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# “Multiple Inference-Inviting Properties” of Interpersonal Verbs: Event Instigation, Dispositional Inference, and Implicit Causality

Gün R. Semin and J. Gooitske Marsman

The properties of interpersonal verbs (e.g., *help*, *dislike*, etc.) that systematically influence “implicit causality” are analyzed in 3 studies. It is argued that interpersonal verbs have a set of properties (multiple inference-inviting properties [MIIPs]) that are differentially elicited as a function of the type of property primed by the type of inference request. Study 1 distinguishes event instigation as a property that is systematically influenced by verb type: Action verbs induce subject inferences, and state verbs induce object inferences. Study 2 shows that dispositional inferences are mainly mediated by action verbs and the referentiality (sentence subject or object) of adjectives that are morphologically derived from verbs. Study 3 shows that studies of implicit causality have confounded event instigation and dispositional inferences in their operationalizations and Study 3 suggests that inferences of dispositionality and event instigation are orthogonal factors contributing differentially to what has to date been referred to as “implicit causality.” The implications of these findings are discussed in terms of the interface between language and social cognition.

A stable empirical phenomenon is food for scientific thought and inquiry, particularly if the phenomenon presents a conceptual lock in search of a key. The phenomenon of the “causality implicit in interpersonal verbs” (Brown & Fish, 1983a, 1983b) is in many ways such a puzzle. Take, for example, a sentence with an ambiguous personal pronoun in its subsidiary clause, such as “Paul helps David because of the kind of person he is. Who is he?” The personal pronoun in this sentence is generally disambiguated with reference to Paul. In other cases, such as “Paul likes David because of the kind of person he is. Who is he?” the personal pronoun is generally disambiguated with reference to David. The verb in the former sentence is typically a verb referring to an action and in the latter one a verb referring to a state. This is one illustration of the phenomenon that has been termed *the causality implicit in interpersonal verbs*. The conceptual problem is to explain why and how different verb types systematically mediate different “causal inferences.” Indeed, there have been different attempts to explain this phenomenon (e.g., Brown & Fish, 1983a; Fiedler & Semin, 1988; Hoffman & Tchir, 1990). There have also been a number of contributions that have questioned the generality of the phenomenon (e.g., Au, 1986), leading to revisions (e.g., VanKleeck, Hillger, & Brown, 1988), as well as some critical research on the conditions surrounding the phenomenon (Mannetti & De Grada, 1991), and its dependence on factors such as verb va-

lence or contextual information (Corrigan, 1988; Franco & Arcuri, 1990; LaFrance & Hahn, 1991).

The research we present here consists of a conceptual and empirical analysis of the properties of interpersonal verbs that invite inferences. We regard implicit causality as one such “inference-inviting property,” and we also know from previous research that interpersonal verbs have additional properties that invite a number of other systematic inferences, such as the perceived temporal duration of an event, the amount of information conveyed about a person, how enduring a quality they imply, how easy or difficult it is to confirm or disconfirm such statements (Semin & Fiedler, 1988, 1991, 1992), affective consistency (Brown & VanKleeck, 1989), and so forth. We speak of the multiple inference-inviting properties (MIIPs) of interpersonal verbs because the argument that we develop here suggests that interpersonal verbs in Subject-verb-Object (SvO) sentences have not only one (e.g., implicit causality) but a number of such properties. Moreover, these multiple properties channel inferences systematically and not randomly. Because the research we report here is an attempt to understand those properties of interpersonal verbs that contribute to the causality implicit in interpersonal verbs, our analysis focuses on this particular issue in the first instance. We start therefore with a brief overview of the issue and the competing theoretical explanations for the phenomenon.

## Causality Implicit in Interpersonal Verbs

The influence of verb category on attribution processes is a question that has featured in the work of some attribution theorists (e.g., Abelson & Kanouse, 1966; Gilson & Abelson, 1965; Kanouse, 1972; McArthur, 1972) and in linguistics (e.g., Garvey & Caramazza, 1974; Garvey, Caramazza, & Yates, 1976). In the former work specific verb types (e.g., Kanouse, 1972) were shown to influence validation of sentences, with state and

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action verbs<sup>1</sup> influencing perceived generality of sentence object and subject, respectively, and thus influencing causal attribution. In the latter work, the role interpersonal verbs play in disambiguation tasks has been primarily regarded not as a psychological propensity but as a property of verb semantics. A shortcoming of the early psychological work was the absence of independent linguistic (e.g., semantic) criteria in the classification of verbs, which leads to the problem of circularity.

The article by Brown and Fish (1983b) has had a paradigmatic influence on the revitalization and development of this research. This was due in part to the systematic way in which these researchers differentiated between interpersonal verbs by examining the semantic roles (cf. Chafe, 1970; Fillmore, 1968, 1971) associated with noun predicates (subject and object) in sentences constructed with these verbs. Thus, for a specific group of verbs, namely, verbs of action<sup>2</sup> (e.g., *help*, *cheat*, and *invite*), the relevant semantic roles are agent and patient. The former refers to the role occupied by someone who causes or instigates an action and the latter to someone undergoing a change. In the case of state verbs (e.g., *like*, *hate*, and *respect*) the respective roles are stimulus and experiencer: The former is the origin of a certain experience and the latter (experiencer) someone having a specific experience. Brown and Fish's (1983b) results suggest that implicit causality is located in the agent of SvO sentences constructed with action verbs and the stimulus of sentences with state verbs.

Two of the three social psychological explanations of implicit causality stem from Brown and Fish (1983b). The one that they favor, the causal schema hypothesis (Brown & VanKleeck, 1989; VanKleeck et al., 1988), suggests that the processes mediating implicit causality reflect a universal of human thought (e.g., Brown, 1986; Brown & Fish, 1983b, p. 271) and are based on the agent-patient or stimulus-experiencer schemas that are elicited, respectively, by action and state verbs. These schemas convey the causal information. The assumption is that an action verb (e.g., *help*, *obey*, and *cheat*) activates an agent-patient schema and a state verb (e.g., *trust*, *abhor*, and *like*) a stimulus-experiencer schema. In this hypothetical process it is assumed that the interpersonal verb in an SvO sentence primes a lexical entry in memory that includes a syntactic class (verb) along with its subclass, namely, an action or state verb. The semantic roles or verb arguments (agent-patient or stimulus-experiencer) are thus accessed along with grammatical subject and object assignment of the roles, which in turn gives rise to the assignment of relative causal weights.

In conceptualizing these schemas Brown and his colleagues coupled them with two attribution theoretical principles, namely, consensus and distinctiveness. Consensus is high (low) when many (few) people do or feel "x," and high (low) distinctiveness means that few (many) are susceptible to being "x-ed" or capable of inspiring "x." The agent-patient schema is coupled with a low consensus-low distinctiveness (LL) schema and the stimulus-experiencer schema with a high consensus-high distinctiveness (HH) schema. This means that sentences with an action verb are readily generalized to other objects or patients but not to other subjects or agents. Thus, the sentence "John helps Harold" is readily generalized to other objects (pa-

tients) so that the subject (agent) is distinctive, and therefore people point to John as the cause. On the other hand, sentences with a state verb are more readily generalized across subjects or experiencers rather than across objects or stimuli. From the sentence "John likes Caroline" people infer that others aside from John like Caroline, so Caroline is distinctive and therefore identified as the dispositional cause. The general assumption is one that equates verb-mediated implicit causality with dispositional inferences people make from simple sentences.

