"Küß mich tot!"
—Pina Bausch, Die Klage der Kaiserin

"I ate my plate completely soggy."
—Moo Bishop, at a paper-plate dinner party, Dorchester, Massachusetts

1. Overview

In this article we investigate the argument structure of resultative verbs in order to establish the syntactic structure of the sentences they occur in and, more generally, to shed light on the nature of the relationship between argument structure and syntactic structure.

Resultatives in English come in the two varieties shown in (1) and (2).

(1) Transitive resultatives
a. The gardener watered the tulips flat.
   b. The grocer ground the coffee beans \((\text{in})\) to a fine powder.
   c. They painted their house a hideous shade of green.

(2) Intransitive resultatives
a. The joggers ran their Nikes threadbare.
   b. The kids laughed themselves into a frenzy.
   c. He sneezed his handkerchief completely soggy.

Those in (1) we will call transitive resultatives, and those in (2) intransitive resultatives,

Colleagues too numerous to list here contributed to our thinking about these issues. For their direct influence on this article we thank Josef Bayer, Samuel Epstein, Marco Haverkort, Masayuki Ike-Uchi, Ray Jackendoff, Jaklin Kornfilt, Elaine McNulty, Tova Rapoport, Susan Rothstein, Jane Simpson, and the participants in the Lexicon Project at MIT. We are also grateful for the comments of an anonymous LI reviewer. Special thanks go to Joseph Emonds and John Frampton for generous doses of time, ideas, and spirit. Janet Randall acknowledges the Max Planck Institute for Psycholinguistics and the Northeastern University Research Scholarship Development Fund for their support during the writing of this article. The order of the authors' names is alphabetical.
based on the transitivity of their verbs in nonresultative sentences such as (3) and (4).  

(3) a. The gardener watered the tulips.
   b. The grocer ground the coffee beans.
   c. They painted their house.

(4) a. The joggers ran.
   b. The kids laughed.
   c. He sneezed.

We will show that for both transitive and intransitive verbs the result phrase (flat in (1a) and threadbare in (2a)) is an argument of (i.e., is 8-marked by) the verb. Furthermore, for transitive resultatives (though not intransitives), the postverbal NP (the tulips in (1a)) is also an argument of the verb. Under the standard assumption that argumenthood requires sisterhood (as for example in Chomsky (1986, 13)), the verb, the postverbal NP, and the result XP must all be sisters, in a ternary-branching VP. This means that a variety of small clause and complex verb analyses of resultatives are untenable.

In the course of establishing the syntactic structures of resultatives, we come to a more general conclusion about the relationship between the two levels of grammatical representation, argument structure and syntactic structure. In a departure from standard assumptions, we will argue that the relationship between these two levels is asymmetric. Although an argument of a verb must be its syntactic sister, a sister of a verb is not necessarily its argument.

We will show, further, that the relationship between syntactic structure and semantics is also asymmetric. Although syntactic constituents always correspond to semantic units, a semantic subject-predicate unit does not always turn out to be a syntactic constituent.

1.1. Three Competing Analyses of Resultatives: The Binary Small Clause Analysis, the Ternary Analysis, and the Hybrid Small Clause Analysis

The analyses that have been given in the literature for resultatives like (1) and (2) fall into two basic types: those in which the postverbal NP and the result phrase form a small clause (SC) and those in which they do not. The SC analyses themselves fall into several types. The most widely adopted one, shown in (5), is the one we will primarily

---

1 Acceptability judgments of resultatives vary widely across speakers. The judgments in this article represent those of a liberal dialect. However, as we will illustrate, many potential resultatives are impossible for all speakers, for principled reasons. Readers with more restrictive dialects should note that most of the judgments involve relative acceptability, which they will be able to detect as well. For discussion, see Carrier and Randall (to appear).

2 Throughout this article we will use intransitive verb to mean 'unergative verb'—that is, a verb whose sole argument is an external argument. We will refer to monadic verbs whose sole argument is a direct internal argument as unaccusative verbs, following Perlmutter (1978). Burzio (1986) called these ergative verbs.
discuss (Kayne (1985), Van Voorst (1986), Hoekstra (1988)). We call it the *Binary SC Analysis* because it assigns binary-branching *VPs* to both transitive and intransitive resultatives. In contrast, we call the SC analysis in (6) the *Hybrid SC Analysis* because although it assigns intransitive resultatives a binary-branching VP, it assigns transitive resultatives a ternary-branching VP, containing an SC whose subject is PRO.³⁴

(5) *The Binary SC Analysis*

![Binary SC Analysis Diagram](image)

(6) *The Hybrid SC Analysis*

a. Transitive resultatives

![Hybrid SC Analysis Diagram](image)

³ In focusing on the Binary and Hybrid SC Analyses, we have chosen what we feel are the strongest among the conceivable analyses involving SCs. However, two alternative hybrid analyses will be discussed and rejected in section 5.

⁴ We label the SC constituent simply SC first, because there is no consensus among SC proponents with respect to either the category or the bar-level of the SC, and second, because our claims do not hinge on the choice for either of these. However, we will discuss the bar-level of the SC in section 5, where it is relevant to our evaluation of the Hybrid SC Analysis. As for category, Stowell (1981) has argued that SCs be treated as projections of the predicate inside them because often, verbs that take SCs seem to c-select the category of the SC predicate. This would mean that resultative SCs can be APs, PPs, and NPs, since resultative predicates come in all three category types, as in (la–c). However, we argue in section 2.1 that, in fact, the selection of the result predicate is semantic s-selection and not syntactic c-selection. Moreover, as we will show, the facts of argument structure require that there be no resultative SC constituent, so the question of what category the SC might be becomes moot.
b. Intransitive resultatives

The second basic type of analysis given to resultatives is the **Ternary Analysis**, in which the postverbal NP and the result phrase are sisters within a ternary-branching VP (Green (1972; 1974), Randall (1982), Schein (1982), Rothstein (1983), Simpson (1983; 1986), Rapoport (1986), Carrier and Randall (to appear)). This is shown in (7). Like the Binary SC Analysis, but unlike the Hybrid SC Analysis, the Ternary Analysis assigns a single structure to the two types of resultatives.

(7) **The Ternary Analysis**

1.2. Argumenthood and the Definition of Argument

The three syntactic analyses of resultatives make different predictions about the argument structure of resultatives. We will show that only the Ternary Analysis makes the correct ones. But before we can demonstrate this, we must spell out our assumptions about argument structure in general.

The lexical entry of each verb specifies what in recent approaches is called a verb's **Argument Structure** (henceforth AS). The AS of each verb gives the number of arguments that must be satisfied in the syntax, in accordance with clause (a) of Chomsky’s (1982, 8) Extended Projection Principle, stated informally in (8).

(8) **Extended Projection Principle**

a. The 0-marking properties of each lexical item must be represented categorically at each syntactic level: at LF, at S-Structure, and at D-Structure.

b. All clauses must have subjects.
Since the early 1980s many investigators (e.g., Williams (1981), Pesetsky (1982), Marantz (1984)) have portrayed ASs as θ-Grids, where each argument is listed not in terms of its syntactic category or linear order but in terms of its θ-role. The AS for put, for example, is (9) (adapted from Marantz (1984)):

\[(9) \text{put} \quad \text{agent} \left[ \text{theme} \quad \text{goal} \right] \]

According to (9), put takes three obligatory arguments. The agent is the external argument, represented outside the square brackets. As such, this argument must be identified with an NP in D-Structure that is outside the verb's maximal projection, namely, the subject NP in (10).

\[(10) \quad \text{NP} \left[ \text{VP put} \quad \text{NP} \left[ \text{PP P NP} \right] \right] \quad \text{D-Structure} \]

\[
\begin{array}{c}
| \quad | \\
\mid \quad | \\
| \quad |
\end{array}
\]

\[
\begin{array}{ccc}
\text{agent} & [\text{theme} & \text{goal}] \\
\end{array}
\]

Argument Structure

Put has two internal arguments, a theme and a goal. The theme is underlined to indicate that it is the direct internal argument, "direct" in the sense that it receives its 0-role directly from the verb. Since direct 0-marking requires mutual c-command, this argument must be identified with a D-Structure NP that is a sister of the verb. Case-marking considerations further ensure that this argument is identified with a rightwardly adjacent sister of the verb. The goal argument is an "indirect" internal argument, in the sense that it is assigned its 0-role not by the verb directly, but by a governing preposition. Accordingly, it is identified with a D-Structure NP in that preposition's domain. In short, each NP argument in the D-Structure representation in (10) bears the particular 0-role in the verb's AS that its structural position allows it to be identified with.

Verbs are not the only category to have ASs. An adjective like flat takes a single external argument, as shown in (11).

\[(11) \text{flat} \quad \text{theme} \left[ \quad \right] \]

As above, at D-Structure only an NP outside the maximal projection of the adjective (i.e., outside the AP) is eligible to be identified with this external theme position.

\[5 \quad \text{Although we will use θ-Grids as AS representations for the purposes of this discussion, in fact, we believe that 0-roles are not expressed at the level of AS at all. Rather, as proposed by Jackendoff (1983; 1990a) and Rappaport and Levin (1988), we assume that agent, theme, goal, and so on, are just shorthand for entities in a separate level within the verb's entry, Lexical Conceptual Structure. Our decision to use the more familiar θ-Grid approach here does not affect any of the arguments against the SC analyses of resultatives that we give below. To see them cast in terms of Lexical Conceptual Structure, see Carrier and Randall (to appear).} \]

\[6 \quad \text{Here, once again, we are following the standard assumption. However, in Camer and Randall (to appear) we assume that the entire PP following put and not the NP object of the preposition is an argument of the verb and thus that there is no such thing as an indirect argument. Carrier (1989) argues for this position.} \]

\[7 \quad \text{Other adjectives can take both an internal and an external argument, for example, fond or sick as in (i).} \]

(i) John is \{fond\} of raspberries.
Now let us return to what the three syntactic analyses of resultatives each imply about the AS of resultative verbs. We focus first on the Binary SC Analysis and the Ternary Analysis.

Under both, transitive and intransitive resultatives have an identical syntax. And both take the relationship between the result phrase and the NP to be one of predication; the postverbal NP is the subject of the result predicate. A crucial difference between the two analyses, however, lies in the AS relationship that can hold between the postverbal NP and the verb. Under both analyses, when the verb *water* is used in the non-resultative sentence in (3a), it has a direct internal argument, namely, *the tulips*. Its 0-Grid is (13).

(13) \[\text{water} \quad \text{agent} \quad \text{[theme]}\]

When *water* is used in a resultative sentence like (1a), however, the two analyses diverge. Under the Binary SC Analysis, *the tulips* is no longer a sister of the verb and therefore is not its argument. Since it is not its argument, it cannot receive a 0-role from it. Rather, if the verb assigns a 8-role at all, it can only be to the entire SC constituent. Under this analysis, then, forming a resultative from a transitive verb involves (a) suppressing the direct internal argument and (b) adding an SC argument that (for lack of a better label) we will call *resultant event* (or *r-event*). (14) contains the \(\theta\)-Grids for transitive *water* and intransitive *run* and their resultative counterparts, according to the Binary SC Analysis. Notice that the resultative \(\theta\)-Grids are identical; transitive and intransitive resultatives have identical ASs.\(^8\)

(14) \(\theta\)-Grids under the Binary SC Analysis

<table>
<thead>
<tr>
<th>Basic verb</th>
<th>Resultative verb</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>water</em></td>
<td>agent [theme]</td>
</tr>
<tr>
<td><em>run</em></td>
<td>agent []</td>
</tr>
</tbody>
</table>

\(^8\) Alternatively, the SC is not an argument, as suggested by Hoekstra (1988), who considers them complements, but not arguments. The \(\theta\)-Grids would then be as follows:

(i) \[\text{water} \quad \text{agent} \quad \text{[}]\]
(ii) \[\text{run} \quad \text{agent} \quad \text{[}]\]

All the arguments we will give against (14), however, will apply to this version as well.
In contrast, under the Ternary Analysis of (1a), *the tulips* is still a sister of the verb. **Since** it is still properly positioned to be the verb's direct internal argument, it can continue to receive the theme 0-role from the verb. This is shown in (15). The Ternary Analysis also makes it possible to claim that verbs in resultative sentences inherit the **ASS** that they have in nonresultatives, only adding an argument. We will call this added argument the **r(esultant)-state**.9

(15) **θ-Grids under the Ternary Analysis**

<table>
<thead>
<tr>
<th>Basic verb</th>
<th>Resultative verb</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>water</em></td>
<td>agent [theme]</td>
</tr>
<tr>
<td><em>run</em></td>
<td>agent [theme r-state]</td>
</tr>
<tr>
<td></td>
<td>agent [r-state]</td>
</tr>
</tbody>
</table>

Crucially, then, under the Ternary but not the Binary SC Analysis, the postverbal NP can be an argument of the verb. Note that "can be an argument of the verb" does not mean "is necessarily an argument of the verb." In fact, we will argue that although for transitive resultatives the NP sister of the verb is its argument, for intransitive resultatives it is not. This means that transitive resultatives, like their nonresultative counterparts, assign their postverbal NP a θ-role; intransitive resultatives, like their nonresultative counterparts, do not.

Following from the two different predictions that these analyses make about the argumenthood of the postverbal NP are two different predictions about what resultatives mean. If the postverbal NP in a transitive resultative is an argument of the verb, as allowed by the Ternary Analysis but not the Binary SC Analysis, then it receives a θ-role from that verb. Consequently, the cases in (1) should have "transitive" meanings. (1a) should mean, 'As a consequence of the gardener *watering the tulips*, the tulips became flat'. We will argue that this is in fact what such sentences mean. Under the Binary SC Analysis, where the postverbal NP cannot be an argument of the verb and therefore does not receive a 0-role from it, our so-called "transitive" resultatives in (1) are not really "transitive." (1a) can only mean, 'As a consequence of the gardener *engaging in the activity of watering*, the tulips became flat'. This is the meaning that Kayne (1985) and Hoekstra (1988) attribute to it, as will become clear below.

