

17 This question has implications for whether or not I-meanings are, in a certain sense, "holistic" or "atomistic." The issue is whether the existence of a given I-meaning in Peter's lexicon can or cannot entail the existence of a certain other I-meaning in his lexicon. To the extent that I-meanings are explicit definitions, then the existence of each is independent of the other, and they are "atomistic." But to the extent that I-meanings specify regularities of use, then they require the deployment of concepts other than the one they directly determine. Note that this "holism" is in no way implausible or objectionable. In particular, it should not be confused with another doctrine, sometimes given the same name, according to which any change, no matter how slight, in what is believed by a person, alters to some degree the meaning of every one of his terms. The latter idea – endorsed by Davidson (*Truth and Interpretation*) and by Ned Block ("An Argument for Holism," *Proceedings of the Aristotelian Society*, 95 (1994–5), 151–69) – is indeed unattractive; but it is quite different from the view that the meanings of certain terms are inextricably interdependent.

18 There are at least two ways for *a priori* belief to arise from within the VSP perspective. One way is through the innateness of certain conceptual roles. For example, it may be an innate feature of C/I that there is a Mentalese token "q" such that "p^oq" is inferred from "p" and "q," and vice versa; and in that case the belief that if dogs bark and pigs fly, then pigs fly, is *a priori*. Another kind of *a priori* commitment arises by virtue of the pragmatic decision to hold true a certain sentence (so that it is not held true for empirical reasons). For example, "Bachelors are unmarried" is maintained for the sake of a socially useful distinction, not in order to accommodate experience.

19 One might be tempted to try a further simplification – that is, to eliminate, not merely I-meanings, but I-sounds as well! But this is clearly not feasible. For there must be information of some sort passed between P/A and C/I; so there have to be terms in which that information is articulated. Moreover, there must be a system capable of taking the output of P/A – roughly, a string of sounds – and determining its compositional structure. Thus, neither I-sounds nor FL can be dispensed with.

20 I don't mean to suggest that either Chomsky or Davidson holds this view – only that their remarks on compositionality have led others to adopt it. See, for example, R. Larson and G. Segal, *Knowledge of Meaning* (Cambridge, Mass.: MIT Press, 1995).

21 This approach to compositionality is developed in my "The Composition of Meanings," *Philosophical Review*, vol. 106, no. 4 (1997), 503–31; reprinted as chapter 7 of *Meaning and in my "Deflating Compositionality," Ratio*, 14 (December 2001).

22 I am very grateful to Ned Block, Robyn Carsten, Tim Crane, Michael Harnish, Rita Manzini, Alec Marantz, Barry C. Smith, Neil Smith, and especially to Noam Chomsky, for their helpful comments on an earlier draft of this paper.

8

Small Verbs, Complex Events: Analyticity without Synonymy

PAUL M. PIETROSKI

I was introduced to linguistics and philosophy of language at the same time, in a setting which encouraged the thought that these enterprises can be fully continuous and mutually supporting. Noam Chomsky provided my initial exposure to this field of inquiry. For this, I am deeply grateful.¹

In this chapter, I combine an aspect of Chomsky's (1995a) minimalist program with a version of Davidson's (1967) event analysis. This may seem odd, given Chomsky's recent claims about truth-conditional semantics. (See Chomsky 1995b: 23–7.) But perhaps what follows is an exercise in what Chomsky calls "internalist" semantics – a "form of syntax" that does not contribute to "an account of communication in terms of shared entities" or Fregean *Bedeutungen*. Then again, perhaps we really do need to say that certain verbs are semantically associated with events, in order to explain certain facts about human linguistic competence. In any case, minimalism and the event analysis are made for each other, especially with respect to sentences like

- (1) John boiled the water.
- (2) The water boiled.

In my view, the inference from (1) to (2) is valid; (2) follows from (1), much as (2) follows from

- (3) John did something, and the water boiled.

Correlatively, I think that

- (4) If John boiled the water, then the water boiled.

- (6) If John did something and the water boiled, then the water boiled.

is true on any interpretation of its nonlogical lexical items. And the inference from (3) to (2) is valid. As Kripke showed, we must distinguish modal relations between propositions from model-theoretic relations between syntactically individuated linguistic entities. (See also Etchemendy 1990; Hanson 1997.)

As I use the term, (6) is analytic. Intuitively, one can know that (6) is true, by virtue of knowing English – and a little logic, if this is not already part of knowing a language with logical connectives. I do not say that (6) is true by virtue of its meaning, or that (6) is true by convention. If a sentence is true by virtue of anything, it is true by virtue of how the world is. A sentence is true when the world is the way the sentence says it is. The world is such that: if John did something and the water boiled, then the water boiled. It takes only rudimentary logic to appreciate that the world is this way (since it must be this way); and any competent speaker of English knows that (6) is true, if the world is this way. (In general, if a sentence has the same truth value on any interpretation of its nonlogical elements, then its truth value is a function of its form and its logical elements; and such a sentence expresses a noncontingent proposition.)

One might complain that my usage of “analytic” is overly inclusive. So let me note that Quine himself distinguished two classes of alleged analytic statements:

Those of the first class, which may be called *logically true*, are typified by

- (1) No unmarried man is married.

The relevant feature of this example is that it is not merely true as it stands, but remains true under any and all reinterpretations of “man” and “married” . . . a logical truth is a statement which is true and remains true under all reinterpretations of its components other than the logical particles. But there is also a second class of analytic statements, typified by

- (2) No bachelor is married.

The characteristic of such a statement is that it can be turned into a logical truth by putting synonyms for synonyms . . . We still lack a proper characterization of this second class of analytic statements, and therewith of analyticity generally, inasmuch as we have had in the above description to lean on a notion of “synonymy” which is no less in need of clarification than analyticity itself . . . Our problem, however, is analyticity; and here the major difficulty lies not in the first class of analytic statements, the logical truths, but rather in the second class, which depends on the notion of synonymy. (Quine 1953: 22–4, his italics and my bold)

For present purposes, I grant that: there are no second-class analyticities, or at least none that can be characterized without vicious circularity; and this loss need

is analytic – knowable by virtue of knowing a language. This view has been criticized, most recently by Fodor and Lepore (1998, 1999). But one can respond, by combining a Davidsonian treatment of action sentences with Chomsky’s claim that transitive constructions like (1) result from merging intransitive verb phrases with “small” verbs – hidden lexical elements that resemble the causative morphemes posited by many theorists. This lets one maintain that the inference from (1) to (2) is an instance of a valid form; although specifying the logical form of (1), and saying *why* (2) follows from (1), requires both semantic and syntactic theory. The proposed account introduces a motivated twist on traditional causative analyses of (1), thereby avoiding various criticisms of such analyses. And analyticities like (4) do not rely on synonymy, meaning postulates, or any other semantic relations eschewed by Quineans. (This is fully in keeping with Chomsky’s own defense of analyticity; see Chomsky 1992: 112–16.)

1 Hidden Tautologies

Any talk of analytic truths is likely to arouse suspicions. So let me begin by saying how such talk is to be understood for these purposes. It should be relatively uncontroversial that there are analyticities of the sort I have in mind. The controversial claim will be that (4) is an example.

1.1

All analytic truths are necessary truths, but the converse does not hold. Consider

- (5) If John heated the water, then John raised the mean molecular energy of the water.

