Two Types of Compositionally Derived Events

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It is now commonly assumed by semanticists that the logical representation of sentences contains reference to underlying events via event variables, following Davidson (1967), and that verbs are predicates of events (Higginbotham 1985; Kratzer 1989, 1995; Krifka 1992, 1998; Landman 1992; Parsons 1990; Rothstein 1995). Given these assumptions, researchers have asked questions such as: What constructions can be accounted for by positing underlying quantification over events? How is the quantification over events syntactically represented? Do all sentences contain quantification over events? What is the model-theoretic representation of events?

A less frequently asked question is: What entities in the world qualify as events? It is clear that events are spatiotemporally defined entities; they are happenings which take place or hold in time. Since events are not perceptually individuated in the same way that physical objects are (Clark 1978; Croft 1991; Gentner 1981, 1982; among others), it is not always clear what in the continuous chain of happenings in the world counts as an event. We assume that it is only possible to give a linguistic answer to this question and take the lexicon as a guide. If we take verbs to be predicates of event, then events are just those happenings with a collection of properties which can be named by a verb. That is, a happening or chain of happenings in the real world or in an imaginary world counts as an event if it can potentially be named by a verb.[1] As Croft (1998:46) puts it, "individuation of events is surely what naming them by verbs is all about". So we can restate the question as: What is a possible denotation of a verb? A similar question has been addressed by psychologists with respect to the denotations of nouns (Bloom 1994; Gentner 1981, 1982; Markman 1991, 1994; Waxman 1994; among others), but verbs have not received the same attention from this perspective.

It is often assumed that verbs can refer to single happenings, as in the following quote from Kiparsky (1997:476, (5)), "Simple predicates refer to single events ...". However, even a cursory glance at attested verb meanings reveals that verbs often denote a complex chain of happenings. Goldberg (1998) discusses the verb *sauté*, which describes a situation involving heating food with a small amount of fat and

[1] This of course does not mean that every chain of happenings which can be considered an event will be lexicalized by a verb in every language. The kinds of happenings which are named by verbs depend to a certain extent on the cultural context of the language. See also note 2.

simultaneously stirring it. Dowty (1979:170) points out in his discussion of the subinterval property of activities that certain activities involve complex patterns of change of position, and "Even particular *sequences* of more simple changes of position can be required for some activities. ... [T]here may be a sequential series of simpler activities required to characterize a certain complex activity, though no particular member of the sequence need occur first" (1979:171). Dowty illustrates this point with the verb *waltz*, which takes its name from a dance characterized by the repetition of a series of three steps, and the same point could have been made with any verb that takes its name from a dance. Yet another verb that describes a complex chain of sequential happenings—though one whose make-up is less fixed by convention than that named by *waltz* or similar verbs—is *juggle*.

We refer to the naming of a chain of happenings by a single verb as the LEXICALIZATION of a chain of happenings by a verb. We will restrict the term EVENT to a happening or chain of happenings which can potentially be lexicalized by a verb and its arguments in some natural language, as in the cases of *sauté*, *waltz*, and *juggle*, or by a light verb together with a predicative complement and their arguments, as in the case of *become sick*. The question of which kinds of chains of happenings can be construed as events is an important one, but we will not provide an answer to this question in this paper. We raise this question in order to differentiate it from, and thus clarify a related question, which will be the focus of this paper.

This paper focuses on a phenomenon illustrated by the examples in (1). In each example a complement of the verb invokes an event not strictly entailed by the verb itself; this event involves a change of state or a change of location.

(1) a. Tracy danced out of the room.

b. Elena coughed the foam off the cappuccino.
(adapted from Goldberg 1997:384, (2b))

c. ... she had worked like a Trojan to scrub the house clean of decades of muddy boot-prints ... (S. Webster, *Small Tales of a Town*, St. Martin's, New York, 1988, p. 19)

d. We searched the woods and cliffs, yelled ourselves hoarse and imagined you drowned ... (M. Wesley, *A Sensible Life*, Viking, New York, 1990, p. 327)

e. I ... ruthlessly roused Mr. Contreras by knocking on his door until the dog barked him awake. (S. Paretsky, *Blood Shot*, Dell, New York, 1988, p. 183)

In (1a), Tracy ends up outside the room, although the verb *dance* itself does not strictly speaking entail any locational displacement, as it is possible to dance in place. In (1b), the foam ends up off the cappuccino, though the verb does not entail that anything was caused to be moved by the cough. The verb *scrub* does not entail that the scrubbed entity becomes clean as it does in (1c), as evidenced by the fact that there is no contradiction in *Even after Pat scrubbed his hands, they were still dirty.* Yelling does not entail that the yeller ends up becoming hoarse as the searchers do in (1d), and it is certainly not the case that the verb *bark* entails that anyone was awakened by the barking, as the neighbor is in (1e).

The examples in (1) have fallen under a variety of rubrics in the literature. Most have been considered examples of the resultative construction since they involve the addition of an XP which describes a result state or location; however, (1a) is not analyzed as a resultative by Jackendoff (1990:223) or by Verspoor (1997, 1998), though see Tortora (1998) for arguments to the contrary, and (1b) has been taken by Goldberg (1995) to be an example of the caused-motion construction, which, according to her, is a more general construction that, in turn, subsumes the resultative construction. Some researchers simply discuss these phenomena under the general heading of aspectual shift or coercion since the result XP often serves to telicize an atelic verb. These differences in classification notwithstanding, almost all analyses of the sentences in (1) involve semantic representations taking the form of a complex event structure containing two subevents (Carrier and Randall 1993; Dowty 1979; van Hout 1996; Jackendoff 1990; Levin and Rapoport 1988; L&RH 1995; Pustejovsky 1991b, 1995; Van Valin 1990; among others). Consider these examples once again: (1a) involves an event of dancing and an event of going out of the room; (1b) involves an event of coughing and an event of the foam moving off the cappuccino; (1c) involves an event of scrubbing and an event of becoming clean; (1d) involves an event of yelling and an event of becoming hoarse; and (1e) involves an event of barking and an event of becoming awake. Indeed, by the criteria introduced above, the added complements do represent events since they represent happenings which can be lexicalized by a verb and its arguments, as in *go to the store*, or a verb, its predicative complement, and their arguments, as in *become hoarse*.

The XPs added to the verbs in (1) are quite closely bound to the verb syntactically, and all constituency tests indicate that they are as closely bound to the verb as normal subcategorized complements (L&RH 1995; Tenny 1994; Roberts 1988). Therefore, we assume that the event named by the verb and the additional event invoked by the added complement are construed as a single, though compositionally derived, event. The event must be considered compositionally derived since, as just indicated, the result states in these examples are not lexically entailed. We refer to the naming of compositionally derived events in a single verb-headed clause (i.e., in a clause with a single verb) as EVENT CONFLATION. Event conflation is to be differentiated from what we have already referred to as lexicalization, where reference to a chain of happenings is built into the basic meaning of a verb. Event conflation, as we use the term, refers to the composition of added conceptual constituents with the basic meaning of the verb and is the focus of this paper.

A question which naturally arises in the context of event conflation is what relation must hold between two events in order for them to be conflated. This question has been previously addressed (Croft 1991; Gawron 1985; Goldberg 1995; Kaufmann 1995b; Kiparsky 1997; Wunderlich 1997), although, as far as we know, it has rarely been explicitly distinguished from the question raised at the outset of this paper concerning lexicalization. Gawron (1985) comes the closest to distinguishing the two questions in introducing the notion of CO-PREDICATING PP, a type of PP which introduces a motion event not entailed by the verb, as in (2); he further argues that the event denoted by the verb and the introduced event are causally related.

(2) a. Doris broke the hammer against the wall. (Gawron 1985:40, (39))

b. Theresa hit the ball against the fence. (Gawron 1985:41, (42))

Croft (1991:160) also proposes that only causally-related events can be conflated: "Individual lexical items appear to denote only causally linked events".[2] Similarly, Kaufmann (1995b:86) writes "Successive subsituations of a situation encoded by a verb must be causally connected". Although both Croft's and Kaufmann's proposals are stated in terms of lexicalization and might appear to be references to lexicalization, the examples used to illustrate them include clear instances of what we call event conflation since they involve complements that are not strictly lexically entailed by the verb. Thus, Croft supports his proposal with the examples in (3).

(3) a. The boat sailed into the cave. (Croft 1991:160, (21))
b. ∗The boat burned into the cave. (Croft 1991:160, (22))
c. The branding iron burned into the calf's skin. (Croft 1991:161, (25))

In (3a) above, the event of motion into the cave can be conflated with the event of sailing since according to Croft the sailing causes the motion. In (3b), an event of motion into the cave, although it may accompany the event of the boat's burning, cannot be conflated with the event of burning since the burning does not cause the motion of the boat. Therefore, the event of motion and the event of burning cannot be expressed in a single verb-headed clause, but must be expressed periphrastically as in *The boat burned while going into the cave.* Example (3c) shows that whether or not a particular verb can appear with a PP complement invoking a motion event that can be conflated with the event denoted by the verb does not depend on the verb alone; rather, what is crucial is the relation between the event denoted by the verb and the candidate motion event. In (3c) the burning DOES cause the movement of the branding iron, and so the motion event and the burning event may be conflated and expressed in a single verb-headed clause.

A second question about event conflation follows from the first: What event structure representation results from event conflation? As mentioned above, many previous analyses assign all sentences like those in (1) the same complex event structure representation consisting of two distinct subevents. In this paper we challenge the assumption that all instances of event conflation should be given the same linguistic event structure representation.

In answer to the first question, there is certainly something right about the proposal that a causal relation must hold between events conflated in a single verb-headed

[2]This criterion seems to differentiate between the notions of event conflation and lexicalization as we have defined them. So, for example, while the verb *sauté* involves both heating with a small amount of fat and stirring, there is no causal relation between these two subparts of the event of sautéing. Similarly, there is no evident causal relation between the series of steps making up an event of waltzing or tangoing. Nor is there any causal relation between the series of steps that make up juggling. In fact, unlike the dancer of a waltz or tango, who must follow a specified pattern, a juggler has considerable latitude in determining what pattern to follow. Such examples suggest that the happenings which are minimally lexicalized in a verb need not be causally related. An alternative proposal is suggested by Wunderlich (1997:36, (13)) "A lexical SF [= semantic form — MRH&BL] conjunction is contemporaneously or causally interpreted". But the happenings which are minimally lexicalized in a verb need not meet this extended requirement either. Although, contemporaneity holds of the happenings lexicalized by the verb *sauté*, it does not hold of those lexicalized by the verbs *tango, waltz*, and *juggle*. It appears that there are distinct requirements on lexicalization and event conflation, presumably reflecting the different nature of these processes; lexicalization, for instance, applies to sequences of happenings that are conventionally performed together.

clause. (But see Goldberg (1998) for some potential counterexamples.) In all the examples in (1) there is informally-speaking a causal relation between the event denoted by the verb and the event invoked by the result XP. However, we will show in this paper that a careful scrutiny of a range of event conflations demonstrates a need to distinguish between two types of event conflation. We show that the semantic relation between the conflated events in the two instances differs in a very specific way, and that this semantic difference is correlated with a syntactic difference. The first type shows certain hallmarks of lexical causatives, suggesting that this type be given the same linguistic event structure as a causative. The second type lacks the properties of causatives, and we will suggest that it does not receive the linguistic representation of a causative. Thus, we will posit that each type of event conflation has a distinct associated event structure representation, as described below.

• The conflation of two temporally-independent events, giving rise to a causative event structure comprising two subevents; this event structure is also given to lexical causatives.[3]

• The conflation of two temporally-dependent events, giving rise to a simple event structure with "coidentified subevents".

The distinction we draw among event conflations is motivated by a detailed study of event conflations based on intransitive verbs, and, in particular, the well-known observation that intransitive verbs appear in two different syntactic patterns when in combination with result XPs in the resultative construction. We claim that these two syntactic patterns are manifestations of the two different types of event structure set out above. We show that the major semantic difference between the two kinds of event conflations concerns the temporal relations between their constituent subevents, with "coidentification" of events reflecting a very specific type of event contemporaneity. We further claim that independently established principles of argument realization determine the mapping between the two types of event structure and their associated syntactic structures.

This paper, then, clarifies what it means for an event to have the linguistic representation of a causative. In particular, we will show that in some instances a pretheoretic intuition that two events are causally related does not translate into a linguistically-represented instance of causation. Furthermore, since Dowty (1979) there has been a tendency to equate the class of verbs showing the temporal properties of accomplishments (i.e., those verbs denoting events with a duration and an endpoint) with the class of causative verbs. The results of our study of event conflations challenge this equation, and thus this study strengthens the conclusion arrived at by Van Valin and LaPolla (1997) that not all accomplishments are causatives and not all causatives are accomplishments.

[3]Another conception of the term "complex event" is found in the work of van Hout (1996) and Pustejovsky (1991b, 1995). They take any eventuality involving a transition from one state to a second to have a representation as a complex event. Such representations are complex in that there is a process or state prior to the moment of transition and a result state following it. Thus, all telic events will be represented as complex events given this characterization; however, in this paper we argue that not all telic events have the same representation and that some appear to have simple (noncausative) event structures. (We further note that for Pustejovsky the notion "cause" has no place in event structure proper, but rather belongs to a richer level of semantic representation he calls LCS′.) We plan to evaluate the differences in these conceptions of what constitutes a complex event in future work.

This paper has several larger contributions to make. Our analysis of event conflation involves a semantic account of those facets of the resultative construction that have been considered to provide some of the strongest evidence for the syntactic encoding of unaccusativity in English. Thus, this study suggests that the question of whether unaccusativity is syntactically represented in English, as has been widely assumed, and as we have argued in L&RH (1995), needs to be reexamined, though we do not take on this task here. In addition, this study provides insight, based on linguistic evidence, into the much-debated issue of event identity (Davidson 1969; Lombard 1986; Parsons 1990; among others).

Throughout the paper, we often refer to instances of event conflation as "resultative constructions", especially when reviewing previous literature on the topic. We do this because we can identify two subevents in each instance of event conflation—informally, a causing subevent and a result subevent—and the term "resultative construction" is often used to cover the range of examples we are looking at. Since, as mentioned above, some researchers take certain instances of event conflation to represent something distinct from the resultative construction, and we ourselves also make distinctions among subtypes of this construction, we stress that the term "resultative construction" is used merely for descriptive convenience, whereas the term "event conflation" has a precise definition.

In section 1 we introduce the two syntactic patterns associated with event conflations based on intransitive verbs, drawing on the literature on resultatives, and we outline a familiar syntactic approach to explaining the differences in the syntax. We then review some problems facing the syntactic account and the reasons why they have motivated alternative, semantic accounts. We begin section 2 by introducing Wechsler's (1997) semantic account, which is the first to point out that the semantic relation between the verb and the result XP is the key to understanding the syntax of the two forms of the resultative construction. After discussing the shortcomings of Wechsler's semantic account, we propose an alternative basis for a semantic analysis. Based on a close examination of the resultative data, we show that the temporal relation between the event denoted by the verb and the event of achieving the result state introduced by the result XP is different in the two resultative patterns. In section 3 we examine the implications of the differences for the event structure associated with the two resultative patterns. We also suggest that the temporal relation between the subevents in one pattern characterizes causative events in general, supporting analyses of some resultatives as causatives, while we show that the other pattern does not show the properties of causatives. In section 4 we show how the distinct syntax of the two resultative patterns can be made to follow from independently established principles governing the mapping between event structure and syntax once a principle of "event coidentification" is recognized. In section 5 we address several issues that need to be resolved in order to give a complete semantic account of the resultative construction; in section 5.2 we explore a consequence of our analysis for the set of possible verb meanings.

1 Resultative Constructions Based on Intransitive Verbs

English resultatives[4] have been the focus of a large body of literature (Carrier and Randall 1992; Dowty 1979; Goldberg 1995; Hoekstra 1984, 1988; Jackendoff 1990; L&RH 1995; Neeleman 1994; Neeleman and Weerman 1993; Simpson 1983; among others, as well as references in Levin 1993 and Napoli 1994). Here we only summarize the essential properties of the construction, referring the reader to these other studies for a more detailed discussion and demonstration of these properties. English allows the addition to a verb (and its object, if there is one) of a number of different types of XPs which receive a result interpretation. Thus, *Pat wiped the table clean* receives the interpretation that the table has become clean as a result of Pat's wiping the table.

In English, result XPs must be predicated of objects (Simpson 1983; among others). In L&RH (1995) we called this generalization, which has important implications for the possible syntactic analyses of the resultative construction, the Direct Object Restriction (DOR). Thus, in (4), a resultative construction based on a transitive verb, it is the table that ends up clean and not Pat.

(4) Pat wiped the table clean.

Furthermore, when a verb can alternate between expressing an argument as a direct object or in a prepositional phrase complement, as in (5), a result XP can only be predicated of this argument when it is expressed as a direct object, despite the similar semantic relation associated with the two expressions (Simpson 1983; Williams 1980).

(5) a. Sandy pounded the metal flat.
b. *Sandy pounded on the metal flat.

The DOR holds of the resultative construction in some languages other than English, including Dutch (Hoekstra 1988) and Japanese (Miyagawa 1989:98), but it does not hold in other languages, such as Chinese (Cheng 1993; Cheng and Huang 1994; Li 1990) and Korean (Kim and Maling 1997).[5]

[4]Resultative constructions can be classified along several dimensions, giving rise to multiple subtypes. In this note, we clarify the terms we use to refer to the subtypes of interest in this paper. We refer to resultative constructions headed by transitive and intransitive verbs as TRANSITIVE-BASED and INTRANSITIVE-BASED resultative constructions, respectively. Resultative constructions also differ as to whether or not there is a postverbal NP following the verb; we will refer to resultatives in which there is no such NP as the BARE XP PATTERN and those in which there is such an NP as the NP-XP PATTERN. The bare XP pattern can only be based on intransitive verbs; the NP-XP pattern can be based on either transitive or intransitive verbs. The NP-XP pattern falls into several subtypes, according to the nature of the postverbal NP. We will focus primarily on two of these subtypes, which we call the REFLEXIVE and NONSUBCATEGORIZED NP patterns; in the former, the postverbal NP is a reflexive pronoun coreferential with the subject, in the latter it is a nonreflexive NP which is not subcategorized by the verb. Each of these types of resultatives will be introduced in turn in this subsection and the following one. Finally, we use the term POSTVERBAL NP to refer to the NP following the verb in the NP-XP pattern, since we do not take a stand on the issue of whether such an NP is always a direct object of the matrix verb or whether it is sometimes or always the subject of a small clause (for different perspectives see Bowers 1997; Carrier and Randall 1992; Hoekstra 1988, 1992b; L&RH 1995).

[5]As stressed in L&RH (1995), the DOR is a descriptive generalization which is in need of an

1.1 Consequences of the DOR

A much-discussed consequence of the DOR is that an intransitive verb cannot have a result XP predicated directly of its subject. Frequently, when the result XP is predicated of the referent of the subject of an intransitive verb, the verb must appear with a reflexive pronoun—sometimes called a "fake" reflexive (Simpson 1983)—as object, apparently to satisfy the syntactic requirement that a result XP be predicated of an object. The sentences in (6) illustrate this pattern, which we will refer to as the REFLEXIVE RESULTATIVE PATTERN. The examples in (7) show that the result XPs in (6) cannot be predicated directly of the subject of the verb, and those in (8) show that these verbs are intransitive and cannot take a reflexive object.

(6) a. We searched the woods and cliffs, yelled ourselves hoarse and imagined you drowned, until we realised your case was gone. (M. Wesley, *A Sensible Life*, Viking, New York, 1990, p. 327)

b. But she'd have to act fast or he'd rock and chant himself into a trance. (A. Padgett, *Strawgirl*, Mysterious Press, New York, 1960, p. 160)

c. ... out with the Maigret novels, to read myself into an inferiority complex ... (F. Fyfield, *A Question of Guilt*, Pocket Books, New York, 1989, p. 49)

d. ... poor Sam had been wretchedly ill and had coughed himself into a haemorrhage ... (J. Aiken, *Jane Fairfax*, St. Martin's Press, New York, 1990, p. 98)

(7) a. *We yelled hoarse.

b. *He'd rock and chant into a trance.

c. *I read into an inferiority complex.

d. *Sam coughed into a haemorrhage.