The second hypothesis Brown and Fish (1983b) entertained (and rejected) is a morphological one. This argument maintains that an examination of the dictionary suggests that the majority of adjectives derived from action verbs (e.g., *help*-*helpful*) refer to the subject of SvO sentences (with exceptions, for example, *corrupt*-*corruptible* and *approach*-*approachable*). In contrast, the referentiality of adjectives that are derived from state verbs is predominantly to sentence objects (e.g., *like*-*likable*). They suggest that the morphological hypothesis would imply a priming process "in a network that both includes the verb and the derivational adjective" (p. 244). Thus, the assumption is that the interpersonal verb (e.g., *help*) in an SvO sentence activates in long-term memory an adjective derived from the verb (*helpful*). The definition of the adjective—the kind of person that helps people—is stored with the adjective, which then mediates the choice between sentence subject or object. Brown and Fish (1983b) dismissed the morphological hypothesis on theoretical grounds. They pointed out that there are a number of "largely unrestricted fully reproductive suffixes" that can be used to generate adjectival forms attributive to both a sentence subject and object for all types of interpersonal verbs (e.g., -er, -ing; -full, -able, -ible, etc.). By considering frequency of adjective occurrence as defined by use (Kucera & Francis, 1967) and examining action and state verbs, they concluded the following: "It is not the English language that is biased toward the creation of derived forms for Agents rather than Patients, Stimulus rather than Experiencers; it is the habits of speakers" (p. 247). With these considerations they dismissed the morphological hypothesis in favor of the dual schema hypothesis discussed earlier. In Brown and Fish's (1983b) view, this is a universal process; they maintain that "speakers of whatever language, operate with two basic causal schemas in the domain of psychology and that the way we talk is a consequence of these schemas, not the cause for them" (p. 247). It is these two schemas that are therefore regarded as responsible in generating the bias to be found in dictionaries for the morphologically related adjectives for action (subject referent) and state verbs (object referent) as well as the differentially mediated implicit causality.

There is, however, a problematic element in the empirical evidence they advance for their model (e.g., Brown & Fish, 1983b). This is to be found essentially in their particular selection of state and action verbs, which involved random entries to the dictionary and an explicit selection of verbs with derived adjectives attributive to the agent in the case of action verbs and

<sup>1</sup> These were termed *subjective* and *manifest* verbs in the earlier work.

<sup>2</sup> A more formal distinction between verb classes in the interpersonal domain is introduced later in the *Overview and Method* section.

to the stimulus in the case of state verbs. This point has been raised by Hoffman and Tchir (1990), who have argued that the morphological hypothesis has not had a fair test before it has been discarded. In a series of studies these researchers examined the morphological alternative, that language may influence causal inference, by experimentally controlling the attributive reference of derived adjectives for both action and state verbs (Experiments 1 and 2). Thus, half of the action verbs they chose had agent referent adjectives (e.g., *help*–*helpful*) and the other half patient referent adjectives (*tickle*–*ticklish*). Similarly, they controlled for state verbs (e.g., stimulus adjective: *like*–*likable*; experiencer adjective: *resent*–*resentful*). Their first experiment provides ambivalent evidence for an adjective availability (morphological) hypothesis, demonstrating that the ascription of causality is not clearly predictable from the attributive reference of dispositional terms. It also shows that the verb type effect expected from the implicit causality view is only evident for action verbs. However, if subjects are primed in advance with the dispositional terms then there is some evidence for the morphological hypothesis. Their second experiment—which utilizes one of Brown and Fish's (1983b) studies, however, controlling for the attributive reference of adjectives systematically—contrasts the predictions that arise from mapping SvO sentences with interpersonal verbs onto concepts derived from Kelley's (1967) attribution theory and those predictions that are derived by the attributive reference of adjectives. Their findings indicate that “the relation between causal asymmetry embodied in interactive verbs and the attributive reference of the dispositional terms derived from those verbs was not fully explained by the third variable of role generality (i.e., distinctiveness and consensus)” (Hoffman & Tchir, 1990, p. 772).

The third alternative hypothesis is one advanced by Fiedler and Semin (1988) that is an attempt to explain implicit causality in terms of the imagined context of a stimulus sentence, that is, what preceded an event described in the target sentence (antecedent or cause) and what happened afterward (consequent). We do not detail this account herein, because at the antecedent level there is no contradiction between their explanation and predictions for the phenomenon from those advanced by Brown and Fish (1983b). Furthermore, this explanation also focuses on the verb type as the central mediator of implicit causality, although the proposed hypothetical mediating process is different. The sentence-context-based account by Fiedler and Semin (1988) differs from the two previous explanations to the extent that it attempts to incorporate into its explanation of implicit causality not only the pattern of “cause responses” (i.e., to explanations to the question “What happened before?”) but also the pattern of responses to the consequent (i.e., “What happened afterward?”) question. The answers to the consequent questions systematically reverse the pattern of inferences observed for the cause questions (a point demonstrated by Au, 1986).<sup>3</sup> Thus, if the cause for an action verb sentence (“John helps David”) is the sentence subject (John), then the consequent for the same sentence is the sentence object (David), and vice versa for sentences with state verbs. Their argument is that the dual schema hypothesis does not incorporate the possibility of predicting this reversal for consequences and that a central

factor contributing to the phenomenon of implicit causality is imagined sentence context (i.e., cause and consequent) that is elicited by an SvO sentence, whereby verb type (state vs. action) is assumed to elicit different contexts that consist of specific constellations of antecedent and consequence sentences.

### General Problems With Explanations of Implicit Causality

There are at least four types of general problems that we can identify with the theories and evidence on implicit causality. The first one is that all three accounts actually make linguistically determinate assumptions in their explanations of the “phenomenon” in question. All three approaches assume that, whatever the inference process is, it is triggered by the interpersonal verb in an SvO sentence. Thus, all three approaches view the interface between the interpersonal verb and the inference process as one that stands in a linguistically determinate relationship (irrespective of what the authors claim)—the verb (language) is always assumed to trigger the inference process (schema, adjective, or sentence context). Furthermore, all three approaches assume that a single process is triggered by the interpersonal verb, whatever other types of co-related manifestations this may have (e.g., dispositional inference, consensus, and distinctiveness [Brown & Fish, 1983a, 1983b; VanKleeck et al., 1988; Hoffman & Tchir, 1990]; affective consistency [Brown & VanKleeck, 1989]; implicit sentence context [Fiedler & Semin, 1988]).

The second problem is methodological and one that is difficult to disentangle in the context of this type of language work. All evidence to date is correlational, and this provides for considerable leeway for interpretation.<sup>4</sup>

The third problem is also methodological and also applies to all studies to date. All the reported studies have failed to control attributive reference of adjectives systematically (e.g., no study has, to our knowledge, included verbs with adjectives that have attributive reference to both sentence subject and object, for example, *respect*, *respectful*–*respectable*, and for verbs with no attributive reference, for example, *cherish*) along with verb valence (positivity and negativity), which has been shown to influence implicit causality (Franco & Arcuri, 1990; LaFrance & Hahn, 1991).

The fourth and final problem is empirical and may derive, as we argue next, from the absence of a clear conceptualization of the processes involved in implicit causality. There are studies

<sup>3</sup> Thus, for sentences with action verbs the consequent sentence predominantly utilizes the object of the target sentence as the subject of the consequent sentence (an example would be target sentence: “John helps David,” antecedent: “John likes David,” and consequent: “David invites John to a party”). For state verbs, the object of the target sentence is predominantly used as the subject of the consequent sentence (e.g., target sentence: “John likes David,” antecedent: “David helps John,” and consequent: “John gives David a present”).

<sup>4</sup> It is possible to argue that the second experiment reported by Hoffman and Tchir (1990), utilizing a priming paradigm, is an exception to this criticism.

showing inconsistencies in findings, for example, that specific action verbs do not display the phenomenon (e.g., Au, 1986), thus restricting the generality of the phenomenon (e.g., Brown & VanKleeck, 1989; VanKleeck et al., 1988). Other studies report difficulties in demonstrating the phenomenon as clearly and unambiguously for state verbs (Hoffman & Tchir, 1990). Yet others report that the strength of the causal inference varies as a function of the verb category (e.g., action vs. state verbs; cf. Mannetti & De Grada, 1991) or of verb valence (Franco & Arcuri, 1990). The purpose of the studies reported here is to advance a conceptual framework along with complementary empirical evidence to shed some light on these problems and find a resolution to the diverse conceptual and empirical inconsistencies in the literature.