Following Kripke (1980), I assume that there is no possible situation in which John heated the water without raising its mean molecular energy. Yet (5) is not analytic. Competent speakers of English can fail to know that this conditional is true. Correspondingly, the argument “John heated the water, so John raised the mean molecular energy of the water” strikes us as invalid: failure to draw this inference is not a failure to exhibit logical competence, even though there is no possible situation in which the premiss (as interpreted) is true and the conclusion (as interpreted) is false. If we construe the premiss and conclusion as syntactic objects, though, there are possible interpretations of (the nonlogical elements of) the premiss and conclusion that make the former true and the latter false. Similar remarks apply to “if John boiled some H₂O, then John boiled some water” and “if Hesperus is big, then Phosphorus is big.” By contrast,

not be mourned, since no theoretically interesting goals are served by positing these local semantic relations between distinct lexical items.

My interest lies with first-class analyticities, which Quine characterized in model-theoretic terms. I assume that "Someone ran, if John ran" is analytic, although its surface appearance does not make its analyticity manifest. An inference can be truth-preserving on any interpretation of its (nonlogical) lexical elements, even if determining that (and why) this is so requires theoretically interesting work. That is, first-class analyticities can be more or less "hidden," depending on their surface appearances. My claim is that instances of "y boiled, if x boiled y" are hidden first-class analyticities.²

1.2

An important motivation for this claim is that "boiled" appears to be one of many verbs " Φ ," such that inferences of the form " $x \Phi y$, so $y \Phi$ " are compelling. Consider: "melted," "froze," "broke," "opened," "closed," "sank," etc. Not every verb appears in both transitive and intransitive constructions. And if Nora counted the marbles, then Nora counted, while the marbles did not. Still, many instances of " $x \Phi y$, so $y \Phi$ " are about as compelling as instances of "P and Q, so Q." When many compelling inferences exhibit a pattern, one suspects that the inferences share a (perhaps hidden) valid form.

Nonetheless, it remains a hypothesis (not a datum) that instances of "x boiled y, so y boiled" are valid. Validity requires that the *same* verb appear in both the transitive and intransitive constructions; else there would be no guarantee that every interpretation (of the nonlogical components) that makes "x boiled y" true also makes "y boiled" true. That is, the sound of "boil" must not be ambiguous as between: "boil₂," which takes two arguments, as in "John boiled₂ the water"; and "boil₁," which takes one argument, as in "the water boiled₁." (On this view, the pattern alluded to above is a surface pattern due to the homophony of distinct verbs.) Yet perhaps "boil" is ambiguous in just this way. Indeed, if the verb in the transitive construction takes more arguments than the verb in the intransitive construction, how can it be the *same* verb in both constructions? Presenting and defending a nonambiguity hypothesis will require the rest of this essay. Let me say briefly, though, why ambiguity hypotheses are unattractive.

If one denies that the same verb appears twice in "x boiled y, so y boiled," one must still account for the compellingness of such inferences. One might reply that "boil₂" and "boil₁" are related by a meaning postulate: if x boiled₂ y, then y boiled₁. But this is to posit a second-class analyticity. Moreover, even those unimpressed by Quine's arguments should be wary of positing so *many* meaning postulates – if x melted₂ y, then y melted₁, etc. – to account for what appears to be a widespread (and arguably productive) linguistic phenomenon. So if the

"hidden first-class analyticity" hypothesis can be defended, it is preferable to the "ambiguity plus meaning postulate" hypothesis.

In reply, one might advance an "ambiguity plus background knowledge" hypothesis. An invalid inference can be compelling, even when the corresponding conditional expresses a necessary truth. Any competent speaker of English who knows about the nature of heat will infer from "John heated the water" to "John raised the mean molecular energy of the water." Of course, competent speakers of English can fail to know facts discovered by scientific investigation. But competent speakers presumably share *some* background knowledge; and perhaps it is a piece of (extralinguistic) common sense that y boiled₁ if x boiled₂ y. (The parenthetical qualifier is needed to rule out truisms like "Q, if P and Q.")

On this view, the two verbs ("boiled₂" and "boiled₁") are homophones, but no more semantically related than "smoked" and "burned." Indeed, on this view, the following conditionals are on a par:

(7) If John burned₂ the wood, then the wood burned₁.

(8) If John burned₂ the wood, then the wood smoked.

Herein lies the difficulty. Let us stipulate a third meaning for "burned": y burned_{1A} iff y smoked. Then

(9) If John burned₂ the wood, then the wood burned_{1A}.

has the same meaning as (8). But *prima facie*, (7) and (9) are not on a par. In (9), the homophony is unrelated to the compellingness of the inference; yet it is hard to believe that this is also true of (7). Correlatively, even if it is metaphysically impossible to burn₂ wood that does not burn_{1A}, this seems epistemically possible. We can imagine burning₂ wood that does not smoke. Yet it seems epistemically impossible to burn₂ wood that does not burn₁. Moreover, the fact that so many verbs fit this pattern calls for explanation. Why is homophony correlated with epistemic impossibility of the sort just noted? And why is background knowledge correlated with homophony?

Thus, there is considerable motivation for the claim that the same verb ("boil," "burn," "melt," etc.) appears in both transitive and intransitive constructions. But perhaps nonambiguity hypotheses will face even greater difficulties. Moreover, one might claim that the *same* verb appears in *different forms* in transitive and intransitive constructions. Perhaps "boil" can appear as a transitive or intransitive verb, taking two arguments or just one, and inferences of the form "x boiled₂ y, so y boiled₁" are not valid (absent meaning postulates). For reasons that will emerge below, I think this is an ambiguity hypothesis in disguise. Nonetheless, if one rejects such hypotheses, one owes another explanation for why "boil" can *appear as* a transitive or intransitive verb. Most importantly, those of us who say that

- (4) If John boiled the water, then the water boiled.

is valid owe an account of *why* this is so. And serious objections await the attempt to discharge this debt. The question of whether (4) is analytic turns, in large part, on whether these objections can be avoided.³

A caveat before proceeding: the view to be defended does *not* entail that the number of lexical primitives is much smaller than the number of surface form words. But I assume that the relevant surface pattern, in which the transitive and intransitive constructions exhibit verbal homophony, is the manifestation of a regularity some of whose instances do *not* exhibit this pattern. Consider

- (10) If John raised the pistol, then the pistol rose.

I assume that (10) is an instance of "if $x \Phi y$, then $y \Phi$." There are reasons for treating the phonological difference between "raised" and "rose" as an irregularity, not a sign of distinct verbs. And while

- (11) If John killed Abe, then Abe died.

leaves more room for dispute, I treat it on a par with (10), in part because the Old English words for "kill" and "die" were "cwell" and "cwel." (Evidently, "cwell" was replaced with the Scandinavian "die"; Traugott 1972: 75.) But assimilating such cases to the general pattern requires independent argumentation (e.g., appeal to crosslinguistic data); and I am not wedded to any particular examples.

In particular, I do not say that (12–14) are instances of "if $x \Phi y$, then $y \Phi$ ":

- (12) If Nora persuaded Nick to buy a car, then Nick intended to buy a car.
 (13) If Nora tripped Nick, then Nick stumbled.
 (14) If Nora saw a cat, then Nora saw a feline animal.

If such inferences are valid, the lexicon may contain far fewer primitive items than one might have thought. (Instead, it may contain resources for generating a plethora of surface form words from a significantly smaller stock of primitive items; see Jackendoff 1990, Pustajevsky 1995.) But defending this thesis is not my agenda. The phenomenon that interests me may well be restricted to instances that involve homophony, along with a handful of cases like (10–11) independently motivated on a case-by-case basis. This will seem like a reduction of the lexicon, only to the extent that one expected pairs like "boiled"/"boiled" ("raised"/"rose," "killed"/"died") to be examples of distinct lexical items – i.e., distinct primitive linguistic expressions.