(8) a. *We yelled ourselves.

b. *He'd rock and chant himself.

c. *I read myself.

d. *Sam coughed himself.

Notwithstanding the DOR, some intransitive verbs may have a result XP predicated directly of their subject, as in (9). We refer to this pattern as the BARE XP RESULTATIVE PATTERN.

explanation. In L&RH, we suggest that the result XP is always predicated of an argument bearing a particular SEMANTIC relation to the verb, and that the DOR is a result of the fact that an argument in this particular semantic relation (the entity undergoing a directed change) is always expressed as a direct object. If it turns out that an argument bearing this semantic relation can sometimes be expressed otherwise (e.g., as a subject), then there may be resultative XPs predicated of nonobjects. Both Verspoor (1997:150-151) and Wechsler (1997:313) offer possible examples of subject-predicated resultatives in English; e.g., Wechsler's examples *The wise men followed the star out of Bethlehem* and *The sailors managed to catch a breeze and ride it clear of the rocks.* In these examples, the entity denoted by the SUBJECT undergoes the directed change and is also the subject of the result phrase. As mentioned in L&RH (1995), there is still a syntactic requirement that the result XP and the NP it is predicated of mutually c-command each other, although this requirement alone does not account for the DOR. See also section 5.2.

(9) a. The pond froze solid.

b. The bottle broke open.

c. This time the curtain rolled open on the court of the Caesars ... (Olivia, *Olivia*, Hogarth Press, London, 1949, p. 35)

d. The doors swinging shut obliterated the street. (E. Taylor, *A Game of Hide and Seek*, Peter Davies, Great Britain, 1951, p. 3)

e. After dinner—minus the cookies, which Doreen forgot about until they had burned black—Michael reads to Kara ... (P. Orenstein, "Almost Equal", *The New York Times Magazine*, April 5, 1998, p. 48)

f. Sitting with our damp outer clothes steaming dry on the radiators ... (N. Edwards, *Mud*, The Women's Press, London, 1986, p. 38)

g. If kettle is allowed to boil dry, damage may occur to porcelainized coating. (brochure included with Copco Tea Kettle)

h. The branding iron burned into the calf's skin. (Croft 1991:161, (25))

i. The clothes soaked clean.

Kaufmann (1995a:416, 425) and Pustejovsky (1991b), among others, have claimed that instances of the resultative construction in which a result XP is predicated directly of the subject are not true resultatives—or, in the terms we have developed in this paper, are not true instances of event conflation—since the result XPs are added to verbs which already lexically entail the achievement of a result state; Rapoport (1998) makes a similar observation about these result XPs. Although this property holds of some intransitive resultatives, such as (9a) and (9b), this property does not hold of the verbs in the other examples in (9). For example, the verb *roll* found in (9c) is atelic and does not lexically entail a result state. In (9g), the verb *boil* is used in the sense 'be in the state of boiling', rather than the sense 'come to boil'. This sense is atelic, as evidenced by sentences such as *The kettle boiled for five minutes*, and does not entail that a state of dryness will come about. Finally, although (9h) describes a change of location, the verb *burn*, whatever its basic aspectual properties, does not entail a change of location. Therefore, in at least some of the examples in (9), the achievement of the result state is an event that is not lexically entailed by the verb, and this event is conflated with the event denoted by the verb to form a compositionally derived event. As stated in the introduction, it is this property of the resultative construction—that the result state denoted by the result XP is usually not lexically entailed by the verb it is a complement of—that has prompted a complex event analysis of the resultative construction, with the verb representing a causing event and the result XP representing a second, result event.

1.2 A Syntactic Account of the Resultative Construction

The fact that result XPs give rise to two syntactic patterns when added to intransitive verbs must receive an explanation. The contrasting resultative patterns based on intransitive verbs illustrated in (6) and (9) have been given a syntactic explanation, first offered by Simpson (1983) and later developed by Bresnan and Zaenen (1990), Hoekstra (1984, 1988), L&RH (1995), among others. The explanation is built on the

syntactic classification of the verbs in (6) as unergative and those in (9) as unaccusative. If the subject of an unaccusative verb is an underlying object, as posited by the Unaccusative Hypothesis (Burzio 1986; L&RH 1995; Perlmutter 1978), then at some level of representation the result XP in all the examples in (9) is still predicated of an object; thus, the DOR is met.[6] In contrast, an unergative verb cannot have the result XP predicated directly of its subject, since its subject is not a direct object at any level of representation.

The syntactic account also explains why unergative verbs, but not unaccusative verbs, show up in yet another resultative pattern, one which resembles the reflexive resultative pattern in that the verb is again followed by an NP and an XP. However, this pattern is characterized by a postverbal NP that is not reflexive and that is not the object of the verb in isolation; for this reason we refer to this pattern as the NONSUBCATEGORIZED NP RESULTATIVE PATTERN. We refer to the reflexive and nonsubcategorized NP patterns collectively as the NP-XP PATTERNS. The nonsubcategorized NP pattern is illustrated in (10); the examples in (11) show that the postverbal NPs in these examples are not subcategorized by the verb.

(10) a. The joggers ran the pavement thin.
b. I jogged my sneakers threadbare.
c. The dog barked my mother awake.
d. Frank sneezed the tissue off the table. (Goldberg 1995:152, (2))
e. Elena coughed the foam off the cappuccino.
(adapted from Goldberg 1997:384, (2b))

(11) a. *I ran the pavement.
b. *I jogged my sneakers.
c. *The dog barked my mother.
d. *He sneezed the tissue.
e. *She coughed the foam.

The syntactic account explains why unergative verbs, but not unaccusative verbs, show up in the nonsubcategorized NP pattern. The postverbal NPs in (10) receive Case from the unergative verbs, which, as argued by Burzio (1986), are case-assigners, and, although these NPs do not receive a theta-role from the verb, they do receive a theta-role from the result XP (Hoekstra 1988; L&RH 1995; Rothstein 1992). Unaccusative verbs, however, are not case assigners, and as noted in L&RH (1995) they are not found in the nonsubcategorized NP pattern.

(12) a. *The bomb exploded the watermelons into the air.
b. *The ice melted the floor clean.

[6]This explanation is implemented differently by Bresnan and Zaenan (1990), who formulate their analysis within LFG's Lexical Mapping Theory (Bresnan and Kanerva 1989). In place of assigning the surface subjects in the two resultative patterns different underlying grammatical relations, the subjects are assigned different initial argument classifications.

c. *The water evaporated the pot dry.

d. *The ball bounced the markings off the floor.

e. *The wagon rolled the rubber off its wheels.

Verbs of manner of motion such as *run, jog, dance*, and *hop* and verbs of sound emission such as *rumble, whistle*, and *screech* are found both in the NP-XP (reflexive and nonsubcategorized NP) and bare XP resultative patterns, as illustrated below. (Even if the (a) examples are sometimes classified differently from the (b) and (c) examples, with only the latter considered to be resultatives, both are instances of what we term "event conflation"; thus, there is reason to compare the syntax of the two sets of examples.)

(13) a. Dan ran/jogged/danced/hopped to the station.

b. '... Walk yourself into a coma and see what your subconscious comes up with.' (M. Wesley, *The Camomile Lawn*, Summit, New York, 1984, p. 213)

c. ... she started to run the hangover out of her system. (V. McDermid, *Open and Shut*, St. Martin's, New York, 1991, p. 10)

(14) a. The car rumbled/roared/screeched into the driveway.

b. If the telephone bell rang, it could ring itself silly. (P. Wentworth, *The Blind Side*, J.B. Lippincott, 1939; Warner, New York, 1991, p. 23)

c. The alarm clock next to Edwards's bed buzzed them awake at six the next morning. (M. Truman, *Murder in the CIA*, Random House, New York, 1987, p. 83)

The syntactic account of the resultative construction rests on the crucial assumption that verbs such as those in (13) and (14) come with two sets of syntactic properties, which vary according to the meaning of the sentence they appear in; for this reason, we called them "variable behavior verbs" in L&RH (1995). When these verbs appear in sentences describing simple activities (a manner of motion or the emission of a sound) as in the (b) and (c) examples, then they are associated with unergative syntax—that is, they appear with a postverbal NP or reflexive. When they appear in sentences describing directed motion, as in the (a) examples, then they are associated with unaccusative syntax—that is, there is no postverbal NP or reflexive. For this reason, in (13) and (14) these verbs appear with unaccusative syntax only if the result XP represents a change of location; when the result XP represents a change of state, these verbs appear with unergative syntax. In Bresnan and Zaenen (1990), Hoekstra (1988), L&RH (1995), among others, these facts are shown to follow from independently established principles of argument realization.[7]

[7]The question of whether the distribution of result XPs should receive a syntactic or a semantic explanation is independent of another issue which is the subject of debate: whether or not verbs which display variable behavior should have multiple lexical listings and, more generally, whether or not verbs are listed in the lexicon together with particular argument-realization possibilities. The approach which takes verbs to be associated with an indication of their argument-taking properties can be termed LEXICAL, while the approach which takes the argument-taking properties of a verb

This property of the syntactic approach—the assignment of more than one syntactic classification to many verbs—has been viewed as problematic by many researchers (Borer 1994, 1998; Dowty 1991; Van Valin 1990; Wechsler 1997; Zaenen 1993). As an alternative, some researchers (Alsina 1997; Kaufmann 1995a; Van Valin 1990; Wechsler 1997; Zaenen 1993) have attempted to provide a semantic account of the ways in which result XPs are combined with intransitive verbs, which does not posit a syntactic difference between unaccusative and unergative verbs and more generally does not posit multiple syntactic frames for variable behavior verbs. To our mind, none of these attempts has been entirely successful. (See L&RH (1995) for a review of Van Valin (1990).) These accounts generally attempt to identify a difference in the event structure associated with each of the resultative patterns based on intransitive verbs; however, they do not provide an accurate semantic characterization of this difference, and they also fail to explain the connection between the event type and the syntactic structure characteristic of each pattern. A semantic account will obviate the need to posit a syntactic difference between the verbs in the two classes of resultative constructions only if it provides an accurate characterization of the event type represented by each pattern and is able to explain the connection between each event type and the associated syntactic structure.

In the following sections, we provide a semantic explanation of the two ways in which result XPs can combine with intransitive verbs. Even if the difference between the classes of intransitive verbs—the unaccusative verbs and unergative verbs— is syntactically represented, there remains the question of the semantic basis of the contrast. As Wechsler (1997) correctly points out, the syntactic approach begs the question of why certain verbs can appear in both resultative patterns, while others cannot. That is, what is it about verbs like *run* and *rumble* which allows them to appear in both resultative patterns, while other verbs such as *hesitate*, *laugh*, and *play*, cannot? Surely, even the proponents of the syntactic approach assume that there is an answer to this question. If we assume that syntactic differences are reflexes of semantic differences, as is often assumed in the literature, then we can seek to identify a semantic difference behind the different syntactic patterns exhibited by intransitive verbs when they are found in the resultative construction. In sections 3 and 4 we explicate such a semantic difference. Furthermore, in section 5 we show

to be derived from the construction in which it appears, can be termed CONSTRUCTIONAL (RH&L 1996, 1998a). There are a number of proponents of the constructional approach to variable behavior verbs, many of whom espouse very different approaches to syntax; they include Borer (1994, 1998), Goldberg (1995), van Hout (1996), and Hoekstra (1992a). Jackendoff (1990:223-224) also takes a constructional approach to the variable behavior of manner of motion verbs, introducing the goal phrase by a rule which adds a superordinate *GO*-adjunct to a verb's semantic representation. The constructional vs. lexical approach question is independent of the question of whether the distribution of result XPs should receive a syntactic or semantic explanation, as evidenced by the fact that Hoekstra and Borer provide a syntactic explanation, while Goldberg and Jackendoff do not, yet all are proponents of the constructional approach. That is, Hoekstra and Borer have verbs associated with multiple syntactic frames, but for them this association is never lexical. The account we present here should be able to be implemented either lexically or constructionally. As we have stressed in RH&L (1996, 1998a), it is very difficult to find convincing evidence which favors one of these two approaches over the other, and the same basic research questions need to be answered on either approach. In particular, the relation between the basic meaning of the verb and the meanings associated with the various argument realization options needs to be made explicit on both approaches. We take this to be the most interesting question, and the present paper is meant to contribute to this understanding, by explicating the relation between the basic meanings of verbs and result XPs, including goal phrases.

how this semantic difference can be used to explain the distinct syntactic resultative patterns. We can remain agnostic as to whether or not there is a syntactic difference between unaccusative and unergative verbs. Certainly, in English the facts concerning the distribution of result XPs have constituted the strongest evidence for the syntactic difference between unaccusative and unergative verbs. If there is an alternative semantic account which explains the syntactic properties of the construction, it calls into question whether there is any evidence for the syntactic encoding of unaccusativity in English, but, as mentioned, we do not provide a definitive answer to this question, as it is not the main concern of this paper.

2 The Key Semantic Property: Temporal Constituency

As a starting point for determining the semantic basis of the contrast between the two patterns based on intransitive verbs, we consider variable behavior verbs further. In L&RH (1995) we propose an analysis of such verbs that allowed a syntactic analysis to be maintained. We review this analysis and show that it is problematic. We then suggest, as does Wechsler (1997), that the appropriate question relates not so much to the classification of the verb, but rather to the semantic relation between the verb and the result XP.

In L&RH (1995) we assumed the existence of lexical statements of the form 'A verb in semantic class x is also a member of semantic class y' (L&RH 1995:29). For verbs of manner of motion and verbs of sound emission the statement would be to the effect that verbs in these classes are also members of the class of verbs of directed motion, such as *arrive* and *come*. As verbs of directed motion, they are unaccusative, and they also take a goal phrase. When they are not used as verbs of directed motion, they cannot take a goal phrase directly, as only verbs of directed motion may, and since they are unergative, they can only appear with a goal phrase via the mediation of a "fake" reflexive, as in *Don't expect to jog yourself sober*. In contrast, there is no lexical rule which allows other verbs, such as *hesitate, laugh*, and *play*, to become verbs of directed motion, explaining why these verbs never take a bare goal phrase (**Penny hesitated/laughed/played into the room*), but appear in the other resultative pattern. Although this may be one way of describing the phenomenon, it is hardly likely that statements such as these exist anywhere in the grammar, since, as L&RH (1995) note, these semantic classes are probably epiphenomena and not lexical primitives, and thus lexical statements would not be expected to include direct reference to them.

The lexical rule analysis was motivated primarily by the behavior of verbs of manner of motion and verbs of sound emission, since there is an impressive degree of uniformity in the behavior of the members of these classes with respect to variable syntactic behavior, which may give the impression that the classes themselves are implicated in a lexical process or relation. However, there are verbs which are not verbs of directed motion in their basic sense, which, nevertheless, allow the addition of a bare goal phrase, even though they do not share this property with other members of any identifiable semantic classes. Consider, for example, *The chocolate melted into the sofa*, or example (3c), repeated below; in both, the verbs themselves do not strictly entail the motion event.

(15) The branding iron burned into the calf's skin. (Croft 1991:161, (25))

The verbs *melt* and *burn* do not belong to semantic classes whose members all undergo a similar lexical shift. For example, *melt* is a verb of change of state, yet it is certainly not the case that all verbs in this class allow the addition of a goal phrase (e.g., **The banana blackened into the garbage*; **The berries ripened onto the ground*). If there is to be an explanation for the behavior of the verbs *burn* and *melt* that extends to the verbs of manner of motion and verbs of sound emission, then an analysis based on reference to lexical classes can be dispensed with; in fact, an alternative analysis would be empirically preferable.[8]

A closer look at the distribution of bare goal phrases, then, suggests that the question for investigation is more general: What must the semantic relation be between the event denoted by the verb and the event represented by the result XP in order for a bare goal phrase to be added to this verb? This semantic relation must be one that can hold across the entire classes of verbs of manner of motion and verbs of sound emission, but that holds differentially across verbs of change of state. Generalizing further, the question that needs to be addressed in understanding the distribution of the two resultative patterns with intransitive verbs is: What semantic relation must hold between the event denoted by the verb and the event represented by the result XP in each resultative pattern?[9]

2.1 Wechsler's Semantic Account of the Resultative Construction

The importance of this question has been recognized in other recent work. Wechsler (1997) suggests that it is not the classification of a verb as unaccusative or unergative which determines the syntax of a resultative construction based on an intransitive verb, but rather the semantic relation between the verb and the result XP. He makes the important observation that the semantic relation between an intransitive verb and the result XP in the bare XP pattern is tighter than in the two NP-XP patterns. Drawing a parallel between resultative constructions and constructions involving verbs taking infinitival sentential complements, Wechsler makes a distinction between "control resultatives", in which the result XP is predicated of an argument of the verb, and "ECM resultatives", in which the result XP is not predicated of an argument of the verb. For resultative constructions based on intransitive verbs, control resultatives correspond to the bare XP pattern and ECM resultatives to the NP-XP pattern. Wechsler further proposes that the result XPs in the bare XP pattern is selected by the verb, as is the NP it is predicated of (i.e., the subject of the verb). In the NP-XP pattern neither the result XP nor the NP it is predicated of are

[8]There is another problem with the dual class membership account in L&RH (1995). This account would predict that when verbs from one class become members of a second, they should show precisely the behavior of the verbs in the second class. In fact, verbs of manner of motion with directional complements do not behave precisely like verbs of inherently directed motion such as *arrive* and *come*, as would be expected if they had become members of this semantic class. For example, the former, but not the latter, often appear in causative uses, as in *The coach ran the athletes around the field*, but not in **The coach went the athletes around the field.*

[9]This question arises for both the lexical and constructional approaches to argument realization discussed in note 7, although it would be phrased somewhat differently in the context of the constructional approach.

arguments of the verb. Thus, the verb that the resultative construction is based on places semantic sortal restrictions on the result XP in the bare XP pattern, but not in the NP-XP pattern.[10] In an effort to give some content to what it means for a result XP to be selected by the verb, Wechsler (1997:309) suggests that control resultatives (i.e., the bare XP pattern) show what he calls the Canonical Result Restriction in (16).[11]

(16) Canonical Result Restriction (CRR):
A *control resultative* must represent a 'canonical' or 'normal' result state of an action of the type denoted by the verb. (Wechsler 1997:310, (10))

Since the associated canonical result is idiosyncratic to a particular verb, it would be encoded in that verb's lexical entry; as Wechsler (1997:315) puts it, "any verb which can, in principle, have a result state, lexically specifies a sort of argument slot for that result state". In fact, Pustejovsky (1991a, 1995) encodes precisely this information in the telic role of his qualia structure, a structured lexical semantic representation.

We now present some specific examples to show how Wechsler's account works. We begin with Wechsler's discussion of the verb *run*, a verb which appears in both the bare XP and the NP-XP resultative patterns.

(17) Robert ran clear of the fire/free of the car/*exhausted.
(Wechsler 1997:310, (7a))

(18) The joggers ran their Nikes threadbare. (Wechsler 1997:310, (8d))

In the bare XP pattern, *run* can appear with a location as result XP, but not a state, as shown in (17), because "The normal result associated with 'x running' is 'x being in a new location'" (Wechsler 1997:310). In contrast, since (18) instantiates the NP-XP pattern, the result XP need not be a canonical result. In fact, the result XP *threadbare* describes the resulting condition of the runner's shoes, and the achievement of this condition is not a canonical result of running. The verb *run* can appear in both resultative patterns because its canonical result is lexically specified as being optionally expressed. In contrast, some verbs, such as *laugh*, denote activities which, according to Wechsler (1997:310), do not have an "inherent or canonical result"; thus, such verbs do not appear in the bare XP pattern at all, as shown in (19a). They may appear in the NP-XP pattern, as in (19b), because this pattern does not impose the requirement on the result XP that it denote a canonical result state. According to Wechsler (1997:310) such results are "accidental or contingent states" that in the case of (19a), for example, "seem to be extrinsic to 'laughing' qua activity type".