The claim made possible by the Ternary Analysis, in which the postverbal NP is an argument of the verb for transitive resultatives, has implications for the 0-Criterion. Recall that the r-state argument itself has a 0-role to assign. As their **ASS**s in (16) show, both *flat* and *threadbare*, in turn, each take an external argument.

(16) *flat* theme [ ]
    *threadbare* theme [ ]

Under the Ternary Analysis, then, the postverbal NP is in a position where it can receive

---

9 We are inventing the new 8-role label **resultant-state** for the result phrase for the purposes of this discussion. Simpson (1986) treats the result phrase as a goal. This is close in spirit to our treatment in Carrier and Randall (to appear), although we believe that 0-roles are expressed and their meanings captured at the more elaborated level of Lexical Conceptual Structure (see footnote 5).
two 8-roles: one from the resultative verb, by virtue of being its direct internal argument, and one from the result predicate, by virtue of being its external argument. We will claim that for transitive resultatives, two 0-roles are indeed assigned to the postverbal NP. So in (1a), *The gardener watered the tulips flat, the tulips is θ-marked by both water and flat.*

This point is not novel. Both Schein (1982) and Rapoport (1986) endorse the Ternary Analysis and have also taken the position that the postverbal NP for transitive resultatives is an argument of both the verb and the result XP. And, as they point out, this requires a revised θ-Criterion. In our formulation (a modification of Rapoport's), an XP can bear more than one 8-role as long as each 8-role is assigned by a different head.

(18) **Relativized θ-Criterion**

An XP chain can be associated with at most one argument position in any given AS. Each AS position must be satisfied by one and only one XP chain in the syntax.

(18) allows the postverbal NP to be doubly 8-marked, once each by *water* and by *flat*. In intransitive cases like (2a), *The joggers ran their Nikes threadbare*, the postverbal NP is not an argument of the verb, but it is an argument of the result predicate. Consequently, it receives only one 0-role, as shown in (19).

---

10 Several other versions have been proposed, including those of Williams (1983) and Emonds (1985). Our version is similar to Chomsky's (1981) final version (p. 335), which essentially states that an XP cannot receive more than one 0-role from a single predicate but may receive separate θ-roles when there is more than one source. See Emonds (1985, chap. 2) for discussion and additional evidence from gerunds.
According to the Ternary Analysis, then, despite their identical syntax, transitive and intransitive resultatives potentially differ with respect to AS. As (15) showed, transitives can have an additional argument. If the two types of resultatives do in fact differ at the level of AS, then we have a case where AS and syntactic structure are not isomorphic: being a sister of a verb does not entail being an argument of that verb.

The Ternary Analysis and the Binary SC Analysis also make different claims with respect to the status of the result phrase (e.g., flat and threadbare). According to the Binary SC Analysis, the result phrase is embedded within the SC sister of the verb. Only under the Ternary Analysis is the result phrase the verb's sister and therefore potentially its argument.

Let us now turn briefly to the Hybrid SC Analysis, depicted in (6) and repeated here as (20).

(20) *The Hybrid SC Analysis*

a. Transitive resultatives

```
  VP
   \ /
  V  NP  SC
     \   /  \\
    water the tulips NP AP
       \   /  \\
        PRO  flat
```

b. Intransitive resultatives

```
  VP
   \ /
  V  SC
     / \  \\
    run  NP AP
      /   /  \\
    their Nikes threadbare
```

Like the Binary SC Analysis and unlike the Ternary Analysis, the Hybrid SC Analysis claims that the result phrase is not a sister of the verb and therefore not its argument. On the other hand, unlike the Binary SC Analysis and like the Ternary Analysis, it claims that the postverbal NP for transitive resultatives is a sister and therefore potentially an argument of the verb. Also, as under the Ternary Analysis, a resultative verb differs from its base verb only in having an additional argument. However, this argument bears
the 0-role "r(esultant)-event" and is satisfied by an SC constituent in the syntax. The 0-Grids for basic and resultative run and water under the Hybrid SC Analysis are given in (21).

<table>
<thead>
<tr>
<th>Basic verb</th>
<th>Resultative verb</th>
</tr>
</thead>
<tbody>
<tr>
<td>water</td>
<td>agent [theme]</td>
</tr>
<tr>
<td>run</td>
<td>agent [r-event]</td>
</tr>
</tbody>
</table>

1.3. Road Map

In this article we will argue for the Ternary Analysis of resultatives over both the Binary SC and Hybrid SC Analyses. In section 2 we review the evidence that the result XP is an argument of the verb for both transitive and intransitive resultatives, contrary to both the Binary SC and the Hybrid SC Analyses. The evidence involves the selection of result XPs and long-distance extraction of wh-result XPs.

In section 3 we bring to light new evidence that a ternary structure is correct for transitive resultatives, by showing that the transitive postverbal NP is an argument of the verb. This fact is compatible with either the Ternary Analysis or the Hybrid SC Analysis, but is incompatible with the Binary SC Analysis, which claims that the postverbal NP and the verb are not sisters for either type of resultative. There are four arguments for the claim that the postverbal NP in transitive resultatives has the status of an argument. First, the postverbal NP is selected by the verb. Further, transitive resultatives undergo three rules that apply only to verbs whose postverbal NP is a direct internal argument: (i) Middle Formation, (ii) Adjectival Passive Formation, and (iii) Nominal Formation. A fifth set of facts, from long-distance extraction, is compatible with this claim. The same five criteria also show that for intransitive resultatives the postverbal NP is not an argument of the verb.

Before completely rejecting the Binary SC Analysis, however, in section 4 we review an argument that has been given in favor of it, based on the extraction of a subpart of resultative postverbal NPs (Kayne (1985)). Here we show that although the data are rather murky, if anything, they argue that neither transitive nor intransitive resultatives have binary-branching VPs. As such, the extraction facts actually argue against the Binary SC Analysis that they were intended to support. They also argue against the Hybrid SC Analysis, since this analysis assigns the same syntactic structure to intransitive resultatives that the Binary SC Analysis does.

In section 5 we give more conclusive evidence against the Hybrid SC Analysis, showing that it requires contradictory assumptions about whether result SCs are barriers to government.

All three analyses assume that the postverbal NP and the result XP are in a subject-predicate relation. However, as we show in section 6, each makes different assumptions about the structural conditions on control and on the subject-predicate relation. There
take up the C-Command, Mutual C-Command, and Mutual M-Command Conditions and show that the Ternary Analysis is superior to both the Binary SC and Hybrid SC Analyses in that the conditions it must assume are those required in the grammar anyway.

In section 7 we turn to the implications of choosing a ternary structure for resultatives. The most significant is that it requires that syntax and argument structure be nonisomorphic: although arguments are always syntactic sisters, not all sisters are arguments. Syntactic constituency also does not necessarily reflect semantic constituency. Two syntactic phrases that together express an event or a proposition do not necessarily exhaustively form a syntactic constituent. So although *water the tulips flat* means that the tulips become flat, *the tulips* and *flat* are not a syntactic unit. Having reached these conclusions on the basis of resultatives, we turn to the question of whether other constructions classically given SC analyses are analyzable instead in ternary terms.

In an appendix we examine the possibility of extending Larson's (1988) Complex Verb Analysis of dative verbs to resultatives. We show that it does not offer a reasonable alternative to the Ternary Analysis.

2. Arguments for the Ternary Analysis

2.1. The Selection of the Result Predicate

The Ternary Analysis has been argued for in other works on the basis of the s-selection that holds between the verb and the result predicate (Green (1972; 1974), Randall (1982), Simpson (1983; 1986), Rothstein (1983), and Carrier and Randall (to appear)). Although the result predicate is fairly free in terms of category—it can be an AP, PP, or NP—still, not every potential result phrase within these categories is allowed.

(22) **AP result phrases**
   a. She pounded the dough [*AP flat as a pancake*].
   b. She painted the barn [*AP red*].
   c. They ran their sneakers [*AP ragged*].

(23) **PP result phrases**
   a. She pounded the dough [*PP into a pancake*].
   b. *She painted the barn [*PP (in)to a weird shade of red]*
   c. They ran their sneakers [*PP to tatters*].

(24) **NP result phrases**
   a. *She pounded the dough [*NP a pancake*].
   b. She painted the barn [*NP a weird shade of red*].
   c. They ran their sneakers [*NP a dingy shade of grey*].

Most NPs, such as *a pancake* in (24a), are unacceptable unless they are inside a PP headed *by to or into*. Other NPs are possible, though, such as *a weird shade of red* in (24b). Simpson (1983) proposes that whatever its category, the result XP must designate a state. *A weird shade of red* meets this requirement, but *a pancake* does not. Though'
it is not clear what the precise formulation of the state restriction should be, it does seem clear that one is needed, as c-selection does not go very far in determining the class of allowable result XPs.

Further evidence of s-selection comes from the fact that although APs are the most common category for result phrases, APs headed by deverbal -ing and -ed adjectives are systematically barred from both transitive and intransitive resultatives.\footnote{Syllabic -ed adjectives like ragged, three-legged, and wicked are not deverbal and so they are fine. Certain -ing adjectives that have drifted semantically are also allowed.}

(25) a. Transitive resultatives
   The maid scrubbed the pot [\textit{AP shiny/*shined/*shining}].
   The jockeys raced the horses [\textit{AP sweaty/*sweating}].
   The chef cooked the food [\textit{AP black/*blackened/*charred}].

b. Intransitive \textit{resultatives}
   The joggers ran themselves [\textit{AP sweaty/*sweating/exhausted}].
   The kids laughed themselves [\textit{AP sick/*sickened}].
   The chef cooked the kitchen walls [\textit{AP black/*blackened}].
   The tourists walked their feet [\textit{AP sore/blistery/*blistered}].

We propose (following Simpson (1983) and Smith (1983)) that the constraint is a semantic one; there is an aspectual clash between the meaning of resultatives and the meanings of -ed and -ing adjectives. Though the semantics of these adjectives is beyond the scope of this article, it is clear that c-selection is of no help in accounting for (25).

Finally, many resultatives are like idioms in that they require a result phrase that can be satisfied only by either one unique lexical item (e.g., smite dead in (26a)) or a small set of lexical items with a highly idiosyncratic meaning (e.g., drive crazy/bonkers/) etc. in (26b), where the result phrase must designate a deranged mental state).

(26) a. God smote him \textit{dead/*half-dead/*black} and blue.
    b. He drove her \{\textit{crazy/bonkers/over the edge/to the brink of lunacy} \}
       \* \textit{happy/*to the brink of ecstasy}.

Since the semantic features of a result predicate cannot percolate up to the next higher node the way categorical features can, we must assume that the verb s-selects the result phrase directly. The result phrase must therefore be an argument of the verb. This requires that it be a sister of the verb for both transitive and intransitive resultatives, as claimed by the Ternary Analysis, but not by the Binary SC or the Hybrid SC Analyses.

2.2. Long-Distance Extraction of the Result XP

A second argument for the claim that the result XP is an internal argument of the verb comes from long-distance movement. As McNulty (1988, 157, 165) points out, when \textit{wh-}
result XPs are extracted out of wh-islands, the result is a Subjacency violation rather than an Empty Category Principle (ECP) violation. The cases in (27) illustrate this.

(27) Long-distance extraction of result XPs
a. Out of transitive resultatives
   ?How flat do you wonder whether they hammered the metal? (from McNulty (1988))
   ?How shiny do you wonder which gems to polish?
   ?Which colors do you wonder which shirts to dye?
   ?Which sizes do you wonder which logs to cut?

b. Out of intransitive resultatives
   ?How threadbare do you wonder whether they should run their sneakers?
   ?How hoarse do you wonder whether they sang themselves?
   ?How bald do you wonder which tires to drive?
   ?How dry do you wonder whether the sun baked the field?

In this respect, result XPs behave like internal arguments and unlike adjuncts, subjects, or depictives, as shown by the contrast between (28) on the one hand and (29), on the other.

(28) Long-distance extraction of internal arguments
a. *[Which boys] do you wonder whether to punish ti?
   *[Which boys] do you wonder [who] should punish ti?
   *[Which boys] do you wonder [how] to punish ti?

b. *[Which guests] do you wonder [which dishes] to serve ti?
   *[Which kids] do you wonder [which stories] to tell ti?

c. *[Which letters] do you wonder [how vaguely] to word ti?
   *[Which dignitaries] do you wonder [how well] to treat ti?

d. *[How vaguely] do you wonder [which letters] to word ti?
   *[How well] do you wonder [which dignitaries] to treat ti?

(29) Long-distance extraction of adjuncts, subjects, and depictives
a. *[How] do you wonder whether to punish these boys ti?
   *[How] do you wonder [who] should punish these boys ti?
   *[How] do you wonder [which boys] to punish ti?

b. *[Who] do you wonder [which boys] should punish ti?
   *[Who] do you wonder [how] to punish these boys ti?

c. "*[How angry] does Mary wonder whether John left ti?
   *[How angry] does Mary wonder [why] John left ti?"
3. Evidence against the Binary Small Clause Analysis: The 0-Marking of the Postverbal NP

In this section we will give four arguments that the postverbal NP in a transitive resultative is an argument of the verb. As such, transitive resultatives must have a structure in which the postverbal NP and the verb are sisters. This rules out the Binary SC Analysis, which claims that both transitive and intransitive resultatives have binary-branching VPs. The fact that the transitive postverbal NP is an argument of the verb in and of itself does not rule out the Hybrid SC Analysis, in which transitive resultatives have a ternary structure but intransitive resultatives have a binary structure. However, we have given one argument against the Hybrid SC Analysis in the last section, and we will present further arguments in sections 4 and 5. Thus, the Ternary Analysis of resultatives is the only one of the three that is compatible with all of the AS facts.