2 Causatives without "Cause"

A traditional idea is that "x boiled y" means that x caused y to boil. And for many purposes,

- (15) John caused the water to boil.

is an acceptable paraphrase of

- (1) John boiled the water.

One might, however, advance a bolder hypothesis: the two surface forms have the same underlying form – perhaps, because (1) is somehow derived from (15); and the inference from (1) to

- (2) The water boiled.

is valid, because the inference from (15) to (2) is valid. (See, e.g., McCawley 1968.) In this section, I review some reasons for rejecting this bolder hypothesis in favor of a Davidsonian variation on it.

2.1

Fodor (1970) offers three reasons for not deriving "kill" from "cause to die." These reasons apply, as Fodor and Lepore (1998, 1999) note, to any suggestion that (15) reflects the logical form of (1).

The first objection is that (15) is not a perfect paraphrase of (1). If John sets a house on fire, and as a result some water in the house boils, it seems wrong to say that John boiled the water; but John caused the water to boil. Or suppose John is not an arsonist, but a chef who orders an underling to boil some water. Arguably, John caused the water to boil, but *he* did not boil it. Even if one insists that (1) does follow from (15), an asymmetry remains: why does it *seem* that (15) can be true, while (1) is false? A familiar reply is to introduce a technical term "cause*," and propose that (1) has the same meaning as

- (15*) John caused* the water to boil.

Perhaps "cause*" means: caused in a normal way; whereas in the examples above, John's causal relation to the subsequent boiling is abnormal. But for reasons discussed below, I think this proposal is mistaken.

The second objection is that (1) and (15) differ, in the scope of temporal modifiers. Consider

- (16) On Tuesday, John boiled the water.
 (17) On Tuesday, John caused the water to boil.

Suppose John turned a dial on his stove, creating a flame beneath a pot of water, at 11.59 p.m. on Tuesday; but the water did not boil until after midnight. Then intuitively, (17) is true, while (16) is false. And even if one rejects this intuition, why do (16) and (17) seem to differ, if (15) and (1) are relevantly similar?

The third objection is that (15) creates a potential for ambiguity that (1) does not. Consider

- (18) John boiled the water on Tuesday.
 (19) John caused the water to boil on Tuesday.

While (18) has a single reading, (19) is ambiguous. (Cf. "John wanted the water to boil on Tuesday.") On one reading, (19) implies that the water boiled on Tuesday; on this reading, (19) would be false in the scenario described above. On the other reading, (19) implies that John's action occurred on Tuesday; on this reading, (19) would be true in the scenario described above. A similar contrast is exhibited by

- (20) John boiled the soup without getting burnt.
 (21) John caused the soup to boil without getting burnt.

In (21), "without getting burnt" can modify John's action. (implying that *he* didn't get burnt) or the subsequent boiling of the soup (implying that *it* didn't get burnt); (20) has only the first reading.⁴

These objections point to important facts about the meaning of (1). But such objections should not convince us that instances of "x boiled y, so y boiled" are invalid. Claiming that (15) reflects the logical form of (1) is *not* the only way to show that instances of "x boiled y, so y boiled" are valid. Indeed, this may be a poor strategy. For it leaves us asking why instances of "x caused y to boil, so y boiled" are valid. Such inferences are truth-preserving, and they may well be valid. But their validity is not manifest. (See note 4 below. The logical form of "x caused y to boil" is not obvious; cf. "x turned the dial and y boiled, so y boiled.") In this respect, shifting from (1) to (15) may not help. But comparison with (15) is instructive. Perhaps the underlying syntax of (1), ignoring tense, is: [x [v [boil y]]]; where "v" is a hidden verb whose meaning has something to do with causation, and "boil" is an intransitive verb that can appear in transitive constructions (along with a hidden verb that takes a second argument). If the underlying syntax of "y boiled" is as it appears, modulo word order, one might

look for a semantics according to which: every interpretation that makes [x [v [boil y]]] true also makes [boil y] true.

Moreover, talk of causation suggests that talk of *events* may well be relevant. And as we shall see in the rest of this section, an independently motivated eventish semantics shows why inferences from [x [v [boil y]]] to [boil y] would preserve truth. This semantics also provides a plausible interpretation for the hypothesized hidden verb, with the consequence that two of Fodor's three objections are avoided. The more serious third objection will remain, until the eventish semantics is combined with the Chomskian syntax, which provides independent motivation for appeal to hidden verbs.

2.2

At this point, let me briefly review the main arguments for Davidson's (1967) event analysis, and the implications for the kinds of events over which we (tacitly) quantify. In section 2.3, I return to so-called causative constructions.

Inferences like the following appear to be valid:

- (22) Booth shot Lincoln with a pistol; so (23) Booth shot Lincoln.
 (24) Booth pulled the trigger with his finger; so (25) Booth pulled the trigger.

Similarly, if Booth shot Lincoln with a pistol on April 13, Booth shot Lincoln with a pistol. More generally, if x shot y with z, then x shot y; if x shot y with z on w, then x shot y with z, etc. According to the event analysis, such inferences are valid, because: action sentences are interpreted as existentially quantified constructions; and adjunct phrases (like "with a pistol" and "on April 13") serve as *conjunctions* of an event description. Modifying Davidson's notation slightly, the proposal is that the logical form of (22) is

- (22D) $\exists e[\text{Shoot}(e, \text{Booth}, \text{Lincoln}) \ \& \ \text{With-a-Pistol}(e)];$ so (23D) $\exists e[\text{Shoot}(e, \text{Booth}, \text{Lincoln})].$

where " $\Phi(e, x, y)$ " means that e is a Φ -ing of x by y, and compositionality *within* adjunct phrases is ignored for simplicity. The inference from (22) to (23) is said to be an instance of " $\exists e[\Phi(e, x, y) \ \& \ \Psi(e)],$ so $\exists e[\Phi(e, x, y)],$ " instances of which are truth-preserving on any interpretation of their lexical elements. (The logical form of "x Φ y with α on β " is said to be: $\exists e[\Phi(e, x, y) \ \& \ \text{With-}\alpha(e) \ \& \ \text{On-}\beta(e)].$)

Evidence for the event analysis is not confined to entailment patterns. As Parsons (1990) notes,

- (26) After the shooting, Booth fled.

is true, iff an event of Booth's fleeing occurred after the shooting. Moreover, consider

(27) Nora heard Fido bark.

which differs from the propositional attitude report "Nora heard that Fido barked": in (27), "bark" is untensed, and substituting coreferential expressions for "Fido" preserves truth. Following Higginbotham (1983) and Vlach (1983), one can render (27) as "there is a hearing by Nora of a barking by Fido":

(27a) $\exists e \exists f [\text{Hear}(e, \text{Nora}, f) \ \& \ \text{Bark}(f, \text{Fido})]$.

This also explains the ambiguity of "Nora heard Fido bark in her apartment," if "in her apartment" can modify the e-position event (the hearing) or the f-position event (the barking).⁵

I assume, therefore, that Davidson's basic proposal is correct. Still, I think it is incomplete. If x shot y , it *follows* that there was a shooting, and that x did something. So notation like " $\exists e [\text{Shoot}(e, x, y)]$ " may mask further structure, as Castañeda (1967) suggested:

(22a) $\exists e [\text{Agent}(e, \text{Booth}) \ \& \ \text{Shooting}(e) \ \& \ \text{Theme}(e, \text{Lincoln}) \ \& \ \text{With-a-pistol}(e)]$

(23a) $\exists e [\text{Agent}(e, \text{Booth}) \ \& \ \text{Shooting}(e) \ \& \ \text{Theme}(e, \text{Lincoln})]$.