[10] This generalization holds of resultative constructions based on intransitive verbs only. Wechsler also discusses resultative construction based on transitive verbs where the postverbal NP is understood to be the argument of the verb, such as *Sam hammered the metal flat* (cf. *Sam hammered the metal*). Such resultatives also qualify as control resultatives in which the result XP is again selected by the verb. We return to a discussion of this type of resultative in sections 3.3 and 5.2.

[11] Washio (1997), building on discussion in McNulty (1988), appeals to a similar notion—a "disposition" towards a certain state—in explaining differences between the distribution of resultatives in English and Japanese; however, Washio does not see this as a matter of selection.

(19) a. ∗John laughed silly/off his chair. (Wechsler 1997:310, (7b))
b. We laughed ourselves silly. (Wechsler 1997:310, (8c))

Wechsler (1997) does not elaborate on the analysis of verbs such as intransitive *freeze* and *break*. Given that such verbs would obligatorily have a lexically-specified result state, his account would require them to appear only in the bare XP pattern, consistent with the observations in section 1.2 that they do not appear in the nonsubcategorized NP pattern.

(20) a. The water froze solid. (Wechsler 1997:308, (3b)
b. The mirror broke into pieces.

Although we agree with Wechsler that the semantic relation between the event denoted by the verb and the result state denoted by the XP is crucial to predicting the distribution of the two resultative patterns, we offer a different account of the relation between the verb and the result XP in the two patterns. It seems to us that the notion "canonical result", upon which Wechsler's account of the difference between the two patterns rests, is vague and difficult to apply. (See Verspoor (1997:123-127) for additional discussion of the difficulties with this notion.) For example, given the distinct syntax of the pair of sentences in (21), Wechsler's account suggests that becoming hoarse is less of a canonical result of yelling than becoming open is of rolling, but it is not clear why this should be so.

(21) a. The fans yelled themselves hoarse.
b. The door rolled open.

In section 2.2, we present an alternative semantic relation between the verb and the result XP which forms the basis of our analysis.

Wechsler's account also suffers from inadequate empirical coverage with respect to resultative constructions based on intransitive verbs. The notion of canonical result does not help in explaining the ungrammaticality of some of the examples in (12) and repeated here—a set of examples which involve unaccusative verbs in the nonsubcategorized NP resultative pattern.

(22) a. ∗The bomb exploded the watermelons into the air.
b. ∗The ice melted the floor clean.
c. ∗The water evaporated the pot dry.
d. ∗The ball bounced the markings off the floor.
e. ∗The wagon rolled the rubber off its wheels.

Wechsler has no explanation for the contrasting behavior of verbs like *roll* and *bounce*, which cannot appear in the nonsubcategorized NP pattern, as shown in (22d) and (22e), and verbs like *run* and *swim*, which do. According to Wechsler, *roll* and *bounce*

should be able to optionally select for canonical results, in the same way that verbs like *run* and *swim* do, and thus should be found in this pattern. (The other examples in (22) do not pose a problem for Wechsler since they involve verbs which involve a lexically-specified result state, and as just discussed these can only be found in the bare XP pattern.)

Wechsler's account also predicts that a given result XP will appear in only one kind of resultative pattern with any particular verb, as that result XP either represents a canonical result of the action denoted by the verb or it does not. However, we have found verbs which can appear with result XPs with identical heads in both resultative patterns. Illustrative minimal pairs are given in (23)-(25); in each, the (a) sentence is an instance of the bare XP pattern and the (b) sentence is an instance of the reflexive pattern.[12]

(23) a. A 16-year-old girl said that while she was walking to work about 11 a.m. Friday, a man grabbed and groped her and tried to get under her clothing, but she kicked free and fled. (Staff, "Crime Reports", *The Courier-Journal*, April 21, 1998, p. 05B)

b. McFarlane writes: "Laughing uproariously, Beckett lunged around the office with one leg of his pants on fire, trying to kick himself free ..." (G. Weingarten, "The Hardy Boys: The Final Chapter ... In Which We Plumb the Mystery Behind the Wildly Successful Kids' Novels. And Bring a Ghost to Life", *The Washington Post*, August 9, 1998, p. F01)

(24) a. One woman gets up to leave, but Red-Eyes grabs her roughly by the arm and pulls her into his lap. She wriggles free, but remains seated obediently beside him. (F. O'Reilly, "Killing Time in the Shadow of War", *The Ottawa Citizen*, November 30, 1997, p. D10)

b. "As he was entering the lift he was struck on the shoulder by the door and became stuck," Ms Romeril said. "Mr Duggan became alarmed about being caught in the door of a lift which was about to begin its descent and wriggled himself free." ("Historian Settles Action on Lift Incident", *The Irish Times*, December 2, 1994, p. 4)

(25) a. On the way to the speedway, one of his race cars wiggled loose inside the transporter and caused damage to both of his cars. (S. Rose, "Robby Gordon Finds Problems Again at Track", *The Kansas City Star*, August 1, 1997, p. D11)

b. "I had it [=the snake] pinned and when I lifted it up into the bag, it wiggled itself loose and just sank its fangs on my knuckle" ... (M.E. Fernandez, "No Bark, But Big, Big Bite; Va. Man Wounded By Copperhead", *The Washington Post*, July 11, 1998, p. C03)

One might ask whether the (b) sentences are true instances of the reflexive pattern since the verbs in these examples have transitive as well as intransitive uses, so that

[12]Such examples also pose a problem for L&RH's (1995) lexical account of variable behavior verbs since this account uses semantic differences in the result XPs found in the two resultative patterns to justify a dual semantic—and, hence, syntactic—classification of variable behavior verbs.

these sentences might simply involve instances of a reflexive pronoun. However, it is clear from the context that *kick* in (23b) does not have a reflexive object. As for the other two (b) sentences, the verbs *wiggle* and *wriggle* do not appear with an isolated reflexive object (**I wiggled/wriggled myself*); rather, they generally take body part objects as transitives (*He wiggled his ears/his loose tooth*). Given this observation, it seems unlikely that the objects in (24b) and (25b) are simply ordinary reflexive pronouns. Furthermore, these sentences receive interpretations that seem to parallel those of other instances of the reflexive resultative pattern. For instance, in (24b) Mr. Duggan wriggles, resulting in his freedom, parallel to *He yelled himself hoarse*, where the subject does the yelling, resulting in his hoarseness; the interpretation is not, for instance, a causative one where Mr. Duggan does some unspecified activity that causes him to wriggle free.

Finally, Wechsler never makes fully explicit the relation between the syntactic form of the resultatives and their semantic type: that is, why is it that nonselected result XPs are necessarily predicated of direct objects, necessitating the appearance of the fake reflexive with unergative verbs? The syntactic account, as Wechsler himself points out, was motivated largely to provide an account for the appearance of the fake reflexive. A semantic account which is meant to replace the syntactic account rather than merely to supplement it must have an explanation for the appearance of the fake reflexive, otherwise it does not entirely supersede the syntactic account.

As we show in the next section, section 2.2, a close examination of the resultative data reveals that the relation between the event denoted by the verb and the added event of achieving the result state is indeed different in those instances where the result XP is added directly to the verb from those instances where a mediating reflexive pronoun is required. We argue that the difference does not involve the notion "canonical result", but rather involves the nature of the temporal relationship between the two subevents. In section 2.3 we show that although the result XP is a delimiter in both resultative patterns, its role in each pattern is slightly different. In section 3, we elucidate the event structure associated with the two resultative patterns, and then in section 4 we examine the consequences of this improved semantic characterization for the different syntax of the two types of resultative construction.

2.2 Explicating the Relation Between the Conflated Events

As mentioned in the introduction, resultative constructions typically involve the conflation of two events: the process denoted by the verb (the causing subevent) and the achievement of the result state denoted by the result XP (the result subevent). The basic insight behind our account of the difference between the two resultative patterns based on intransitive verbs is that the temporal relation between the conflated events is different in the two patterns. Specifically, in the bare XP pattern—that is, when the result XP can be added to the verb without the mediation of a reflexive pronoun—the temporal progress of the event denoted by the verb is dependent on the temporal progress of the achievement of the result state. In contrast, in the reflexive pattern—that is, when a reflexive pronoun is required—the temporal progress of the event denoted by the verb is independent of the temporal progress of the event of achieving the result state. Furthermore, the temporal relation between the two subevents in the reflexive pattern is the same as that which holds between the two

subevents in the nonsubcategorized NP pattern. We begin by clarifying the nature of the distinct temporal relations we have described.

An examination of instances of the bare XP pattern, such as those in (26), reveals that the action denoted by the verb necessarily extends at least until the result state is achieved.

(26) a. Tracy danced out of the room.
b. The branding iron burned into the calf's skin.
c. The gate swung shut.
d. The door rolled open.
e. The kettle boiled dry.
f. The toast burned black.
g. The pond froze solid.
h. The truck rumbled into the driveway.

For instance, in (26a) the dancing cannot have stopped before the state of being out of the room is achieved; in (26b) the burning cannot have stopped before the branding iron is in the calf's skin; in (26c) the swinging cannot have stopped before the state of the gate being shut is achieved; and so on for the other examples in (26).

The temporal dependence between subevents characteristic of the bare XP resultative pattern contrasts with the reflexive resultative pattern, illustrated in (27).

(27) a. Robin danced herself stiff.
b. "Miss Bates, are you mad to let your niece sing herself hoarse in this manner, after she has been plagued by such a bad cold? ..." (J. Aiken, *Jane Fairfax*, St. Martin's, New York, 1990, p. 200)
c. ... out with the Maigret novels, to read myself into an inferiority complex ... (F. Fyfield, *A Question of Guilt*, Pocket Books, New York, 1989, p. 49)
d. ... a dashing young commercial traveler who had drunk himself and his business into the grave in a couple of years ... (A. Thirkell, *Growing Up*, 1943; Moyer Bell, Wakefield, RI, 1995, p. 40)

For example, a possible interpretation of (27a) is that Robin danced enthusiastically one evening and woke up stiff the following morning. It is appropriate to describe this situation with (27a), even though the dancing did not extend until the state of stiffness came about. The same holds for singing oneself hoarse, as in (27b), and for reading oneself into an inferiority complex, as in (27c). With respect to this last example, it is possible for the inferiority complex to develop a few days after the reader has finished reading Maigret's novels. Even in these circumstances, the reader can still say: *I have read myself into an inferiority complex.* Finally, in (27d) it is quite clear that the drinking need not have extended up until the death of the commercial traveler and the demise of his business.

The same temporal independence between the event denoted by the verb and the event of achieving the result state holds in the nonsubcategorized NP resultative pattern.

(28) a. Frank sneezed the tissue off the table.

b. Elena coughed the foam off the cappuccino.

c. Ralph MacDonald had descended from his throne to hint me away from Roz Fuentes's affairs. (S. Paretsky, *Burn Marks*, Delacorte, New York, 1990, p. 202)

In (28a), the event may be over when the tissue is off the table, whether or not the sneezer continues to sneeze. In fact, given the (near) punctual nature of a sneeze, if a single sneeze caused the tissue to move, then it is likely that the sneeze was over before the tissue even left the table. A lack of temporal overlap is even more clearly evident in (28c), since any decision on the part of the writer to stop investigating Roz Fuentes's affairs can only be taken after the event of hinting is complete.

Given the relation of temporal dependence characteristic of the bare XP pattern, the time course of a compositionally derived event described in an instance of the bare XP pattern should mirror the time course of the event denoted by the verb itself. Examples, such as (29), which involve verbs from the same semantic class that differ in aspectual classification, show that this prediction is borne out.

(29) a. The trapdoor banged/thudded shut.

b. The gate creaked/rumbled shut.

The verbs of sound emission *bang* and *thud* denote punctual events, while the verbs of sound emission *creak* and *rumble* denote durative events. When the first two verbs are used in the bare XP pattern, as in (29a), the shutting is interpreted as close to punctual; in contrast, when the other two verbs are used in the same pattern, as in (29b), the shutting is interpreted as taking time. Thus, such examples once again demonstrate the temporal dependence between the two subevents in the bare XP pattern.

Manner adverbs can also be used to bring out the temporal interconnectedness of the conflated events in instances of the bare XP pattern. As an instance of this pattern, (30) involves an event of running and an event of moving across the field.

(30) Tracy slowly ran to the other side of the field.

In this sentence, the manner adverb *slowly* modifies both of these events: the running and the progress towards the other side of the field. That is, (30) entails both of the sentences in (31).

(31) a. Tracy ran slowly.

b. Tracy went to the other side of the field slowly.

(30) cannot receive an interpretation where the progress towards the other side of the field was slow, but the running was quick. Further support for the observations regarding the temporal relationship between the two subevents in the bare XP resultative pattern comes from (32), which gives the impression of being a contradiction.

(32) Lewis ran quickly to the theater, but it took him a long time to get there since he took a circuitous route.

If the two subevents described—the running and the getting to the theater—were not necessarily temporally dependent, then this sentence should not be contradictory. That is, it should be possible for the adverbial *quickly* to modify only one of the subevents, say the running, allowing for a second temporal phrase to independently specify information about the amount of time it takes to reach the destination (*a long time*), as the example does. However, the observation that this sentence is contradictory shows that the adverbial applies to both the running and the going to the theater—they are understood to be both simultaneous and quick—and this is incompatible with the temporal extent phrase, *a long time*, which refers to the getting there and states that it nevertheless extended over a long period of time. This observation is reinforced, when (32) is contrasted with (33), which is not understood to be a contradiction.

(33) Lewis ran quickly, but it took him a long time to get to the theater since he took a circuitous route.

There is no event conflation in (33), so that the manner adverbial modifies the running event without modifying the event of reaching a goal, which can then be independently modified.

The interpretation of manner adverbials in the bare XP pattern contrasts with their interpretation in the NP-XP pattern in a way that supports the claimed difference in the temporal relation between the subevents in the two patterns. Compare (30) to a similar example of the nonsubcategorized NP pattern in (34).

(34) The runners slowly and steadily ran the pavement thin.

Sentence (34), like (30), involves the conflation of two events: specifically, an event of running and an event of the pavement being worn thin. In (34), the adverbial *slowly and steadily* can only modify the wearing down of the pavement and not the running. That is, (34) entails (35b), but it does not entail (35a).[13] The running may in fact have been fast for running, even if the wearing down of the pavement is slow.

[13]A question which we leave unanswered is why, in this instance of the NP-XP pattern the adverbial can only be understood as modifying one of the conflated events and not the other, while in some other instances, adverbials have the option of modifying either of the conflated events, though not simultaneously.

(35) a. The runners ran slowly and steadily.

b. The pavement slowly and steadily became thin.

The interpretation of (34) contrasts with that of (30), where the adverbial does modify the running event. The same temporal independence between the two subevents is illustrated in (36), an instance of the reflexive pattern. Here there is an event of reading and an event of developing an inferiority complex.

(36) Peter quickly read himself into an inferiority complex.

(36) entails (37a), but not (37b), and, consistent with this, the addition of a clause explicitly asserting that the reading was slow does not lead to a contradiction in (38).

(37) a. Peter quickly developed an inferiority complex.

b. Peter read quickly.

(38) Peter quickly read himself into an inferiority complex with a few slow, deliberate readings of his classmates' theses.

(38) explicitly states that the reading was slow, but that the inferiority complex developed quickly, and in so doing shows the temporal independence of the two subevents.

We return now to the bare XP and reflexive resultative minimal pairs with the same verb and with result XPs with the same head, which were cited in section 2.1 as being problematic for Wechsler's semantic account (1997). Such minimal pairs do not pose a problem for a semantic approach that distinguishes between the bare XP and reflexive patterns in terms of the temporal relation between the subevents in the events described. This account simply requires that certain temporal relations hold between the subevent associated with the verb and the subevent associated with the result XP. In most instances, the nature of these relations means that a particular result XP will be found in one resultative pattern but not in the other; however, if a particular result XP introduces an event that could be either temporally dependent or independent of the event described by the verb, then it should be found in both patterns. We propose that the result XPs headed by *free* and *loose* in the minimal pairs (23)-(25) are such XPs. There is a difference in interpretation between the two members of each of these three pairs that is consistent with the hypothesized difference in the relation between subevents in the two resultative patterns. Consider one of these pairs, which is repeated here.

(39) a. One woman gets up to leave, but Red-Eyes grabs her roughly by the arm and pulls her into his lap. She wriggles free, but remains seated obediently beside him. (F. O'Reilly, "Killing Time in the Shadow of War", *The Ottawa Citizen*, November 30, 1997, p. D10)

b. "As he was entering the lift he was struck on the shoulder by the door and became stuck," Ms Romeril said. "Mr Duggan became alarmed about being caught in the door of a lift which was about to begin its descent and wriggled himself free." ("Historian Settles Action on Lift Incident", *The Irish Times*, December 2, 1994, p. 4)

The bare XP example, (39a), shows the temporal dependence between subevents that we predict. The wriggling and the becoming free unfold together; the wriggling is the becoming free. Although in (39b) the wriggling and becoming free could be temporally coextensive, this sentence also has a natural interpretation where this need not be the case: the stuck man could have been wriggling for some time before he becomes freed from the doors. That is, the subevents are temporally independent. These minimal pairs, then, effectively highlight the use of the bare XP and reflexive patterns to portray temporally-dependent and temporally-independent subevents, respectively.

Despite the evidence just cited in support of the proposal that the bare XP pattern involves temporally-dependent subevents, bare XP resultatives such as those in (26c) and (26d), repeated in (40), might appear to lend themselves to an analysis where the conflated events are consecutive rather than contemporaneous.

(40) a. The gate swung shut.

b. The door rolled open.

That is, these examples might appear to be open to an analysis in which the gate swings and as a result becomes shut or the door rolls and as a result becomes open. If such an analysis were plausible, then these bare XP resultatives would be problematic, showing temporal properties which we claim to be characteristic of the NP-XP pattern. However, a close scrutiny of such examples shows that the sequential analysis is not viable. Imagine a window which can open in two ways, as some windows in Germany do: either it swings open from the side on a vertical hinge or it can open from the top with the pane lowering outward because of a horizontal hinge at the bottom. If such a window swung repeatedly back and forth on its vertical hinge and as a result, the window fell open through the pane lowering outward, there are two swingings: a vertical one and a horizontal one. But crucially, the sentence *The window swung open* cannot refer to the entire scenario just described. It can refer to the window falling open from the top with a single horizontal swing outward, or it can refer to the window opening outward from the side due to a swing on the vertical axis. That is, the result XP *open* must necessarily describe a swing which began simultaneously with the opening and is delimited by that opening.

The bare XP pattern, then, requires temporal dependence between two subevents. Temporal dependence between two subevents requires temporal coextensiveness, but it is not the same as temporal coextensiveness. In the remainder of this section, we first show that temporal coextensiveness alone is not sufficient for characterizing the relationship between the conflated events in the bare XP pattern. Then, we characterize more precisely the temporal relationship between the two subevents in the NP-XP pattern.

For resultative constructions, the crucial distinction is whether or not two subevents are inherently temporally dependent, not whether or not they are actually temporally coextensive.[14] There are instances of the two NP-XP patterns that demonstrate that temporal coextensiveness is not the issue since they allow interpretations

[14]More work remains to be done to figure out precisely what factors determine temporal dependence between events. We plan to return to this problem in further work.

where the two subevents can, in fact, be coextensive. Consider one interpretation of *Peter read himself into an inferiority complex*. Peter can read a book, with the concomitant development of an inferiority complex, which reaches fruition at the conclusion of the reading of that book. Even in these circumstances, the reflexive resultative pattern must be used, and the bare XP resultative pattern would be inappropriate (**Peter read into an inferiority complex*). Or consider (27a), *Robin danced herself stiff*, again. It is possible for Robin's limbs to slowly become stiff while dancing, with the stiffness being realized precisely when the dancing finishes. Even in this scenario it would be inappropriate to say **Robin danced stiff*. Thus, it is not sufficient for two subevents to be temporally coextensive, they must also necessarily unfold at the same rate. When dancing is the means of getting somewhere, as in (26a), *Tracy danced out of the room*, then the dancing and the progress toward the goal cannot be separated: as the dancer dances, progress towards the goal is achieved. Similarly, in (26h), *The truck rumbled into the driveway*, the rumbling and the motion into the driveway necessarily unfold simultaneously. The same observation holds of all the other examples in (26).[15] The two subevents must unfold together due to the inherent dependence between them that arises because of the nature of the two subevents; the temporal coextensiveness cannot be due to some accident. We will make the notion of temporal dependence between conflated events more precise in section 3.2.3.