### Inference-Inviting Properties of Interpersonal Verbs

The explanation we advance here has two central assumptions and one corollary. The first assumption is that interpersonal verbs have not one inference-inviting property but many. This assumption, which we refer to as the multiple property assumption, is one that the explanations reviewed so far do not make. Examples of such inference-inviting properties are the systematic way by which different verb types (e.g., action vs. state verbs) influence inferences about the temporal stability of events, endurability of subject and object referent qualities, voluntary control of events, and so forth (cf. Semin & Fiedler, 1988, 1991, 1992). The second assumption is that it is not the interpersonal verb in an SvO sentence that triggers an inference process but rather the type of question that primes a specific inference task. Thus, the type of question primes those distinctive properties of an interpersonal verb that are relevant to the specific inference process. These two assumptions, in our view, take out the deterministic perspective that is found in the literature, because these two assumptions suggest that different primes (task demands formulated in questions) make different properties of interpersonal verbs salient. The type of inference process relies on the property that is made salient by the question. Obviously, there are a finite number of inference-inviting properties that interpersonal verbs have, and these set the boundaries within which variations in inferences are possible. Finally, a corollary from these two central assumptions is that a question may prime more than one inference-inviting property at one time. Indeed, what we would like to argue is that what has been referred to as the causality implicit in interpersonal verbs may in fact be a composite inference process effected by the use of a subcluster from multiple properties that are elicited by the type of question posed in previous research (cf. Delancey, 1984).<sup>5</sup>

In our view, much of the theoretical and empirical contradictions in the literature are due to how implicit causality has been conceptualized and how it has been operationalized. The commonly shared view of implicit causality is best exemplified by quoting Brown and Fish (1983b) directly: "For action, . . . we attribute causality primarily to dispositions in the Agent . . . Thus an instance of helping seems to us to arise out of a *disposition* to be helpful . . . For mental states, . . . we attribute

causality primarily to *dispositions* in the Stimulus" (p. 247, emphases added). The way this has been operationalized varies from study to study. These operationalizations could take the form of direct questions about "some characteristic" of the subject or object that caused the interpersonal event in the target sentence (e.g., Hoffman & Tchir, 1990), or "the degree to which it can be said that X is the type of person who 'verbs' Y" (e.g., Brown & Fish, 1983b; Corrigan, 1988). Alternatively, they may take the form of an SvO sentence with an open-ended "because" clause that the subjects have to complete (e.g., Au, 1986). Whichever, the responses of the subjects are interpreted in terms of the relative strength by which people attribute the cause of the interpersonal event to a disposition in the sentence subject or object. Within linguistics *implicit causality* is defined as "a feature that selects one or the other of the available candidate nouns as primarily responsible for *instigating the action or state*" (Garvey et al., 1976, pp. 240–241, emphasis added). This meaning is in terms of the instigator of the event; namely, who brought the event about? Indeed, a careful examination of the semantic role argument reveals that it is primarily about agency and not a dispositional property (Chafe, 1970; Fillmore, 1968, 1971). The agent and the stimulus are referred to as event instigators, and there is no mention of dispositions or dispositionality. Neither is there a reference to dispositionality in the definition of patient or experiencer.

The question is whether inferences of dispositionality and event instigation can be regarded as one and the same thing. The answer to this question is, in our view, no. This is apparent, particularly in cases where the evidence seems to contradict the two-schema model. Take cases with verbs such as *blame* or *praise*, which are verbs depicting actions, but we know (cf. Au, 1986) that they give rise to "patient" inferences when one inquires about dispositional cause. Indeed, one might suggest that these verbs follow the pattern suggested by the morphological hypothesis, *blameworthy* and *praiseworthy* are indicative of the patient in the respective SvO sentences. However, the event depicted by such sentences is instigated by the agent. It is the agent who is doing the praising or blaming. It is this type of reasoning that led us to postulate two inference-inviting properties of interpersonal verbs: one about the instigator of the interpersonal event and the other about the dispositional properties of the sentence subject and sentence object. In addition, we postulated that these two properties are independent of each other. Finally, we postulated that dispositional inference may be identified in

<sup>5</sup> The types of dependent variables and questions used in the literature vary considerably, and there has not been a systematic or serious consideration of question type because the explanation has always been anchored in attribution theory and to that extent the interpretation of questions and answers has always been driven from within this interpretative perspective. It is within that context that this type of dissection or separation of descriptive verbs and interpretative verbs and their variation from study to study is also likely to give rise to inconsistent results because the results are regarded primarily from an attribution theoretical notion of dispositional inference. This is the problematic element central to most of the equations that can be advanced across this research field.

language by the availability of a verb-derived adjective and how adjective referentiality is marked. We find that in both Dutch and English there are action verbs as well as state verbs with derived adjectives indicative of the subject (action verb: *helpful*; state verb: *mournful*), the object (action: *silent*; state: *likable*), and the subject and object (action: *corrupt–corruptible*; state: *respectful–respectable*), and there are verbs with no derived adjectives for subject and object (action: *to kick*; state: *to cherish*). Nevertheless, there is an overall bias in the lexicon for derived adjectives indicative of the agent for action verbs and indicative of the stimulus for state verbs, as Brown and Fish (1983b) maintain.<sup>6</sup> This bias may be due to the differential impact of verb agency, as Brown and Fish argued. That is, verb agency may influence derivation of adjectives.

To summarize, we identify at least two distinct properties that may contribute to the phenomenon identified as the causality implicit in interpersonal verbs: event instigation and dispositional inference whereby the latter may be marked by morphologically derived adjective availability. Undoubtedly, there are other properties by which interpersonal verbs invite systematic inferences (affect, temporal duration of event, confirmability–disconfirmability of event, etc.; cf. Semin & Fiedler, 1992). However, in the first instance, our concern is to identify those properties that contribute to implicit causality.

If the following two arguments are correct, namely, (a) that inferences about event instigation and dispositional qualities are independent inferences and (b) that these two inference-inviting properties have been confounded in the way in which implicit causality has traditionally been assessed and interpreted, then it follows that we should examine these two properties separately. Thus, our first experiment was concerned with an examination of event instigation. The hypothesized outcome for event instigation is the following: If event instigation is located in the agent of action verbs and the stimulus of state verbs, then the availability of different types of adjectives should not influence event instigation inferences. To test this we chose state and action verbs while controlling for type and availability of morphologically derived adjectives. A quarter of the verbs had only a subject referent adjective available, a quarter had only an object referent adjective, a further quarter had adjectives available for both subject and object arguments, and the last quarter of verbs had no derived adjectives. In addition, we controlled for verb valence, essentially because there are some studies indicating that results with specific experimental paradigms (e.g., Fiedler & Semin, 1988) are only observed for interpersonal verbs with a negative verb valence (Franco & Arcuri, 1990; LaFrance & Hahn, 1991). The predictions were the following: If event instigation is a general property that is marked by verb class (action vs. state verbs) then we should only obtain a verb type main effect. If, however, the morphological hypothesis is correct and event instigation is influenced by adjective referentiality, then we should obtain an interaction between the two adjective referentiality factors (i.e., Subject Referent Adjective [SRA]: present vs. absent; Object Referent Adjective [ORA]: absent vs. present), whereby adjective referentiality should influence inference strength in the direction of the available adjective. A third possible outcome is a third level interaction among verb

type and the two adjective referentiality factors, indicating that the degree to which the morphological hypothesis is operative is influenced by verb type. The first study reported below examines these hypotheses.

## Study 1

### Method

*Subjects.* Nineteen undergraduates participated in this study on a paid voluntary basis in a session that lasted approximately 20 min. Participants were tested individually. All subjects were native Dutch speakers.

*Design.* The questionnaire that was used contained SvO sentences with 48 interpersonal verbs. These verbs were selected from a Dutch corpus<sup>7</sup> and controlled for verb type (interpretative action verb [IAV] vs. state action verb [SAV] vs. state verb [SV]; see *Selection of Verbs* section below for details), and within verb type we controlled for three further factors: SRA (present vs. absent), ORA (present vs. absent), and verb valence (positive vs. negative). The complete design was a  $3 \times 2 \times 2 \times 2$  complete within-subjects design, whereby the order of presentation of sentences was randomized over the subjects. Furthermore, the names we used for sentence subject and object were randomized and controlled for gender, with the provision that each sentence had same gender name pairs. Although most SvO sentences had the same gender, for two state action verbs (*attract* and *fascinate*) and six state verbs (*adore*, *idolize*, *love*, *admire*, *fond of*, and *dote on*) we constructed mixed-gender name SvO sentences and balanced for grammatical subject and object positions over the subjects and within questionnaires.