The inference from (22a) to (23a) is valid. But on this view, a verb with n arguments is not true of $(n+1)$ -tuples. Instead an event is represented as being of a certain *sort*, and as standing in (binary) thematic relations to each of the verb's arguments. For present purposes, it will suffice to think of Agents as salient initiators of events, and Themes as things saliently affected in the course of events. Parsons (1990) provides motivation for elaborating the event analysis in this way. (For example, there is often no *contradiction* in saying that a thematic role went unfilled. Consider: in my dream, there was a shooting, and I was shot; but no one shot me.) Schein (1993) shows that a plausible semantics of plurals requires, not just the event analysis, but also the "separation" of arguments at logical form; for further arguments, see Herburger (2000), Pietroski (2000b, 2001, forthcoming). So henceforth, I will take this version of the event analysis as given.

The more important point, for present purposes, concerns the kinds of events over which the quantifier ranges. As we shall see, this bears on two of Fodor's three objections. Assume that: Booth shot Lincoln exactly once; he shot Lincoln with a pistol; he pulled the trigger exactly once; and he pulled the trigger with his finger. Then a unique event is the truth-maker for (22a–23a), and similarly for

(24a) $\exists e [\text{Agent}(e, \text{Booth}) \ \& \ \text{Pulling}(e) \ \& \ \text{Theme}(e, \text{the trigger}) \ \& \ \text{With-his-finger}(e)]$.

(25a) $\exists e [\text{Agent}(e, \text{Booth}) \ \& \ \text{Pulling}(e) \ \& \ \text{Theme}(e, \text{the trigger})]$.

One might think that the shooting *was* the pulling; and Davidson (1971) encourages this thought. But the shooting and the pulling must be distinct events. For consider

(28) Booth shot Lincoln with his finger. (29) Booth pulled the trigger with a pistol.

These sentences are false, and their logical forms are:

(28a) $\exists e [\text{Agent}(e, \text{Booth}) \ \& \ \text{Shooting}(e) \ \& \ \text{Theme}(e, \text{Lincoln}) \ \& \ \text{With-his-finger}(e)]$.

(29a) $\exists e [\text{Agent}(e, \text{Booth}) \ \& \ \text{Pulling}(e) \ \& \ \text{Theme}(e, \text{the trigger}) \ \& \ \text{With-a-pistol}(e)]$.

Let α be the event of Booth's shooting of Lincoln; let β be the event of Booth's pulling the trigger. Since α satisfies the first three conjuncts of (28a), and (28a) is false, α does *not* satisfy "With-his-finger." But β does satisfy "With-his-finger," since (24a) is true. Similarly, β satisfies the first three conjuncts of (29a), which is false; hence, β does *not* satisfy "With-a-pistol." But α does satisfy "With-a-pistol," since (22a) is true. So $\alpha \neq \beta$. The shooting is With-a-pistol, but not With-his-finger; while the pulling is With-his-finger, but not With-a-pistol.

Taylor (1984) and Parsons (1990) mention other examples of this sort in the context of the event analysis; see also Francken and Lombard (1992). Thomson (1971), Thalberg (1972), and others have made similar points, by focusing on the spatiotemporal properties of events. The pulling and the shooting seem to end in different places at different times. The intuition is even clearer with regard to killings. Booth shot Lincoln on April 13, 1865; but Lincoln died on April 14. So the shooting and the killing must be distinct events, since the latter event could not have ended before Lincoln died.

This presents a puzzle, if one wants to say that Booth's action of pulling the trigger *was* his action of shooting Lincoln. How can there be one action, if the pulling and the shooting are distinct events? Elsewhere (Pietroski 1998), I propose an answer. But here, I just want to note that these examples prompt two related thoughts: an action usually has a *concertina* of effects (see Anscombe 1957; Feinberg 1965); and some events, like wars, have parts that are causally related (see Thomson 1977). For plausibly, one of Booth's actions caused (i) the event of the trigger going back, and thus (ii) the event of the bullet entering Lincoln. Intuitively, the pulling ended with (i), while the shooting ended with (ii). So a

natural thought is that events like pullings and shootings have actions and certain effects of actions as parts.

Let us say that event *D* grounds event *E*, iff: *D* and *E* both occur; *D* is a (perhaps improper) part of *E*; and *D* causes every event that is a proper part of *E* but is not a part of *D*.⁶ Every event grounds itself. But more interestingly, the toppling of one domino can ground the complex event that is the toppling of ten dominoes; and if ten dominoes topple, the toppling of the first five dominoes also grounds the (complex event that is the) toppling of the first five dominoes. Thus, a single event can be the grounder of distinct complex events. If pullings and shootings are complex events, the event of Booth's pulling the trigger can be distinguished from the event of Booth's shooting Lincoln. The latter event had parts that began after the trigger went back. Let us say that event *F* terminates event *E*, iff: *F* and *E* occur; *F* is a (perhaps improper) part of *E*; and *F* is an effect of every event that is a proper part of *E* but is not a part of *F*. Then for each *n*, the toppling of the *n*th domino terminates the toppling of the first *n* dominoes. And crucially, *different* events terminate the shooting and the pulling.

Appeal to complex events lets us see how (22) and (28) can differ in truth value. The event of Booth's shooting Lincoln is *longer* than the event of Booth's pulling the trigger; and only the longer event is With-a-pistol. Similarly, (24) and (29) can differ in truth value, if only the shorter event is With-his-finger. Thus, I claim that action sentences quantify over events grounded by actions, as indicated in figure 8.1. (For these purposes, I take no stand on whether paradigmatic actions are: bodily motions; causes of bodily motions; or complex events with bodily motions as parts. See Pietroski 1998, 2000a.)

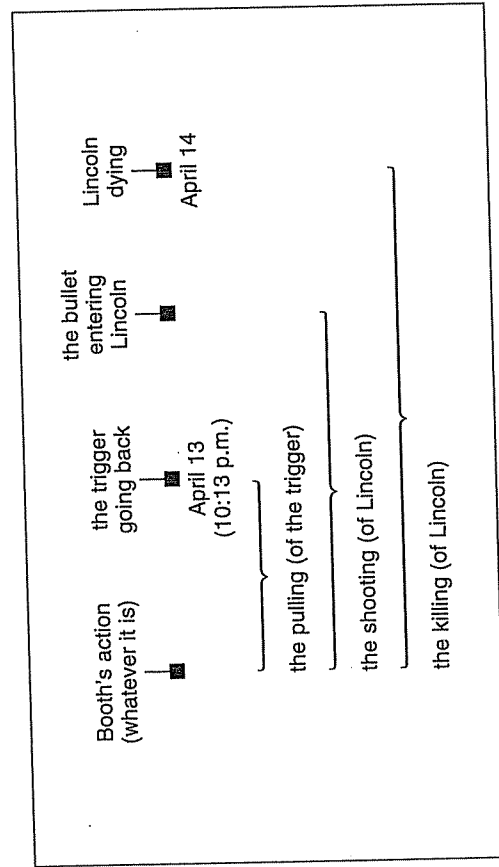


Figure 8.1

2.3

Let me now return to

- (1) John boiled the water; so (2) the water boiled.