We now try to better understand the precise temporal relation which can hold between the conflated events denoted in the NP-XP patterns. There are many ways that the two subevents of a compositionally derived event could be ordered with respect to each other, and given the temporal independence between the constituent subevents that is characteristic of the NP-XP patterns, we might expect to find that the two subevents could be temporally related in more than one way. As we elaborate below, this is, in fact, what we find. Despite this variety, we show that there are some constraints on the temporal relation between the conflated events.[16]

[15]A problematic example is represented in *The victim bled to death*. Imagine for example, that someone bled profusely until a paramedic stopped the bleeding, but that the person consequently died of loss of blood. It is still entirely appropriate to say that this person bled to death, contrary to what we predict, since the bleeding does not necessarily extend up to the time of death. However, it turns out that any VP with *to death* has properties that are not characteristic of typical resultatives. For example, in all the resultatives in this paper the intonation pattern is one which places main stress on the result XP. This is not true, however, for any example with *to death*. In *The victim bled to death*, the primary stress is on the verb, as it is with any other example with a verb followed by the PP *to death*. As Manfred Krifka has pointed out to us, the intonation exhibited by the *to death* examples is characteristic of sentences with intensifying modifiers, like *a lot*. And, indeed, often the phrase *to death*, while looking like a result XP, is in fact just an intensifier, as evidenced by the atelicity of examples such as *I sweated to death for five hours in the pressing room; The lecturer bored me to death for two hours*. The odd thing about examples such as *The victim bled to death* is that here the PP seems to have a true result interpretation, while it has the intonation pattern of an intensifier. We have no explanation for this fact, or for the fact that the intonation pattern of the resultative is not really available at all. (*The victim bled to DEATH* seems quite infelicitous, except if the stress is contrastive.) If the PP is not a true result XP, then perhaps the fact that the syntax is not what is predicted by our theory is not problematic.

[16]One of the most detailed discussions of the temporal relations that can hold between the constituent events of a complex event is found in Pustejovsky (1995:68-71). Pustejovsky defines three possible temporal relations which may hold between subevents. One relation, which he names "exhaustive overlap part of", holds of a complex event consisting of two temporally coextensive subevents. This relation, then, is part of the temporal dependence that characterizes the two subevents in the bare XP pattern, though, as discussed, temporal coextensiveness alone is not

Consider a compositionally derived event of the type described in the NP-XP pattern, consisting of a causing subevent and a result subevent. In each of the examples illustrating the NP-XP pattern, the result subevent does not begin before the causing subevent begins. Assuming, as we have, that the two subevents are causally related, this temporal relation is not unexpected: a result cannot precede a cause. Further examination of the temporal relationships that hold between the conflated events in the illustrative examples reveals that there are few constraints involving the relative temporal ordering of the endpoints of the two subevents. The result subevent could begin just when the causing subevent ends, so that the event as a whole consists of two nonoverlapping pieces. This possibility is illustrated in (28c), repeated as (41a), where the move away from Roz Fuentes's affairs can only have begun after the event of hinting is completed, and a second example is found in (41b), where the majority of bathers would have started to leave the water only after the whistling was over.

(41) a. Ralph MacDonald had descended from his throne to hint me away from Roz Fuentes's affairs. (S. Paretsky, *Burn Marks*, Delacorte, New York, 1990, p. 202)

b. Almost immediately, worried lifeguards, following standing orders, whistled hundreds of bathers out of the water. (P.S. Gutis, "Beach Waste Raises New Fears", *The New York Times*, July 17, 1988, Section 12, p. 1)

Alternatively, the two subevents could overlap, and they could do so in one of several ways. Most obviously, the two subevents could both conclude at the same time or the causing subevent could conclude before the result subevent. Example (27a), repeated in (42), is open to two interpretations that involve temporally overlapping subevents: the stiffness could start in the course of the dancing with the dancer becoming stiff either at the close of dancing or long after finishing dancing.

(42) Robin danced herself stiff.

It is also conceivable that the causing subevent continues, although the result subevent has concluded; however, in this instance one would say that the complex event as a whole has concluded. Example (42) also allows such an interpretation: the dancer might still continue dancing even after the stiffness has set in. What is important is that on each interpretation of this example, the achievement of stiffness—that is, the conclusion of the result subevent—bounds the event as a whole, while the endpoint of the causing event is not relevant to the bounding of the complex event.

Generalizing from this discussion, there are two constraints on the temporal relation between the two subevents in the NP-XP resultative pattern. First, the result subevent cannot begin before the causing subevent. Second, the result subevent must bound the event as a whole. That is, if a complex event has subevents related by

sufficient to fully characterize temporal dependence. The other two relations that Pustejovsky defines—"exhaustive ordered part of" and "exhaustive ordered overlap"—turn out to be special instances of the more general temporal constraints holding between the two subevents in the NP-XP pattern. Since the relation between the subevents can be more varied than either of Pustejovsky's possibilities allows, neither of them is adequate for our purposes, and we do not discuss them further.

the temporal relation characteristic of the NP-XP pattern, then any assertion about the endpoint of such a complex event also makes an assertion about when the result subevent ends, but does not make explicit the temporal extent of the causing subevent. The first constraint probably does not have to be stated independently since it should follow from the nature of causation itself. In section 3.1 we compare the NP-XP pattern to lexical causatives and suggest that the second constraint also is characteristic of causative events in general, and that this asymmetry in what is stated about the temporal extent of the two subevents is inherent in the semantics of causation as it is encoded in natural languages.

We would expect to find instances of the NP-XP resultative pattern as long as the two subevents making up the complex event described are temporally related in a way that is consistent with the just-stated constraints. In particular, these constraints allow for a complex event in which there is a temporal gap between the conclusion of the causing subevent and the inception of the result subevent. This possibility may seem problematic. In fact, Goldberg (1995:194) claims that the subevents of a resultative construction must be temporally contiguous; furthermore, a general assumption that gaps between the subevents of a complex event are not possible seems to be implicit in Pustejovsky's (1995) discussion of the temporal structure of complex events. Pustejovsky (1995:68-71) sets out three possible temporal relations which may hold between the constituent subevents of a complex event, and none of them allow for a temporal gap between the subevents (see note 16). He explicitly defines the temporal relations so that the two subevents exhaust the complex event; that is, any moment of time that is part of the complex event is part of the causing subevent, the result subevent, or—if the two subevents overlap—both. Although the assumption that the subevents are either contiguous or overlap may seem intuitively plausible, some of the cited examples of the NP-XP resultative pattern suggest that this assumption cannot be maintained. Examples such as those in (41) illustrate this point. For instance, in (41a) the writer will only take action once the implications of the hints sink in, and this might not happen the moment that the hints are uttered. Such examples suggest that gaps between the two subevents are possible, consistent with our constraint. We discuss this issue further in section 3.1.

To conclude this section, we briefly compare the generalization which is the basis for the syntactic account of resultatives described in section 1 to the generalization underlying the semantic account we have just presented. In this section we have argued that the bare XP and the NP-XP patterns with resultatives based on intransitive verbs can be differentiated from each other on the basis of the temporal relation between the two subevents in the event conflation represented by a resultative. This account does not appeal to the syntactic classification of the verb heading the resultative construction as unaccusative or unergative to explain the distribution of verbs across the resultative patterns as the syntactic account does. In fact, our account predicts that any conflation of two temporally-dependent events should be expressed via the bare XP pattern, even if the verb naming one of the subevents is one that is typically classified as unergative. Thus, the instances of the bare XP pattern discussed in section 1.2 headed by verbs of manner of motion and verbs of sound emission could be handled without positing that each of these verbs has a second classification as an unaccusative, as well as its primary classification as an unergative. Furthermore, on the syntactic account the "variable behavior" reflects a semantic reclassification of these verbs as verbs of directed motion. This semantic

reclassification is justified by the presence in the bare XP pattern of result XPs that describe locations rather than those that describe states as in the NP-XP pattern. The temporal account does not impose such a restriction, so that there may be instances of the bare XP pattern headed by unergative verbs, even when the result XP itself does not describe a location. All that matters is that the event represented by the verb and the event represented by the result XP are temporally dependent. In fact, we have found an example in our corpus of naturally-occurring resultatives which supports this prediction.

(43) The line clicked dead. (S. Andrews, *Only Flesh and Bones*, St. Martin's, New York, 1998, p. 235)

As a verb of sound emission, the verb *click* is an unergative verb (L&RH 1995), but the bare XP pattern has been associated with unaccusative verbs. Although L&RH (1995) argue that verbs of sound emission can also have an unaccusative classification in the bare XP pattern (see the introduction to section 2), they argue this possibility only arises in the presence of goal phrases. The result XP in (43) does not qualify as a goal phrase, so the unaccusative reclassification explanation will not work here. However, this example does involve two temporally-dependent events: the clicking and the going dead coincide at a point in time. Thus, this example suggests that the semantic account is superior to the syntactic account.[17]

2.3 The Semantic Contribution of the Result XP to Temporal Constituency

Having characterized the distinct temporal relations between the conflated events in the two resultative patterns, we now more closely examine the role of the result XP in the two patterns. We show that it plays a part in delimiting the event expressed by both pattern, but its precise role is different in each pattern. Certain events have a constituent which stands in a homomorphic relation to the temporal extent of the event (Dowty 1991; Jackendoff 1996; Krifka 1992, to appear; Ramchand 1997; Tenny 1987, 1994; Verkuyl 1993). Following Dowty (1991) we refer to this constituent as the INCREMENTAL THEME, broadening his application of the term somewhat. In Jackendoff's (1996) terminology, this constituent is connected by a STRUCTURE PRESERVING BINDING RELATION, or is SP-BOUND, to the temporal axis of the event. Certain verbs lexically specify the incremental theme; this constituent may be an argument of the verb, or it may be lexicalized in the meaning of the verb. For verbs of consumption and creation such as *eat* and *build*, the entity denoted by the direct object stands in this relation through its physical extent. Each part of the physical extent of this entity can be mapped onto a part of the temporal extent of the event, and the temporal progress of the event is measured by the progress through the physical extent of the created or consumed entity.[18] For verbs such as *freeze, open,*

[17]In note 12 we pointed out that the minimal pairs in (23)-(25) were problematic for L&RH's (1995) syntactic analysis of the resultative construction. As discussed earlier in this section, such examples are not a problem for our semantic account, but rather, such examples are expected to exist. Thus, in this area also the semantic account has better coverage than the syntactic account.

[18]As Jackendoff (1996) points out, for a verb like *eat*, there is an alternative analysis in which the entire entity denoted by the direct object gradually goes out of existence. Such an analysis makes

thicken, and *widen*, a scalar property lexicalized in the verb and predicated of an argument of the verb stands in this relation. That is, these verbs are associated with some scalar property, and the temporal progress of the event is measured by progress along what Ramchand (1997) calls the "property degree path". For example, an event of a door opening is measured according to the degree of openness of the door. For verbs of motion with directional PPs, such as *come* and *go*, a spatial path traversed by one of the arguments of the verb is the incremental theme. In an event of Kim's coming home, the temporal progress of the event is measured by Kim's progress along the path home.

The result XPs in all the examples we have discussed name endpoints on various types of paths, if we subsume the notion of property degree path under the general notion of path (cf. Jackendoff (1978, 1983) on semantic fields). We will show that the result XP in the bare XP pattern names the endpoint on a path which serves as the incremental theme of both the result subevent and the entire compositionally derived event, since the temporal extents of the conflated events in these instances are, by hypothesis, identical. In contrast, the result XP in the NP-XP pattern names the endpoint on a path which serves as the incremental theme of the result subevent only; in so doing, the result XP provides the endpoint of the compositionally derived event as a whole, but does not serve as an incremental theme of the event as a whole. We now consider each case in detail.

We start with intransitive verbs which allow the direct addition of a result XP, considering the various subcases in turn. Consider first verbs which lexically specify a scale which maps onto the temporal extent of the event, serving as the incremental theme; e.g., the verb of change of state *freeze*, where the scale is the degree of frozenness. The progress along the path representing the degree of frozenness is mapped onto the temporal progress of the event of freezing. In a resultative construction based on the verb *freeze* such as (44), the result XP provides an explicit expression of the endpoint for the implicit scale associated with the verb.

(44) The pond froze solid.

In such examples there is no event conflation, contrasting with the examples of the bare XP pattern that have been our focus so far where the result XP invokes an event in addition to the event specified by the verb. In (44) and similar examples, the verb defines a scale which serves as the incremental theme of the event, and the result XP provides an explicit expression of the endpoint of this verb-defined scale. There are other instances of the bare XP pattern in which the verb lexically specifies a scale, where the result XP, instead of specifying the endpoint of this scale, modifies the endpoint in some way, as in the examples in (45).

(45) a. The mirror shattered to pieces.
b. The bottle broke open.

In (45), shattering to pieces describes a particular kind of shattering and breaking open describes a particular kind of breaking. It is not possible to analyze the result

a verb like *eat* more similar to verbs such as *thicken* or *widen*, with direct objects denoting entities which undergo a scalar change.

XPs in (44) or (45) as adding another, distinct scale because of the well-established constraint that an event may have only one incremental theme and thus be delimited only once (Goldberg 1995; Tenny 1987, 1994). Such verbs can only be found with XPs which can be analyzed as further specifying the endpoint of the verb's associated lexically specified scale in some way. As (46) illustrates, it is not possible to add XPs which clearly introduce a new scale, as this would violate the constraint against a single incremental theme.

(46) $*$The bottle froze to pieces.

Example (46) cannot mean that the bottle froze and as a result ended up in pieces, although this scenario is not uncommon. The constraint against more than one incremental theme rules such sentences out. It is clear, therefore, that in examples (44) and (45) the XP does not introduce a second event; there is only a single event.

As mentioned in section 1.1, Kaufmann (1995a:416, 425) and Pustejovsky (1991b) take examples of the bare XP pattern where the result XP does not invoke an event in addition to that which is specified by the verb to be representative of the pattern; however, as also stated in section 1.1 we believe this proposal is incorrect, as there are many other instances of this pattern, such as those in (47), where the result XP invokes an additional event.

(47) a. Tracy danced out of the room.
b. The gate swung open.
c. The door rolled open.
d. They swam clear of the oncoming boat.
e. The truck rumbled into the driveway.
f. The branding iron burned into the calf's skin.

All the verbs in these examples lack a lexically-specified incremental theme, and thus they are unable to describe bounded events on their own. The result XP, by naming a result state or location, introduces an additional implicit event, the achievement of the result state or location the XP names. This event contains a scale or a path, and the points on this scale or path map onto the points on the temporal extent of the result subevent. For example, the points on the spatial path in (47a) map onto the points on the temporal extent of the result subevent of going out of the room. The temporal progress of this event is measured by the progress of the entity denoted by the subject along this path. In (47b), the verb *swing* itself lacks an incremental theme, but the AP *open* introduces a path which serves as the incremental theme for the compositionally derived event since the points on the temporal extent of the event of swinging map onto the points on the temporal extent of the event of the gate becoming open. In (47e), there is a verb of sound emission—which by its very nature does not lexically specify an incremental theme—and again the result XP invokes an additional event, involving motion along a path that serves as the incremental theme of the event. In all these examples, the nature of the relation between the event denoted by the verb and that denoted by the result XP is such that the temporal

progress of the event denoted by the verb is dependent on the temporal progress of the achievement of the result. Therefore, the result XP names the endpoint of a path which serves as the incremental theme of the event as a whole.

Two of the examples in (47) merit further comment. In (47f) the branding iron does not undergo a scalar change specified by the verb *burn*. In this example, the verb is used as a verb of heat emission and, hence, is atelic. The PP introduces the path which telicizes the VP. This examples differs from (48), another resultative with the verb *burn*, where the verb does specify a scalar change, that of becoming incrementally more burned—that is, being consumed by heat or fire.

(48) After dinner—minus the cookies, which Doreen forgot about until they had burned black—Michael reads to Kara ... (P. Orenstein, "Almost Equal", *The New York Times Magazine*, April 5, 1998, p. 48)

The difference between these two senses of *burn* is similar to the difference, discussed in L&RH (1995:101), between the two Hebrew verbs translating English *burn*: *saraf* 'consume by fire' and *ba'ar* 'emit heat or light'. At first glance, example (48) might seem problematic given the restriction against two incremental themes, since it appears that *burn* contains a lexically-specified incremental theme—that of becoming incrementally burned—and the result XP *black* specifies another—that of becoming incrementally black. We propose that actually this example is no different from (44), and that here also the result XP provides an explicit expression of the endpoint of the implicit scale associated with the verb in its change of state sense. That is, it is a fact about the world that certain kinds of burnt objects are black, and thus *black* can serve as the endpoint of burning, and progress along the path of becoming burned necessarily unfolds at the rate as the progress along the path of becoming black.

We turn now to the two forms of the NP-XP pattern in order to show that in this pattern the result XP plays a slightly different role in the semantic structure of the sentence. The intransitive verbs found in these patterns typically do not lexically specify an incremental theme; consider the illustrative examples, which have included verbs such as *dance, sneeze, cough, bark*, and *yell*. Rather, the result XP names an endpoint, and in so doing, it introduces an additional event of change—the result subevent—with a path or scale which serves as its incremental theme. That is, the result XP names the endpoint of an implicit path which is the incremental theme of the result subevent. The implicit path, however, is not the incremental theme of the entire compositionally derived event for the reasons given in section 2.2. For example, in (28a), repeated here as (49), the event of sneezing begins before the tissue ever moves and can come to an end before the tissue reaches a place off the table or even moves at all.

(49) Frank sneezed the tissue off the table.

Likewise, in (50), the verb *sing* also lacks a lexically-specified incremental theme.

(50) Sam sang himself hoarse.

The result XP names the endpoint on a path which is part of the introduced result event, and this path serves as the incremental theme of the result event. Since the process of becoming hoarse can begin after the singing begins and can come to fruition after the singing has stopped, this path cannot be the incremental theme of the entire event, but rather its endpoint serves only to delimit the compositionally derived event.

The difference in the semantic contribution of the result XP in the NP-XP and bare XP patterns strengthens the proposed analysis which takes the crucial semantic difference between the two resultative patterns to be in the temporal relation between the conflated events. In the bare XP pattern the two events are temporally dependent and the incremental theme introduced by the result XP serves as the incremental theme of the event as a whole. In the NP-XP pattern the two events are temporally independent; the time course of the causing subevent plays no part in bounding the event as a whole, rather the incremental theme introduced by the result XP provides the endpoint of the event, even though it is not the incremental theme of the event as a whole.

3 Causative and Noncausative Resultatives

Having clarified the semantic relation between the conflated events in the different resultative patterns, we now investigate what kind of event structure representations should be associated with each resultative pattern. Many researchers assign resultatives the same event structure as lexical causatives—verbs such as *kill* or transitive *break* which lexicalize two causally-related events (Dowty 1979; Carrier and Randall 1993; Parsons 1990; Pustejovsky 1991b; among others). In a tradition dating back at least to work in generative semantics (e.g., McCawley 1971), lexical causatives are usually analyzed as complex events comprised of two subevents—a causing event and a result event (Dowty 1979; L&RH 1995; Parsons 1990; Pustejovsky 1991b, 1995; among others)—as schematized in (51).

(51) '*causing event* CAUSE *result event*'

Most analyses of resultatives also assign them a causative event structure composed of two subevents, as in (51). However, in contrast to lexical causatives, where the verb itself lexicalizes both subevents, most resultatives are event conflations with the causing subevent lexicalized by the verb and the result subevent lexicalized by the result XP.