3.1. 8-Role Assignment and Selectional Restrictions

Our first argument that the postverbal NP in a transitive resultative is an argument of the verb is that it receives an 8-role from and is selected by the verb. In the resultative sentence (30a) the tulips receives the same 0-role from water as it does in the non-resultative sentence (30b). Both lead to the intuition that the tulips get watered. This is not the intuition one has for intransitive resultatives like (31a), however; their Nikes do not get run. Such intuitions are expected if in the (a)-examples the tulips but not their Nikes is an argument of the verb.

(30) a. The gardener watered the tulips flat.
   b. The gardener watered the tulips.

(31) a. The joggers ran their Nikes threadbare.
   b. The joggers ran.

Kayne (1985) argues to the contrary that the intuition that the tulips get watered in (30a) is a result of pragmatics, not argument structure. As evidence, he cites cases like (32), where the tulips is clearly not an argument of water, yet the tulips are nevertheless understood as getting watered.

(32) A little more watering should get these tulips flat.

He claims that this interpretation of (32) is a result of our real-world knowledge; in order for the tulips to get flat as a result of some watering taking place, it must be that the tulips are what is getting watered. And if this is so, Kayne argues, then the understood relationship between water and the tulips in (30a) can be explained in the same way. In order to be understood as getting watered, the tulips does not have to be the direct internal argument of water.\(^{12}\) The Binary SC Analysis, then, is not yet ruled out.

We agree with Kayne that there is a reading of (30a) in which the tulips is not 0-
marked by water. As (33) illustrates, water can also be used intransitively, with an indefinite object reading. The Kayne-type example in (32) is an instance of this intransitive use.

(33) The gardener watered for hours.

Moreover, the claim that there are two waters leads us to the claim that it is possible to form two resultative waters: a transitive resultative from transitive water and an intransitive resultative from intransitive water. (The sentences in (34), though actually ambiguous, highlight these two readings.)

(34) a. The gardener watered the tulips. →
   The gardener watered the tulips flat.
   b. The gardener watered. →
   The gardener watered his sneakers soggy.

What clinches the necessity of allowing a resultative verb to 8-mark its postverbal NP comes from obligatorily transitive verbs such as those in (35).

(35) a. The bears frightened *(the hikers).
   b. *The baby shattered *(the porringer).
   c. The magician hypnotized *(the volunteers).

If, as the Binary SC Analysis maintains, the postverbal NP in a resultative is never θ-marked by the verb, then resultatives based on these verbs too should have only indefinite object readings.13

(36) a. The bears frightened the hikers speechless.
   b. The baby shattered the porringer into pieces.
   c. The magician hypnotized the volunteers into a trance.

For example, (36a) should mean 'The bears frightened someone or other, thereby causing the hikers to become speechless'. "Someone or other" might be the hikers, the park rangers, or anybody else. But, in fact, no indefinite object reading is possible in (36a). It must be the hikers who are frightened. Thus, the postverbal NP must be an argument. The same is true for (36b–c).

Selectional restrictions provide further evidence that these verbs require their postverbal NPs to be arguments, as (37) illustrates.

(37) a. *The bears frightened the campground empty.
   b. *The baby shattered the oatmeal into portions.
   c. *The magician hypnotized the auditorium quiet.

13 Notice that in claiming that resultatives formed from obligatorily transitive verbs like frighten have implicit object readings, the Binary SC Analysis must assume a lexical treatment of resultatives. Frighten must be listed in the lexicon with two separate AS representations, one for resultatives and one for nonresultatives. This is because the AS of the obligatorily transitive verb frighten will not be satisfied in a resultative sentence as required by the Projection Principle.
If they permitted a nonargument reading (parallel to (34b) and (32)–(33)), then (37a) would mean that the bears frightened someone (the park rangers, the hikers,...) causing the campground to become empty. (37a–c) would all be grammatical, and would violate no selectional restrictions, because selection can only operate over arguments. Under the Ternary Analysis, where it is possible to claim that the AS of a basic verb is maintained in a resultative sentence, the lack of indefinite argument readings for these verbs is easy to explain. They have obligatory direct internal arguments on which they impose selectional restrictions. Violating them, as (37a–c) do, has the same effect as violating the selectional restrictions of their nonresultative bases:

(38) a. *The bears frightened the campground.
    b. *The baby shattered the oatmeal.
    c. *The magician hypnotized the auditorium.

We are led to conclude that since obligatorily transitive resultative verbs 0-mark and select their postverbal NP, the verb and postverbal NP must be sisters. Thus, transitive resultatives cannot have the structure assigned to them by the Binary SC Analysis.

3.2. Middle Formation

Middle Formation (MF) provides our second argument against a binary structure for transitive resultatives. We will show, first, that MF applies only to verbs that have a direct internal argument (something that has been tacitly assumed in the literature) and, second, that MF applies to transitive resultative verbs. In a transitive resultative sentence, then, the postverbal NP must be a direct internal argument of the verb. This means that the verb and postverbal NP are sisters, as claimed under the Ternary and Hybrid SC Analyses but not the Binary SC Analysis.

We adopt the view that middle verbs, such as read in (39b), are derived from active verbs like read in (39a) in much the same way as verbal passives are (Keyser and Roeper (1984)).

(39) a. She reads *Linguistic Inquiry.

According to Keyser and Roeper, the derivation of a middle sentence has two components. In the lexicon the rule of MF, like the rule of Verbal Passive Formation (VPF), suppresses the verb's external argument and its ability to assign accusative case. In the syntax the postverbal NP moves into subject position so that it can receive case. The derivation of (39b) is (40).

It is clear that the problem lies with the selectional properties of the verb. Compare (37a) to the grammatical The storm blew the campground empty and The earthquake shook the campground empty.
There is one problem with this account, though, noted by Fagan (1988). If this is all there is to it, then VPF and MF should apply to the same class of verbs. But although confide and laugh undergo VPF to form so-called pseudopassives, they do not undergo MF.

(41) a. Passive
Mary is someone who can be confided in.
The politician was laughed at.

b. Middle
*Mary confides in easily.
*Politicians laugh at easily.

To explain the contrast, we propose that MF—but not VPF—is subject to the Argument Structure condition in (42).

(42) Condition on MF
MF applies to a verb only if it has a direct internal argument.

A verb like read can undergo both VPF and MF because, as its AS in the first line of (40) shows, its theme is a direct internal argument. But confide (or laugh) has no direct internal argument, as shown in the first line of (43). For this reason, confide cannot undergo MF. In contrast, VPF has no direct internal argument condition, so it can apply to confide. Once lexical insertion has occurred, the passive verb + PP sequence

---

15 Although imposing this condition is clearly better than treating the verbs that fail to undergo MF as lexical exceptions, (42) is still an arbitrary stipulation, one that we should hope to explain. In fact, though, the possible inputs to MF are limited by other subtle semantic conditions that, as far as we know, have never been adequately characterized. For instance, Roberts (1988) proposes that MF applies only to verbs with an affected direct internal argument, but this would incorrectly rule out (39b). For now, we consider (42) a descriptive statement that may ultimately follow from the right semantic characterization of the possible inputs to MF. Furthermore, we note that many lexical rules seem to be subject to a condition like (42), including Adjectival Passive Formation, as we will show in section 3.3.

16 Footnote 19 gives Fagan’s account of the contrast between (41a) and (41b) and difficulties facing that account.
[\nu \text{confided}] [\text{PP in Mary}] can be reanalyzed as [\nu \text{confide in}] [\text{NP Mary}]. \textit{Mary} must then move in order to receive \textit{case}.\textsuperscript{17}

\[(43)\]

\[
\begin{array}{c|c|c}
\text{agent [location]} & \text{AS of active \textit{confide}} & \text{Lexicon} \\
\downarrow & \text{VPF} & \\
\text{[location]} & \text{AS of passive \textit{confided}} & \\
\downarrow & \text{Lexical insertion} & \\
\end{array}
\]

So \textit{confide} and \textit{laugh} in (41) can undergo VPF but not MF because MF requires its input verb to have a direct internal argument but VPF does not. There is independent evidence for the direct internal argument condition in (42). Notice that in (44), where the postverbal NP is clearly not an argument of the verb, VPF can apply but MF cannot.\textsuperscript{18}

\[(44)\]

\[
\begin{array}{l}
\text{a. Active} \\
\text{We believe \textit{there} to be three criminals in that drug ring.} \\
\text{b. Passive} \\
\text{\textit{There} are believed to be three criminals in that drug ring.} \\
\text{c. Middle} \\
\text{"\textit{There} believe easily to be three criminals in that drug ring.}\}
\end{array}
\]

Having established that condition (42) holds of MF, we can now use it to test our original claim, that the NP following a transitive resultative verb is its direct internal argument. As the contrast between (45) and (46) shows, transitive resultatives form grammatical middles, whereas intransitive resultatives do not.

\textsuperscript{17} Baker (1985) considers reanalysis a form of incorporation, but we are using the more classical formulation here. Fagan (1988) argues that reanalysis is a syntactic process based on the fact that it does not feed lexical word-formation processes. Prepositions are deleted rather than incorporated in many derived words:

(i) a. The politician was laughed at.
   b. *His defense was laughatable.
   c. His defense was laughable.

\textsuperscript{18} The same verb used with a direct argument forms a middle that is substantially better:

(i) Teary-eyed witnesses believe easily.

Why this example is not perfect may be related to the semantic condition on the direct internal argument mentioned in footnote 15.
Arguments & Syntactic Structure of Resultatives

Middles from transitive resultative verbs

NP water the new seedlings flat → New seedlings water t flat (easily).
NP break those cookies into pieces → Those cookies break t into pieces (easily).
NP won't scrub my socks clean → My socks won't scrub t clean (easily).
NP iron permanent press napkins flat → Permanent press napkins iron t flat (easily).

Middles from intransitive resultative verbs

NP run competition Nikes threadbare → "Competition Nikes run threadbare (easily).
NP talk Phys Ed majors into a stupor → *Phys Ed majors talk into a stupor (easily).
NP walk delicate feet to pieces → *Delicate feet walk to pieces (easily).

Once again, then, we have evidence that transitive resultatives have direct internal arguments.

Notice that although intransitive resultatives do not form middles because they do not meet condition (42), they, like transitive resultatives, can form passives, as expected:

(47) a. Verbal passives from transitive resultative verbs
   The seedlings were watered t flat.
   Those cookies were broken t into pieces.
   The socks have finally been scrubbed t clean.

b. Verbal passives from intransitive resultative verbs
   Her Nikes have been run t threadbare.
   We had been talked t into a stupor.

We should point out that the grammaticality of the resultatives in (45) also shows that Keyser and Roeper (1984) were correct in assuming that syntactic movement (Move a) is involved in the derivation of middle sentences. In the middles in (45), the surface subject originates in postverbal position, leaving a trace to serve as subject of the result XP predicate. This must be so, because resultative XPs can only be predicated of D-Structure objects, as shown by the contrast between (48a) and (48b). (The exact nature of this condition is discussed in section 6.)

   b. Those teenagers laughed themselves sick.

Fagan (1988) argues, contrary to Keyser and Roeper, that middles involve lexical rather than syntactic movement, in order to explain why verbs like confide and laugh form passives but not middles. Under her analysis, middles involve movement in the lexicon, so by the time confide + in is reanalyzed as a verb in the syntax, the lexical rule that forms middles can no longer apply. (In contrast, passives involve the syntactic rule of Move a, which applies after reanalysis.) The problem for this account is that if the movement involved in forming a middle were lexical, there would be no postverbal trace in the middle resultatives in (45) for the result XP to be predicated of, since lexical movement does not leave a trace. Thus, our account, which pins the failure of MF to apply to confide on condition (42), seems correct.
To sum up this section, MF requires that its inputs have a direct internal argument, and transitive resulatives meet this requirement. Again, assuming that argumenthood requires sisterhood, MF provides further evidence that transitive resultatives have a ternary rather than a binary structure. This conclusion is compatible with either the Ternary or the Hybrid SC Analysis, but provides the third type of evidence against the Binary SC Analysis.

3.3. Adjectival Passive Formation

Adjectival Passive Formation (APF) also sheds light on the argument status of the postverbal NP in resultatives. APF derives adjectives like [\text{A} broken] in (49). Their form is identical to that of verbal passive participles, but their occurrence prenominally or as a complement of seem or look shows that they are adjectival rather than verbal.\footnote{See Wasow (1981) and Levin and Rappaport (1986) on the distinction between verbal passive participles and adjectival passives.}

(49) a. the broken radio
the frozen pond

b. The radio seemed\textipa{\textipa{l}} looked broken.
The pond seemed\textipa{\textipa{l}} looked frozen.

The formulations of APF that have been proposed in the literature are diverse (Williams (1981), Bresnan (1982), Levin and Rappaport (1986), Grimshaw (1990)). Yet they all agree that the primary syntactic effect of APF is to externalize a direct internal argument.\footnote{Although their accounts differ in detail, both Levin and Rappaport (1986) and Cinque (1990) treat the externalization process as a side effect of converting a verb into an adjective rather than something stipulated by the rule itself.}

We follow Levin and Rappaport in claiming that the inputs to APF are passive verbs whose external arguments have already been suppressed by the rule of Verbal Passive Formation (VPF). APF then externalizes the direct internal argument of the passive verb. For example, from the active verb [v break], with one external and one internal argument, VPF forms [v broken], suppressing the external argument and retaining the verb's one internal argument. APF then converts the passive verb into an adjective, [\text{A} broken], externalizing the internal argument:

(50) agent [theme] \quad AS of active break \quad [v break] a cup
\downarrow VPF
[theme] \quad AS of passive broken \quad a cup was [v broken]
\downarrow APF
theme [ ] \quad AS of adj. passive \text{,broken} \quad a [\text{A} broken] cup

In order to use APF to show that the postverbal NP of transitive resultatives is a direct internal argument of the verb, we must first be on firm ground in claiming that what APF externalizes is a verb's direct internal argument.
Levin and Rappaport (1986), whose analysis we adopt here, argue against Williams (1981) and Bresnan (1982), who claim that the argument that APF externalizes must bear a particular 0-role, namely, the theme. Rather, they show that APF externalizes a verb's direct internal argument, whatever its 0-role. Their evidence involves verbs like *feed* in (51), which forms an adjectival passive although the externalized argument is the goal.