The event analysis does not rule out ambiguity hypotheses. One can say the logical forms of (1–2) are: $\exists e[\text{Agent}(e, \text{John}) \ \& \ \text{Boiling}_2(e) \ \& \ \text{Theme}(e, \text{the water})]$; and $\exists e[\text{Boiling}_1(e) \ \& \ \text{Theme}(e, \text{the water})]$.⁷ One can say that “boil₂” is true of certain complex events grounded by actions, that “boil₁” is true of certain events in which a liquid undergoes a change of state, and that (as a matter of fact) a boiling₂ always ends in a boiling₁. But on this view, the inference above is invalid, absent a meaning postulate: $\forall y\{\exists e[\text{Boiling}_2(e) \ \& \ \text{Theme}(e, y)] \rightarrow \exists e[\text{Boiling}_1(e) \ \& \ \text{Theme}(e, y)]\}$. And the earlier objections to ambiguity hypotheses remain. On the other hand, if “*x* boiled *y*” contains a hidden verb – i.e., [*x* [*v* [boil *y*]]] – then perhaps the Davidsonian logical forms of (1–2) are:

- (1a) $\exists e\exists f[\text{Agent}(e, \text{John}) \ \& \ \text{R}(e, f) \ \& \ \text{Boiling}(f) \ \& \ \text{Theme}(f, \text{the water})]$
 (2a) $\exists f[\text{Boiling}(f) \ \& \ \text{Theme}(f, \text{the water})]$

where “*R*” is a metalanguage predicate whose interpretation is yet to be given. The idea is that the hidden verb expresses a binary relation between events. And *whatever* relation this is, the inference from (1a) to (2a) is an instance of the valid form $\exists e\exists f[\Phi(e, x) \ \& \ \Psi(e, f) \ \& \ \Omega(f, y)]$, so $\exists f[\Omega(f) \ \& \ \Pi(f, y)]$.⁸

That is, the interpretation of the hypothesized hidden verb is irrelevant to the validity of the inference. Nonetheless, the meaning of (1) tells us that relation *R* has something to do with causation. So the simplest hypothesis would be that *R* just is the relation of causation. This is Parsons’s (1990) view, according to which (1) is true, iff:

- (1-P) $\exists e\exists f[\text{Agent}(e, \text{John}) \ \& \ \text{Cause}(e, f) \ \& \ \text{Boiling}(f) \ \& \ \text{Theme}(f, \text{the water})]$.

But (1-P) is true, while (1) is false, if John’s act of arson caused the boiling of the water; and similarly for other examples of so-called deviant causal chains. Or consider

- (16) On Tuesday, John boiled the water.

- (16-P) $\exists e\exists f[\text{On-Tuesday}(e) \ \& \ \text{Agent}(e, \text{John}) \ \& \ \text{Cause}(e, f) \ \& \ \text{Boiling}(f) \ \& \ \text{Theme}(f, \text{the water})]$.

If the water did not boil until Wednesday, then (16-P) can be true while (16) is false.

These objections can be avoided, however, by saying that R is the relation *terminates in*: $R(e, f)$, iff f terminates e . Recall that f terminates e , iff: f and e occur; f is a part of e ; and f is an effect of every event that is a proper part of e but is not a part of f . Replacing (1-P) with

- (1a) $\exists e \exists f [\text{Agent}(e, \text{John}) \ \& \ \text{Terminates-in}(e, f) \ \& \ \text{Boiling}(f) \ \& \ \text{Theme}(f, \text{the water})]$

lets us say that the e -position events are *complex* events of which the f -position events are parts. In which case, e -position events do not cause f -position events. Rather, (1) is true, iff John is the Agent of a *complex event that terminates in a boiling of the water*. John's act of arson may not make him the Agent of any such complex event. For there may not be any event (grounded by John's action) that has as parts both John's act of arson *and* the subsequent boiling of the water. The mere fact that C caused E does not ensure the existence of a complex event C^* that has C and E as parts. And if there is no event (grounded by John's action) that has the boiling of the water as a part, then John did not boil the water, even though John's action caused the boiling of the water.⁸ Similarly, if the water did not boil until Wednesday, (16) is false. For there was no complex event e , such that: e occurred (entirely) on Tuesday, John was the agent of e , and e terminated in a boiling of the water.

This minor revision of Parson's semantics is independently motivated, since the event analysis demands complex events (which terminate in other events) anyway. So Fodor's first two objections do not refute the Davidsonian analysis that treats "x boiled y" as *importantly like* "x caused y to boil." Still, the third objection remains. Moreover, there are two bothersome features of (1a): John and the water are not represented as Agent and Theme of the *same* event; and it is not clear how these truth conditions can be determined *compositionally*. To appreciate the force of this latter point, consider two possible implementations of the current proposal, focusing on the interpretations of the verbal components (figure 8.2).

In each case, "boil" is an event sortal; the hidden verb is true of ordered pairs of events; and the complex verb phrase [v [boil y]] is true of events that terminate

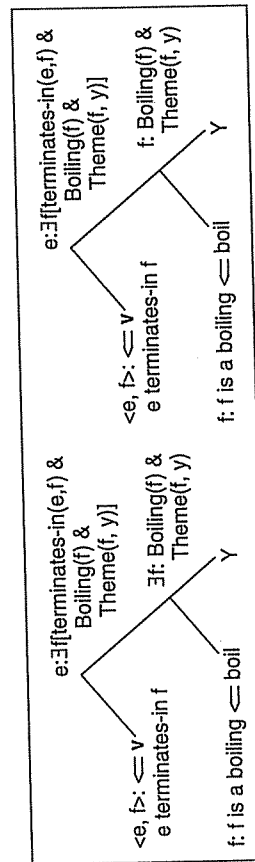


Figure 8.2

in a boiling of y . The difference concerns the interpretation of [boil y]: is it sentential (as indicated on the left), like "the water boiled", or is it subsentential, like "boiled on Tuesday"? The event analysis treatment of "x heard y boil" would seem to require the former hypothesis, which is also supported by Fregean considerations about the relation of truth to function/argument structure (and unsaturated/saturated components of thought). But if truth values are the semantic values of sentences, the interpretation on the left will not satisfy a familiar compositionality constraint: the semantic value of each node is to be a function of the semantic values of its immediate constituents. For no suitably general function will map *truth values* and the extension of "terminates-in" onto events that terminate in a boiling of y . (Compare the interpretation on the right, which is compositional.) Perhaps another plausible choice for sentential semantic values will avoid this problem, though I doubt it. Or perhaps we should weaken the compositionality constraint, requiring only that the semantic value of each node be a function of its constituents; but this should be a last resort. Moreover, one would like to preserve an idea suggested by other eventish analyses: the interpretation of subsentential structure is as simple as conjunction; see Pietroski (2002). So revision is needed somewhere.

3 Minimal Syntax

Thus far, my perspective has been overtly semantic. I have spoken of inferences, truth conditions, and intuitions of possibility. In this section, I focus on some syntactic details, in responding to Fodor's third objection (and the worry about compositionality just voiced). As Fodor notes, one expects constructions with two verbs to be potentially ambiguous when adjuncts are employed. Recall

- (19) John caused the water to boil on Tuesday.