In this section we demonstrate that the temporal relation between the conflated events in the NP-XP resultative pattern is identical to that which holds between the causing and result subevents of a lexical causative. This parallel, then, strengthens the assumption that the NP-XP resultative pattern should be associated with a causative event structure. We argue, however, that the different temporal relation between the conflated events in the bare XP pattern argues against the assignment of a causative event structure to this pattern. In section 3.2 we review other evidence which bolsters the assumption that the bare XP pattern is not associated with a causative event structure. We then demonstrate in section 3.3 that the same two patterns of temporal

constituency found with resultatives based on intransitive verbs can also be found with resultatives based on transitive verbs.

3.1 A Causative Event Structure for the NP-XP Pattern Based on Intransitive Verbs

In this section we argue that the temporal relation holding between the conflated events found in the two forms of the NP-XP pattern based on intransitive verbs parallels that between the two subevents in lexical causatives. That is, it is a property of lexical causative verbs that the temporal progress of the causing and result subevents are independent of each other, that the result subevent cannot begin before the causing subevent, and that the causative event as a whole is bounded by the result subevent, independent of the temporal extent of the causing subevent, which is never made explicit by syntactic or morphological means. We further suggest that these properties, which we elaborate below, hold of all causatives as encoded in natural languages.

The temporal independence between the two subevents in sentences with lexical causative verbs can be illustrated with the sentences in (52).

(52) a. The widow murdered the old man by putting arsenic in his coffee.

b. Casey's persistent banging broke the window.

c. Terry shocked Sandy by deciding to run for office.

In (52a), the act of putting arsenic in the coffee certainly does not extend to the point of death, and the dying does not start when the arsenic is put in the coffee. (See Davidson (1980:177) for a more extended discussion of a comparable example.) In (52b), although the banging is protracted, the breaking may nevertheless be punctual. In (52c), the act of deciding to run for office may have completely preceded the event of Sandy becoming shocked, especially if Sandy found out about the decision long after it was taken.

Furthermore, an utterance involving the past tense use of a causative verb is judged true when the result subevent culminates, independent of the temporal extent of the causing subevent.

(53) Moshe's piano playing woke my cat up.

For (53) to be true, it must be the case that the cat's waking up is completed prior to the time of utterance, but the piano playing could have continued or it could also have been completed.

Studies of causatives frequently distinguish between direct and indirect causation (Comrie 1985; Nedjalkov and Silnitskij 1973; Shibatani 1976; among others), and these studies have also firmly established that lexical causatives such as those in (52) represent direct causation (Comrie 1985; Fodor 1970; McCawley 1978; Pinker 1984, 1989; Shibatani 1976; Smith 1970; among others). The nonlexically-entailed

causatives represented by the resultative construction can also only describe direct causation, as argued by Goldberg (1995). For example, (54) cannot be used to describe a situation in which the barking of the dog caused the neighbor's baby to cry which in turn woke the neighbor up. The barking must be the direct cause of the neighbor's waking.

(54) The dog barked the neighbor awake.

It has been claimed in discussions of lexical causatives (Fodor 1970; Smith 1970) that direct causation requires temporal contiguity of the causing subevent and the result subevent, and, as mentioned in section 2.2, Goldberg (1995:194) makes a similar claim with respect to the resultative construction. Although temporal contiguity holds in most instances, lexical causatives such as (52a) and (52c) and resultatives such as (28) and (41) show that temporal contiguity is not always found. We suggest that the primitive requirement for direct causation is that there be no intervening event in the causal chain between the causing subevent and the result subevent.[19] For verbs such as *break, shatter, smash,* and *crack*, which describe physical changes brought about by the manipulation of physical objects, the requirement that there be no intervening event in the causal chain is tantamount to the requirement of temporal contiguity. But for verbs of psychological change, a distant event can be the direct cause of a change of state, without there being an intervening causing event, because in the world as we know it, a change of psychological state can be directly brought about without direct contact between the cause and the entity undergoing the psychological change. It is for this reason, that in section 2.2 we did not formulate a requirement that the two subevents be either contiguous or overlapping, and we allowed for a temporal gap between them. Here we add that a temporal gap is allowed in the NP-XP resultative pattern only insofar as it is consistent with a relation of direct causation between the subevents.

As stated above, lexical causatives are usually analyzed as we have analyzed resultatives: as complex events comprised of a causing subevent and a result subevent, as in (51). Lexical causatives are sometimes equated with the aspectual class of accomplishment verbs, and the members of this class are then given the bievent analysis 'activity cause achievement' (Dowty 1979; Foley and Van Valin 1984; Van Valin 1990). This analysis may be appropriate for the prototypical lexical causative verb (Croft 1990, 1991), but it is certainly not the correct analysis of all lexical causatives (Dowty 1979; McCawley 1976; Van Valin and LaPolla 1997). For instance, even the verb *break*, which is often cited when exemplifying lexical causatives, does not lexically specify that the causing subevent in the event it denotes be an activity: a punctual event such as a ball hitting a window can be the causing event in a breaking event. Causative verbs that describe a change of psychological state such as *amuse* and *shock* may have a state as the causing subevent, as in *The manager's indifference shocked us.* Nor does the result subevent in a lexical causative have to be an achievement,

[19]Goldberg (1995:168-169) notes an exception to this constraint, citing Shibatani (1973), "activities which are conventionally accomplished in a particular way may be expressed as simple causatives, even when the causation is indirect insofar as there is in actuality an intermediate cause". This statement describes examples such as *The invalid owner ran his favorite horse (in the race); Chris cut her hair at the salon on University Avenue* (Goldberg 1995:169, (84)-(85)). Goldberg concludes that "Conventionalized scenarios can be cognitively packaged as a single event even if an intervening cause exists" (1995:169).

as in *The child flew a kite*; in fact, this lexical causative is not an accomplishment, but an activity. Van Valin and LaPolla (1997) cite examples of lexical causatives belonging to all aspectual classes, as does McCawley 1976). [20] Therefore, given the variability in the makeup and aspectual classification of lexical causatives, we do not equate the notion "causative" with the notion "accomplishment". We assume that the event structure for a lexical causative is as given in (51), where the two arguments of the predicate CAUSE are specified simply to be events. Thus, for us causatives are nothing more than complex events—events with two subevents with the particular temporal relation we have just specified between them.

The similarities in the relations between the subevents of NP-XP resultatives and lexical causatives supports the widespread analysis of such resultatives as causatives. Thus, we will assign the NP-XP resultatives the same complex event structure as lexical causatives. The complex event analysis of the NP-XP pattern will play an important part in accounting for the syntax of such resultatives, and particularly, in explaining the presence of the "fake" reflexive in the reflexive resultative pattern. We turn to the connection between the event structure and the syntax of the NP-XP pattern in section 4. First, we turn back to the event structure of the bare XP pattern.

3.2 Against a Causative Analysis of the Bare XP Pattern Based on Intransitive Verbs

Although there seems to be little disagreement about assigning a causative analysis to the NP-XP resultative pattern, there is less agreement as to the best analysis of the bare XP pattern. Until recently, there has been little systematic discussion of whether or not instances of the bare XP pattern should receive a causative analysis, but recently Verspoor (1997, 1998) and Van Valin and LaPolla (1997) have explicitly argued against the assignment of a causative event structure to instances of the bare XP pattern. In this section, we review several types of evidence, some of it from this previous work, that argue against a causative analysis.

Instances of the bare XP resultative pattern with manner of motion verbs such as *Tracy ran to the station* as well as most other instances of the bare XP pattern have consistently been given analyses as complex events with two subevents (Croft 1991; Dowty 1979; Foley and Van Valin 1984; Jackendoff 1990; Pustejovsky 1991b; Van Valin 1990), but there is not general agreement about the nature of the relation between the conflated events in this pattern. Some researchers have suggested that these subevents are causally related, just as they are in the NP-XP pattern (Carrier and Randall 1989; Croft 1991; Foley and Van Valin 1984; Pustejovsky 1991b; Van Valin 1990). For example, Croft provides the causative paraphrase 'the activity of sailing *causes* the motion to come about' for the sentence first given in (3a) and repeated in (55).

[20] Nor can accomplishments be considered a subclass of lexical causatives: there are events that are often considered accomplishments, but which are not appropriately described as lexical causatives, such as *Tracy ran to the station*, an example we come back to in section 3.2. In fact, accomplishments are usually identified by a range of aspectual tests and the term is usually not given a precise definition. It is unclear that the term is used consistently by researchers. In this paper, then, the term CAUSATIVE covers precisely the cases which involve two subevents in the temporal relation made explicit in section 2.2, while we avoid the term ACCOMPLISHMENT altogether.

(55) The boat sailed into the cave. (Croft 1991:160, (21))

A causative analysis of instances of the bare XP pattern headed by verbs of manner of motion appears natural since such examples are often analyzed as accomplishments, and, as mentioned in section 3.1, it is often assumed that all accomplishments are causatives (e.g., Dowty 1979:91).[21] This appears to be the motivation behind Van Valin's (1990) adoption of a causative analysis for bare XP resultatives of this type, as in (56).

(56) Susan ran to the house.
[**run′**(Susan)] CAUSE [BECOME **be-at′**(house, Susan)]
(Van Valin 1990:224, (3d))

However, as also discussed in section 3.1 and note 20, on closer examination the notions "causative" and "accomplishment" cannot be equated. Furthermore, the parallels between lexical causatives and the NP-XP pattern used to justify assigning them the same event structure involved the similarities in the temporal relations between the causally-related subevents in both instances. Although the conflated events in the bare XP resultatives could, informally speaking, be said to be causally related, as Croft's paraphrase of (55) suggests, that alone may not be sufficient to justify assigning this pattern the same event structure as a lexical causative. As argued extensively in section 4.2, the temporal relation between the conflated events in the bare XP pattern is significantly tighter than in the NP-XP pattern, and we suggest that this difference is reflected in the event structure. In this section, we present linguistic evidence that the event structure representation of the bare XP pattern should not be the the same as that assigned to lexical causatives. Interestingly, Van Valin and LaPolla (1997) also argue that Van Valin's causative analysis (1990) of bare XP resultatives with manner of motion verbs should be replaced by an alternative, noncausative analysis; we also review their arguments, as well as further arguments against the causative analysis of such resultatives presented by Verspoor (1997, 1998).

Proponents and opponents of the causative analysis have used causative paraphrases of the bare XP pattern to support their position. Thus, as noted above, Croft (1991), who supports a causative analysis, justifies it by suggesting that (55) can have a causative paraphrase. In contrast, Van Valin and LaPolla (1997:101) argue that 'Carl's running caused him to arrive at the store', is not an appropriate paraphrase of *Carl ran to the store*.[22] Due to the disagreement on this issue, we

[21] An early discussion of this issue is presented by Dowty (1979:207-213), who considers the possibility that the events in *John walked to Chicago* (207, (26b)) are causally related. He rejects this analysis, since he suggests that the causal relation between the events in this example may be due to conversational implicature rather than to entailment. He bases this suggestion on the intuition that this sentence may be true if John walked up and down the aisle of a plane all the way to Chicago. He suggests that if this intuition is NOT correct, then the causal relation should be built into the representation of such examples. We feel rather strongly that in such examples any perceived causal relation between events is entailed and not the result of conversational implicature (e.g., we believe that it CANNOT be negated as Dowty suggests it can be). But although we believe that the causal relation is entailed and not the result of conversational implicature, we will still argue that such examples are NOT given a causative representation.

[22] Van Valin and LaPolla (1997) judge this paraphrase to be inappropriate based on a specific assumption that they make, but do not justify. They propose that the paraphrase of a sentence

present a systematic comparison of causative paraphrases for a range of resultative types to provide a fuller context for assessing the implications of the paraphrase data. Two potential causative paraphrases are given for each example considered; in each instance, the second paraphrase given—the one with an event as subject—is comparable to the paraphrases considered by Van Valin and LaPolla (1997) and by Verspoor (1997, 1998). We begin with instances of the NP-XP resultative, as in (57). Both paraphrases appear to be appropriate in these instances.

(57) a. Pat jogged himself stiff.
= 'Pat caused himself to become stiff by jogging.'
= 'Pat's jogging caused him to become stiff.'

b. The joggers ran the pavement thin.
= 'The joggers caused the pavement to become thin by running on it.'
= 'The joggers' running on the pavement caused it to become thin.'

As expected, a causative paraphrase, which by its very nature distinguishes two subevents, is clearly inappropriate for those instances of the bare XP pattern which were argued to involve a single subevent in section 2.3, as shown in (58).[23]

(58) a. The bottle broke open.
≠ 'The bottle caused itself to open by breaking.'
≠ 'The bottle's breaking caused it to open.'

b. The pond froze solid.
≠ 'The pond caused itself to become solid by freezing.'
≠ 'The pond's freezing caused it to become solid.'

With this background, we reconsider the appropriateness of causative paraphrases for instances of the bare XP pattern with nonlexically-entailed result XPs, focusing on those based on manner of motion verbs, as in (59).

(59) a. Tracy ran to the station.
≠ 'Tracy caused herself to get to the station by running.'
≠ 'Tracy's running caused her to get to the station.'

b. The invalid limped over to the armchair.
≠ 'The invalid caused himself to get over to the armchair by limping.'
≠ 'The invalid's limping caused him to get over to the armchair.'

Our impression is that such paraphrases do not capture the sense of the sentences in (59) as well as they capture the sense of the sentences in (57), where verbs of

should not have more NPs than the sentence itself (1997:101). In this instance, the paraphrase has three NPs, while the sentence paraphrased only has two. Instead, our focus in evaluating a sentence's paraphrase is on how well the paraphrase captures the original sentence's sense, an issue that Van Valin and LaPolla do not comment on explicitly.

[23]These paraphrases differ according to whether or not *cause* takes an event as subject. The unavailability of paraphrase comparable to the first paraphrase in each set, where *cause* takes a nonevent as subject, might be attributed to a preference for animate, potentially volitional, subjects for *cause*; however, such a preference is actually more subtle, as *cause* can take subjects that are inanimates capable of triggering an event, such as forces of nature.

manner of motion are used in the two types of NP-XP pattern. While in (57), the situations described by the paraphrases correspond quite well to those described in the examples themselves, the paraphrases in (59) are more likely to be taken to describe situations where the relation between the causing and result subevents is less direct than that described in the sentences being paraphrased. There seems to be a gradient in how well the paraphrases are perceived to capture the sense of the various types of resultatives presented so far, with verbs of manner of motion plus directional phrases falling in the middle. An examination of an even broader range of bare XP resultatives shows that the situation is even more complicated. Comparable paraphrases seem to capture the sense of bare XP resultatives with manner of motion verbs even less well when the motion is predicated of an inanimate entity, as in the examples in (60).

(60) a. The boulder rolled into the stream at the bottom of the slope.
≠ 'The boulder caused itself to end up in the stream by rolling.'
≠ 'The boulder's rolling caused it to end up in the stream.'

b. The ball bounced across the room.
≠ 'The ball caused itself to end up across the room by bouncing.'
≠ 'The ball's bouncing caused it to end up across the room.'

c. The bottle floated to the bridge.
≠ 'The bottle caused itself to end up at the bridge by floating.'
≠ 'The bottle's floating caused it to end up at the bridge.'
(Verspoor 1997:115; 1998:154)

Such causative paraphrases also appear to be less appropriate when the verb in the bare XP pattern describes a manner of motion that is less likely to involve significant displacement than that associated with the verbs *run* and *limp*.

(61) The cat jumped onto the counter.
≠ 'The cat caused itself to end up on the counter by jumping.'
≠ 'The cat's jumping caused it to end up on the counter.'

We suggest that the variation in the perceived adequacy of causative paraphrases of the different types of sentences is at the root of the disagreement in the literature over the availability of such paraphrases in the first place. Given the contrasts in paraphrase appropriateness across the various bare XP resultative examples, a causative analysis of the bare XP pattern cannot be easily justified by this data.

Verspoor (1997, 1998) presents the example in (62), which very effectively shows that the causative analysis is not applicable to the bare XP resultative pattern.

(62) The director pulled the puppet strings and the clowns swung apart.
(Verspoor 1997:116, (4.39a); 1998:155, (18a))

The first, context-providing clause describes an agent performing an action that could cause the clown puppets to move apart. Thus, this sentence must be followed by a continuation sentence which can be interpreted as describing a situation directly caused

by the situation described in the first sentence. The felicity of the second, continuation clause follows if it has a noncausative analysis and thus would not contradict the preceding material. Verspoor concludes that the bare XP pattern lacks a causative analysis.[24]

A further argument against the causative analysis involves the actual expression of the causing and result subevents that make up the event conflations represented in bare XP resultatives. In the NP-XP resultative pattern, the verb uniformly represents the causing subevent and the result XP the result subevent. In the bare XP pattern, however, to the extent that a causative relation is perceived between the two subevents it turns out that the "cause" and "effect" do not map onto positions in the sentence consistently. The lack of a consistent correlation raises questions about the relevance of any perceived causal relation between subevents to the assignment of an event structure to this pattern. Specifically, instances of the bare XP pattern based on verbs of manner of motion and verbs of sound emission differ systematically in this respect. Contrast the relation between subevents in the following examples, which are based on verbs from these two semantic classes.

(63) a. Tracy ran into the room.
(Verb of manner of motion: V expresses cause, XP result)

b. Terry clattered into the room.
(Verb of sound emission: V expresses result, XP cause)

The use of the term "result XP" for the postverbal XP in (63a) and comparable bare XP resultatives with verbs of manner of motion reflects the interpretation of such sentences: the event invoked by the result XP is in some sense brought about by the subevent denoted by the verb itself. For example, in (63a) it is the running which causes the motion into the room. In contrast, although the two subevents in (63b), the clattering subevent and the motion subevent, are causally related, the relation between the subevents is reversed, as also noted by Goldberg (in press). That is, in (63b) it is not the clattering that causes the motion, as shown by the total inappropriateness of the paraphrase 'Terry's clattering caused her to move into the room'; rather, it is the motion into the room which is the source of the clattering.[25] The subevent

[24]To emphasize her point, Verspoor contrasts the felicitous (62) with the infelicitous #*The director pulled the puppet strings and the clowns swung themselves apart* (Verspoor 1997:116, (4.39b); 1998:155, (18b)). She treats the second clause in this sentence as a reflexive resultative; however, a simple causative analysis of the type attributed to *The rider jumped the horse* might also be available. That is, the reflexive resultative reading would be one where the clowns swing and the swinging causes the clowns to become separated, while the causative reading would be one where the clowns do something which causes them to swing to a position in which they are separated. It is difficult to tell these two possibilities apart. (See also the discussion of *wiggle* and *wriggle* in section 2.1.) Both analyses, however, are causative, explaining the infelicity of this continuation: there is an incompatibility between the clowns as causers within the continuation and the overt agent in the prior phrase. The contrast in felicity between this continuation and that in (62) only reaffirms Verspoor's conclusion that the bare XP pattern should not receive a causative analysis.

[25]If the bare XP pattern cannot be used to describe an event in which a sound emission event causes an event of directed movement, then how would such an event be expressed? Imagine a scenario in which a car standing at the top of a steep incline emitted a rumbling sound, which caused the car to shudder and move a bit, sending the car down the incline. The bare XP resultative *The car rumbled down the hill* could not be used to describe this scenario, but it is possible that the NP-XP resultative *The car rumbled itself down the hill* could be used, consistent with the causative analysis we have proposed for such resultatives.

represented by the XP is actually the causing subevent and not the result subevent since it is the motion which causes the emission of the sound and not the other way around. In fact, as L&RH (1995) point out, the verbs of sound emission found in this construction are precisely those in which the sound is a necessary concomitant of motion; thus, *clatter*, *rustle*, and *splash* are found in this construction, while *babble*, *murmur*, and *whoop* are not. The direction of causation exhibited in (63b) is shared in all instances of the bare XP pattern in which verbs of sound emission appear with directional phrases, as in the examples in (64).