(51) the fed baby

In fact, if the theme of *feed* is externalized instead, the result is ungrammatical:

(52) *the fed peas

To explain why it is the theme that is externalized for *break* but it is the goal for *feed*, Levin and Rappaport first suspend the theme condition, allowing APF to externalize either a theme or a goal. This explains the grammaticality of (51). To explain the ungrammaticality of (52), first, they propose that the active verb *feed* has two distinct ASs: (53a), with an obligatory direct internal goal argument and an additional optional theme; and (53b), with an obligatory direct internal theme argument and an additional obligatory goal.

(53) a. agent [goal (theme)]
   b. agent [theme goal]

   They fed the baby (peas).
   They fed peas to the baby.

VPF and then APF apply to these inputs, as shown in (54) and (55).

(54) Adjectival passive from (53a)

agent [goal (theme)]
   ↓
   [goal (theme)]
   ↓
   \{
   goal \[(\text{theme})]\,
   \{theme [goal]\}

   They [\(v\) fed] the baby (peas).
   The baby was [\(v\) fed] (peas).
   \{the [\(\lambda\) fed] baby\}
   \{*the [\(\lambda\) fed] peas\}

(55) Adjectival passive from (53b)

agent [theme goal]
   ↓
   [theme goal]
   ↓
   \{theme [goal]\}
   \{goal [theme]\}

   They [\(v\) fed] peas to the baby.
   Peas were [\(v\) fed] to the baby.
   \{*the [\(\lambda\) fed] peas to the baby\}
   \{*the [\(\lambda\) fed] baby\}
   (*on this derivation)

With the theme condition abandoned, APF is permitted to externalize either the theme or the goal in (54) and (55). Both *the fed baby* and *the fed peas* should be well-formed
outputs. However, these outputs must also satisfy the 0-Criterion, which requires all obligatory arguments to be realized. In the first output of (54) this is the case. In the second output of (54) and in both outputs of (55), however, an obligatory argument remains unexpressed. Thus, only one of the four potential outputs is grammatical. Although APF is not constrained by a theme condition, the ASs of adjectives derived by APF must be satisfied in the syntax, in accordance with the 0-Criterion.

But Levin and Rappaport note that a different condition does hold of APF. This is illustrated by verbs like read in (56), which takes two optional arguments. Here, whichever argument APF externalizes, the remaining internal argument, being optional, should not have to be syntactically realized for the 0-Criterion to be satisfied. Read should yield two good APF outputs, both (57a) and (57b).23

(56) read agent [(theme) (goal)] [v read] (books) (to the kids)

(57) a. the recently read books
   b. *the recently read kids

However, (57b) is impossible. Levin and Rappaport therefore conclude that the argument externalized by APF must be a direct internal argument. This is stated in (58).

(58) Condition on APF
     APF applies to a verb only if it has a direct internal argument.

(58) rules out (57b) and is still consistent with the grammaticality facts for feed.24

22 Levin and Rappaport note that PP complements cannot be incorporated inside an adjective, preventing (i). But the realizations in (ii) are also impossible.
   (i) *the [a fed to the baby] peas
   (ii) *the [a fed] peas to the baby
        *the [a fed] peas of baby
        *the [a fed] baby of peas

This is because these arguments are being realized outside the domain of the adjective, and they cannot satisfy an argument in the adjective's AS from that position.

23 Read has another AS, in which the goal is the direct internal argument and both the goal and the theme are obligatory:
   (i) read the kids the book
       *read the kids

The AS for this read is identical to that for feed in (53b).

24 Adjectives that include prepositions, like slept-in, look like counterexamples to (58). However, these cannot be formed productively. We believe that they come from syntactically restructured verb + preposition sequences that have become lexicalized, much like idioms. Two arguments for this claim are that most such adjectival passives are ungrammatical, though their syntactic verbal passives are fine, as (i) shows, and that the grammatical adjectival passives of this type, as in (ii), have drifted, quirky semantics.

(i) *the sat-on chair The chair was sat on.
   *the stomped-on hat My hat has been stomped on.
   *the swum-in pool This pool has never been swum in.
   *a confided-in friend A real friend can always be confided in.
Having motivated the direct internal argument condition on APF, let us now return to resultatives. Given (58), APF becomes a diagnostic for the argumenthood of postverbal NPs in resultatives. If we are correct that the postverbal NP in a transitive resultative is the verb's direct internal argument, then these verbs should form grammatical adjectival passives. If the postverbal NP of an intransitive resultative is not the verb's direct internal argument, then adjectival passives from these verbs should be ill formed. As (59) shows, this is the case.25

(59) a. *Adjectival passives from transitive resultatives*
   the stomped-flat grapes
   the spun-dry sheets
   the smashed-open safe.
   the scrubbed-clean socks

b. *Adjectival passives from intransitive resultatives*
   *the danced-thin soles
   *the run-threadbare Nikes
   *the crowed-awake children
   *the talked-unconscious audience

In contrast to this difference, both transitive and intransitive resultative verbs form

(ii) a lived-in house
    the house looks lived-in
   a slept-in bed
    the bed looks slept-in
   a put-upon worker
    the worker looks put-upon

≠ The house has (had) people living in it.
≠ The house looks like people live in it.
≠ The bed has (had) someone sleeping in it.
≠ The bed looks like someone has slept in it.
≠ The worker was put-upon by someone.
≠ The worker looks like someone put something upon her.

The drifted semantics is even clearer from cases like (iii), where the look is not what has had someone sleeping in it, yet the phrase is grammatical.

(iii) Her pants have a slept-in look.

25 As a reviewer has pointed out, resultative adjectival passives might seem to contradict the conclusion we reached in section 3.2 that result XPs must be predicated of a D-Structure postverbal NP. (Recall that we used this to argue that middle resultatives involve syntactic movement of the subject of the result XP into the subject position of the clause.) In (i) it appears that flat is predicated of the argument of watered that has been externalized by APF. This seems to be a problem because lexical externalization processes do not leave traces.

(i) the watered-flat tulips

However, we propose that in (i) flat is no longer an independent predicate. Rather, APF has created a new adjective watered-flat, which, like other adjectives, can be used as a predicate, taking the noun following it as its subject. Supporting this claim is the fact that such resultative adjectival passives can be conjoined with other adjectives in prenominal position:

(ii) the washed and spun-dry sheets
    the watered-flat but uncrushed tulips

If we are correct that APF merges water and flat into a single adjective watered-flat that has a single AS, then in these cases APF involves more than the simple externalization of the direct internal argument discussed by Levin and Rappaport and others. See Carrier and Randall (to appear) for a more complete characterization of APF.
grammatical verbal passives. The intransitive cases in (60b) are no worse than the transitive cases in (60a). And they are much better than the adjectival passives in (59b).26

(60) a. Verbal passives from transitive resultatives
The grapes were stomped flat (by the French winemakers).
The sheets were spun dry, and nearly ruined, (by that industrial-grade dryer).
The safe was smashed open (by the burglars).
The socks were scrubbed clean (by the laundry attendant).

b. Verbal passives from intransitive resultatives
These soles have been danced thin (by a professional hoofer).
By the end of the marathon, his Nikes had been run threadbare.
Every morning on the farm, the children are crowed awake (by the roosters).
By the end of the lecture, the audience had been talked unconscious (by the boring professor).

The contrast between (60b) and (59b) shows two things: (i) that no direct internal argument condition holds of VPF, as proposed above, and (ii) that the ungrammaticality of the cases in (59b) cannot be attributed to the ungrammaticality of verbal passives from intransitive resultatives. Since in our account adjectival passives are derived from verbal passives, this is a necessary fact to establish.27

In sum, APF provides more evidence that the AS of a verb is preserved when it is used in a resultative sentence: for transitive resultatives the postverbal NP is an argument, and for intransitive resultatives it is not. Once again, this means that transitive resultatives have a ternary-branching and not a binary-branching VP. This is one more argument against the Binary SC Analysis and in favor of either the Ternary or the Hybrid SC Analysis of resultatives.

26 Some speakers, in fact, find passivization to be slightly worse in the intransitive cases than in transitive cases, but the speakers in question seem to be those with a more restrictive dialect, in which intransitive resultatives are not formed as freely to begin with (see footnote 1).

27 One further argument that the postverbal NP in transitive resultatives is an argument of the verb comes from the rule for forming verbal compounds, which applies to transitive but not intransitive resultatives, as Yamada (1987) has pointed out. (The examples in (ia) are from Randall (1982, 195).)

(i) a. short-cropped hair
   a clean-shaven face
   thin-sliced cheese
b. *blind-cried eyes
   *thin-run pavement
   *sick-laughed lady

This contrast can be handled by saying that the verbal compounding rule, like MF and APF, requires a direct internal argument and only transitive resultatives have one. However, it may be that these verbal compounds are themselves derived from adjectival passives, in which case there would be no source for the intransitive ones.
3.4. Nominal Formation

Our fourth argument that the postverbal NP is a direct internal argument of transitive but not intransitive resultative verbs comes from process nominals. We will focus on -ing process nominals because they provide the clearest cases. What they show is that, like MF and APF, the rule of Nominal Formation (NF) applies to transitive but not intransitive resultatives. Before we look at nominals based on resultatives, however, we must first look at -ing nominals in general.

3.4.1. Process versus Result Nominals

It is well known that -ing nominals often have both a "result" and a "process" interpretation (Randall (1988), Grimshaw (1990), among others). Roughly, the result reading names the end product of the base verb's activity. The process reading names an event. Result and process readings are highlighted by the contexts in (61) and (62), respectively. In (62) process readings are forced by VPs that express the duration of time.

(61) Result -ing
The rejoicing was loud.
The babbling is on the tape.  
**The thinking** is backwards.
The cooking was distinctive.  
The typing was sitting on the desk. 
The writing is crooked.

(62) Process -ing
The rejoicing went on for hours.
The babbling lasted for hours.  
The thinking took a long time. 
The cooking went on for several hours. 
The typing took a long time.  
The writing took three hours.

The two types of nominals differ in their argument structures: a process but not a result nominal inherits the AS of its base verb (for discussion, see Randall (1988), Grimshaw (1990)). As a result, only process nominals can help to reveal the ASs of nominals based on resultative verbs and consequently of resultative verbs themselves. From here on, then, we will restrict our discussion to process nominals.

3.4.2. The Argument Structure of Process -ing Nominals

Following Grimshaw (1990),

\---

28 In fact, Grimshaw (1990) argues that the process/result distinction is not subtle enough. Rather, the correct distinction is between nominals that do and do not have an associated event structure. In her system, unless they have an appropriate event structure, even nouns that denote events pattern with result nominals. Since our concern here is with the nouns that pattern with event process nominals, we can use the rough but more familiar distinction.
we assume that the rule that creates nominals, Nominal Formation (NF), like the rule that creates verbal passives, Verbal Passive Formation (VPF), suppresses the external argument of the base verb. The verbal passive in (63b) and the nominal in (63c) inherit the argument structure of their base verb *devour* in (63a), except that they lack that verb’s external argument.

    b. [theme] Vast quantities of junk food were [$v$ devoured].
    c. [theme] The [N devouring] of vast quantities of junk food takes no time at all.

In both a verbal passive and a nominal, an optional by-phrase can realize the θ-role of the suppressed external argument, as shown in (64).

(64) a. Vast quantities of junk food were devoured yesterday by the hungry students.
    b. The devouring of junk food by college students takes no time at all.

We take this by-PP to be an adjunct, meaning that it does not correspond to, or satisfy, a position in the AS of the nominal.29

To determine the AS of process nominals, consider next what we will call the of-NP, the NP introduced by of, immediately adjacent to the head. In the transitive-based nominals in (64b) and (65), this of-NP is the direct internal argument of the nominal, inherited from the base verb of which it was also the direct internal argument.

29 But how can an adjunct PP realize a 0-role of an external argument suppressed in word formation? Following Jackendoff (1983; 1987; 1990b) and others, we claim that 0-roles are AS projections of entities represented at the separate lexical level of Lexical Conceptual Structure (LCS). When passives and nominals are formed, the external argument is suppressed at the AS level, but it persists unaltered at LCS. This is the source of the implicit agent intuition for passives like *The food was devoured* that have no overt by-phrases. When a by-phrase is present in a passive or nominal, it can be construed with this LCS argument (see Jackendoff (1990b)). Note that by-phrases are not necessarily construed with implicit agents, though. They occur with result nominals, (ia), and nonderived nouns, (ib). (The examples in (ia) are from Grimshaw (1990, chap. 3), and the first two examples in (ib) are from Wasow (1981), citing Bresnan (1972).)

(i) a. An examination by a competent instructor will reveal . . .
    The assignment by Fred was no good.
    b. a symphony by Mozart
    a portrait by Vermeer
    body by Fisher

We propose that possessive NPs work similarly to by-phrases. They can either realize a suppressed θ-role, as in (ii), or not, as in (iii).