Or consider the verb phrase "heard Fido bark in her apartment," which has the readings shown in figure 8.3. But "x boiled y on Tuesday" is *not* ambiguous as

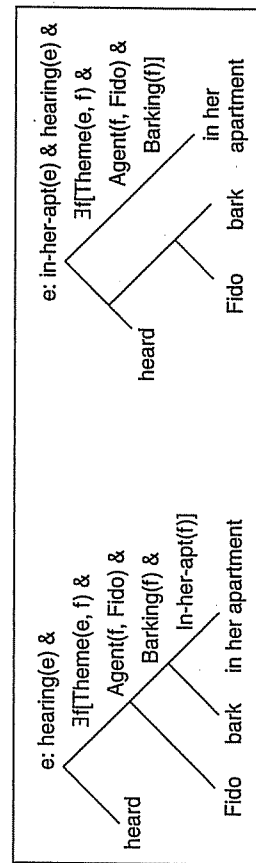


Figure 8.3

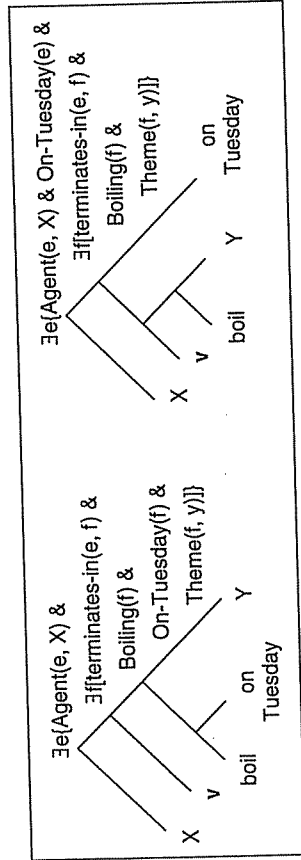


Figure 8.4

between the readings in figure 8.4. The adjunct phrase must modify the e-position event, as indicated on the right. As we shall see, one can provide principled reasons for excluding the downstairs adjunction structure indicated on the left. Still, if the underlying syntax of “x boiled y” is either [x [boil y]] or [x [v [boil y]]], the nonambiguity of

- (18) John boiled the water on Tuesday.

might be a point in favor of the former analysis, which also preserves the appearance that (18) contains a transitive verb that takes two arguments. But Chomsky (1995a) gives us reason for preferring the hidden-verb analysis, once we ask where transitive structure comes from, and why it has the character it does.

3.1

One might claim that the ambiguity of (19) is irrelevant, once one abandons the idea of deriving (18) from (19). For one might say that the overt verb “cause” differs from the hidden verb, in that the latter provides a *mandatory* target for adjuncts. But as it stands, this is not a satisfactory reply to Fodor’s objection; it merely describes the facts as they must be described, *if* (18) contains a hidden verb.

A more promising line of thought is developed by Baker (1988) and others. The tense marker appears on the matrix verb in “x caused y to boil” and “x heard y bark.” So perhaps “x boiled y” is the result of a *transformation* on the basic structure: x [v [boil y]]. Suppose that “boil” moves and combines with the hidden verb, thereby forming a *unit* to which a tense marker can be attached: x [[v-boil]_ity]_j; where [v-boil]_i is treated as a unit – in effect, a terminal node of the tree. (This would satisfy a familiar principle governing transformations: a trace must be dominated by the node immediately dominating the antecedent of the trace.) Baker provides extensive support for the idea that one semantically

significant piece of language can come to be “inside” another. Indeed, he argues that verb incorporation is overt in many languages. Consider his example from Chichewa (pp. 10–11, agreement and aspect markers ignored):

Mtsuko	u-na-gwa-a				
The waterpot	past fall				(The waterpot fell)
Mtsikana	u-na-u-gw-ets-a			mtsuko	
The girl	past fall causative			the waterpot	(The girl made the waterpot fall)

The latter construction results from the transformation indicated in figure 8.5, where small “v” indicates a functional item that combines with an ordinary lexical item (like “fall”) to form a new verb. (I assume that the new unit keeps the label of the item adjoined to.) This construction can be interpreted as: the girl was the agent of an event that terminated in a falling of the waterpot.

If “boil” incorporates with a hidden causative-forming verb (“#”), then the structures to consider with respect to (18) are indicated in figure 8.6 (ignoring the order of “#” and “boil”). And the incorporation hypothesis suggests a potential reason for why the structure on the left does *not* reflect a possible reading of (18): perhaps the “downstairs adjunct” would block the movement of “boil”; for other potential reasons and related discussion, see Pietroski and Uriagereka (2002), Pietroski (forthcoming).

It is a familiar idea in linguistics that too much structure can block movement. And it is not implausible that the overt verb can move to the hidden verb only in the absence of intervening nodes – or alternatively, that there cannot be nodes between the incorporated verb and the overt verb’s trace. But finding *independent* evidence for this suggestion will be hard, since Fodor and Lepore’s alternative claim is that morphemes matter. They will object that the Baker-inspired proposal *presupposes* that English is relevantly like languages with overt causative elements: the downstairs adjunct (allegedly) blocks a transformation that is

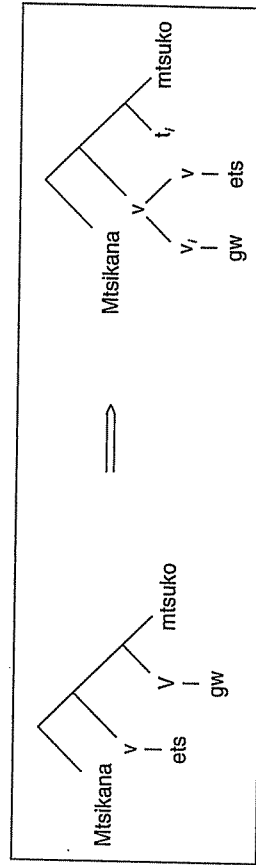


Figure 8.5

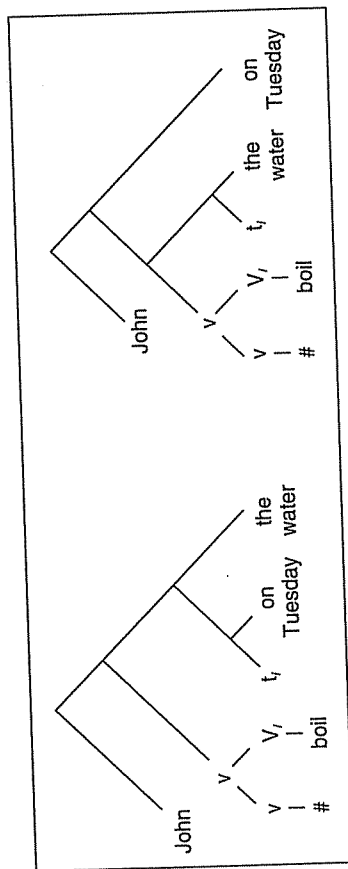


Figure 8.6

(allegedly) required by the (alleged) presence of a hidden verb. Nonetheless, we can now see at least one way in which syntactic constraints might rule out the nonexistent reading of (18), even if the hidden-verb hypothesis is correct; hence, the nonambiguity of (18) does not refute this hypothesis. Fodor and Lepore suggest that the nonambiguity of (18) still tells against the presence of a hidden verb, absent an independently confirmed account of the nonambiguity. But even if one grants this methodological point, one must also consider the *prima facie* implausibilities of treating “boil” as ambiguous. Moreover, crosslinguistic data can bear on the issue indirectly.

For example, Baker (1988, 1997) defends the Uniformity of Thematic Assignment Hypothesis (UTAH), according to which grammatical relations determine thematic roles (and vice versa); and Pestersky (1995) argues, in defending a slightly weaker thesis (viz., that Agents are always represented in a “higher” grammatical position than Themes), that English has an unpronounced causative morpheme. A potential problem for UTAH is that “be angry” appears to permit representations of the same event participants in different grammatical positions, as in:

- (30) Bill was angry at the article.
 (31) The article angered Bill.

But perhaps “Bill” is the subject of “be angry” in each sentence; while “the article” is an object in (30), and the subject of a causative verb (to which “angry” adjoins) in (31). The idea is that the underlying syntax is as follows: [Bill [be-angry [(at) [the article]]]; and [the article [[make-angry] [Bill t_i]].