(64) a. The elevator creaked to the ground floor and I climbed in. (S. Paretsky, *Guardian Angel*, Delacorte, New York, 1992, p. 96)

b. ... other women swished past them to and from the cubicles. (P. Gosling, *A Few Dying Words*, Mysterious Press, New York, 1993, p. 170)

In fact, for many instances of bare XP resultatives headed by verbs of sound emission the most natural paraphrases make no reference to the notion "cause". For instance, *The car rumbled down the hill* might best be paraphrased as 'The car went down the hill, rumbling'. This observation further weakens the proposal that bare XP resultatives should receive a causative analysis.

The comparison of the directed motion uses of verbs of manner of motion and verbs of sound emission expressed via the bare XP pattern shows that to the extent that a causative relation between subevents can be identified in such examples, the notions "cause" and "effect" do not correlate systematically with specific subevents. Nevertheless, independent of whether the verb is a verb of manner of motion or a verb of sound emission, the XP consistently represents the change of location subevent, while the process, whether it is the result of the motion, as with verbs of sound emission, or the cause of the motion, as with verbs of manner of motion, is represented by the verb. Thus, the XP is always in some sense a "result XP", though not in the sense intended in the typical causative analysis. The fact that a causative analysis cannot be uniformly applied to these bare XP resultatives suggests that it is not the correct analysis, and that an alternative event structure must be assigned to such resultatives.

A third argument against the causative analysis, also pointed out in Van Valin and LaPolla (1997:101), draws on cross-linguistic evidence. If the causative analysis of bare XP resultatives based on verbs of manner of motion is valid, then the verbs in such examples might be expected to show a causative morpheme in some languages. We have found no evidence of such morphological marking, and neither have Van Valin and LaPolla (1997:101). Van Valin and LaPolla further point out that where causative forms of verbs of manner of motion do exist, they are understood to be the causatives of the simple, manner of motion sense. St'át'imcets Salish is such a language (Hamida Demirdache p.c.). In St'át'imcets verbs of manner of motion can take directional phrases directly without any overt morphology. This property is particularly striking since in this language a transitive causativizer must be attached to a bare verb root with a state or inchoative meaning to create the equivalent of an English simple lexical causative verb (Demirdache to appear). If the use of verbs of manner of motion to describe motion towards a goal did receive a causative analysis,

the transitive causativizer might have been expected to appear in these instances given its ubiquity in St'át'imcets. In contrast, in some other languages the addition of a goal XP to a verb of manner of motion must be accompanied by morphological marking on the verb, but, significantly, this morpheme is not that associated with causativization. Thus, Schaefer (1985) describes the requirement that in Tswana, a Bantu language, a verb of manner of motion must add an applicative morpheme in order to take a bare goal phrase complement. Furthermore, in Tswana lexical causatives are morphologically simple transitive verbs, whose intransitive counterparts are formed by affixing a morpheme distinct from the applicative morpheme (Cole 1955); the applicative morpheme is also distinct from the morpheme used to form productive causatives in Tswana (Cole 1955). These observations suggest that the morphologies of languages support a causative analysis for verbs like *break* or *dry*, but not for verbs of manner of motion in combination with a directional XPs, as in *run to the station*.

Taken together the arguments in this section make clear that although from a common sense perspective some instances of the bare XP pattern, including those headed by manner of motion verbs could be said to involve two causally-related events, there seems to be good reason to assume that they should not receive the same event structure as true lexical causatives. As we showed in section 2.2, the temporal relation between the conflated events is much tighter in the bare XP pattern than in the NP-XP pattern. In fact, temporally-dependent event conflations involving manner of motion verbs receive the same expression as those instances of the bare XP pattern where there is no reason to posit a second subevent, such as *The bottle broke open* and *The river froze solid*, as discussed in section 2.3. If, as commonly assumed, event structure is a major determinant of syntactic argument expression, then the parallel syntactic structure suggests that they too must have the same event structure. The question remains, then, what kind of event structure is appropriate for instances of the bare XP resultative pattern with nonlexically-entailed result states. We return to this question in section 4.3, after we further consider the event structure of the NP-XP pattern. First, however, we turn to a brief discussion of resultatives based on transitive verbs.

3.3 Resultative Constructions Based on Transitive Verbs

Our focus up to now has been on resultative constructions based on intransitive verbs, but there are many resultative constructions based on TRANSITIVE verbs, as in (65).

(65) a. ... she had to rock him quiet again. (O. Masters, *Amy's Children*, University of Queensland Press, St. Lucia, Queensland, 1987, p. 240)

b. Then he got up to rinse their tea mugs clean ... (S. Henry, *Sleeping Lady*, William Morrow, New York, 1996, p. 121)

c. ... hands like black roots ... hammered flat to the sole the nail that was to hold it [=the leather patch] in place. (N. Gordimer, *A Sport of Nature*, Knopf, New York, 1987, p. 137)

In contrast to resultatives based on intransitive verbs, "dropping" the result XP in the examples in (65) leads to a grammatical sentence, since the verbs are transitive

and the postverbal NP in the resultative is also the understood object of the verb.

(66) a. She rocked him.
b. He rinsed their tea mugs.
c. Hands hammered the nail.

In (65), the verbs do not lexically entail a specific result, so that the resultatives in (65) can be considered instances of event conflation. Given that we have claimed that the temporal relation between the events in conflated structures is significant, we need to investigate the nature of the temporal relation between the events in resultatives based on transitive verbs. An examination of such resultatives shows a parallel with what we found with resultatives based on intransitive verbs: the two subevents may be either temporally dependent or temporally independent.

Evidence that the two conflated events can be temporally independent is provided by the examples in (67). In each one the temporal progress of the causing event and the temporal progress of the result event are independent.

(67) a. Clara rocked the baby to sleep.
b. The police shot the robber to death.

In (67a), it is clear that the rocking caused the baby to fall asleep, but the rocking does not necessarily have to continue until the baby has fallen asleep, and there is certainly no implication that the more Clara rocked, the closer the baby got to being asleep. Adverbial modification can also be used to bring out the independence of the two subevents, as it was in section 2.2. Thus, (68) entails (69a), but not (69b).

(68) Clara quickly rocked the baby to sleep.

(69) a. The baby quickly fell asleep.
b. Clara quickly rocked the baby.

Consistent with this observation, the addition of a *with* phrase explicitly asserting that the rocking was slow, as in (70), does not lead to a contradiction. The felicity of the *with* clause shows that *quickly* need not modify the rocking subevent. Each subevent can proceed at its own pace.

(70) Clara quickly rocked the baby to sleep with a few slow rocks of the cradle.

In (67b), the shooting begins as soon as the bullet leaves the gun, but at that point the process of the robber dying has not yet begun, nor does the process of shooting have to continue until the robber is dead. This example also illustrates that the two subevents need not overlap, and the example below makes this point even more clearly.[26]

[26]We would like to thank Chris Kennedy for suggesting this example.

(71) The critics panned the play out of town.

In (71) the play is likely to be forced to leave town only as a result of reactions to the reviews, and the reviews must necessarily appear before these reactions can develop. In fact, this example is also consistent with a temporal gap since the writing of the reviews is likely to be over well before the play is forced out of town.

Nothing we have said so far precludes the existence of event conflations based on transitive verbs in which the causing subevent and the result subevent are temporally dependent in the way that they are in the bare XP pattern. Conflations based on the verb *pull* and certain other verbs of exerting force such as *tug* and *yank* seem to instantiate this possibility. Illustrative examples appear in (72).

(72) a. We all pulled the crate out of the water.
b. They yanked the nails out of the board.
c. The coast guard tugged the raft back to shore.

The verb *pull* describes the exertion of a force on a physical object, but an event of pulling does not necessarily entail that the object show any positional displacement, as it is possible to pull something without it ever moving. However, when the pulling does cause the displacement of a physical object, as in the resultative example (72a), then the pulling has to extend all the way until the achievement of the object's result location. That is, in (72a), the duration of the pulling necessarily extends until the crate is out of the water. The same observations extend to the other examples in (72). The temporal dependence can once again be brought out through the use of adverbial modification. For instance, the adverb *slowly* modifies both the subevents in (73a); that is, this sentence entails both the (b) and (c) sentences.

(73) a. The coast guard slowly tugged the raft back to shore.
b. The coast guard slowly tugged the raft.
c. The coast guard slowly brought the raft back to shore.

An attempt to independently modify the rate of exertion of the force and the rate with which the crate moves out of the water, as in (74), results in a contradiction, as expected if these two events are temporally dependent.

(74) We rapidly pulled the crate out of the water with one slow, steady, coordinated pull.

Verbs such as *pull* and *tug* have been previously singled out because of unexpected limitations in their argument expression options. What is particularly interesting is that previous researchers tied these limitations to the temporal dependence between the exertion of a force on a physical object, as denoted by the verb, and the motion of that object. As Pesetsky (1995) and Pinker (1989) note, *pull*, *tug*, and semantically similar verbs—what we call verbs of exerting force and what Pinker (1989) calls "verbs of continuous causation of accompanied motion in some manner"—fail to be found in the double object construction.

(75) a. Mary pulled the trunk to Sue.

b. ∗Mary pulled Sue the trunk. (Pesetsky 1995:137, (371a,b))

These verbs contrast in their behavior with what Pinker calls "verbs of instantaneous causation of ballistic motion" such as *fling, kick* and *throw*, which are found in the double object construction.[27]

(76) a. Mary threw John the book.

b. Mary threw the book to John. (Pesetsky 1995:137, (370a,b))

As Pinker and Pesetsky point out, when verbs such as *push* and *tug* are used in the description of a motion event, the motion of the physical object requires the continuous imparting of force denoted by the verb, while the motion described with verbs such as *fling* and *throw* is not required to be coextensive with the exertion of the force that sets the object in motion. This force is applied momentarily, as the name Pinker gives to this class suggests. What Pinker and Pesetsky are describing in their discussion of verbs of exerting force is the temporal dependence between the two subevents of a complex event: a subevent of exerting force and a subevent of motion.

Event conflations based on transitive verbs, then, exhibit the same two types of temporal relations between their subevents as resultative constructions based on intransitive verbs: the subevents can be either temporally dependent or temporally independent. Given that these two types of temporal relations are identical to those observed for the two types of event conflations based on intransitive verbs, we would expect the two types of event structure analyses proposed for the two types of resultatives based on intransitive verbs to extend to the resultatives based on transitive verbs. That is, the transitive verb-based resultatives with temporally-independent subevents should also receive a causative analysis, while those with temporally-dependent subevents should receive a noncausative analysis. For instance, we would expect that causative paraphrases should not capture the sense of the temporally-dependent instances as well as the ones where there is temporal independence. Our judgment is that this prediction holds as well. Compare the following two sentences, one involving temporally-dependent subevents and the other temporally-independent subevents, and their paraphrases.

(77) We all pulled the crate out of the water.
≠ 'Our pulling the crate caused it to be out of the water.'
≠ 'We caused the crate to be out of the water by pulling it.'

(78) He rinsed the tea mugs clean.
= 'His rinsing the tea mugs caused them to be clean.'
= 'He caused the tea mugs to be clean by rinsing them.'

[27]There is some disagreement concerning whether all verbs of exerting force always describe events that involve accompanied motion; Talmy (1976) explicitly states that the verb *push* can be used both as what Pinker would call a verb of instantaneous causation of ballistic motion and a verb of exerting force, citing relevant examples.

4 The Mapping to Syntax

We have established a semantic difference in the relation between the conflated events of the resultative construction in the two syntactic patterns and have determined that a causative analysis is appropriate for the NP-XP pattern but not for the bare XP pattern. In this section, we show how the syntax of the NP-XP and bare XP resultative patterns—particularly the presence of a postverbal NP in the former, but not in the latter—can be made to follow from independently established principles governing the mapping between event structure and syntax once a phenomenon of "event coidentification", which we introduce in section 4.3, is recognized. We draw on the theories of event structure and of the mapping from event structure to syntax laid out in RH&L (1998a). In section 4.1 we briefly review the basics of these theories. Then in section 4.2 we show how the principles governing argument realization require the expression of an object in the reflexive resultative pattern, the pattern where the presence of an object might appear superfluous on a semantic account to the resultative construction. In section 4.3 we examine the consequences of these principles for the bare XP pattern.

4.1 Principles of Event Structure Realization

In this section we sketch the essentials of the theory of event structure presented in RH&L (1998a). This theory formalizes how "core" meanings of verbs are associated with event structures based on the ontological categorization of these "core" meanings, how these event structures can be extended to derive more complex meanings, and how the basic and derived event structures are associated with syntactic structures (L&RH 1995; RH&L, 1996, 1998a). RH&L (1998a) point out that most theories of event structure representation consist of building blocks of two types: event structure templates and constants. The first type of building blocks—the event structure templates—comprise the inventory of possible event structures, and following others (e.g., Foley and Van Valin 1984; Van Valin 1990, 1993; Van Valin and LaPolla 1997; Pustejovsky 1991b, 1995), we define them in terms of ontological categories of event types along lines similar to the aspectual classifications of event types familiar in the literature. It is the structure of the event structure template which determines the realization of arguments, and consequently, the event structure template can be viewed as the grammatically-relevant component of an event structure representation. (See L&RH 1995; RH&L 1998a for discussion.)

The second type of building block is the constant, which encodes what is idiosyncratic to a particular verb—i.e., its "core" meaning. RH&L (1998a) show that although the event structure templates have received the most attention, the constants play a significant role in the determination of syntactic behavior, and much is to be learned by careful study of the role of the constant. There is an open-ended set of constants, but each constant is associated with an ontological categorization, selected from a fixed set of ontological types (e.g., place, state, thing, manner). Each constant also has an associated name (i.e., a phonological string). By its nature, a constant determines the minimum number of arguments in the associated event (see also Goldberg 1995; van Hout 1996). A constant has a basic association with a particular event structure template that is determined by its ontological type.

Listed in (79) are the major event structure templates from RH&L (1998a); the constants in each template are enclosed in angle brackets and identified by their ontological types.[28] Thus, these event structure templates also illustrate the basic associations between constants and event structures.

(79) a. [x ACT$_{<MANNER>}$]
b. [x <*STATE*>]
c. [BECOME [x <*STATE*>]]
d. [[x ACT$_{<MANNER>}$] CAUSE [BECOME [y <*STATE*>]]]

The pairing of a particular constant and an event structure constitutes a basic verb meaning; the "name" associated with this meaning comes from the constant (RH&L 1998a, 1998b). Since the constant specifies what is idiosyncratic to a particular verb, the verb can be said to lexicalize the constant. To take an example, the verb *scrub* lexicalizes a constant which specifies a certain manner of surface contact involving motion. Due to the nature of this activity, this constant is associated with two arguments, the actor and the surface, and it is basically associated with event structure template (79a). Since this event structure template has a single variable, the constant is associated with more participants than there are variables in the event structure template it is paired with. The actor participant is paired with the variable in the event structure template, while the surface participant is not matched up with a variable in the template and is licensed by the constant alone (RH&L 1998a).

(80) [x ACT$_{<SCRUB>}$ <u>y</u>]

Those participants in an event structure required by the event structure template are called "structure" participants, and the arguments that realize them are "structure" arguments (RH&L 1998a; see also Grimshaw 1993). Variables in the event structure which do not represent structure participants are underlined.

More complex verb meanings are built in a monotonic fashion, by a process of template augmentation, whereby existing event structure templates may be augmented (RH&L 1998a). Template augmentation is constrained to create meanings that are consistent with the inventory of lexical event structure templates. A similar process of event composition is described in detail in the work of Pustejovsky (1995) and van Hout (1996), though the building blocks used are not precisely the same. The well-formedness conditions constraining the association of lexical event structure templates—whether basic or derived via template augmentation—with syntactic structures presented in RH&L (1998a:112-113) are set out below; for further discussion see RH&L (1998a).

(81) Subvent Identification Condition: Each subevent in an event structure must be identified by a lexical head (e.g., a V, an A, or a P) in the syntax.

[28] We assume that manner constants, which characterize activity verbs, such as *laugh* or *run* are modifiers of the event structure and indicate this relationship via subscripting in the template. See RH&L (1998a) for more discussion.

(82) ARGUMENT IDENTIFICATION CONDITION: Each argument XP in the syntax must be associated with an identified subevent in the event structure.

(83) STRUCTURE PARTICIPANT CONDITION: There must be an argument XP in the syntax for each structure participant in the event structure.

The first condition, the Subvent Identification Condition, (81), governs the appearance of predicates in the syntax, requiring there to be a verb, adjective, or other predicate which lexicalizes the predicative content of that subevent. The remaining conditions govern the distribution of arguments in the syntax. The first of these, the Argument Identification Condition, (82), disallows arguments that are not associated with identified subevents in the event structure; it resembles the Government-Binding framework's Theta-Criterion (Chomsky 1981, 1986) or Lexical Functional Grammar's Completeness and Coherence Conditions (Kaplan and Bresnan 1982). The other condition—and the one that is most relevant to the syntax of the resultative construction—is the Structure Participant Condition, (83), a condition that is inspired by similar conditions in Grimshaw and Vikner (1993) and van Hout (1996, in press). As we now show, this condition will require that an event structure comprising two subevents be realized by a verb with two arguments, a transitive verb, since each subevent must have a structure participant.

Before discussing the applicability of the Structure Participant Condition to the resultative construction, we review one type of evidence that was used to motivate such a condition in RH&L (1988a); the same evidence is sketched in Grimshaw (1993) and comparable evidence from Russian is discussed by van Hout (in press). This condition can be used to explain why verbs of surface contact by motion and verbs of change of state differ with respect to the obligatoriness of their objects. As discussed in RH&L (1988a), verbs of surface contact by motion such as *wipe* or *sweep* allow unspecified objects, while verbs of change of state such as *break* or *melt* do not, even in an example constructed so as to provide a context where the omitted object can be inferred.[29]

(84) a. After dinner, Tracy washed, Kim wiped, and Leslie swept.

b. *Kelly broke again tonight when she did the dishes.

As noted above, verbs of surface contact by motion are associated with manner constants, which are paired with the simple event structure template in (79a) consisting of only a single subevent. This template contains a single variable, but the

[29]We are aware of a few apparent exceptions to this generalization, but believe the generalization can be maintained and the apparent exceptions explained. They involve verbs of change of state—the verbs *clean* and *dry*—which can be used intransitively as in *If you wash, I'll dry.* Notice however, that in such uses they refer to the activities that canonically bring about the changes of state. Thus, in the example just given, the verb *dry* refers to the process of wiping dishes with a dishcloth rather than the achievement of a dry state for the dishes. Evidence for this analysis comes from examples such as *Although Kim dried this evening, the dishes were still not completely dry*, where the attainment of the endstate is felicitously denied, and *I don't like it when my son cleans the house since the house is never really clean when he finishes*, where attainment of a clean state is felicitously denied. Nevertheless, this phenomenon requires further investigation. For additional discussion of the distribution of unspecified objects see Rice (1988) and Resnik (1993, 1996).

constant is associated with two participants—an actor and a surface. In the event structure given in (80), only the actor is a structure participant, so only it needs to be expressed by the Structure Participant Condition. Such verbs can leave their surface participant, which is not a structure participant, unexpressed. Thus, verbs of surface contact by motion can be used intransitively with an unspecified object interpretation, as in (84a). (Of course, semantic and pragmatic conditions on the unexpressed argument must be met; see RH&L 1998a and Brisson 1994 for discussion.)

As discussed in section 3.1, transitive verbs of change of state are basically causative verbs, and, given this, such verbs are associated with the complex event structure template with two subevents given in (79d), and repeated here.

(85) [[x ACT$_{<MANNER>}$] CAUSE [BECOME [y <*STATE*>]]]

As this template includes two structure participants, one for each subevent, by the Structure Participant Condition such verbs must have two arguments realized, one associated with each subevent. The argument associated with the first subevent is what is typically called the agent, while the argument associated with the second subevent, as the argument that undergoes a change of state, is what is typically called the patient. Since both arguments are required, given the canonical realization of such arguments, the verb must have both a subject and an object. Thus, these verbs do not allow unspecified objects, as shown by (84b) (Grimshaw 1993; Grimshaw and Vikner 1993; van Hout 1996; RH&L 1998a). This theory of argument realization has an important consequence: it requires causatives to have objects. This consequence bears on the analysis of resultatives, as we show in section 4.2.