*Selection of verbs.* In the literature, there are a variety of classifications for interpersonal verbs with a certain degree of convergence between them (e.g., Abelson & Kanouse, 1966; Brown, 1986; Brown & Fish, 1983a, 1983b; Gilson & Abelson, 1965; McArthur, 1972; Semin & Greenslade, 1985). The classification we prefer and have used here is one we have proposed earlier and used extensively in a number of studies (cf. Semin & Fiedler, 1988, 1991, 1992). In this classification we distinguish between descriptive action verbs (DAVs), IAVs, SAVs, and SVs. There are a number of conventional grammatical tests and semantic contrasts (cf. Miller & Johnson-Laird, 1976) by which one can distinguish among these four verb classes (cf. Semin & Fiedler, 1991). For instance, one can distinguish between action verbs (DAV and IAV) and verbs implying states (SAV and SV) in that it is generally difficult to use the imperative unrestrictedly with the latter two (e.g., “Please admire me!” and “Need money!”). In addition, the latter two verb classes resist taking the progressive form (e.g., “John is liking Mary”). One can distinguish between SAVs and SVs (cf. Johnson-Laird & Oatley, 1989, cf. p. 98 ff) by applying the “but” test (Bendix, 1966). The former (SAVs) refer to states that are caused by the observable action of an agent and describe the “emotional consequences” of this action on a patient (*surprise*, *bore*, and *thrill*). The latter (SVs) refer to unobservable states (*love*, *hate*, and *abhor*). Thus, one can say “I like Mary, but I don’t know why,” whereas the statement “Mary surprised me, but I don’t know why” is awkward. The reason is mainly because SAVs “signify a feeling that has a cause known to the individual experiencing it” (Johnson-

<sup>6</sup> We have a complete Dutch corpus of interpersonal verbs and an English one that we are still working on. This asymmetric adjective distribution for verb class is observed in both corpora but is more pronounced in English.

<sup>7</sup> Available from the authors.

Laird & Oatley, 1989, p. 99).<sup>8</sup> It should be noted that the classification of interpersonal verbs that we have adopted is not in contradiction with those used by Brown and Fish (1983a, 1983b) or Hoffman and Tchir (1990). What these latter authors classify as “stimulus-experiencer verbs” are classified in our case as SAVs, and the advantage of classifying these as a separate category of action verbs is evident in the fact that these authors do not provide any a priori criteria to distinguish SVs from SAVs, whereas the present classification system does.

In selecting verb classes for this study we omitted DAVs mainly because we know from previous research that these verb types (*dance, phone, kick, touch, and kiss*) show very weak effects (cf. Mannetti & De Grada, 1991). Moreover, an examination of DAVs reveals that in general very few have derived adjectives available.

Having singled out IAV, SAV, and SV as the three verb classes for our study, we proceeded in the following manner. We first established an exhaustive corpus of interpersonal verbs in Dutch and checked the reliability of the classification with two independent coders. This corpus included information of derived adjective availability as well. Thus, within each verb category we had a fourfold distinction between verbs with (a) only SRAs, (b) only ORAs, (c) both SRAs and ORAs, and, finally, (d) no available adjectives. In addition, we controlled for verb valence (positive vs. negative). This gave rise to a Verb Type (three levels)  $\times$  SRA (two levels)  $\times$  ORA (two levels)  $\times$  Verb Valence (two levels) selection criteria (24 distinct verbs), and we randomly selected within each of these requirements two verbs, which gives rise to the 48 verbs we used in our study (see the Appendix for a full list of these verbs).

*Dependent variable.* Participants were given a booklet, containing general instructions about their task, examples of how to use the scales in question, and finally, 48 SvO sentences in a randomized order that we varied between subjects. The position of the names for each sentence was counterbalanced. After the general instruction about the purpose of the study participants received the following instruction: “We would like you to indicate who you think brought about the event or state described in the sentences below. For example: ‘Peter helps John.’ Who brought the ‘helping’ about?” The answer was a forced choice format in which participants had to cross out the name that applied. Thus, the dependent variable per item received either a value of 1 indicating the subject as the choice of instigator or a value of 2 indicating a sentence object as the choice of instigator. Because there were 48 sentences, each cell of the 3 (verb type)  $\times$  2 (SRA)  $\times$  2 (ORA)  $\times$  2 (verb valence) design had two sentences. However, because each cell contains more than two sentences (in fact, because the manipulation check for valence was not significant there are a minimum of 4 sentences per cell) the values of the dependent variable can vary from 1.00, over the values of 1.25, 1.50, 1.75, to 2.00.<sup>9</sup>

*Check on verb valence manipulation.* In an additional study, using an independent set of 18 subjects, who also came from a student subject pool, we administered the same 48 verbs in their infinitive form (i.e., *to help, to like*, and not in an SvO context) and asked participants to rate each verb on the 9 semantic differential scales (Evaluation: *good-bad, happy-sad*, and *beautiful-ugly*; Potency: *strong-weak, brave-cowardly*, and *hard-soft*; Activity: *fast-slow, tense-relaxed*, and *active-passive*) on 7-point scales with standard instructions. Verb order was randomized within each questionnaire as was semantic differential rating within verb, and both varied from subject to subject.

## Results

Verb valence control was checked by examining the evaluation factor of the semantic differential in a 3 (verb type)  $\times$  2 (SRA)  $\times$  2 (ORA)  $\times$  2 (verb valence) analysis of variance (ANOVA) with averaged evaluation (over three scales) as the de-

pendent variable. This analysis did not yield any main and higher interaction significant effects with verb valence, confirming the balance of verb choice over conditions.

We then conducted a 3 (verb type)  $\times$  2 (SRA)  $\times$  2 (ORA)  $\times$  2 (verb valence) ANOVA with instigator choice as the dependent variable, treating subjects as the data points in one case (complete within-subjects design) and verbs as the data points in the other case (complete between-subjects design). In addition, we also checked  $F'$  (cf. Clark, 1973) to examine the generalizability from the sample of available verbal stimuli. The expected outcome from the MIIP point of view is that event instigation is marked by verb type only. That is, the sentence subject is expected to be chosen as the event instigator for IAV and SAV sentences and the sentence object for SV sentences. That is a verb type main effect. In contrast, the morphological hypothesis suggests the choice of instigator to be mediated by adjective availability. Thus, for sentences with verbs that have either both SRA and ORA available or no morphologically derived adjective available the expected outcome for sentence subject and object to be chosen as instigator are equally likely (scale midpoint). For verbs with an SRA the instigator choice is expected to be the sentence subject and for verbs with an ORA the instigator choice is expected to be the sentence object. Thus, the predicted effect is an interaction between the SRA and ORA factors.

We found, as predicted by the MIIP approach, that the main effect for verb type was significant using the within-subjects design,  $F(2, 36) = 163.33, p < .001 (\eta^2 = .90, \delta = 1.00)$ ; and the between-subjects design,  $F(2, 24) = 94.12, p < .001 (\eta^2 = .89, \delta = 1.00)$ ;  $F(2, 49) = 59.71, p < .01$ . This finding was in the expected direction, with IAVs and SAVs showing a subject inference ( $M = 1.22$  and  $M = 1.19$ , respectively) and SVs showing an object inference ( $M = 1.79$ ). The IAV and SAV means were not significantly different from each other.

The only other effect that reached an acceptable amount of explained variance and power was a main effect for valence using the within-subjects design,  $F(1, 18) = 13.35, p < .01 (\eta^2 = .43, \delta = .77)$ ; and the between-subjects design,  $F(1, 24) = 6.56, p < .05 (\eta^2 = .22, \delta = .69)$ ;  $F(1, 40) = 4.40, p \leq .05$ . Positive verbs led to weaker subject inferences than negative ones ( $M = 1.45$  vs.  $M = 1.35$ ). All other main and higher order effects did not reach significance nor did they fulfill standard criteria of acceptance for the amount of explained variance and power.<sup>10</sup>

<sup>8</sup> As Chafe (1970) pointed out, “Such rules of thumb are presented only as rough, practical guides, not as ‘discovery procedures.’ They are not necessarily always accurate, nor do they necessarily provide unfailing criteria for decisions in doubtful cases. In general, there is no reason to think that a particular semantic fact will be mirrored with 100 percent consistency by some other fact” (p. 99).

<sup>9</sup> In addition, it should be noted that (in the extreme case of even one sentence per cell) it is permissible to conduct ANOVAs which produce acceptable tests for dichotomous data (cf. Cochran, 1950).