(ii) the college students’ devouring of the junk food
(iii) a. a competent instructor's examination
    Fred's assignment
    b. Mozart's symphony
    Vermeer's portrait

Grimshaw (1990), taking a different view, makes a three-way distinction among adjuncts, arguments, and argument-adjuncts.
A third interpretation of of-phrases corresponds to neither the direct internal nor the external argument but to what we will call the adverbial adjunct interpretation illustrated in (67). We propose that these phrases, like those in (66) (and unlike those in (65)), are PP adjuncts.\footnote{Exactly what kinds of adverbials fall into this category is a question we will not pursue here. However, it seems that in addition to the time adverbials in (67), cases like those in (i) are also possible.}

(67) of-NP = an adverbial adjunct
    The constant rejoicing of the holiday season makes Fred nervous.
    The quick cooking of the 1990s requires a microwave.

In sum, of-NPs bear one of three relationships to a nominal:

(68) An of-NP may be
    a. a direct internal argument
    b. an adjunct corresponding to the suppressed external argument
    c. an adverbial adjunct.

In nominals derived from obligatorily transitive verbs, the of-NP can only be a direct internal argument. It cannot be interpreted as either a suppressed external argument or an adverbial adjunct, as the ungrammaticality of (69a) and (69b) shows.

(69) a. of-NP = an adjunct corresponding to the suppressed external argument
    *The devouring of hungry students takes no time at all.
    *The slicing of the caterers often takes two hours.
    *The clearing of snowplows takes several hours.

\footnote{Exactly what kinds of adverbials fall into this category is a question we will not pursue here. However, it seems that in addition to the time adverbials in (67), cases like those in (i) are also possible.}

(i) the constant rejoicing of certain religious areas in India
    the frequent rejoicing of the southern countries
    the constant rejoicing of certain religious life-styles
b. of-NP = *an adverbial adjunct*

*The devouring of the holiday season makes everyone sick.*

*The slicing of New Year's Eve often takes two hours.*

*The clearing of the winter season often goes on all night long.*

This is because transitive-based nominals inherit an obligatory direct internal argument from their base verbs, which the *of-NP* must satisfy.  

This account makes the correct prediction with respect to nominals based on optionally transitive verbs. Since these forms inherit an optional direct internal argument, their *of-NP* is optional. Therefore, when present, an *of-NP* allows any of the three possible interpretations, as (70a–c) show.

(70) a. **Direct internal argument**
   The cooking (of the banquet meal) went on for several hours.

b. **Suppressed external argument**
   The cooking (of the chefs) went on for several hours.

c. **Adverbial adjunct**
   The cooking (of our grandmothers' day) was very time-consuming.

Limiting the interpretations of the *of-NP* to the cases in (68) explains the lack of nominals based on the verbs in (71a–e), whose postverbal NPs are not arguments, but are either degree expressions (a–b) or idiom chunks (c–e).

(71) a. It rained cats and dogs.
   b. The guests ate tons.
   c. He doesn't give a damn.
   d. We pulled John's leg.
   e. He kicked the bucket.

Since these postverbal NPs are neither direct internal arguments, nor external arguments, nor the appropriate type of adverbials, they cannot show up as *of-NPs* in the corresponding nominals.

---

31 Sentences with more than one of-NP are ungrammatical:

(i) *the devouring of rich food of the holiday season
   *the devouring of junk food of college students
   (cf. the devouring of junk food by college students)
   *the rejoicing of college students of the holiday season

It is clear that this restriction is not due to any general prohibition on two PPs headed by homophonous prepositions:

(ii) The umbrella was left by the front door by some absentminded person.

The restriction might involve the mechanics of of-insertion. For example, although we have distinguished of-NP arguments from of-adjuncts, it is possible that the *of* in both is inserted by a single rule that is restricted to apply only under linear adjacency to the head. We leave this as a question for future research.
(72) a. *the raining of cats and dogs  
   b. *the eating of tons  
   c. *the giving of a damn  
   d. *the pulling of John's leg  
   e. *the kicking of the bucket

Nominals also cannot be formed from raising verbs, for the same reason. Their postverbal NP is not an argument and no adverbial adjunct reading is available.

(73) a. NP expects there to be a riot.  
   NP believes there to be a spy among us.  
   b. *The expecting of there to be a riot is in the news.  
   *The believing of there to be a spy among us is spooky.

3.4.3. Process -ing Nominals as a Test of Argument Structure in Resultatives  
We are now in a position to use the interpretation of of-NPs in nominals to determine the ASs of verbs in resultative sentences. First, observe that the postverbal NP in a transitive resultative but not an intransitive resultative can occur in an of-NP in the corresponding nominal:

(74) a. Transitive resultative nominals  
   The watering of tulips flat is a criminal offense in Holland.  
   The slicing of cheese into thin wedges is the current rage.  
   The painting of fire engines the color of schoolbuses is strictly prohibited by state law.  
   The Surgeon General warns against the cooking of food black.

   b. Intransitive resultative nominals  
   *The drinking of oneself sick is commonplace in one's freshman year.  
   *The talking of your confidant silly is a bad idea.  
   *What Christmas shopping means to me is the walking of my feet to pieces.  
   *The jogging craze has resulted in the running of a lot of pairs of Nikes threadbare.

The contrast between (74a) and (74b) follows from a difference in how the of-NPs are licensed in the two cases. Starting with the transitive cases of (74a), the of-NPs here are licensed by (68a), since they are interpreted as direct internal arguments of their head nominals. This provides the evidence that we are looking for: the base resultative verbs from which these nominals inherit their AS have direct internal arguments themselves. This conclusion is compatible with the syntactic structure assigned to transitive resultatives by either the Ternary or the Hybrid SC Analysis, but not the Binary SC Analysis.

We should point out that the grammaticality of (74a) also tells us something about the internal syntactic structure of resultative nominals. Specifically, the NP following must be a sister of the head nominal, as shown in (75a), rather than being embedded in a PP headed by of, as in (75b).
(75) a. of-NP = direct internal argument

```
     N'  
     /   
N    NP   AP
   /     
watering (of) tulips flat
```

b. of-NP = adjunct corresponding to suppressed external argument

```
     N'  
     /   
N     PP   AP
   /     
watering of tulips flat
```

This is because the result phrase cannot be predicated of the object of a preposition, as the contrast between (76a) and (76b) shows.

(76) a. She squashed/stomped the bug flat.

b. *She stepped/stomped on the bug flat.

The rule of of-insertion, then, does not create PP structure.

In contrast to the grammatical cases in (74a), the nominals formed from intransitive resultatives in (74b) are ungrammatical because their of-NPs are not licensed by any of the possibilities in (68a–c). First of all, and most crucially for our point, they cannot be interpreted as direct internal arguments, because their base verbs have no direct internal arguments to be inherited. Nor can they be interpreted either as adjuncts corresponding to a suppressed external argument or as adverbial adjuncts because they do not have the right meaning. In fact, as adjuncts, these of-NPs would be embedded within PPs and so would not stand in the proper structural relation to the result phrase to allow for resultative predication. (See Carrier and Randall (to appear) for an elaboration of this claim.)

To conclude, the of-NP in any resultative nominal can only be interpreted as a direct

---

32 This contrast was noted by Simpson (1983), among others. How this is accounted for under each of the three analyses of resultatives will be taken up in section 6.

33 Grimshaw (1990) assumes to the contrary that of-NP arguments are PPs. Not only is this part of her analysis contradicted by the grammaticality of (74a), it requires a complication. She must assume that the NP is "0-marked by" the preposition but "gets its 0-role from" the nominal.
internal argument; adjunct readings are excluded for semantic and structural reasons. This being the case, the ability of transitive but not intransitive resultatives to undergo NF argues that the postverbal NP of only the former is an argument of the verb. This contrast is not captured by the Binary SC Analysis since it claims (a) that the postverbal NP is an argument of neither transitive nor intransitive verbs, and (b) that transitive and intransitive resultatives have identical syntactic structures and ASs. Again, we have support for a ternary structure for transitive resultatives and therefore for either the Ternary or the Hybrid SC Analysis.

Before leaving the topic of nominals, we should point out that Kayne (1985) claims that no resultatives nominalize at all, including those based on transitive verbs. He cites examples like (77) (his (114)).

(77) a. *The starving of John into giving up could have been avoided.
   b. *The hammering of metal flat is exceedingly difficult.

Kayne takes the ungrammaticality of (77) as evidence for the Binary SC Analysis, since other verbs that are considered to take binary SC complements also do not form nominal.34

(78) a. *the considering of John a fool . . .
   b. *the believing of George Bush to be sincere . . .
   c. *the finding of one's surroundings pleasant . . .

Kayne reasons that (77) and (78) can both be handled by saying that verbs with binary SC complements do not form nominals, and that resultatives contain binary SC complements.35 As we have shown, though, transitive resultatives do in fact form nominals. What, then, is the problem with the particular cases in (77)? We believe that it is an aspectual one. In rough terms, nominals derived from verbs often involve durative or iterative and generic activity. Therefore, they sound better either with an indefinite object or with a context that induces a "habitual" reading, or both. If we change Kayne's cases along these lines, we find them completely acceptable:

(79) a. The starving of rebels into submission has become a tactic of the contras.
   b. In cold weather, mechanics find the hammering of metal flat to be exceedingly difficult.

And as we would predict, a parallel context does not improve the consider cases:

(80) a. *The considering of rebels worthless has become a hallmark of the contras.
   b. *The believing of George Bush to be sincere is exceedingly difficult for anyone who reads the alternative press.
   c. *The finding of one's surroundings pleasant always helps to boost morale.

---

34 Like other SC proponents, Kayne considers only the Binary SC Analysis for resultatives and for classic SC verbs such as consider. He therefore refers to what we are calling the Binary SC Analysis as the Small Clause Analysis.

35 His explanation is that SCs are barriers to government by nouns but not by verbs.
So transitive resultatives do not behave like the classic SC cases of (78) after all. But notice that our account also correctly predicts that the cases of (78) are ungrammatical, for the same reason that intransitive resultative nominals are: John in (78a), for example, is not an argument of considering. Moreover, notice that this would be true even if John and a fool were not sisters in a binary SC constituent, but rather were sisters of considering in a ternary-branching structure, parallel to resultatives. This is because, as we have argued, although argumenthood implies sisterhood, sisterhood does not imply argumenthood. We will return to this issue in section 7.

To sum up at this point, contrary to Kayne’s original claim, the fact that transitive but not intransitive resultatives undergo NF provides a fourth type of evidence against the Binary SC Analysis.

3.5. Long-Distance Extraction of the Postverbal NP

The facts of long-distance extraction, though not providing an argument of their own, are compatible with our claim that in a transitive resultative, the postverbal NP is an argument and a syntactic sister of the verb. Long-distance extraction of a transitive postverbal NP results in a Subjacency violation rather than an ECP violation:

(81) Long-distance extraction of NP out of transitive resultative
   a. ?Which metal do you wonder who hammered flat?
   b. ?Which metal do you wonder whether to hammer flat?

The transitive postverbal NP, then, must be lexically governed by the verb.

Interestingly, however, transitive and intransitive resultatives behave alike in this respect. Long-distance extraction of the intransitive postverbal NP seems to us to be equally good: 36

(82) Long-distance extraction of NP out of intransitive resultative
   a. ?Which sneakers do you wonder who ran threadbare?
   b. ?Which sneakers do you wonder whether to run threadbare?

The intransitive postverbal NP, then, must also be lexically governed by the verb, despite the fact that it is not an argument of that verb. This result bears on the proper definition of lexical government relative to the ECP: as claimed by Rizzi (1982) and Lasnik and Saito (1984), lexical government does not require 8-marking.

The long-distance extraction facts are also compatible with both the Hybrid SC Analysis and the Binary SC Analysis, provided a matrix verb head-governs the subject of its SC complement, for example, if run head-governs the NP-trace in (83).

36 Ike-Uchi (1990, 17) finds such NP extractions worse out of intransitive resultatives than out of transitive resultatives. To account for this difference, he adopts a ”hybrid” analysis in which transitive resultatives have a ternary-branching VP, as under the Ternary Analysis, but intransitive resultatives have the structure in (i), in which the postverbal NP is not governed by the verb.
We will not pursue this issue here. The important point is that the long-distance extraction facts are compatible with the Ternary Analysis.

To summarize our conclusions so far: In section 2 we reviewed evidence that the result phrase is selected by the verb, a fact that is incompatible with both the Binary SC and Hybrid SC Analyses. In sections 3.1–3.4 we gave new arguments from selection and from MF, APF, and NF that the postverbal NP in a transitive resultative is an argument of the verb. This new evidence is compatible with the Ternary Analysis or the Hybrid SC Analysis, both of which assign a ternary-branching VP to transitive resultatives, but it is incompatible with the Binary SC Analysis. Finally, in this section we pointed out that the long-distance extraction facts are also compatible with the Ternary Analysis. So far, then, the Ternary Analysis is the only one of the three analyses of resultatives that has no strikes against it.

4. An Alleged Argument for the Binary Small Clause Analysis: Extraction of a Subpart of the Postverbal NP

Before dismissing the Binary SC Analysis completely, in this section we will address one argument that has been advanced in its favor and show that it does not go through. Before we proceed, however, we should point out that the arguments given so far in

We agree that (81b) is somewhat better than (82b) but we believe that the difference is pragmatic, not structural. In (82b), as in most intransitive resultatives, the result is not an intended outcome of the activity, making it odd to use a whether to question.

37 However, in section 5 we show that the Hybrid SC Analysis must make contradictory assumptions about whether the subject of resultative SCs is governed or not.
favor of a ternary structure run counter to Kayne's (1981) claim that all syntactic structure is binary-branching. Clearly, if Kayne's claim were correct, then the claim that resultative VPs are ternary-branching could not be. In this article we will not address the binary-branching constraint in general. However, to the extent that the arguments in sections 2 and 3 in favor of a ternary resultative structure hold up and the argument that we are about to discuss in favor of a binary resultative structure fails, the claim that all syntactic structure is binary must be reevaluated.

Kayne (1985) has argued that resultatives behave like traditional binary SCs with respect to the extraction of a subpart of the postverbal NP. If resultatives were binary SCs, he reasons, this parallel is explained. We will show that resultatives do not behave as he claims. The data he cites are not representative. When the relevant data are considered, the supposed parallel vanishes.