Before returning to the resultative construction, we review another difference between verbs of surface contact by motion and verbs of change of state with respect to the expression of objects. This difference again depends on our theory of argument realization. As noted in RH&L (1998a), the object of a verb of change of state is necessarily the patient, while the object of a verb of surface contact by motion need not always be the surface. Thus, verbs like *wipe* have uses such as (86), where the stuff on the surface, and not the surface, is the direct object.

(86) a. ... wiping the caramel off my fingers with a tissue ... (H. Holt, *Mrs. Malory: Death of a Dean*, Dutton, New York, 1996, p. 24)

b. My mother patted the flour off her hands. (A. Tan, *The Joy Luck Club*, Putnam, New York, 1989, p. 94)

c. I had time to powder the glow off my face and get some water before Mary Helen Frady was brought to me. (W. Hornsby, *77th Street Requiem*, Dutton, New York, 1995, p. 146)

Verbs like *break* do not have comparable uses; that is, there is no sentence (87), with the interpretation 'Kelly broke the table and as a result the dishes went off the table' that would be comparable to the interpretation of (86a), 'I wiped my fingers and as a result the caramel went off my fingers'.

(87) *Kelly broke the dishes off the table.

Thus, the object in (86a) is not subcategorized by *wipe*: *I wiped the caramel* only has the nonsensical reading where the caramel is itself taken to be a surface. The contrast between the two types of verbs in terms of range of objects follows from the theory of argument realization. Verbs of change of state such as *break* are basically associated with an event structure template with two subevents, as in (85). The patient argument of such verbs, as the structure participant of the second subevent, must be realized in the syntax; the linking rules determine that it is expressed as a direct object. Consequently, verbs like *break* cannot be found in constructions such as (87) in which the direct object does not correspond to the "normal" direct object of the verb. In contrast, a verb of surface contact by motion is basically associated with an event structure template with a single subevent as in (79a), which can be augmented to a causative template, as in (79d). The constant associated with such verbs involves two participants: the actor and the surface. These two participants are present in the basic single subevent event structure for the verb, and this event structure is the causing subevent in the more complex event structure associated with the uses of such verbs shown in (86). In (86a), for example, the direct object, *the crumbs*, does not realize one of the participants of the causing subevent; rather, it realizes a participant of the result subevent. The Structure Participant Condition requires that this argument must be expressed since it realizes a structure participant of the result subevent. In contrast, the second participant of the causing subevent is the surface, which need not be expressed since it is not a structure participant; thus, it is licensed by the constant alone. The added, second subevent is identified by the preposition *off* heading the result XP in (86a); given the nature of this particular result XP, the surface can be expressed within it. (See RH&L (1998a) for more details.)

4.2 The NP-XP Resultative Pattern

With this background, we turn back to the resultative construction. First, we show how the causative analysis of the reflexive resultative pattern results in the appearance of "fake" reflexives. As argued in section 3.1, the reflexive pattern is associated with a causative event structure, consisting of two subevents in which one subevent causes the second, as in (79d). Given the Structure Participant Condition, there must be an independent argument in the syntax for each of the subevents, as each has a structure participant. So although the single participant of the second subevent has the same referent as the participant of the first subevent, it must necessarily be realized independently. Due to the shared reference between the participants, it is realized as a reflexive pronoun. Thus, the reflexive pattern must include a reflexive object in order to meet the Structure Participant Condition on argument realization.

(88) He drank *(himself) into an early grave.

On this analysis, then, the term "fake" reflexive is a misnomer. Although it might appear that the reflexive object is superfluous on a semantic account since it does not appear to have a semantic contribution to make, its obligatory appearance is explained by the conditions governing the event structure-syntax mapping and is a reflection of the bievent analysis of the reflexive resultative pattern.

The nonsubcategorized NP pattern also involves the causative event structure. In this pattern the two subevents do not share an argument with the same referent; thus, the expression of the direct object in this pattern is not a concern. Nevertheless, our analysis once again necessitates an object in such resultatives due to the Structure Participant Condition. Given the nature of the situation described by such resultatives, the subject and object have distinct referents. In fact, the requirement that such resultatives have an object can be illustrated by looking at resultatives based on verbs of surface contact by motion, a set of verbs that in isolation allow their object to be unexpressed (RH&L 1998a and section 4.1). Nevertheless, these verbs must be found in the NP-XP pattern, whether with a fake reflexive or nonsubcategorized NP object, and cannot turn up in the bare XP pattern, as shown in the following examples.

(89) a. By that time Sophie had ... scrubbed herself into a state when she could hardly move. (D. Wynne Jones, *Howl's Moving Castle*, Greenwillow Books, New York, 1986, p. 43)

b. * By that time Sophie had swept and scrubbed into a state when she could hardly move.

(90) a. Kim scrubbed his knees sore every morning.

b. * Kim scrubbed sore every morning.

Interestingly, in (89a) and (90a) the overt object is not understood as the surface argument of the verb *scrub*, as it is in a simple transitive use of this verb (*Kim scrubbed the floor*); rather, the surface is understood to be unspecified in this example. This interpretation is not an accident. When a verb of surface contact is used intransitively with an unspecified object interpretation (*Kim scrubbed*), the understood object is the surface. Since the surface argument of *scrub* is not a structure argument, it can be left unexpressed, as it is in (89a) and (90a). This makes "room" for the argument that must be added if the Structure Participant Condition is to be met by the result subevent. Thus, the first subevent contributes the "unspecified object", while the second subevent contributes the actual object, which is not itself "subcategorized" by the main verb.

The availability of an unspecified object interpretation with verbs of surface contact cannot, however, give rise to the bare XP pattern represented by (89b) and (90b). As a consequence of the causative event structure associated with the resultative construction, an argument XP must be expressed to realize the structure participant in each subevent. In both (89b) and (90b) there is no explicit argument XP associated with the second subevent, so the sentence is unacceptable. These sentences are unacceptable whether the intended interpretation is that Sophie or Kim scrubbed something and became stiff or sore as a consequence, or Sophie or Kim scrubbed something and caused someone else to become stiff or sore. The events of scrubbing and becoming sore are temporally independent (one can scrub a surface quickly and slowly become sore), so that under any interpretation of (89b) and (90b) there must be a causative event structure. Given this, there must be an argument XP in the syntax associated with each subevent.

4.3 The Bare XP Resultative Pattern

We turn now to the implications of this analysis of the event structure-syntax mapping for the bare XP pattern. In section 3.1 we provided semantic evidence, based on internal temporal constituency, that the NP-XP pattern should receive a causative analysis. Once we accept the causative analysis, the appearance of the fake reflexive is not only explained, but could be viewed as syntactic support for the causative analysis. Proceeding along these lines, we might say that the syntax of the bare XP pattern points to an event structure that is not causative in nature and that contains only a single subevent. Such an analysis would explain the absence of the fake reflexive in this pattern. In fact, as already pointed out in section 2.3, there are certain instances of this pattern, where the result is lexically entailed by the verb, and there is no motivation for positing event conflation. Examples of this sort are given in (91), repeated from (44) and (45).

(91) a. The pond froze solid.
b. The mirror shattered to pieces.
c. The bottle broke open.

If we take the syntax as a guide, we can conclude, as we suggested in section 3.2, that other examples of the bare XP pattern, such as those in (92), in which the verb does not lexically entail an achieved state or an achieved location, also involve an event structure with only one subevent.

(92) a. The car rumbled into the driveway.
b. The rice boiled dry.
c. The branding iron burned into the calf's skin.
d. Casey waltzed out of the room.

On the other hand, instances of the bare XP pattern such as those in (92) have paraphrases in which there is explicit reference to two events. For instance, (92b) can be paraphrased as in (93a) and (92d) can be paraphrased as in (93b).

(93) a. The rice got dry by boiling.
b. Casey went out of the room by waltzing.

Examples of this sort recall Davidson's (1967) and Parsons's (1990) discussion of "explicit reference to events", since in the *by*-phrases direct reference appears to be made to entities which can only be classified as events. The paraphrases in (93) suggest that the events described in (92) are conceptualized as compositionally derived from two events, while the syntax of (92) suggests that the resulting conflation involves an event structure with only one subevent. So the question is: how can a single subevent analysis be made consistent with the view that such examples involve event conflation? We suggest that, although these examples are compositionally derived from two events in terms of their conceptual representation, the relationship between the two constituent events is tight enough that they can be analyzed as a simple event in event structure terms. We elaborate on the nature of this relationship in the next section.

4.3.1 Event Coidentification

As mentioned in the introduction, the continuous flow of happenings in the world does not come with perceptually individuated subunits which can be identified as individual events. But happenings in the world have identifiable properties which are lexicalized by verbs. A stretch of time with properties that are lexicalized in a verb is recognized and construed as an event—an individuated chunk of time. Verbs, then, are predicates of events, where we take the term "event" not to refer directly to a happening in the world, but rather to the conceptual construal of an individuated happening in the world.

Sometimes a happening in the world involves properties which can be lexicalized by two distinct verbs, and so this happening can potentially be conceptualized as involving two events. Consider, for example, the happening reported in (94).

(94) Robin danced out of the room

The properties of Robin dancing and of Robin traversing a path out of the room can also be lexicalized separately as in *Robin danced* and *Robin went out of the room.* They can even be lexicalized separately in the same sentence, as in *Robin went out of the room, dancing.* However, the syntax of (94)—specifically, the fact that it is an instance of the bare XP pattern—suggests that when expressed in this way the happening is not construed as composed of two distinct events. Rather, the property of traversing the path out of the room is added to the property of dancing, modifying the same single event, though it is not a property lexically entailed by the verb *dance.* To put this another way, if we were to provide a Parsons-style (1990) representation of (94) using an event variable, it would receive the representation in (95).

(95) (∃e)[Dancing(e) & Agent(e,Robin) & Out(e,the room)]

Thus, this happening in the world, which has properties describable by two predicates and thus could be expressed as two distinct events, can nonetheless qualify for construal as a single event with a compositionally derived set of properties since it is possible to combine these properties and predicate them of the same event. We will say that when this happens, as in (94), the two events—i.e., the two sets of time-anchored properties—are COIDENTIFIED.[30] Our choice of the term "event coidentification" for the relationship that holds between events that are distinct in terms of conceptual structure, but that can be represented as a single simple event in event structure terms reflects the nature of this relationship, which, we argue, bears certain hallmarks of the notion "event identity", as it is discussed in the philosophy and linguistics literature (Davidson 1969; Lombard 1986; Parsons 1990; among others).

Our proposal, then, is that two events that are potentially conceptually distinct can be represented as one event in event structure terms because they meet conditions on event identity. Following discussions of event individuation in the philosophy and

[30] As mentioned in section 4.1, in RH&L (1998a) we propose template augmentation as a way of extending basic verb meanings; event coidentification would then be an additional way of doing this.

linguistics literature, an essential requirement on event identity is that two events that are candidates for identity have the same temporal and spatial properties (Davidson 1969; Parsons 1990; among others). In section 2.2 we demonstrated extensively that the two events in the bare XP resultative pattern have identical temporal properties—that is, they are temporally coextensive. In (94), the event of Robin's dancing and the event of Robin going out of the room have the same temporal extents. The two events also have the same spatial properties. Again in (94), the dancing and the going out of the room cover the same spatial extents. In fact, in all instances of the bare XP pattern, the conflated events have the same spatial and temporal properties.

When event conflation takes place between two events which do not meet the conditions on event identity, event coidentification cannot take place, and the properties of the two events must remain just that: properties of two events. So, for example, (96) contains reference to two events: an event of dancing and an event of becoming stiff.

(96) Robin danced herself stiff.

Because the property of dancing and the property of becoming stiff are not inherently temporally dependent, then these two properties cannot be taken as properties of the very same event. They can, however, be taken to be properties of two subevents of a complex causative event, and, as we have argued extensively, sentences such as these indeed do have a causative event structure.

However, as shown in section 2.2, it is not sufficient that two conflated events be temporally coextensive in order for them to be coidentified. They must also be inherently temporally dependent, unfolding at the same rate. In all such event conflations there is an identifiable incremental theme for the event as a whole, and the temporal dependence between the conflated events reflects the existence of such an incremental theme. Moreover, the participant that the incremental theme is predicated of is shared by both of the conflated events. For example, in (94), Robin is a participant in both the events (the dancing and the going out of the room), the going event has an incremental theme (the path out of the room), and, crucially, this incremental theme is predicated of Robin, the participant shared by both subevents. The same is true for all instances of the bare XP pattern with result XPs that are not lexically entailed by the verb. In each instance, the result subevent introduces an incremental theme which is predicated of a participant shared by both subevents. In (97), for example, the XP *dry*, by naming a result state, introduces an event with a scale which serves as the incremental theme of the event as a whole. This scale is predicated of the rice, which is a participant in both subevents.

(97) The rice boiled dry.

What is the source of the requirements on event coidentification? Why, for example, do all instances of coidentified events involve an event structure with a constituent which serves as an incremental theme? We propose that the basic requirement for event coidentification is identity of temporal properties (which, as we have suggested, involves more than mere temporal coextensiveness). The only way to ensure that two events are temporally identical is if there is a temporal "measure", to use Tenny's

(1987, 1994) terminology, or "odometer" to use Verkuyl's (1993), which makes explicit the temporal unfolding of the event as a whole. Clearly, if the two subevents each had their own independent temporal measure, then the events would not necessarily unfold at the same rate. Thus, if such subevents were temporally coextensive, it would in some sense be accidental.

This point can be made more sharply by considering an example taken from Davidson's (1969:178) discussion of the individuation of events; this example is taken up repeatedly in the subsequent literature. Davidson presents the case of a sphere rotating and simultaneously heating up and asks whether these two happenings can be considered to be the same event. As Parsons (1990:157) points out, these happenings cannot be considered to be the same event since the rotating may be quick, while the heating may be slow. Indeed, (98) is unacceptable, as expected if the two subevents cannot be coidentified.

(98) $*$The sphere rotated hot.

This example, however, may be unacceptable for independent reasons. Although the semantic constraints on result XPs are not well understood, Goldberg (1995:195-197) points out that generally a result XP must denote an endpoint on a scale. The AP *hot* does not meet Goldberg's "end-of-scale constraint" since the scale of hotness does not have an upper bound. However, (99a), which is inspired by Parsons' example, but meets Goldberg's constraint, is also marginal on the resultative interpretation, and it is certainly worse than the corresponding reflexive resultative in (99b).

(99) a. ?? The wheel spun flat.

b. The wheel spun itself flat.

The two events—a wheel spinning and the same wheel becoming flat—cannot be coidentified since they are not temporally dependent: the spinning can be fast and the becoming flat can be slow. The lack of temporal dependence explains the marginal status of (99a). The contrast in acceptability between (99a) and (99b) is particularly striking. It shows that the event of the wheel spinning may be conflated with the event of the wheel becoming flat only within a complex, causative event structure, as shown by the syntactic expression of this event structure, which exemplifies the reflexive resultative pattern.[31] The spinning and the becoming flat may have gone hand-in-hand temporally, but because it does not follow from the nature of spinning and the nature of becoming flat that they unfold at the same rate, the two events cannot be coidentified.

The case of the sphere rotating and simultaneously becoming hot can be contrasted with the case of food burning and simultaneously blackening. This event can be expressed via the bare XP pattern as illustrated in (48), which is repeated here, contrasting with the unacceptability of (98) and (99a).

[31] Example (99b) is not entirely felicitous either, and we return to examples of this type in section 5.1. All that matters for the current discussion is the contrast in acceptability between (99a) and (99b).

(100) After dinner—minus the cookies, which Doreen forgot about until they had burned black—Michael reads to Kara ... (P. Orenstein, "Almost Equal", *The New York Times Magazine*, April 5, 1998, p. 48)

When burning—being consumed by heat or fire—and becoming black are both properties of the same object, then it is a fact about the world that the burning and the turning black unfold together. The turning black is a manifestation of the burning and only continues as long as the burning does. Therefore, a burning of the cookies and a becoming black of the cookies can be considered properties of the same event, and the two can be coidentified.

In section 2.2, we used adverbial modification to argue that bare XP resultatives involved temporally-dependent events. We pointed out that in (30), repeated in (101), the adverb *slowly* modifies both the running and the progress across the field.

(101) Tracy slowly ran to the other side of the field.

As Chris Kennedy points out to us, it is unexpected to have *slowly* predicated of both subevents—if there are indeed two distinct subevents—since running and moving across the field are incommensurable events, as the oddness of the following sentence shows: *Tracy's running was slower than her progress across the field* (cf. Kennedy 1997). The fact that *slowly* can modify both the nature of the running and the progress across the field in this instance of the bare XP pattern suggests that it is analyzed as involving a single event. With a single subevent, there would be only one modification and the problem of sense differences reflected in incommensurability does not arise.

One more question remains to be addressed: Why MUST the two subevents in instances of event coidentification such as (94) be construed as a single subevent? That is, in describing a happening in which Robin danced and by dancing also went out of the room, it is not possible to package this complex happening so that the dancing and the going out of the room constitute distinct subevents of a causative event. If this were possible, the event should be expressible using the reflexive resultative pattern as in (102), but this sentence is quite marginal out of context.

(102) ?? Robin danced herself out of the room.

In this example, the temporal relation between the event of Robin dancing and the event of Robin traversing the path out of the room meets the general constraints on the temporal relations between the subevents of a complex, causative event laid out in section 3.1. We suggest that sentences like (102) are not ungrammatical; rather, they reflect a principle that requires that happenings in the world be given the tightest event construal possible, all other things being equal. Since it is possible to construe a happening in which someone danced and thereby went out of the room as a single simplex event, this construal is to be preferred over one in which this happening is construed as consisting of two distinct subevents. Consequently, this happening will be described using the bare XP pattern. We capture this proposal in the Principle of Event Coidentification in (103).

(103) PRINCIPLE OF EVENT COIDENTIFICATION: Predicates which can be construed as predicates of the same simplex event must be so construed.

The Principle of Event Coidentification is probably reducible to some version of Grice's Maxim of Quantity (Grice 1975). (See Horn 1996 for a discussion of other similar phenomena along these lines.) Since the temporal relation between the subevents in the coidentified structure is tighter than—and thus subsumed under—the temporal relation between the subevents in the causative event structure, the use of the coidentified structure is in fact more informative than the use of the causative event structure.

Pragmatic considerations may sometimes disfavor the use of the bare XP resultative pattern in the expression of two subevents that are potentially coidentifiable. For instance, in the expression of motion in some manner towards a goal, the use of the reflexive resultative pattern would lead the hearer to assume that there was something atypical about the motion event being described. In fact, in our corpus there are at least two examples similar to the constructed example (102); the first of these, (104a), describes a pampered cat.