<sup>10</sup> In addition, a third-order interaction was found to be significant: Verb Type  $\times$  SRA  $\times$  Valence, within-subjects  $F(2, 36) = 14.01, p < .001 (\eta^2 = .44, \delta = .88)$ ; between-subjects  $F(2, 24) = 4.07, p < .05 (\eta^2 = .25, \delta = .68)$ ;  $F(2, 38) = 3.15, p \leq .10$ . This interaction is due to two cells in the positively valenced condition, namely, SRA present for IAVs ( $M =$

### Discussion

The results of the first study provide evidence that event initiation follows the predicted pattern of a strong verb type effect. This evidence suggests that when asked to make inferences about who initiated an event, subjects treat agency as the primary cue, which is mediated by verb type. In action verbs (IAV and SAV) the sentence subject is inferred as the event initiator, and in state verbs (SVs) the sentence object is inferred as the event initiator. The absence of an interaction between the two adjective reference factors (SRA  $\times$  ORA) supports this contention.

The results of this study suggest that event initiation can be seen as one important meaning of "causing" an event. However, this does not mean that such an inference is coterminous with a dispositional inference as previous work on implicit causality has assumed. Indeed, this is a conclusion that Hamilton (1988) has forwarded by a different conceptual path. The evidence of our first study suggests that verb type marks event initiation systematically. The question that remains open is whether dispositional inferences are also marked systematically and whether derived adjective availability is an important factor in mediating these inferences. It may well be the case, as we argued in the introduction, that a different prime in the form of a question inquiring about the degree to which subjects can make dispositional inferences to the sentence subject or object is mediated by the referentiality of the morphologically derived adjective. The hypothesis, in this case, is the following: The attributive reference of adjectives influences the type of dispositional inference people make. More specifically, if the attributive reference of the adjective is to the sentence subject (e.g., *help-helpful*) then we expect stronger dispositional inferences to the sentence subject in an SvO sentence. The reverse is expected for verbs with adjectives attributive to the sentence object (e.g., *like-likable*). In fact, the expected outcome from this hypothesis is two main effects. One is expected to be due to the SRA (present vs. absent) and the other to the ORA (present vs. absent) manipulation.

The above argument and hypothesis is driven by the consideration, already advanced by Brown and Fish (1983b), that morphologically derived adjectives have emerged in our vocabulary in response to the need to mark distinctive inferences from particular behaviors and states. In this case, because adjectives refer to enduring properties one may reasonably expect them to mark the direction of dispositional inferences.

However, the specific "morphological" hypothesis developed here needs to be qualified by a propensity specific to verb class. Early studies by Abelson and his colleagues (e.g., Abelson & Kanouse, 1966; Gilson & Abelson, 1965; Kanouse, 1972) suggest that subjects make stronger inductive generalizations from

action verbs (e.g., stimulus: "John helps David"; inference: "John helps people") than from state verbs (e.g., stimulus: "John likes David"; inference: "John likes people"). Independently, Semin and Fiedler (1988, p. 563) found that SvO sentences constructed with action verbs are more informative about a person than sentences constructed with state verbs. Taken together, these studies suggest that subjects are more likely to make a stronger dispositional inference from an action verb than a state verb. This may be due to two different factors. First, it may be the case that people are more likely to make inferences to dispositions from observable behaviors (actions) than unobservable ones (states). If a verb has a direct and observable behavioral referent then it is more probable that a dispositional inference will be made than when no such behavioral reference is available. A critical property of IAVs is that they refer to concrete and observable behaviors. In contrast, for SAVs and SVs we do not have clear behavioral referents. A distinctive feature of SAVs is their exclusive reference to the consequences of an implicit or unspecified action, and such consequences are temporary and outside of the control of the object (e.g., "John surprises Paul"). Therefore, it is difficult to make any dispositional inference with respect to either subject ("What the subject may have done is completely open") or object ("It is something that can happen to everybody"). Similarly, with SVs we have information that the subject is experiencing an unobservable state due to some unspecified properties or qualities of the object (e.g., "John likes Mary").

These considerations and the findings of earlier research suggest that one may expect a verb type effect for dispositional inferences whereby strong dispositional (inductive) inferences to the sentence subject are made in the case of IAVs and not SAVs and SVs.

## Study 2

### Overview and Method

Because both the material and design of this experiment are identical to the first one, with the exception of aspects of the instructions, we shall only detail the different element introduced here. In fact, the only differences here were the instructions about the dependent variable and the nature of the dependent variable itself, namely, dispositional inferences.

*Subjects.* A new sample of 19 University undergraduates participated in this study on a paid voluntary basis. All participants were native Dutch speakers.

*Dependent variable.* Participants were given a brief instruction about the purpose of the experiment and how to answer the questions. After each of the 48 SvO sentences (see Study 1) they had to "indicate whether the sentence conveys more information about the personality make-up (e.g., dispositions) of 'Name of Sentence Subject (e.g., Peter)' or about the personality make-up of 'Name of Sentence Object (e.g., John)'"

### Results

Again, a 3 (verb type)  $\times$  2 (SRA)  $\times$  2 (ORA)  $\times$  2 (verb valence) ANOVA with dispositional inference as the dependent variable was conducted, treating subjects as the data points in

1.37) and SRA absent for SAVs ( $M = 1.42$ ). In both cases the SRA presence (for IAV) and SRA absence (SAV) reduces the likelihood of subject inferences. This effect does not limit the general findings of the present study but simply qualifies it for IAVs and SAVs and only in the positive valence condition, suggesting that subject inferences are weaker when an SRA is available for IAVs and an SRA is not available for SAVs.



the one case (complete within-subjects design) and verbs as the data points in the other case (complete between-subjects design). In addition, we calculated  $F'$  (cf. Clark, 1973) to examine generalizability from the available sample of verbal stimuli. The predicted outcomes in this case were two main effects due to adjective reference (SRA and ORA) as well as a main effect due to verb type. We obtained a main effect for ORA,  $F(1, 18) = 31.55, p < .001$  ( $\eta^2 = .64, \delta = .93$ ); within subjects  $F(1, 24) = 7.14, p < .05$  ( $\eta^2 = .23, \delta = .73$ ); between subjects  $F(1, 34) = 5.82, p \leq .05$ , suggesting an overall subject bias in dispositional inferences, which was moderated by the presence of ORA ( $M = 1.34$ ) and heightened in the absence of ORA ( $M = 1.23$ ). There was no main effect due to SRA. Furthermore, an SRA  $\times$  ORA interaction was obtained,  $F(1, 18) = 10.31, p < .01$  ( $\eta^2 = .36, \delta = .63$ ); within subjects  $F(1, 24) = 4.63, p < .05$  ( $\eta^2 = .16, \delta = .54$ , between subjects), which showed a tendency with respect to its generalizability over the stimulus terms, namely,  $F(1, 40) = 3.20, p < .10$ . This interaction was due to the fact that the ORA+/SRA- condition ( $M = 1.39$ ) is significantly different ( $p < .05$ ) from the remaining three conditions (namely, SRA-/ORA- = 1.19; SRA+/ORA- = 1.26; SRA+/ORA+ = 1.29) whereby ORA+/SRA+ sentences are also significantly different from SRA-/ORA- sentences ( $p < .05$ ). Essentially, these results mean that ORA availability weakens dispositional inferences to sentence subject.

Finally, we found the predicted verb type main effect,  $F(2, 36) = 5.83, p < .01$  ( $\eta^2 = .25, \delta = .63$ ); within subjects  $F(1, 24) = 9.72, p < .001$  ( $\eta^2 = .45, \delta = .59$ ); between subjects  $F(2, 60) = 3.64, p \leq .05$ . This was in the expected direction, with strongest subject referent dispositional inferences for IAVs ( $M = 1.16$ ) and weaker subject referent inferences for SAVs ( $M = 1.31$ ) and SVs ( $M = 1.38$ ).