The fact that Kayne puts forward is that extraction from the subject of an SC is ungrammatical:

(84) *the man that I consider [sc[the brother of t][honest]]

To account for this, he proposes a condition that prohibits the extraction of the subpart of a left branch, which we will dub the Left Branch Subpart Condition (hereafter, the LBSC). He next considers (85), which, according to him, is ambiguous.

(85) The lion ate the knuckles of the hunter raw.  
   a. resultative reading: . . . until they were raw  
   b. depictive reading: . . . when they were raw

Kayne allows this sentence both a depictive reading (the hunter's knuckles were already raw at the time of eating) and—crucially—a resultative reading: the hunter's knuckles became raw as a result of the lion's eating them. However, extraction of the hunter leads to the unambiguous (86) (Kayne's (115)), with only the depictive reading; the resultative reading is blocked.

(86) the hunter that the lion ate the knuckles of t raw  
   a. *resultative reading: . . . until they were raw  
   b. depictive reading: . . . when they were raw

To explain this difference, Kayne gives resultatives the binary SC structure in (87a) and depicts, the structure in (87b).

(87) a. eat [sc[the knuckles of the hunter] [raw]]  
   b. [v[eat] [the knuckles of the hunter]] [sc PRO raw]

In (87a) the knuckles of the hunter is the subject of, and therefore the left branch of, the resultative SC. The LBSC blocks the extraction of the hunter. In contrast, in (87b) the knuckles of the hunter is in the right branch of V', so extraction out of it is possible.

If Kayne's analysis of (86) is correct, then extraction from the postverbal NP should be blocked in all resultatives. However, it is not. Extractions from resultatives like those
in (88) and (89), though somewhat marginal, seem to us no worse than extractions from depictives in (90).

(88) **Extractions from transitive resultatives**
the gang (that) I shot the leaders of dead
the boat (that) I sanded the bottom of as smooth as glass
the trunk (that) I hammered the lid to shut
the door (that) I painted the back of red
the trees (that) the wind blew the tops of bare
the book (that) I read the pages of dog-eared

(89) **Extractions from intransitive resultatives**
the gang (that) I drank the leaders of under the table
the film (that) the producer talked the cast of to death
the Nikes (that) I ran the soles of threadbare/ragged
the shoes (that) I walked the heels of to tatters/paper-thin
the band (that) they hooted the members of off the stage

(90) **Extractions from depictives**
the gang (that) I saw the leaders of naked
the boat (that) I sanded the bottom of wet
the film (that) I heard the soundtrack to live
the door (that) I painted the back of unprimed
the book (that) I read the beginning of in French

But if extraction from resultatives is permitted in general, then we must now explain why (86) cannot have a resultative reading. The reason is that *eat* cannot form a resultative at all, regardless of extraction. Unlike Kayne, we find that under a resultative reading (85) is completely unacceptable. However, if we replace *eat* with *chew*, as in (91), a resultative interpretation is possible and, as shown in (92), the reading holds up under extraction of *the hunter*. (92) is ambiguous between the depictive and resultative readings, exactly as we predict.

(91) The lion chewed the knuckles of the hunter raw.
   a. resultative reading: the knuckles became raw
   b. depictive reading: the knuckles were already raw

---

This is discussed in Randall (1982) and Carrier and Randall (to appear). A second problem with (85) is the awkwardness of the source, *the knuckles of the hunter*. For animate possessors the genitive is preferable: *the hunter's knuckles*. In fact, the same problem holds of (84). Its source, in (i), is also awkward. However, extraction from the parallel (iia) is fine, as (iib) illustrates. This suggests that if the LBSC is correct, then *consider* does not take an SC complement either. We return to this possibility in section 7.

(i) I consider the brother of the man honest.
(ii) a. I consider the leaders of the gang immoral.
   b. the gang that I consider the leaders of immoral
To sum up, extracting from a postverbal NP in resultatives and depictives yields equally grammatical results. This means that if the LBSC is correct, then the Binary SC Analysis of resultatives cannot be; the resultative postverbal NP cannot be the left branch of an SC constituent.39

Having established that extraction is possible from inside the postverbal NP in both transitive and intransitive resultatives, notice that we actually arrive at further evidence in favor of the Ternary Analysis (again, assuming the correctness of the LBSC). Under the Ternary Analysis, the two types of resultatives, although different in AS, are parallel in syntax: the postverbal NP is not a left branch in either one. Thus, the two types of resultatives should behave alike with respect to a purely syntactic constraint like the LBSC, and they do. As we will show in the next section, this fact runs counter to the prediction of the Hybrid SC Analysis.

5. Further Arguments against the Hybrid Small Clause Analysis and Other Hybrids

One motivation for SC analyses in general is the view that a subject and its predicate must be exhaustively contained within a single constituent.40 According to this view, John in (93) must form an SC constituent with a fool. In resultatives, the result XP must form a constituent with its subject. The Binary SC Analysis discussed in previous sections places the subject and predicate in an exhaustive constituent in both transitive and intransitive resultatives as in (94).

39 As Jane Simpson (personal communication) points out, other extraction facts also seem to argue against treating the resultative NP-AP sequence as a constituent. Although the NP and AP may each be extracted independently, they may not be extracted together, as they could if they formed a constituent:

(i) *It was [\text{the roof}] that John painted red.
(ii) *It was [\text{a really bright red}] that John painted the roof.
(iii) It was [\text{the roof a really bright red}] that John painted.

However, other NP-XP sequences claimed to be SCs cannot be extracted in this way either:

(iv) *It was [SC John a fool] that Mary considered.

Either some other constraint is involved or the construction in (iv), like resultatives, does not contain an SC, a possibility that we mentioned in footnote 38 and will return to in section 7.

40 This definition is loose enough to cover a variety of more specific definitions of the subject-predicate relation. For example, both (i) and (ii) are consistent with it.

(i) A subject must occur in the specifier position of a constituent containing its predicate.
(ii) A subject must be dominated by a projection of its predicate.
In section 2 we argued against the Binary SC Analysis based on the fact that the postverbal NP behaves like an argument of the transitive verb in cases like (94a). However, these arguments do not apply to the Hybrid SC Analysis, which is also compatible with the view that a subject and predicate form a constituent.
According to the Hybrid SC Analysis, transitive resultatives have the ternary structure in (95), where an NP sister of the verb controls the PRO subject of the result SC.

In (95) the controller, the tulips, is in the proper position to be \textit{\(\theta\)-marked} by the verb. PRO is \(\theta\)-marked by \textit{flat}. In contrast, in intransitive resultatives the postverbal NP is not an argument of the verb. Therefore, it has to occur in the subject position of the SC, where it is not \(\theta\)-marked by the verb but can be \(\theta\)-marked by the result predicate. Thus, as (96) illustrates, intransitive resultative SCs do not contain PRO.

The Hybrid SC Analysis captures the contrasts between transitive and intransitive resultatives pointed out in section 3. Under this analysis, transitive resultatives are like \textit{persuade} and intransitive resultatives are like \textit{believe} with respect to the status of the postverbal NP. And the analysis need not stipulate that it is transitive resultative SCs whose subject is PRO but intransitive resultative SCs whose subject is a lexically specified NP. The reverse situation is ruled out by general principles:

(97) a. *The gardener [VP watered [NP the tulips] [SC[NP her sneakers] [AP soggy]].

b. *The joggers [VP ran [NP their Nikes] [SC[NP PRO] [AP threadbare]].
In (97a) her sneakers has no way to receive case. In (97b) their Nikes has no way to receive a 0-role. So far, then, it looks as though the Hybrid SC Analysis gives a unified account of transitive and intransitive resultatives. In both cases, it suffices to say that a result SC is added as a sister of the verb. Whether or not the subject of that SC is PRO follows from general principles. Furthermore, the Hybrid SC Analysis meets the above structural definition of the subject-predicate relation and overcomes the difficulties presented in section 3 for the Binary SC Analysis. Yet the Hybrid SC Analysis is untenable, nevertheless.

Consider the structure it assigns to intransitive resultatives, (96). In order for their Nikes to receive case, we must assume either that (a) the result SC is a nonmaximal projection (as argued by Hornstein and Lightfoot (1987)) or that (b) a verb may govern across an SC barrier in order to case-mark the subject NP (following Kayne (1985) and Hoekstra (1988)). Something of this kind may be necessary to explain how the NP after consider-type verbs gets case anyway, and it would also correctly rule out the possibility for [The joggers ran [sc PRO sick]], since PRO would be governed. But whatever we assume for (96) would be true for (95) as well; PRO would be governed there, making that sentence ungrammatical. In short, under the Hybrid SC Analysis in (95) and (96), transitive and intransitive resultatives require contradictory assumptions about whether the resultative SC is a barrier to government.

Of course, one could try to save the Hybrid SC Analysis by proposing that transitive verbs take resultative SCs that are barriers to government and intransitive verbs take resultative SCs that are not barriers to government. But this is obviously an undesirable move. Not only does it require ad hoc stipulations as to which type of SC is required where, it forfeits giving transitive and intransitive resultatives a unified treatment.

There are two additional problems with the Hybrid SC Analysis. First, like the Binary SC Analysis, it cannot handle the fact that the result predicate is s-selected, as shown in section 2.1, since it claims that the result predicate is never a sister of the verb. The second problem concerns the behavior of resultatives with respect to extraction, as discussed in section 4. Recall that in order to explain the contrast between (98) and (99), both of which have depictive predicates, Kayne appeals to a constraint on extraction of a subpart of a left branch, the Left Branch Subpart Condition (LBSC).

---

41 Note that this is a different run from the transitive run that does assign a 0-role: run the race versus run their Nikes.

42 Hoekstra (1988) raises the possibility that the NP is governed not by the verb in a direct sense but rather through the relation of Spec-head agreement, as in Chomsky (1986).

43 A reviewer points out that the problem of the selection of the result XP under the Hybrid SC Analysis might be averted in the following way. Result XPs like flat in (i) impose selectional restrictions on their subjects. But since the subject of flat is PRO, controlled by the NP the tulips, then it is actually the tulips that must meet the selectional restrictions of flat. However, inasmuch as the verb selects the tulips, it actually "indirectly" selects the result predicate; only result predicates whose selectional restrictions are met by the NP selected by the verb are allowed. In (j) flat but not speechless is compatible with the semantic features of PRO controlled by the tulips. What appears to be cross-clausal selection, then, is only an illusion, mediated by control.
(98) *the man that I consider \[_{SC}[the\ brother of t\] [honest]]
(99) the door that I \[_{V'}[painted]\ [_{NP}\ the\ back\ of\ t]\] \[_{SC}\ \{\text{PRO unprimed}\}\]

In (98) (repeated from (84)) the extracted NP comes out of a left branch of the SC complement of \text{consider}, whereas in the object depictive sentence (99) it comes out of the right branch of the \text{V'}. According to Kayne, the postverbal NP in a resultative is the left branch of an \text{SC}, as in (98). Extraction from inside it should be blocked. However, (100) is no worse than (99).

(100) the door that I painted \[_{NP}\ \{\text{the\ top\ of\ t}\]\ \[_{SC}\ \{\text{red}\}\]

To maintain the \text{LBSC}, we were forced to conclude that the postverbal NP of a transitive resultative is not the left branch of an \text{SC} constituent. This conclusion was incompatible with the Binary \text{SC} Analysis but fits either the Hybrid \text{SC} Analysis or the Ternary Analysis, in both of which the postverbal NP is a sister of the verb. However, under the Hybrid \text{SC} Analysis, the intransitive postverbal NP is the left branch of an \text{SC}. Extracting something from inside it should yield worse results than (100). But it does not, as (101) (repeated from (89)) shows.

(101) the gang that I drank \[_{NP}\ \{\text{the\ leaders\ of\ under\ the\ table}\}\]
the film that the producer talked \[_{NP}\ \{\text{the\ cast\ of\ to\ death}\}\]
the Nikes that I ran \[_{NP}\ \{\text{the\ soles\ of\ threadbare/ragged}\]\ the shoes that I walked \[_{NP}\ \{\text{the\ heels\ of\ to\ tatters/paper-thin}\]\ the band that they hooted \[_{NP}\ \{\text{the\ members\ of\ off\ the\ stage}\}\]

However, this way of saving the Hybrid \text{SC} Analysis is not viable, for two reasons. First, it does not work for intransitive resultatives. This is because the verb and the NP are not sisters, so selection cannot operate between them. Second, even for transitive resultatives, the selectional restrictions on the \text{XP} are tighter than this indirect selection account expresses. As was argued in section 2 and is further illustrated in (ii), result \text{AP}s in \text{-ing} and \text{-ed} are semantically incompatible with resultatives. But the incompatibility is not between the result \text{XP} and the postverbal \text{NP}, as is clear from (iii). The problem is between the \text{XP} and the verb.

(ii) The gardener watered the tulips *flattened/*wilting/*flat/*soggy. The jockeys raced the horses *exhausted/*sweating/*thirsty/*hungry/*sweaty.

(iii) the flattened \text{tulips/the} wilting tulips the exhausted \text{horses/the} sweating horses
If the LBSC is correct, then the extraction facts argue against both of the most plausible SC analyses of resultatives, the Binary SC Analysis and the Hybrid SC Analysis.

There are other conceivable hybrid analyses involving small clauses, but none account for the facts we have just seen. For example, one reviewer has proposed the analysis shown in (102) and (103), which we will call the Hybrid 2 Analysis.