Pestersky notes (citing Kuroda, in Akatsuka 1976) that the hypothesized transformation seems explicit in Japanese, as indicated below (where “ga” and “o” are markers for accusative and nominative case):

Tanaka-ga	sono	sirase-o	yorokon-da	(Tanaka was pleased at that news)
Tanaka	that	news	be pleased-past	
Sono sirase-ga	Tanaka-o	yoronkob-ase-ta		(That news pleased Tanaka)
That news	Tanaka	be pleased-causative-past		

Pestersky then shows that a hidden English causative morpheme would explain a range of facts, including the distribution of nominalizations like “annoyance.” And he draws an analogy with Latinate roots like “ceive” and “fer” that occur only with certain prefixes – like “re,” “in,” “per,” and “pre” – suggesting that the causative morpheme can attach to stems that do not occur alone as pronounced verbs.

Yet even if appeal to hidden verbs and incorporation in English is not ad hoc, there is something unsatisfying about saying that downstairs adjuncts would block movement of overt verbs. It can seem that this “explanation” merely describes a salient feature of the structure representing the reading that (18) does not have – but should have, according to Fodor and Lepore, on a hidden-verb hypothesis. So even if we discover a correlation between nonexistent readings and barriers to movement (that overt English verbs would need to make given hidden verbs), Fodor and Lepore can deny that appeal to hidden verbs has been motivated on syntactic grounds. And even if the semantic motivation suffices, given ways of ruling out structures that would carry nonexistent readings, one would like to do better.

3.2

If downstairs adjunction blocks movement, one wants to know *why* it does so. Moreover, I have assumed that incorporation is *required*, given a causative-forming verb. But what is wrong with the structure: $x [v [boiled y]]$? (The tense consideration is only suggestive; perhaps “ x caused y to boil” and “ x heard y bark” differ, precisely because the matrix verbs are overt.) Most importantly, is there any reason to think that natural languages do *not* generate structures like: $[x [boil y]]$; where “boil” is a *primitive* transitive verb? At this stage of the dialectic, Chomsky (1995a) has much to offer.

The minimalist program has many facets; and I will not try to summarize it. But let me stress that Chomsky’s agenda is *not* to abandon the “principles and parameters” view, according to which: the child faces a poverty of stimulus problem that is solved because the child knows (or cognizes) a set of linguistic principles that are universal (for humans) but parameterized; the input the child receives, in combination with universal grammar, suffices to determine the parameter settings; and a language (i.e., an L-language) is a possible setting of the various parameters, in conjunction with a lexicon (see Chomsky 1981, 1986).

Minimalists endorse this basic account, but subject its many posits (e.g., S-structure) to a kind of methodological scrutiny akin to Occam's razor. As an ideal, Chomsky aims for the simplest possible theory that posits only what is required (by "virtual conceptual necessity"), given a certain cluster of linguistic phenomena whose existence is beyond reasonable doubt.

The basic linguistic phenomena include: that linguistic expressions can have (arbitrarily many) constituents; that linguistic structures undergo transformations, in which constituents are displaced from their original positions; and that the resulting structures somehow interface with cognitive systems not exclusively concerned with language. With regard to this last point, each sentence must be able to interface with at least – and so, given minimalist ideals, at most – an articulatory/perceptual (A/P) system that relates linguistic structures to sounds (or signs); and a conceptual/intentional (C/I) system that relates linguistic structures to meanings. Chomsky thus endorses the ancient idea that sentences are structures by virtue of which sounds are paired with meanings.

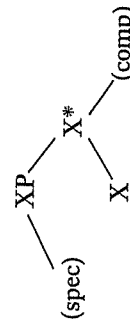
Indeed, a sentence is said to be a pair of instructions – called "PF" and "LF" – for the A/P and C/I systems. If these instructions are to be usable by the extralinguistic systems, PFs and LFs may have to respect constraints that would be arbitrary from a purely linguistic perspective. Chomsky speculates that herein lies the rationale for transformations: basic linguistic structures are being altered to meet demands imposed from outside. (Since we know little about the C/I system, there is little to be said about how it might constrain LFs; though one might view work on the relation between grammatical and thematic categories in this light. See Baker 1997 for discussion.) But whatever the rationale for transformations, minimalists encode the fact that transformations occur as follows: linguistic items are said to have formal (i.e., uninterpretable) features, which must be deleted before interfacing with other systems; and deletion requires displacement to a site at which the feature is "checked off."

This is a compellingly simple conception of natural language. For these purposes, I assume that Chomsky and others have rendered it empirically respectable. So if the minimalist conception favors the hidden-verb hypothesis (as supplemented by Baker), this is important support for that hypothesis – and the corresponding claims about hidden (first-class) analyticities. Indeed, Chomsky provides a framework that lets us see analyticities as spandrels of natural language architecture. There are two related lines of thought here, discussed in sections 3.3 and 3.4 below: a minimalist treatment of constituency suggests that transitive structure is *not* the manifestation of a single verb that takes two arguments; and a minimalist account of movement lets us say why the overt verb must move, in a way that downstairs adjunction would block, to a place that allows for a compositional eventish semantics.

3.3

Perhaps the most basic linguistic phenomenon is that one expression can be *part* of another. Chomsky thus assumes a lexicon and an operation called "Merge" for combining expressions. For at a minimum, it must be possible to combine a determiner like "the" with a noun like "water," combine the result with a verb like "boil," etc. Moreover, complex expressions are interpreted (at the interfaces) as being of certain types; "the water that the man boiled" is interpreted as a nominative, although it contains a verb. So each result of Merge must be labelled, presumably taking its label from one of the Merged items. One can think of Merge as a recursive process for establishing a transitive relation $C(\text{ommand})$: $C < \text{"the"}, \text{"water"} >$, and this instance of C is labeled "DP"; $C < \text{"boil"}, \text{DP} >$, which is labeled "VP"; etc. Or in more familiar notation: $[_{VP} [_{DP} \text{the} [_{N} \text{water}]]]$. Merge plays a significant role in the minimalist program, which thereby takes on a derivational flavor. Instead of talking about bad-making features of trees and barriers to movement, one emphasizes constraints on derivations, which are said to "crash" if they do not satisfy certain constraints (imposed by lexical items, formal features, and so-called economy considerations that I will not discuss here).

Appealing to Merge also lets one eliminate any separate theory of the structures in which lexical items can appear. It has long been common to think of lexical items, and especially verbs, as projecting structures of the following form (see Jackendoff 1977):



where the specifier and complement positions can be filled by projections of other lexical items, and the intermediate category X^* is the site for adjunction. Such structures may be plausible for transitive verb phrases, and clauses like "the student of physics." But it seems gratuitous to suppose that *all* lexical items are surrounded by two further positions. (Correspondingly, the status of X^* has always been less clear than that of lexical and phrasal categories.) Moreover, if verbs project sentential frames, one wants to know *why* these frames have the character indicated above, as opposed to:



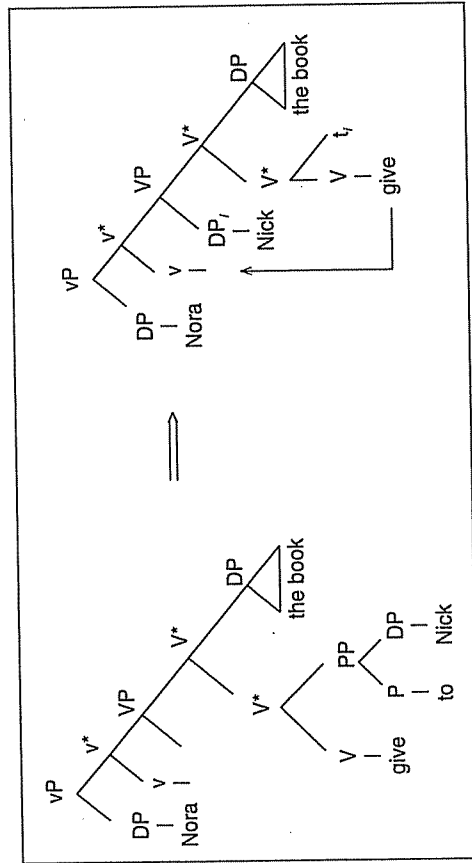


Figure 8.7

These structures reflect different command hierarchies, and no asymmetry between the so-called external (spec) and internal (comp) argument positions. But there are such asymmetries (see, e.g., Williams 1995); and there are reasons for thinking of the external argument as the argument of the unit formed by combining the verb with its internal argument (see Marantz 1984). One would like explanations for these facts, as opposed to the mere stipulation that this is how natural language structure is.