### Discussion

These findings suggest that when making inductive generalizations (or dispositional inferences) from SvO sentences subjects' inferences are driven by both properties of the verb type and, to a lesser extent, the referentiality of the morphologically derived adjective. Verb type influences dispositional inferences independent of the two adjective referentiality factors. This finding converges with earlier studies on inductive generalization from interpersonal verbs (Abelson & Kanouse, 1966; Gilson & Abelson, 1965; Kanouse, 1972) and more recent studies on how informative action and state verbs are about persons (Semin & Fiedler, 1988). This outcome, in our view, is essentially due to the different behavioral information conveyed by the three types of verbs. Whereas IAV conveys clear and unambiguous behavioral information, neither of the two other categories do. To the extent that behavior is informative of a person's enduring tendencies we find this reflected in the fact that the strongest dispositional inferences are mediated by IAVs. Therefore, it is perhaps not surprising that these differences between verb classes emerge.

The weaker finding concerns the influence of adjective availability on dispositional inferences. Subjects appear to be also accessing (in all likelihood implicitly) adjective availability in

order to answer the question of whether a dispositional inference can be made and the degree to which it can be made. However, this effect is primarily due to the presence or absence of an ORA and even in this case the strong overall subject inference is weakened for sentences with verbs that have an ORA. Nevertheless, cuing dispositional inferences with a question introduces a distinctly different pattern of outcomes compared with the event initiation question. First, we find that an overall strong subject inference is made across all verb classes, with IAVs mediating the strongest dispositional inferences. This effect is only moderately influenced by the availability of morphologically derived adjective forms and even then only by ORAs.

These findings are in the opposite direction to the one predicted from the implicit causality model proposed by Brown and Fish (1983b) and more complex than the morphological hypothesis advanced by Hoffman and Tchir (1990). The latter point is evidenced by the interaction between the SRA and ORA factors. This result, which is independent of verb type, suggests that the availability of adjectives influences the strength of dispositional inference, however, only to the extent that the presence of ORAs weakens the overall strong subject referent dispositional inference.

The critical point that can be noted in conclusion to the second study has to do with the contrasting results of the first and second studies. These results suggest that dispositionality and event causation are distinctly independent properties. The question is whether the "causality implicit in interpersonal verbs" is a composite of event instigation inferences and dispositional inference. This conclusion appears likely in view of the way in which implicit causality has been operationalized. In Brown and Fish's (1983b, Experiment 1) and Hoffman and Tchir's (1990, Experiments 1 and 2) views these operationalizations are ambiguous with respect to what they mean. The operationalizations are derivative of Cunningham, Starr, and Kanouse's (1979) measures, which were used in the context of causal attribution. In the implicit causality literature this has meant a confounding between a dispositional inference and an event instigation inference. Thus, the research on the subject has regarded dispositional inference as an inherent aspect of implicit causality that is implicit in the use of the term *attribution* (cf. Hamilton, 1988, p. 379). Consequently, in such experiments (e.g., Brown & Fish, 1983b; Hoffman & Tchir, 1990) each stimulus sentence is followed by dependent variables that have emphasized an inference about both the dispositional properties of the person as well as about who instigated the event (e.g., for a stimulus sentence such as "Paul helps David" the dependent variables were Paul is the type of person [dispositional inference] who helps people [event instigation] and David is the type of person [dispositional inference] who is helped by people [event instigation]). In our view, these operationalizations confound a dispositional inference and an event instigation inference. To examine this issue we conducted a third experiment that was essentially a forced choice replication of Brown and Fish's (1983b) first experiment.

In view of the two previous studies, we made the following predictions: If event instigation is the inference property that is primed by the Brown and Fish (1983b) instruction then we

would expect a considerable overlap in variance between the Brown and Fish instruction and the first study reported above. This would be mainly due to a verb type main effect with strongest subject inferences for IAV and SAV and object inferences in the case of SV. If however, the Brown and Fish instructions prime a dispositional inference, then we would expect a strong overlap between the results of Experiment 2 reported earlier and the present study. This would mean first strong subject inferences across all three verb categories with IAVs giving rise to the strongest subject inferences. In addition, adjective referentiality should influence the inferences to some extent, in particular ORA.

The third possibility, which in our view is the most likely one, is that the original operationalization of implicit causality confounds event instigation inference and dispositional inference. If this is correct then we should also be able to explain inconsistencies in the literature such as those reported by Au (1986). If it is the case that the confounded instructions prime both dispositional and event instigation, then specific verbs should give results that conflict with the original Brown and Fish (1983b) predictions. For instance, an action verb such as *blame* has an adjectival referent to the sentence object (*blameworthy*; or *praise-praiseworthy*, etc.). These are instances where operationalizations confounding event instigation and dispositional inference may be expected to give rise to results that are inexplicable within the previous theoretical frameworks.

Thus, the third study we conducted was essentially a forced choice replication of the Brown and Fish (1983b) study whereby referentiality of adjective was controlled for as in the two previous studies. The prediction we made from the MIIP can be tested in a number of different ways. One possible way is to examine the respective amounts of overlapping or common variance between Experiment 1, Experiment 2, and the replication of Brown and Fish. The expectation is that whereas Experiments 1 (event instigation) and 2 (dispositional inference) do not have much variance in common, the Brown and Fish replication shares a substantial amount of variance with Experiment 2 (dispositional inference). In addition, we would expect Experiment 1 (event instigation) to share a nonnegligible amount of variance with Experiment 3 (Brown and Fish). An alternative way of testing the hypotheses is in terms of predicting specific main effects and interactions.

To the extent that the dependent variable cues event instigation we expect IAVs and SAVs to give rise to sentence subject inferences and SVs to object inferences. However, as we pointed out earlier, the operationalization also cues dispositional inferences. To the extent that these are mediated differently by both verb type and the adjective referentiality we expect the dispositional inference manipulations to influence the outcomes as a function of verb type.

### Study 3

#### Overview and Method

Once again the materials and the design of this study were identical to Study 1. The difference in this case was that we used a forced choice version of the dependent variables used by Brown and Fish (1983b).

*Subjects.* Seventeen university undergraduates participated in this study on an unpaid voluntary basis. They were all native Dutch speakers.

*Dependent variable.* Subjects were given brief instructions about the purpose of the experiment and how to use the scales. The critical change in the instructions here was the following:

You will find two alternative explanations about who may have caused the event described in each of the sentences listed below. Your task is to indicate which of these two, in your view, is the more plausible explanation.

For example:

John helps Peter. Is this because

(a) John is the type of person who helps people.

(b) Peter is the kind of person that is helped by people.

After each of the 48 SvO sentences subjects had to choose one of the two alternatives.

#### Results

Two ANOVAs were conducted with choice as the dependent variable. We again used a 3 (verb type)  $\times$  2 (SRA)  $\times$  2 (ORA)  $\times$  2 (verb valence) design. The first ANOVA treated subjects as the data points (complete within-subjects design) and the second treated verbs as the data points (complete between-subjects design). In addition, we also calculated  $F'$  (cf. Clark, 1973) to examine generalizability from the available sample of verbal stimuli. The predicted outcome was a verb type effect, but not as strong as in the case of Study 1. Indeed, this effect was significant,  $F(2, 32) = 14.84, p < .001$  ( $\eta^2 = .48, \delta = .90$ ); within-subjects  $F(2, 24) = 17.68, p < .001$  ( $\eta^2 = .60, \delta = .93$ ); between-subjects  $F'(2, 56) = 8.07, p \leq .01$ . IAVs and SAVs gave the expected subject inferences ( $M = 1.24$  and  $M = 1.28$ ), but the SV mean ( $M = 1.54$ ) was around the midpoint between subject and object inference.

In addition, we find a significant Verb Type  $\times$  ORA interaction,  $F(2, 32) = 11.06, p < .001$  ( $\eta^2 = .41, \delta = .73$ ); within-subjects  $F(2, 24) = 3.63, p < .05$  ( $\eta^2 = .23, \delta = .61$ ); between-subjects  $F'(2, 29) = 2.73, p < .10$ . As can be seen from Figure 1, this finding is mainly due to the presence of ORAs in the case of SVs, which gives rise to a stronger object inference, thus moderating the verb type effect.

Finally, we found a significant Verb Type  $\times$  Verb Valence interaction,  $F(2, 32) = 9.40, p < .001$  ( $\eta^2 = .37, \delta = .62$ ); within-subjects  $F(2, 24) = 4.51, p < .05$  ( $\eta^2 = .27, \delta = .71$ ); between-subjects  $F'(2, 45) = 3.05, p < .10$ . As can be seen from Table 1 this is largely because the generally expected verb type effect occurs with negatively valenced verbs and is not manifested with positive verbs. This outcome is very much in line with other studies that have controlled for verb valence (e.g., Franco & Arcuri, 1990). What is noteworthy in this context is that this effect is obtained with the Brown and Fish (1983b) operationalization and not the previous two experimental studies.