(102) **The Hybrid 2 Analysis: Transitive resultatives**

```
  VP
   \-- V
        \-- N
            \-- NP
                 \-- W
                      \-- PRO
                           \-- flat

  water
  the tulips
```

(103) **The Hybrid 2 Analysis: Intransitive resultatives**

```
  VP
   \-- V
        \-- Z
             \-- NP
                  \-- their Nikes
                       \-- threadbare

  run
```

One motivation for the Hybrid 2 Analysis is that, unlike the first hybrid analysis, it obeys Kayne's binary-branching constraint. However, the Hybrid 2 Analysis has several problems nonetheless. First, *the tulips* in (102) cannot receive a 8-role from *water*, because it is not its sister. Second, this analysis makes contradictory assumptions about whether the result SC is an $X^\text{max}$, and therefore a barrier to government. Consider (103). Here, as in the first hybrid analysis, *their Nikes* must be governed in order to receive case. So $Z$ must be $X^{\text{nonmax}}$. In (102) $W$ must also be $X^{\text{nonmax}}$ since if it were $X^{\text{max}}$, then *the tulips* could not receive case. However, PRO must be ungoverned in order not to receive case. Therefore, one of the nodes above PRO must be $X^{\text{max}}$. It cannot be $Y$, because
an $X^{\text{max}}$ (i.e., Y) cannot be dominated by an $X^{\text{nonmax}}$ (i.e., W). So it must be W. But we just decided that W is $X^{\text{nonmax}}$. We have hit a contradiction.

Yet another hybrid analysis, which we will call the Hybrid 3 Analysis, pointed out by a different reviewer and independently proposed by Yamada (1987), gives transitive resultatives the structure assigned by the Ternary Analysis, as in (104), and intransitive resultatives the structure assigned by the Binary SC Analysis, as in (105).

(104) The Hybrid 3 Analysis: Transitive resultatives

![Diagram of transitive resultative structure]

(105) The Hybrid 3 Analysis: Intransitive resultatives

![Diagram of intransitive resultative structure]

The Hybrid 3 Analysis abandons Kayne’s claim that all branching is binary. Moreover, it abandons the assumption that a subject and a predicate form a constituent, one of the guiding assumptions behind SC analyses in general. For these reasons, this hybrid seems like a less serious contender. We mention it here, though, because it does not run into the barrier problem discussed above. Since only intransitive resultatives (e.g., 105) contain an SC, it would be possible to claim that the SC is not a barrier to government, allowing the postverbal NP to receive case and the XP to be selected. However, the Hybrid 3 Analysis is nonetheless doomed for the same reason as the original hybrid analysis we considered: it cannot handle the fact that transitive and intransitive resultatives behave identically with respect to extraction of the subpart of a left branch. Also, like both of the other hybrid analyses, it cannot handle the selection of the result XP.

6. Predication and Control

We have shown that of the three analyses we have considered, the Ternary Analysis is the only one that is compatible with the AS of resultatives. In this section we will show
it also makes the most reasonable claims about the structural conditions on predication and control.

All three analyses assume that the postverbal NP and the result phrase are in a subject-predicate relation. Where they differ is in what they assume about the relation between semantic predication relations and syntactic structure. For SC analyses, the unit formed by a subject and its predicate must be mirrored in syntactic structure. So, in both the Binary and Hybrid SC Analyses, the result predicate and its post-NP subject form a unique constituent. In contrast, the Ternary Analysis assumes that a subject and predicate need not exhaustively form a constituent.44

Where each analysis stands on the syntax-semantics relationship has consequences for what each must take to be the proper conditions on predication and control. This can be seen by considering two types of impossible resultatives (pointed out in Simpson (1983)), those in (106), where the subject of the result predicate is embedded inside a PP, and those in (107), where the subject of the result predicate is the subject of the verb.

   (cf. The winemakers stomped the grapes flat.)
   b. *The professor lectured to the class into a stupor.
   (cf. The professor lectured the class into a stupor.)
   c. *Fido chewed on my shoes to tatters.
   (cf. Fido chewed my shoes to tatters.)

(107) a. *The tenors sang hoarse.
   (cf. The tenors sang themselves hoarse.)
   b. "Joggers often run sick.
   (cf. Joggers often run themselves sick.)
   c. *The teacher talked blue in the face.
   (cf. The teacher talked himself blue in the face.)
   d. *The tourists walked ragged.
   (cf. The tourist walked themselves ragged.)

Having already chosen the Ternary Analysis, we must consider how it measures up to the other two analyses with respect to the constraints it needs in order to rule out (106) and (107).

Let us begin with (106). The Ternary Analysis, like the Binary SC Analysis, can handle (106) with the standard C-Command Condition on predication, which requires that a subject c-command its predicate (Williams (1980), Rothstein (1983)). In neither (108) nor (109) is the condition satisfied, so the structures are ruled out.

44 This is not to say that under the Ternary Analysis there is no systematic relation between syntax and semantics, just that the mapping of constituents on one level to constituents on the other is not a simple one-to-one correspondence. We return to this issue below.
(108) The Ternary Analysis

(109) The Binary SC Analysis

In (109) we have assumed that a PP is permitted as the subject of an SC. Of course, if some other principle prevented PPs from occurring in this position, then the sentence would be independently ruled out.45

The Hybrid SC Analysis needs something additional to rule out (106).

(110) The Hybrid SC Analysis

45 A reviewer mentions the alternative SC structure in (i).

(i) [VP[stomp][PP[on][SC[NP the grapes][AP flat]]]]
As (110) illustrates, PRO c-commands flat, so the C-Command Condition is not violated and the sentence should be grammatical. In fact, this structure also satisfies the tighter Mutual C-Command Condition on predication proposed in the literature (Schein (1982), Rothstein (1983), Rapoport (1986)), which requires that a subject and its predicate c-command each other. To block this sentence, the Hybrid SC Analysis needs a separate condition on control, stipulating, basically, that an object of a preposition cannot control a PRO subject of an SC.

To summarize so far, the Ternary Analysis can handle (106) with the same mechanism as the Binary SC Analysis, and with fewer stipulations than the Hybrid SC Analysis. The standard C-Command Condition will suffice.

Turning now to (107), we can see that ruling these cases out is less straightforward, for all three analyses. Under the Ternary Analysis, (107) would have the structure in (111). Here the subject of the result phrase c-commands its predicate, yet the sentence is ungrammatical.

(111) The Ternary Analysis

As (112) shows, however, inserting an NP that not only c-commands the result predicate but is also c-commanded by it saves these sentences. For many speakers, such NPs can only be coreferent reflexives or body parts. For other speakers, lexical NPs (e.g., the pavement in (112e)) are possible:

(112) a. Joggers often run themselves sick.
    b. The teacher talked himself blue in the face.
    c. The tenors sang themselves hoarse.
    d. The tourists walked their shoes ragged.
    e. The joggers have run the pavement thin.

The structure of (112c) under the Ternary Analysis is (113).

Since (i) satisfies the C-Command Condition, an additional constraint would be needed to rule out (106). Another difficulty with this analysis is that it assumes that on assigns a 0-role to the SC [SC the grapes flat].
The Ternary Analysis can rule out (107), while allowing (112), then, by adopting the Mutual C-Command Condition on predication. Notice that the Mutual C-Command Condition is not contradicted by the grammaticality of the passive resultatives in (114), the unaccusative resultatives in (115), or the middle resultatives in (116). In all three cases, the XP predicate is in a mutually c-commanding relationship with its subject, a sister NP-trace.

(114) **Passive resultatives**
The tulips were watered t flat.
The coffee beans were ground t (in)to a fine powder.
Their house was painted t a hideous shade of green.

(115) **Unaccusative resultatives**
The pond froze t solid.
The pitcher smashed t to pieces.
The sweater stretched t out of shape.
The toast burned t black.

(116) **Middle resultatives**
New seedlings water t flat easily.
Those cookies break t into pieces easily.
My running socks don’t scrub t clean easily.
Permanent press napkins iron t flat easily.

It might appear that subject-oriented depictive predicate phrases such as *naked* in (117) pose a problem for the Mutual C-Command Condition. Andrews (1982) and Roberts (1988) have argued that these phrases are VP-internal. If so, they do not c-command their subjects, yet the sentences are grammatical. (In (117) we are making the standard assumption that depictive XPs are adjoined to VP.)
One solution is to claim, following McNulty (1988), that the proper condition on predication is not Mutual C-Command, but Mutual M-Command. Given May's (1985) segmental theory of adjunction together with the assumption that *naked* is adjoined to VP in (117), *naked* is not dominated by VP; rather, it is dominated by only a segment of VP. Therefore, the first maximal projection dominating it is IP, and *John* and *naked* are in a mutual m-command relation. Predication is therefore licensed.46

A Mutual M-Command Condition on predication also trivially accounts for (111),

46 Rather than abandon the Mutual C-Command Condition in favor of Mutual M-Command in the face of VP-internal subject-oriented depictives, Rothstein (1990) adopts a mechanism whereby a predicate can be "absorbed" into a predicate immediately dominating it, to form a complex syntactic predicate. After two applications of absorption, naked would form a complex predicate at the level of I'. Another proposal (Roberts (1988)), which does not use an absorption mechanism, retains the Mutual C-Command Condition by adopting the view that subjects are internal to VP, as in (i).

We will not pursue these alternative proposals here.
the case that motivated us to introduce the Mutual C-Command Condition; the tenors and hoarse mutually m-command each other in addition to mutually c-commanding each other. And switching from c- to m-command does not change the ungrammatical status of (108) ("stomp on the grapes flat); the object of the preposition does not m-command the result XP.

Now consider how the Binary and Hybrid SC Analyses handle (107). Under both, the sentences in (107) would presumably have the structure in (118), with PRO as the subject of the resultative SC, PRO and hoarse c-commanding each other.

(118) The Binary SC and Hybrid SC Analyses

This structure is not ruled out by either the standard C-Command Condition on predication or the Mutual C-Command Condition. These cases must be ruled out by something else. What is necessary is an extra stipulation to the effect that a subject NP cannot control a PRO subject of a resultative SC complement.47

To summarize so far, the three analyses require different conditions on predication and on control. For the Binary SC or Hybrid SC Analysis to rule out the ungrammatical cases in (107) and for the Hybrid SC Analysis to rule out the ungrammatical cases in (106), in addition to the standard C-Command Condition, a condition on what can control a PRO subject of an SC is required. In contrast, the Ternary Analysis needs no additional

47 Of course, if the verb were to govern into the SC, then no extra condition would be needed, given that PRO must be ungoverned. In this way the Binary SC Analysis could get away with only the C-Command Condition on predication. But it is not clear whether the Hybrid SC Analysis could. As we pointed out in section 5, if the verb were to govern into the SC, then the Hybrid SC Analysis incorrectly predicts transitive resultatives also to be ungrammatical, because their subject is PRO. Thus, the Hybrid SC Analysis needs the extra condition on control in addition to the C-Command Condition on predication in order to rule out (107).

The extra condition would also be needed under an SC analysis of the complements of believe and want, in order to rule out cases like (ii).

(i) I want her happy.
(ii) *I want PRO happy.

In section 7, however, we propose that these cases also be given a Ternary Analysis. This eliminates the need for the extra condition on control altogether.
control condition to rule out the cases of (107). But it must replace the C-Command Condition on predication with the tighter Mutual C-Command Condition. But since Mutual C-Command runs into problems with subject-oriented VP-internal depictives like the one in (118), Mutual C-Command must be replaced with Mutual M-Command.

In fact, depictives make it necessary to switch to m-command independent of a consideration of whether command is mutual or not and therefore independent of the Ternary Analysis of resultatives. The C-Command Condition (or the Mutual C-Command Condition, for that matter) cannot account for object-oriented depictives adjoined to \( V' \), without additional assumptions or complications. In (119), for example, the model does not c-command nude.

Neither the M-Command Condition nor the Mutual M-Command Condition has difficulty with (119) since the model and nude m-command each other.

The M-Command Condition is also independently needed to explain the possible interpretations of sentences with two depictive predicates such as those in (120).

\[(120)\]
\[
\begin{align*}
&\text{a. John sketched the model} \_ \_ \_ [\text{nude}]_i \_ [\text{drunk as a skunk}]_j. \\
&\text{b. John} \_ \_ \_ \_ \_ \text{sketched the model} \_ \_ [\text{nude}]_i \_ [\text{drunk as a skunk}]_j. \\
&\text{c. John} \_ \_ \_ \_ \_ \text{sketched the model} [\text{nude}]_i [\text{drunk as a skunk}]_j. \\
&\text{d. *John} \_ \_ \_ \_ \_ \text{sketched the model} [\text{nude}]_i [\text{drunk as a skunk}]_j. 
\end{align*}
\]

The facts to be accounted for are as follows. Both depictives may be object-oriented, as in (120a); the inner depictive can be object-oriented and the outer one subject-oriented, as in (120b); both can be subject-oriented, as in (120c). What is not possible is for the inner depictive to be subject-oriented and the outer one object-oriented, as in (120d).

The Mutual M-Command solution handles these facts as follows. In (120a), shown in (121), nude and drunk are both adjoined to \( V' \) and therefore are in a mutual m-command relation with the model, but not with John. In (120b), also shown in (121), drunk is adjoined to VP. Because it is not contained in all of VP, however, it is in a mutual m-command relation with only John.

---

48 We thank Marco Haverkort for pointing out to us the issues raised by double depictives.

49 The impossibility of (120d) was also observed by Rothstein (1983).
In (120c), shown in (122), *nude* and *drunk* are both adjoined under VP. Since neither is contained in all of VP, they are both in a mutual m-command relation only with *John*. In (120d) *nude* has to be adjoined to VP (as it is in (122)) in order to be in a mutual m-command relation with *John*. But then *drunk* cannot be inside the lowest VP, as it needs to be in order to be in a mutual m-command relation with the *model*. Thus, this interpretation of the sentence is ruled out.