(104) a. Domina implied that her hunger was so debilitating that she could hardly crawl her sleek self across the kitchen floor. (J.R. Hulland, *An Educated Murder*, St. Martin's, New York, 1986, p. 156)

b. Then, without another word, he withdrew from the kitchen and sauntered his Bermuda-shorted self through the front door. (D.M. Davidson, *Killer Pancake*, Bantam, New York, 1995, p. 63)

These two examples are not strictly speaking instances of the reflexive pattern in that they have a modifier "inserted" into a reflexive pronoun rather than the bare reflexive pronoun characteristic of the reflexive resultative pattern. We believe that this slight departure from the reflexive resultative pattern is significant. As has often been noted (e.g., Croft 1991; Talmy 1976), animate entities can be presented as intentional agents—the prototypical construal—or as physical, and thus manipulatable, objects. What the examples in (104) do is present both views of the entity whose motion is being described: as an intentional agent in subject position and, through the choice of appropriate modifiers, as a physical object in the postverbal position. By expressing these happenings through instances of the NP-XP pattern with the modified pronoun *self* rather than in the bare XP pattern, the writers draw attention to the two conceptually distinct events that are being conflated, and thus they are able to convey that in (104a) there is substantial effort involved in the cat getting to the food and that in (104b) the protagonist is trying to create a certain effect by his exit.[32]

[32]Our corpus includes more examples of verbs of manner of motion followed by a reflexive and a directional phrase than those in (104); however, it is not clear that these are instances of the reflexive resultative pattern rather than simple causatives with a reflexive object (see also section 2.1 and note 24). Under limited circumstances, English allows causatives of manner of motion verbs, as in *I marched the kids out of the room*, which receives the interpretation 'I caused the kids to march out of the room', and not the interpretation 'I marched and thereby caused the kids to go out of the room', which would be appropriate if this sentence were a resultative. Thus, examples such as *I marched myself into the Harvard Bookstore ...* (S. Kelly, *The Trail of the Dragon*, Walker,

4.3.2 Crosslinguistic Perspectives on Event Coidentification

The idea that pragmatic considerations influence the way a speaker might choose to express a particular situation has been suggested in the context of causative constructions by McCawley (1978) through a comparison of English and other languages. It is well known that many languages have both lexical and periphrastic causatives. In such languages lexical causatives necessarily express direct causation, while periphrastic causatives are typically said to express indirect causation. McCawley shows that periphrastic causatives can, in fact, describe either direct or indirect causation and argues that their typical restriction to indirect causation can be attributed to conversational implicature. McCawley uses the following example to make his point. Suppose that Black Bart shot the sheriff to death—a clear instance of direct causation. Nevertheless, if in this context one asked the question in (105), it must be answered *Yes*, suggesting that direct causation comes under the scope of the periphrastic causative.

(105) Did Black Bart cause the sheriff to die? Yes/*No, he shot him through the heart and the sheriff died instantly. (McCawley 1978:250, (6b))

McCawley goes on to make an interesting prediction: "periphrastic causatives can be used for direct causation in cases where there is no lexical causative, i.e. whether a periphrastic causative is interpreted as referring to indirect causation depends not only on its own meaning but on what alternatives the lexicon provides for referring to the events in question" (1978:250). Thus, *Bill caused Mary to drop her parcel* is appropriate whether the causation is direct or indirect since there is no lexical causative available for most transitive verbs. McCawley suggests that it is Grice's (1975) Maxim of Quantity which determines that for instances of direct causation the lexical causative must be used, if there is one.

McCawley's work (1978), then, suggests that the possible interpretations of a particular construction may depend on what alternatives a language provides for referring to certain types of events. This point should hold with respect to the instances of event conflation under consideration here. We have suggested that, unless there is reason to choose an alternative expression of a situation, the preferred expression of that situation is the one which involves giving it the event structure with the fewest subevents. Therefore, event coidentification must take place if it can, as set out in the Principle of Event Coidentification. However, it can only take place if a language has a syntactic or morphological means for expressing coidentified events of that type as a single event. Languages, we propose, might differ in this respect, and if so, they should manifest differences in the way they express events that in English can be expressed via event coidentification. Here we can only begin to explore this question and to consider its consequences.

New York, 1988, p. 88) must be evaluated carefully in order to determine whether or not they are best analyzed as causatives or as reflexive resultatives based on intransitive verbs. Under the first analysis, the sentence just cited would have the paraphrase 'I caused myself to march into the bookstore' and under the second analysis the sentence would receive the paraphrase 'I marched, thereby causing myself to go into the bookstore'. The examples in (104) contain verbs which do not readily appear as causatives with nonreflexive objects (**The cat crawled herself*, **He sauntered himself*), and so we can be fairly sure that these examples are not transitive causatives, but rather are reflexive resultatives.

A natural starting for such an investigation is the expression of motion events, as the cross-linguistic lexicalization of such events has received considerable attention. It has often been noted that English allows the free addition of goal phrases to verbs of manner of motion, allowing them to be used in the description of directed motion events, but that many languages do not allow bare goal phrases with such verbs and thus must describe such events in alternative ways (Carter 1988; Malblanc 1968; Slobin 1987, 1991, 1996; Talmy 1975, 1985; Vinay and Darbelnet 1958; Wienold 1995; among many others). It is possible that such languages lack the (morpho)syntactic means for expressing event coidentification in such events.

Thus, the discussion of event coidentification provides a fruitful context for re-examining the alternative devices that languages use to express motion events, while specifying both the goal and the manner of motion. Romance languages, which do not typically allow goal phrases with verbs of manner of motion, tend not to include both goal and manner of motion together in the expression of motion events (Malblanc 1968; Slobin 1996; Vinay and Darbelnet 1958). When these notions are both expressed, the main verb expresses the achievement of the result location, and the manner of motion is expressed independently in an adverbial clause, as in (106b) and (107b), the French counterparts of (106a) and (107b).

(106) a. I hopped into the house.

b. Je suis entrée à la maison en sautillant.
I am entered at the house in hopping
'I went into the house, hopping.'

(107) a. An old woman hobbled in from the back.

b. Une vieille femme arriva en boitant de l'arrière-boutique.
an old woman arrived in hobbling from the back-store
'An old woman came in hobbling from the back.'
(Vinay and Darbelnet 1958:105)

In (106b) and (107b) the use of two verbs in the French examples makes explicit the two subevents implicit in their English counterparts. Presumably, since French does not have a way of expressing coidentified events in structures of this sort, such periphrastic expressions are necessary when a speaker wishes to describe both the direction and manner of motion. While this discussion is only preliminary, we hope it demonstrates that it might be profitable to continue an investigation of cross-linguistic differences in the expression of motion events from the perspective of event coidentification.

5 Further Issues

In this section we briefly address several additional issues relating to our proposal that there are two types of compositionally derived events. First, we turn to some further issues involving the event structure analysis of resultatives. In section 5.1 we propose an account for the absence of unaccusative verbs in the NP-XP resultative pattern, and in section 5.2 we set out the issues that remain to be resolved in future

work. Then, in section 5.3 we explore a consequence of our analysis of compositionally derived events, showing how it explains a gap in the set of possible verb meanings.

5.1 A Restriction on Resultatives Based on Unaccusative Verbs

In section 4 we proposed an event structure-based account for a difference among intransitive verbs in their ability to take result XPs directly without the mediation of a "fake" reflexive—a contrast which had previously received a syntactic account. In this section we offer an event structure-based account of another contrast involving the distribution of result XPs with intransitive verbs which has also been previously given a syntactic explanation. As Burzio (1986), L&RH (1995), and Rothstein (1992) point out, unaccusative verbs are not found with nonsubcategorized NPs, and what is of particular relevance here is that they do not appear with result XPs predicated of such NPs (L&RH 1995), contrasting with unergative verbs, which are found with result XPs predicated of nonsubcategorized NPs—what we have called the NP-XP pattern. The inability of unaccusative verbs to appear in this pattern was illustrated in (12) in section 1.2. Several of these examples are repeated here; we return to the others below.

(108) a. *The bomb exploded the watermelons into the air.
b. *The ice melted the floor clean.
c. *The water evaporated the pot dry.

On a syntactic account to the resultative construction, the ungrammaticality of these resultatives follows from the inability of unaccusative verbs to assign accusative Case to the postverbal NPs (L&RH 1995). We now present an alternative event structure-based explanation for their unacceptability.

In L&RH (1995) we argue for a distinction between two types of verbs: those which describe eventualities that are conceptualized as being brought about by external causes, EXTERNALLY CAUSED VERBS—the verbs of change of state that we have discussed in this paper up to now are of this sort—and those which describe eventualities which are conceptualized as not being brought about by external causes, INTERNALLY CAUSED VERBS. We further suggest that the classification of verbs as internally or externally caused is reflected in their associated event structure representation. Externally caused verbs have the causative bievent structure in (79d) above.[33] Internally caused verbs—verbs such as *laugh, sing* and *dance*—have a simple event structure consisting of only one subevent, as in (79a), repeated below, since there is no external cause involved.

(109) [x ACT$_{<MANNER>}$]

The verbs in (108) are externally caused verbs of change of state. By hypothesis, they are inherently causative in nature, and thus they would be associated with

[33]In L&RH (1995) we assume that these verbs have a causative event structure even in their intransitive use, although in the intransitive use the causing subevent is lexically bound and receives no direct syntactic expression.

a causative event structure, with the causing subevent lexically bound; see L&RH (1995) and RH&L (1998a) for discussion. Event structures can have at most two subevents, and so the sentences in (108) are ruled out since the addition of a result phrase represents the addition of an additional subevent to verbs which already have a fully-elaborated event structure: a two-subevent causative event structure. In a sense, there is no room for the additional subevent in the event structure; see also RH&L (1998a).

We have just suggested that it is the classification of a verb as denoting an externally caused eventuality that is responsible for its incompatibility with the nonsubcategorized NP pattern. The verbs that have been been used to illustrate the NP-XP pattern, such as *laugh*, *sing*, and *dance*, describe internally caused eventualities. However, since these verbs usually appear with a single animate argument, while the subject of intransitive externally caused verbs are usually inanimate, one might assume that the contrast is tied to the animacy of this argument, rather than to the classification of the verb as denoting an internally or externally caused eventuality. However, the animacy of the single argument is not the key to the contrast. There are many internally caused verbs whose single argument may be inanimate, and such verbs are extensively attested with an inanimate single argument in the nonsubcategorized NP pattern in our corpus of resultative constructions. We present some examples below, chosen to exemplify verbs from a range of semantic classes.

(110) a. The phone jangled me into consciousness. (J. Dawson, *Take a Number*, Ballantine, New York, 1993, p. 108)

b. The telephone rang her out of a doze. (L. Colwin, *A Big Storm Knocked It Over*, HarperCollins, New York, 1993, p. 212)

c. He had set an alarm, which rang at five thirty the following morning, shrilling them both awake. (R. Pilcher, *Voices in Summer*, St. Martin's, 1984, p. 116)

d. She laid the flat of her right palm on the car's horn as if it were a siren, so that it blared us onto the block where Sherry and Lars lived. (N. Pickard, *Marriage is Murder*, Scribners', New York, 1987, p. 204)

e. ... a respirator hissed air into her lungs, peaked lines flickered and bleeped on the monitors above. (C. Weir, *Family Practice*, St. Martin's, New York, 1995, p. 43)

f. The fan whirled humid October heat away from Saroj. (K. Narayan, *Love, Stars, and All That*, Pocket Books, New York, 1994, p. 167)

g. The beacons flared the news through the land. (Henderson I 92; cited in K.-G. Lindkvist, *A Comprehensive Study of Conceptions of Locality*, Almqvist and Wiksell International, Stockholm, Sweden, 1976, p. 89)

h. The candle flickered shadows across his face ... (C. Weir, *The Winter Widow*, St. Martin's, New York, 1992, p. 102)

Yet another alternative hypothesis could be considered: that change of state verbs are excluded from the NP-XP pattern. This hypothesis might seem plausible given that the verbs in (108) are all verbs of change of state. There is a small set of internally caused verbs of change of state, including *bloat, bloom, blossom, deteriorate*, and *rot*,

which can be used to test this hypothesis. We have found a few instances of the nonsubcategorized NP pattern based on internally caused verbs of change of state, suggesting that it is external causation and not change of state that is the critical property.

(111) a. By the time I was seven he drank so much every day that the flesh around his eyes had bloated them practically shut. (K. Tucker, *Still Waters*, HarperCollins, New York, 1991, p. 11)

b. Many gardeners take this opportunity to rest on their laurels and enjoy their hanging basket, allowing it to bloom itself into oblivion. (T. Martin, "Showers of Flowers from Hanging Plants", Section 2, *The New York Times*, November 2, 1986, p. 37)

With the verbs in (110) and (111), it is clearly not the animacy of the argument of the verb which licenses the added result subevent. On our analysis the appearance of these verbs in such resultative constructions is expected since, being verbs describing internally caused eventualities, they all have an event structure consisting of single subevent (see RH&L 1998a), and there is room in this event structure for a second subevent to be added.

However, the classification of a verb as denoting an internally or externally caused eventuality is not the only factor which governs the acceptability of intransitive verbs in the nonsubcategorized NP pattern. All the verbs in (108), besides being classified as externally caused, are also verbs with a lexically-specified scale or incremental theme. There are intransitive verbs that describe externally caused eventualities which lack such a lexically-specified scale; these include manner of motion verbs such as *bounce, roll, spin*, and *rock*. Although we have considered examples such as (112) to be ungrammatical in previous work (L&RH 1995), and there are no definitive examples of this sort in our corpus, when presenting such examples to informants, they were consistently judged better than the examples in (108).

(112) a. ?? The ball bounced the markings off the floor.

b. ?? The wagon rolled the rubber off its wheels.

We interpret the difference in judgments as follows. The examples in (108) are ruled out by two constraints. The first is the constraint against an event having more than two subevents. But they are also ruled out by the constraint mentioned in section 2.3 that an event may not have two incremental themes (Goldberg 1995; Tenny 1987, 1994).

The ungrammatical sentences in (108) would have event structures with two subevents, each with its own incremental theme, though only in some of these examples is either incremental theme understood as the incremental theme of the entire causative event. In contrast, the examples in (112) only have the single, nonlexically-specified, incremental theme introduced by the result XP; therefore, they cannot be ruled out by the constraint against an event having two incremental themes. As we discuss in L&RH (1995), certain event types may be conceptualized as being either internally or externally caused, and the types of manner of motion verbs exemplified

in (112) describe event types that are open to both conceptualizations. It may be that these examples are considered acceptable to the extent that they can be conceptualized as involving internally caused uses of the verbs and thus given the same analysis as the examples in (110) and (111).

5.2 Some Unresolved Issues in the Analysis of Resultatives

We have now offered an alternative to the syntactic explanation for the two different resultative patterns exhibited by intransitive verbs with added result XPs. Our account is based on an understanding of the event structures associated with the distinct verb-result XP combinations. In so doing, we have argued for two distinct types of event conflations and elucidated their associated event structures, in accordance with the goal articulated at the outset of the paper. Since we have used the resultative constructions to understand the nature of these event conflations, we want to make clear how our account falls short of being a full semantic account of the resultative construction. Specifically, our account does not yet provide a full treatment of resultative constructions based on transitive verbs, as we elaborate briefly here.

In section 3.3 we showed that resultative constructions based on transitive verbs fall into the same two subtypes as resultative constructions based on intransitive verbs with respect to the possible temporal relations between subevents. We proposed that a causative analysis would be appropriate for resultatives based on transitive verbs with temporally-independent subevents, but not for those with temporally-dependent subevents. In the context of the discussion in section 4.3, we would further propose that transitive verb-based resultatives with temporally-dependent subevents should be assigned an event structure consisting of a single subevent reflecting the two coidentified subevents. However, certain details of the mapping of such event structures to the syntax need to be worked out, specifically, the repercussions of the fact that, as transitive verbs, the base verbs themselves require two arguments. The way in which both these arguments figure in the mapping to syntax needs to be clarified.

We have also not offered a complete alternative analysis of the facts that the DOR explains. We have accounted for the presence of a fake reflexive in some resultative constructions and its absence in others, but we have not offered an account which determines and explains which NP a result XP can be predicated of with transitive verbs. The DOR constrains result XPs to be predicated of direct objects. Without the DOR, it becomes necessary to provide a semantic characterization of the NP which a result XP can be predicated of. It is widely assumed that in English this NP must be the direct object of a transitive verb, and in fact, it is the direct object in the most commonly attested examples. Wechsler (1997), however, claims that there are some result XPs predicated of the subject of transitive verbs in English (see note 5), offering the examples in (113).

(113) a. The wise men followed the star out of Bethlehem.

b. The sailors managed to catch a breeze and ride it clear of the rocks.

c. He followed Lassie free of his captors.

(Wechsler 1997:313, (15))

Verspoor (1997) agrees with Wechsler, offering additional examples.

(114) a. John danced mazurkas across the room.
b. John walked the dog to the store.
c. John swam laps to exhaustion.
d. The children played leapfrog across the park.
(Verspoor 1997:151, (4.102))

If Wechsler's claim is correct, then presumably the subjects in (113) and (114) must also fall under the semantic characterization of NPs which the result XP can be predicated of. This problem is not unrelated to the first problem mentioned in this section, and we plan to return to both in future work that focuses on the resultative construction itself.

5.3 An Explanation for a Lexical Gap

Finally, our analysis explains a little noticed and hitherto unexplained lexical gap in the verbal inventory of English, and, presumably, of all languages. Many English transitive verbs specify a particular change of state in their object, while leaving the action of the agent completely unspecified. That is, although verbs such as *break* and *melt* specify the exact change undergone by the denotation of their object, they say nothing at all about the activity of the agent which brings about this change. A sentence like *Kelly broke the vase* is compatible with any means of direct causation: hitting the vase with a hammer, smashing it against the wall, dropping it, and so on. Similarly, *Sandy melted the chocolate* is compatible with putting the chocolate in a microwave, melting it in a pot over the stove, blowing hot air on it from a blowdryer, or just putting it in the sun. Schematically, these verbs have meanings of the form in (115).

(115) 'unspecified event CAUSE BECOME specified state'

However, as noted in (L&RH 1995:295, n. 13), there are absolutely no verbs with the lexical specification in (116).

(116) 'specified event CAUSE BECOME unspecified state'.

A verb associated with this kind of meaning would be the hypothetical verb *shing*, which differs minimally from *sing* in that *Tracy shang the audience* would mean in addition to 'Tracy sang' that 'Tracy's singing caused an unspecified result state in the audience'.

This lexical gap can be understood in the context of the analysis of causative events which we developed here. We have claimed that in causative sentences, it is the temporal extent of the result subevent which is crucial. The compositionally derived event terminates when the result subevent is over, independent of the temporal extent

of the causing subevent. The truth of a causative sentence is judged relative to the culmination of the result subevent, so that, for example, a causative sentence in the past tense is judged true when the result subevent has culminated whether or not the causing subevent has culminated. But without an explicit indication of the result subevent, there is no way to determine the culmination of the causative event, and no way to judge the truth of a sentence containing it. We propose that since the nonexisting verbs would require such a problematic event structure, this is the reason for the lexical gap.

6 Conclusion

In this paper, we have used event conflations based on intransitive verbs as a probe into the nature of compositionally derived events. We have shown that there are two types of event structures which arise from event conflation, as we proposed at the outset of the paper.

• A causative event structure consisting of two subevents formed from the conflation of two temporally-independent events.

• A simple event structure formed from the conflation of two temporally-dependent "coidentified" events.

In arguing for these two types of event structures, we have clarified the nature of the relation that must hold between two events in order for them to be conflated as subevents of a single event. We have shown that two events can be conflated as subevents of a single event if they are either causally related or temporally dependent. We have also investigated whether the internal structure of event conflations is reflected in their associated linguistic event structure representations. From the perspective of the linguistic representation of events, event conflation does not always result in a causative event structure with two subevents: only the first of the two types of event conflation gives rise to a causative event structure. In addition, we have argued that the two distinct syntactic patterns associated with resultative constructions based on intransitive verbs are manifestations of the two distinct event structures we have identified. Thus, the nature of the event conflation is reflected in the syntax, with causative event structures requiring two arguments in their syntactic realization, following the Structure Participant Condition. Finally, we point out that we were able to uncover these two distinct types of compositionally derived event structures and the different semantic relations between their subevents by paying careful attention to semantic patterns which correlate with syntactic patterns.

Our analysis has a further consequence, mentioned in section 2, which we return to because of its important ramifications. The facts concerning the distribution of result XPs have constituted the strongest evidence for positing distinct syntactic classes of unaccusative and unergative verbs in English, a language that lacks the explicit morphosyntactic indicators of unaccusativity such as auxiliary selection found in some Romance and Germanic languages. In setting out our theory of the nature of compositionally derived events, we have proposed a semantic account of the most widely discussed facets of the resultative construction which explains the syntactic

properties of the construction. In so doing, this work calls even more seriously into question whether there is any evidence for the syntactic encoding of unaccusativity in English. We leave it for further work to pursue these implications.

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