Another way of examining the postulated relationship among Experiments 1, 2, and 3 is by calculating the variance common to each pair of experiments. For this purpose we calculated the variance common to each experiment pair by obtaining  $\eta^2$  for the covariation between each experiment pair. The following re-

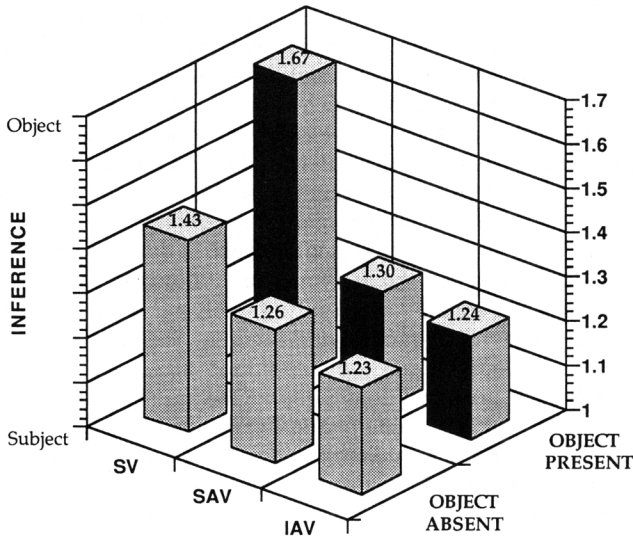


Figure 1. Object referent adjectivity availability and verb type interaction. SV = state verb; SAV = state action verb; IAV = interpretative action verb.

spective  $\eta^2$ s were in the expected direction, with Experiment 2 (dispositional inference) and Experiment 3 (Brown and Fish) sharing the highest amount of variance ( $\eta^2 = .46$ ), Experiment 3 and Experiment 1 sharing a sizable amount of variance ( $\eta^2 = .17$ ), and Experiments 1 and 2 sharing the lowest amount of variance between them ( $\eta^2 = .06$ ).

Finally, a third analysis that can be conducted is a set of analyses of covariance (ANCOVAs), on Experiment 3, by entering Experiment 1 as a covariate first, then Experiment 2, and, finally, Experiments 1 and 2 jointly as covariates. The expectation is that if Experiment 1 is entered as a covariate, then the verb type main effect should disappear because it is mainly due to event instigation, and indeed it did,  $F(2, 23) < 1.0$ . The only remaining effect in this ANCOVA was the second order effect due to verb type and verb valence,  $F(2, 23) = 3.91, p < .05$ . The next ANCOVA was one in which we entered the second experiment as a covariate (dispositional inference), with the expectation that there should only remain a strong verb type effect, which was the case,  $F(2, 23) = 11.56, p < .001 (\eta^2 = .50, \delta = .99)$ , which was also the only significant effect in this analysis. If Experiments 1 and 2 are entered jointly into the ANCOVA then no significant effect is noted, as expected. These covariance analyses suggest clearly that the verb type main effect observed

in Experiment 3 was due to event instigation and not dispositional inference.

Discussion

The results of the third experiment support the MIIP argument. These results show quite clearly that the type of operationalization that has been used in examining what has been termed *implicit causality* is one that invites a compound inference involving both event instigation and dispositional inference. The findings also suggest that the event instigation property of interpersonal verbs is independent of the property to do with dispositional inferences. Whereas the former is marked in verb type and is thus mainly a function of verb category, the latter is influenced by the availability of morphologically derived adjectives. Indeed, adjective referentiality does not seem to follow the simple pattern of biasing dispositional inference in the direction of the referentiality of the available adjective. The results of the second experiment suggest that dispositional inferences (i.e., inductive generalizations) are predominantly in the direction of sentence subject, and the availability of object referent adjectives moderates this effect to some extent but does not reverse it. Indeed, the dispositional inference effect is observed additionally as a strong verb type effect, with IAVs giving rise to the strongest dispositional inferences (to sentence subject).

Conclusions

Taken together, these three studies shed some light on the contradictory results observed to date in the literature on verb "causality." The confounding results in the literature appear to be largely because previous research has not systematically controlled for two factors that are implicitly contained in the manner in which "implicit causality" has been operationalized. The first one is "event initiation" and the second one is dispositional inference. Our argument, supported by the reported studies, is that these two inference-inviting properties are orthogonal and interact differently depending on the property that is cued by the question, the selection of verb type, and, to a lesser extent, the contingent adjective referentiality.

In our view, a part of the reason for the earlier contradictions can be found in the use of the term *causality* (as in implicit causality), which has a somewhat checkered history in attribution theory. Indeed, as Hewstone (1989) pointed out, even the origins of perceived causality (cf. Heider, 1958) are somewhat ambiguous, and certainly, its subsequent conceptualizations have given rise to considerable debate (e.g., Buss, 1978; Kruglanski, 1979; Locke & Pennington, 1982; Miller, Smith, & Uleman, 1981; Ross, 1977; Semin, 1980). If we focus on the use of the term *implicit causality* in the context of interpersonal verbs a similar ambiguity is apparent. The study by Brown and Fish (1983b), which has had a paradigmatic influence on this subject, uses causality in terms of a dispositional inference that is mediated by verb type (e.g., p. 47 ff). As the three experiments reported herein suggest, equating dispositional inference with causality mediated by interpersonal verbs is inappropriate. In-

Table 1  
Verb Valence  $\times$  Verb Type Interaction

Verb type	Interpretative action verb	State action verb	State verb
Negative valence	1.15	1.35	1.57
Positive valence	1.33	1.21	1.52

deed, Hamilton (1988, 1992) has cogently argued that dispositional inferences are different from attributional inferences (intuitive analyses of "why"). He suggests that dispositional inferences "do not require or involve any analysis of causal relations or the causal determinants of the observed behavior" (p. 14). He thus separates causal inferences from dispositional inferences and reaches this conclusion by following a different conceptual path to the one advanced here. In essence, the argument advanced here is also one that suggests that dispositional inferences are distinct and different from inferences about who elicited an event. This, obviously, does not mean that in specific instances event instigation and dispositional inferences may be keyed in the same way.

The main contention that the MIIP perspective developed here introduces is an explicit shift in the emphasis about the "cues" or "properties" setting of the inference process. Whereas all previous research has explicitly or implicitly assumed that the so-called implicit causality phenomenon was driven by invariable properties of the verb (e.g., schema hypothesis or morphological hypothesis) and thus assumed a determinate relationship between verb and inference processes, the present approach takes a distinctly different view. In reading an SvO sentence with an interpersonal verb, it is not the verb that primes a particular schema. The current approach suggests that interpersonal verbs have MIIPs. Which of these MIIPs is to be used in an inference task depends very much on the type of prime that is induced by a question or instruction. Furthermore, because some of these properties are orthogonal, it is unlikely that it is the interpersonal verb that primes any inference. An additional reason not to assume that an interpersonal verb primes implicit causality is the following: If it were the case that interpersonal verbs are so strongly involved in mediating inferences processes, then we submit that this would impose an all too restrictive or deterministic processing frame. It would effectively mean that there is a deterministic relationship between verb type and associated schema (e.g., experiencer-stimulus or agent-patient or the morphological hypothesis).

Indeed, as we have argued and shown here it is possible to prime compound properties or individual properties. The direction and type of inferences are thus dependent on the composition of the prime. Of course, the two properties that we have examined here do not exhaust the range of MIIPs that characterize interpersonal verbs, and we have documented a range of these in previous studies (cf. Semin & Fiedler, 1991, 1992). A number of other properties are also known not to be orthogonal (as is the case with event instigation and dispositionality), but correlated (cf. Semin & Fiedler, 1992).