The standard C-Command Condition, in contrast, cannot explain the ungrammaticality of (120d). If the theory is modified to allow the *model* to c-command *nude* and *drunk* in (121) (as would be necessary to account for the object-oriented interpretations), then all four interpretations in (120) should be good, since both NPs c-command both predicates.\(^{50}\)

\(^{50}\) In contrast to the C-Command Condition, the Mutual C-Command Condition does not predict that (120d) is good, since in (121) *nude* does not c-command *John*. However, as pointed out above, Mutual C-Command runs into a problem with VP-adjoined subject-oriented depictives. Our central point does not hinge on whether this problem is solved by switching to an M-Command Condition or by adopting Rothstein’s mechanism of predicate absorption (see footnote 46). We choose M-Command because it gives a unified account of V’- and VP-adjoined depictives. What is clear, regardless of what refinement one chooses, is that some such refinement is necessary and that it is necessary regardless of the analysis one adopts for resultative constructions.
To sum up, the Mutual M-Command Condition on predication required by the Ternary Analysis of resultatives is independently motivated; it is needed to account for the allowable interpretations of "double" depictive sentences. But the Binary and Hybrid SC Analyses need, in addition, extra stipulations about what can be the controller of a subject in a resultative SC. Thus, besides being preferable on other grounds, the Ternary Analysis allows us to make the most economic set of assumptions about the grammar overall.

7. Beyond Resultatives

We have considered the three syntactic analyses of resultatives in (123), (124), and (125) and have concluded that the Ternary Analysis is the correct one.

(123) The Ternary Analysis
(124) **The Binary SC Analysis**

![Diagram of the Binary SC Analysis]

(125) **The Hybrid SC Analysis**

a. Transitive resultatives

![Diagram of the Hybrid SC Analysis for transitive resultatives]

b. Intransitive resultatives

![Diagram of the Hybrid SC Analysis for intransitive resultatives]

The Ternary Analysis not only gives a unified syntactic account of transitive and intransitive resultatives but also is the only one of the three that handles all of the following facts:

(126) **a.** The result XP is selected by and therefore is an argument of the verb (as was shown in section 2). This means that the result XP must be a sister of the verb, for both transitive and intransitive resultatives, which is true only under the Ternary Analysis.
b. A wh-result XP can be extracted long distances in both transitive and intransitive resultatives, showing that it is lexically governed in both. This is true only under the Ternary Analysis.

c. The postverbal NP is an argument of the verb for transitive resultatives, as shown by Middle Formation, Adjectival Passive Formation, and Nominal Formation, as well as by the selection of the postverbal NP itself (section 3). This means that the postverbal NP must be a sister of the verb for at least transitive resultatives, as is true under the Ternary and the Hybrid SC Analyses. However, the Hybrid SC Analysis can treat the transitive postverbal NP as an argument of the verb only at the cost of making contradictory claims about the barrierhood of result SCs. (This was discussed in section 5.)

d. Extraction of a subpart of the postverbal NP is equally possible in transitive and intransitive resultatives. This would be expected if they had identical syntactic structures, as would be the case under either the Ternary or the Binary SC Analysis. However, if we accept Kayne's LBSC, then the extraction facts rule out the Binary SC Analysis, since according to it, resultative postverbal NPs form the left branch of an SC. (This was shown in section 4.) The LBSC rules out the Hybrid SC Analysis for the same reason, except that the postverbal NP is the left branch of an SC for only intransitive resultatives. (This was discussed in section 5.)

e. Resultatives that contain no lexically specified postverbal NP in D-Structure, for example "They laugh sick," are ungrammatical. In order to account for this, the Ternary Analysis must adopt either a Mutual C-Command Condition or a Mutual M-Command Condition on predication. (We chose M-Command because it also accounts for VP-internal subject-oriented depictives.) However, this elaboration of the standardly assumed C-Command Condition is assumed by much of the literature on predication and also is needed independently to account for the interpretation of double depictives. The Binary SC and Hybrid SC Analyses have to make special assumptions about the control of PRO in resultative SCs to account for *They laugh sick. (This was discussed in section 6.)

The evidence, then, comes down heavily in favor of the Ternary Analysis.

Choosing the Ternary Analysis over the Binary SC and the Hybrid Analyses has broader implications for the grammar. What motivated small clause analyses for resultatives and other verbs is the assumption that a subject and its predicate, because they form a semantic unit, must exhaustively form a constituent. However, given the correctness of the Ternary Analysis, the result predicate and its subject do not form a constituent. Nor do they correspond to a single argument position in the 0-Grid of the resultative verb. Thus, there is a lack of isomorphism between semantic structure and
D-Structure on the one hand and between semantic structure and Argument Structure on the other. The only syntactic condition on the semantic relation of predication is Mutual M-Command.

The Ternary Analysis also sheds light on the relationship between lexically specified Argument Structure representations and the syntactic structures they project to. Resultatives are illuminating because of the apparent paradox they present: transitive and intransitive resultatives have identical syntactic structures, yet the former behave like persuade and the latter like believe with respect to 8-role assignment to the postverbal NP. We have argued that the correct solution to the paradox is to distinguish syntactic structure from Argument Structure. All resultatives share the single ternary syntactic configuration in (127), but their lexically specified AS representations, shown in (128), differ.

Thus, syntax and AS are not isomorphic. It is not the case that every sister of V is represented as an argument at the level of AS.

But if AS and syntax can differ in this way, we can extend this analysis to the classic SC-complement verbs like consider, judge, find, call, and deem and to other subject-predicate structures traditionally given an SC analysis. Consider, for example, is usually assumed to occur in the structure in (129) and to have the AS in (130). (We call the θ-role of the SC argument him cooperative a proposition, simply to give it a name.)
(130) consider experiencer [prop]

Under a ternary analysis, these verbs would have the syntactic structure shown in (131): the AS in (132), parallel to intransitive resultative verbs like *run*. (We call the argument satisfied by cooperative a property.)

![Syntactic structure diagram](image)

(131) consider him cooperative

(132) a. consider experiencer [prop]
    b. cooperative theme

The syntactic representation in (131) differs from the standard Government-Binding Theory representation in (93) in having no intermediate node dominating the subject (him) and the predicate. At the AS level, the difference lies in which element in the syntax is represented as an argument of consider. For SC analyses it is the whole proposition him cooperative, whereas under the current proposal it would be simply the property cooperative. Him corresponds to the external argument in the AS of cooperative.

Making this move for these SC cases, of course, will require examining all of the arguments that have been given in favor of SC analyses in general, for example, Hoekstra’s (1986; 1988) empirical arguments for Dutch. But if our arguments that resultatives require ternary VPs are correct, then two of the basic motivations for positing SC analyses in the first place—the binary-branching constraint and the idea that the semantic subject-predicate relation must be mirrored by a constituent in the syntax—cannot be upheld. And the remaining arguments for having SCs at all must be scrutinized carefully.

Appendix: A Complex Verb Analysis of Resultatives

Following Chomsky (1955/1975), Larson (1988) has proposed a Complex Verb Analysis of dative structures, in which the verb and the indirect object form a constituent, as in (133b).

51 Recall footnote 38, where judgments about extraction from left branches were shown to be consistent with this syntactic structure.
52 Given our proposal that standard SC verbs are counterparts to intransitive run, it is an open question
(133) a. John gave a book to Mary.

This analysis, like the Binary and Hybrid SC Analyses that we have argued against, is incompatible with the standard assumptions that all internal arguments are sisters of their heads and that c-command is the relevant structural relation for government (as in Chomsky (1986)). Under these assumptions, a book could not be 0-marked by give. To solve this problem, Larson allows for a weakening of the structural definition of internal argumenthood: whereas the indirect object of a dative structure (to Mary in give a book to Mary) receives its 0-role directly from the verb in the usual way, the direct object NP a book receives its 0-role compositionally, from the "phrasal verb" give to Mary, in much the same way that an external argument (subject) receives its 0-role compositionally from the entire VP (Marantz (1984)).

In support of this idea, Larson claims that a different 0-role is assigned to the NP the Fifth Symphony in (134a) and (134b). In (134a) the Fifth Symphony is an abstract entity; in (134b) it is a concrete manuscript.

whether there is a class of verbs that could be analyzed as the counterparts of transitive resultatives like water, with two internal arguments, both 0-marked by the verb. One candidate is the class containing elect and nominate. The question is whether their postverbal NPs pass the tests for argumenthood. If (i) and (ii) are indicative, they seem to.

(i) Blacks and women elect/nominate to Congress more easily these days. (MF)
(ii) the electing/nominating of blacks and women to Congress . . . (NF)

Presumably, proponents of the Binary SC Analysis or the Hybrid SC Analysis could also offer alternative structural definitions of argumenthood. However, as far as we know, no specific proposals have been offered.
(134) a. Beethoven gave the Fifth Symphony to the world.
b. Beethoven gave the Fifth Symphony to his patron.
c.

Larson claims that since the semantic role assigned to the NP object of *give* "depends on the nature of the recipient" inside the PP argument, this NP must receive its 8-role not from the verb alone but from the entire complex \( V' \).

Such a complex verb analysis could be applied to resultatives as in (135).

(135) a.
We assume that this analysis, like both the Ternary Analysis we have adopted and the Binary SC Analysis we have rejected, assigns transitive and intransitive resultatives identical syntactic structures. 0-marking would work as follows. In (135a) water would assign a 0-role to flat directly; then the complex verb water flat would assign a 0-role to the tulips. In (135b) run would assign a 0-role to threadbare and the V' run threadbare would assign a 0-role to their Nikes.

In fact, though, extending the Complex Verb Analysis of give-class verbs to resultatives requires a more complicated notion of 0-marking than this. In the case of a transitive resultative complex V', it is not enough to say that the complex V' as a whole assigns a 0-role to its NP sister. Rather, the result XP and the verb inside the complex V' must each contribute a 0-role. As we argued in section 3.1, in water the tulips flat, the tulips get watered and they also get flat. One piece of evidence for this was the contrast between resultatives in which the verb is used transitively, with both the verb and the result XP assigning 0-roles, and resultatives in which these same verbs are used intransitively, with only the result XP assigning a 0-role:

(136) The gardener watered the tulips flat.
The gardener watered his sneakers soggy.

The second piece of evidence that two 0-roles are assigned to the postverbal NP was that the verb and the result XP each separately s-select it. In (137), for example, the hikers meets the restrictions of both frighten and speechless.

(137) The bears frightened the hikers speechless.

However, the cases in (138) are ungrammatical because the NP satisfies the selectional restrictions of one head but violates those of the other. In (138a) the bears meets the
selectional restrictions of \textit{frighten}, but not \textit{speechless}. In (138b) \textit{the redwoods} meets the selectional restrictions of \textit{to death} but not \textit{frighten}.

(138) a. *The hikers frightened the bears speechless.
   b. *The bears frightened the redwoods to death.

This means that two 0-roles and two sets of selectional restrictions — one from the V and one from the result XP — must percolate up to V'. This V' must be able either to transmit or else to merge the two sets of selectional restrictions into their intersection and to merge the two 0-roles into a new "combo-role."

Several consequences arise out of this Complex Verb Analysis of resultatives. First, allowing a single V' to assign two distinct 0-roles to the same argument would require an extension of the 0-Criterion, one that is different from the one we proposed in section 1.1 for the Ternary Analysis. Our Relativized 0-Criterion in (18) allows an argument to receive two 0-roles, but in two independent domains, each 0-role assigned by a distinct 0-assigning head. In contrast, under the Complex Verb Analysis, either two roles come from a single assigner to the same argument, or, if merger of 0-roles into new "combo-roles" is what is happening, then a potentially very large set of subtly distinct 0-roles is needed, to capture differences like giving something to the world and giving something to a patron, as required by (134).\footnote{As mentioned in footnote 36, Ike-Uchi (1990) proposes a complex verb analysis for intransitive resultatives only; transitive resultatives have a ternary syntactic structure, as we claim. Therefore, the complications for 0-marking that we are pointing out do not apply to his analysis.}
A second consequence is that 0-roles and features must be able to percolate up to the V' not only from the head of the V (the V) but also from the nonhead, the result XP. This is a different notion from ordinary percolation, which follows projections from heads of phrases to the nodes dominating them.

A variant of the Complex Verb account is given in Larson (1990), in response to Jackendoff (1990b). The relevant difference is that here Larson uses Chomsky’s (1986) definition of 0-marking: a indirectly 8-marks β where β is the subject of a, subject being defined as any NP in the configuration [NP, XP]. According to Larson, by this definition, the tulips is the subject of the lower VP in (135a) and therefore can receive its 8-role indirectly from the head of V' within VP, water, rather than from the entire V'. This means that percolation of the features of water to V' is not necessary. However, a problem remains. It is not clear how the tulips can also receive a 0-role from flat, since as an adjective, flat is not the head of the XP that the tulips is the subject of. The same problem holds for the intransitive resultative in (135b).

References


ARGUMENT STRUCTURE & SYNTACTIC STRUCTURE OF RESULTATIVES 233


(Carrier)

Department of Linguistics
Grays Hull Basement
Harvard University
Cambridge, Massachusetts 02138

(Randall)

Linguistics Program
406 Holmes Hall
Northeastern University
360 Huntington Avenue
Boston, Massachusetts 02115

RANDALL @ northeastern.edu
Contents

173 The Argument Structure and Syntactic Structure of Resultatives
    Jill Carrier
    Harvard University
    Janet H. Randall
    Northeastern University

235 Derivational Constraints on A-Chain Formation
    Samuel David Epstein
    Harvard University

261 Anaphors in English and the Scope of Binding Theory
    Carl Pollard
    The Ohio State University
    Ivan A. Sag
    Stanford University

Remarks and Replies

305 Coordination and VP-Internal Subjects
    Strang Burton
    Brandeis University
    Sane Grimshaw
    Brandeis University

313 Another Type of Antecedent Government
    Heizo Nakajima
    Tokyo Metropolitan University

329 Squibs and Discussion
    J.-Marc Authier, Louise McNally, Ljiljana Progovac, Richard Sproat

Linguistic Inquiry