given hypothesis when the data have been found to differ from theoretical expectations. Bayes' theorem offers a rule by which to revise the probability of an hypothesis, given the actual data. Hence, Bayesian statistics

are more likely to permit an inductive inference, given a set of findings, when the premises for the inductive syllogism are historical (e.g., recall of past behaviors). Yet Bayesian statistics are rarely used in behavioral research.

Broader Implications

Interestingly enough, the problem of inquiry into past observations raises the broader issue of non-observables in empirical science. However, scientists and philosophers of science addressing issues of realism in science have generally been more concerned with non-observable theoretical entities than with non-observable historical events. The reason for neglecting the study of historical realism may be that it merely raises logical quandaries while the study of unobservable hypothetical entities contributes to the better understanding of nomothetic laws (Eddington, 1967). However, the exception is noted by Feigl (1950), who states:

> . . . the impossibility of *a return to the past* [italics added] . . . are matters either of the basic structure or of special laws of nature. In the context of logical reconstruction we reflect these "predicaments" simply by the choice of the *basis* of reconstruction. The evidential basis thus understood can therefore never provide for sets of statements that would be equivalent to statements whose factual reference transcends the physically possible evidence (Feigl, 1950, p.191).

The failure to distinguish between unobservable historical entities and current behaviors suggests the interchangeability of the two. What is proposed here is that the careful examination of reconstructive processes and the distinction between the past and the present is essential for improved prediction. The distinction between past and present observations can be diminished by recontextualizing subjects' past self-observation within a more realistic framework (of warrants). Such a framework, while not necessarily validating recollections of the past, can still enhance predictions of conduct in the future if subjects perceive circumstances as similar. Further research should address itself to the selection process of warrants, and on attempts at improving the veracity of the selection by the subjects. Relating the past can disclose the future if the teller is carefully guided in the reconstruction, a guidance based on how a subject's reconstruction is affected by the questions asked and by the material to be recalled. However, it must be realized that even under the best of circumstances the reconstruction of personal historical material, of events that have already happened, will be fragmented and probabilistic and, hence, not comparable to direct perceptual observation.

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