A further implication of this research appears to be worth mentioning. This has to do with the question of whether language and language use predicates particular types of inference processes. The problem that this type of formulation introduces is the "language-influences-thought" argument, which is not our intention. Indeed, this is the point at which the main implication of the current work utilizing the MIIP perspective is best introduced, namely, the language-social cognition interface. It is our contention that the MIIP approach dissolves the deterministic relationship between language and social cog-

niton. The reason is simply because it is in the gift of the speaker to choose how he or she describes an interpersonal event, namely, which context and prime the speaker wishes to induce in the formulation, which impression the speaker wishes to convey by the selection of verbs, how the speaker chooses the interlocutors to occupy the sentence subject and sentence object positions, who the speakers implies should be seen as the instigator of an event, what types of dispositional inferences people should draw from the presented evidence in discourse, and so forth. No doubt that the decisions that lead people to use language as a tool are not conscious, deliberate, and controlled consciously. They are produced spontaneously. The significance of the type of idealized research reported here, which under strictly controlled conditions examines the features and psychological implications of interpersonal verbs, lies in the fact that it provides us with a clearer understanding of the psychological properties of language as a tool and therefore also a better way of understanding its strategic use of language in, for instance, how stereotypes are communicated and maintained (e.g., Maass, Salvi, Arcuri, & Semin, 1989; Rubini & Semin, 1994), how egocentric bias and actor-observer discrepancy is mediated in communication (cf. Fiedler, Semin, Koppetsch, 1990; Semin & Fiedler, 1989) by providing us with the analytic tools to systematically examine discourse.

The social psychological implications of this research are manifold. For instance, the finding that action verbs permit stronger dispositional inferences than state verbs has important bearings on the research literature on the spontaneous inference of trait characteristics from behavioral information (e.g., Klein & Loftus, 1990; Newman & Uleman, 1989; Winter & Uleman, 1984; Winter, Uleman, & Cunniff, 1985). This research, which relies on the assumption that dispositional information is implicitly or unconsciously accessed, has hitherto not considered the contribution that language may make toward elucidating the processes that are examined. Undoubtedly, resolving whether the spontaneous trait inferences are due to an encoding or a retrieval process has been difficult (e.g., Uleman & Moskowitz, 1994; Whitney, Waring, & Zingmark, 1992). The current research would permit one to examine whether unconscious dispositional inferences are made at the encoding or retrieval stage and furthermore whether dispositional inferences are made at all without using cued recall measures. If state verbs mediate weak dispositional inferences to sentence subject and object and action verb sentences mediate strong dispositional inferences only to sentence subject, then one could predict that in a free recall task the significantly highest recall is for sentence subject clauses of action verb sentences. Indeed, in a series of experiments—controlling for different information-processing goals—we (Marsman & Semin, 1994) found support for this contention.

Aside from this extended example, there are a number of other domains for which the research reported here on the relationship between language and social cognition has implications. In more applied contexts, such as a question-answer situation, event initiation and dispositional inference can be seen as important features that can be manipulated by the type of verb an interviewer chooses to use in formulating a question

and thus shaping the impression that the interviewee provides (cf. Semin, Rubini, & Fiedler, 1994). For instance, given the fact that a couple danced with each other and the interviewer assumes that the woman initiated the action, then the question "Did you dance with him?" is more likely to be posed than "Did he dance with you?" Because the answer is "yes" in both cases, posing the first question implies that the woman initiated the event rather than the man. This may have grave implications in the context of a rape interview conducted by a police officer who may conclude that the woman in question is unreliable. Uncovering the distinct inference-inviting properties of interpersonal verbs thus suggests a number of distinct social psychological research avenues with both basic and applied implications.

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Appendix

Verbs Used in Experiments 1–3 and Averaged Data Points

Verb <sup>a</sup>	Verb type	Subject referent adjective	Object referent adjective	Valence	Event instigation	Dispositionality	Rep. Brown and Fish
Tease	IAV	Present	Absent	Positive	1.26	1.05	1.24
Manipulate	IAV	Absent	Absent	Negative	1.11	1.05	1.24
Insult	IAV	Present	Present	Negative	1.26	1.00	1.00
Ridicule	IAV	Absent	Present	Negative	1.37	1.05	1.18
Badger	IAV	Present	Absent	Negative	1.05	1.11	1.12
Invite	IAV	Absent	Absent	Positive	1.11	1.16	1.29
Help	IAV	Present	Present	Positive	1.37	1.11	1.06
Privilege	IAV	Absent	Present	Positive	1.32	1.26	1.59
Agree with	IAV	Present	Absent	Positive	1.58	1.42	1.53
Swindle	IAV	Absent	Absent	Negative	1.00	1.11	1.18
Cheat	IAV	Present	Present	Negative	1.16	1.00	1.06
Betray	IAV	Absent	Present	Negative	1.11	1.42	1.35
Lie	IAV	Present	Absent	Negative	1.05	1.00	1.06
Stand up for	IAV	Absent	Absent	Positive	1.37	1.16	1.29
Protect	IAV	Present	Present	Positive	1.26	1.32	1.35
Vex	IAV	Absent	Present	Positive	1.16	1.37	1.29
Discourage	SAV	Absent	Present	Negative	1.11	1.53	1.53
Frighten	SAV	Present	Absent	Negative	1.05	1.47	1.29
Uplift	SAV	Absent	Absent	Positive	1.47	1.37	1.18
Amuse	SAV	Present	Present	Positive	1.00	1.16	1.00
Cheer up	SAV	Absent	Present	Positive	1.42	1.37	1.06
Inspire	SAV	Present	Absent	Positive	1.16	1.32	1.29
Anger	SAV	Absent	Absent	Negative	1.05	1.16	1.29
Hurt	SAV	Present	Present	Negative	1.00	1.11	1.24
Nettle	SAV	Absent	Present	Negative	1.16	1.58	1.47
Provoke	SAV	Present	Absent	Negative	1.26	1.21	1.24
Encourage	SAV	Absent	Absent	Positive	1.42	1.21	1.41
Surprise	SAV	Present	Present	Positive	1.00	1.21	1.06
Attract	SAV	Absent	Present	Positive	1.37	1.47	1.29
Fascinate	SAV	Present	Absent	Positive	1.05	1.32	1.41
Exploit <sup>b</sup>	SAV	Absent	Absent	Negative	1.16	1.05	1.29
Irritate	SAV	Present	Present	Negative	1.32	1.42	1.47
Respect	SV	Present	Present	Positive	1.79	1.74	1.88
Adore	SV	Absent	Present	Positive	1.95	1.32	1.35
Dote on	SV	Present	Absent	Positive	1.58	1.11	1.18
Tremble	SV	Absent	Absent	Negative	2.00	1.58	1.76
Hate	SV	Present	Present	Negative	1.63	1.42	1.59
Envy	SV	Absent	Present	Negative	1.79	1.42	1.65
Distrust	SV	Present	Present	Negative	1.68	1.58	1.47
Love	SV	Absent	Absent	Positive	1.74	1.26	1.53
Believe	SV	Present	Present	Positive	1.89	1.47	1.65
Admire	SV	Absent	Present	Positive	1.95	1.37	1.71
Fond of	SV	Present	Absent	Positive	1.89	1.26	1.59
Disdain	SV	Absent	Absent	Negative	1.53	1.11	1.29
Fear	SV	Present	Present	Negative	1.95	1.47	1.65
Disgust	SV	Absent	Present	Negative	1.74	1.58	1.82
Despise	SV	Present	Absent	Negative	1.79	1.32	1.35
Idolize	SV	Absent	Absent	Positive	1.68	1.11	1.24

Note. The Dutch version of these verbs are in the order in which they appear in the Appendix: *plagen, manipuleren, beledigen, bespotten, treiteren, uitnodigen, helpen, bevoorrechten, instemmen met, oplichten, bedriegen, verraden, liegen tegen, opkomen voor, beschermen, prikkelen, ontmoedigen, afschrikken, opbeuren, amuseren, opvrolijken, inspireren, ophitsen, kwetsen, pikeren, provoceren, bemoedigen, verrassen, aantrekken, betoveren, uitbuiten, irriteren, respecteren, aanbidden, dwepen met, sidderen voor, haten, benijden, wantrouwen, houden van, geloven in, bewonderen, voelen voor, neerzien op, vrezen, walgen van, minachten, and veragoden.*

<sup>a</sup> Precise translations of the interpersonal verbs from Dutch to English is an extremely difficult task. We have provided the best approximations that we considered possible to convey the respective meanings of the verbs. <sup>b</sup> We have what would appear in English to be an IAV (interpretative action verb) which in Dutch is an SAV (state action verb).

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