Worse, the posited frames do not provide enough room for all the arguments of a verb like "give." And Chomsky uses Larson's (1988) treatment of so-called double-object constructions as a model for how the structure associated with an (n + 1)-place verb can emerge from the structure associated with an n-place verb. According to Larson, "Nora gave Nick the book" results from a transformation based on a double verb-phrase structure in which: "give" is the *lower* verb; the higher verb position is *empty*; and "Nick" is the object of a prepositional phrase (see figure 8.7). The idea is that "give" moves into the higher verb position, while "Nick" raises to the specifier position of the lower verb-phrase, and the preposition is absorbed in the process. Larson's account has a host of welcome empirical consequences, in addition to the theoretical virtue of preserving binary branching. But let me stress: on this view, the higher verb position is not occupied by a hidden verb that takes "Nora" as its argument; the claim is rather that, given the constraints imposed by a certain theory of phrase structure, the outer vP shell is required to accommodate the third argument associated with "give." (I say "associated with," since Larson offers reasons – citing Marantz 1984 – for treating "the book" as the argument of the complex unit V^* , and *not* literally as an argument of "give.")

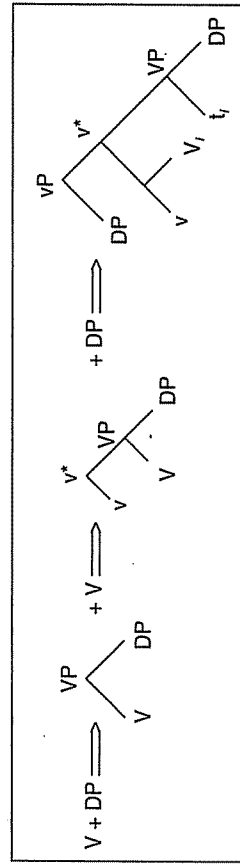


Figure 8.8

From a minimalist perspective, however, one does not take any theory of phrase structure as given. The structure on the left must arise through the operation Merge; so the higher verbal position must be occupied by a (hidden) lexical verb, which presumably does take an argument. Instead of saying that a verb which takes three arguments moves into an empty position, one is led to say that a verb which takes two arguments adjoins to (and incorporates with) something akin to an overt causative morpheme. But if Larsonian shells offer an independently motivated way of seeing how ternary predicate structure can arise from a syntactic process to which no ternary predicates are inputs, then as Chomsky notes, a natural suggestion is that transitive structure emerges the same way (see figure 8.8).

On this view, every *lexical* verb takes one argument; and the argument of a small verb "v" is a verb phrase, the head of which adjoins to "v." Causative constructions provide a model for this process, in which complex structure emerges from a simple operation and simple lexical items. But the claim is *not* that all overt verbs can be decomposed into small verbs and overt (nonpassive) one-place verbs. Recall Pestesky's analogy to the Latinate roots "ceive" and "fer." So we may have to use surface form transitive verbs, in order to give the meaning of some lexical verbs. Perhaps "hit" results from combining a small verb with a lexical verb that is true of events f , such that if x is the agent of an event that terminates in f , then x is the agent of a hitting (cf. Dowty 1979; Lombard 1986).

Chomsky does not explicitly apply his generalization of Larson's account to double-object constructions. But presumably, they would arise from two rounds of merger and incorporation. A verb-phrase headed by a one-place verb ("G") merges with a small verb ("%"), forming a unit that takes a second argument, followed by merger with the small verb "#" to form a unit that takes a third argument (see figure 8.9). One wants to know what "%" and "G" mean. But a plausible thought is that "G" is true of transfers (of an appropriate sort). So suppose that $[vP \ G \ [DP \ Nick]]$ is true, iff: $\exists g[\text{Transfer}(g) \ \& \ \text{Goal}(g, \text{Nick})]$. The argument position made available by "%" is that of Theme. So the truth-conditional contribution of "%" is presumably some relation that holds between events (of which the book is the Theme) and transfers (of which Nick is the Goal). Perhaps the relation is *constitution*: $[_v \ \% \ G \ [vP \ t_i \ Nick]] \ [DP \ \text{the book}]$ is

argument, thereby forming a unit (V^*) that merges with a third argument. Thus, one cannot link the phenomena explained by Larson's account of double-object constructions to the basic architecture of human languages. This is a theoretically regressive line of thought that minimalists avoid.

Another, less theory-internal motivation is that Chomsky's proposal suggests an explanation of Burzio's generalization (see Burzio 1986). It seems to be a general fact about human languages that verbs without external arguments fail to assign accusative case; correlatively, verbs that do not assign accusative case do not assign an external thematic role. Consider the Italian verbs "telefonare" and "arrivare," both of which appear with a single argument (like "telephone" and "arrive" in English). Only "telefonare" assigns accusative case, and only with "arrivare" is the single argument the *complement* of the verb. This is evidenced by a variety of linguistic phenomena, like the distributions of auxiliary verbs and the clitic "ne". But for these purposes, I simply assume that Burzio's generalization is correct, and follow Raposo and Uriagereka (1996) in noting that: this generalization presumably follows from more basic features of natural language; and minimalism provides an attractive explanation, if accusative case assignment depends on the presence of a small verb. This requires that we treat some (surface) intransitive constructions as the products of underlying structure involving a second verb. But this is a small price for a unified treatment of causatives and Burzio's generalization.

Moreover, it is a familiar point that many causative verbs appear in a second entailment pattern involving an adjectival form. If Nora opened the door, the door opened, and so (at some point in time) the door was open. (If $x \Phi_T y$, then $y \Phi_P$, and so y was Φ_{Adj} .) Similarly, if Tom broke the vase, the vase broke, and so the vase was broken; if Booth killed Lincoln, Lincoln died, and so Lincoln was dead; etc. So an attractive suggestion is that "Nora opened the door" results from the derivation shown in figure 8.10. If we assume that the adjective "open"

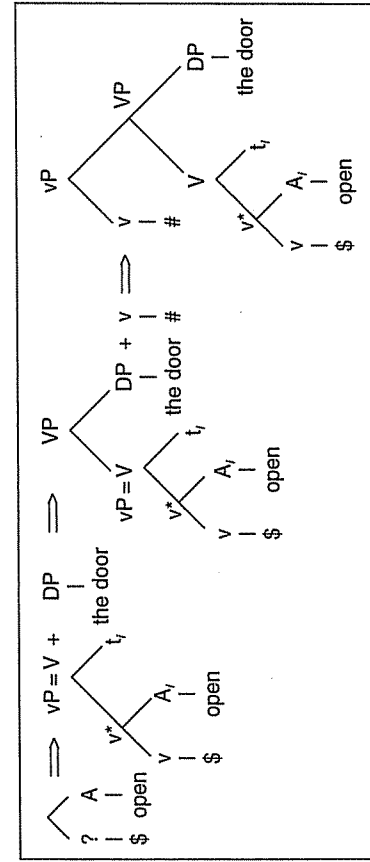


Figure 8.10

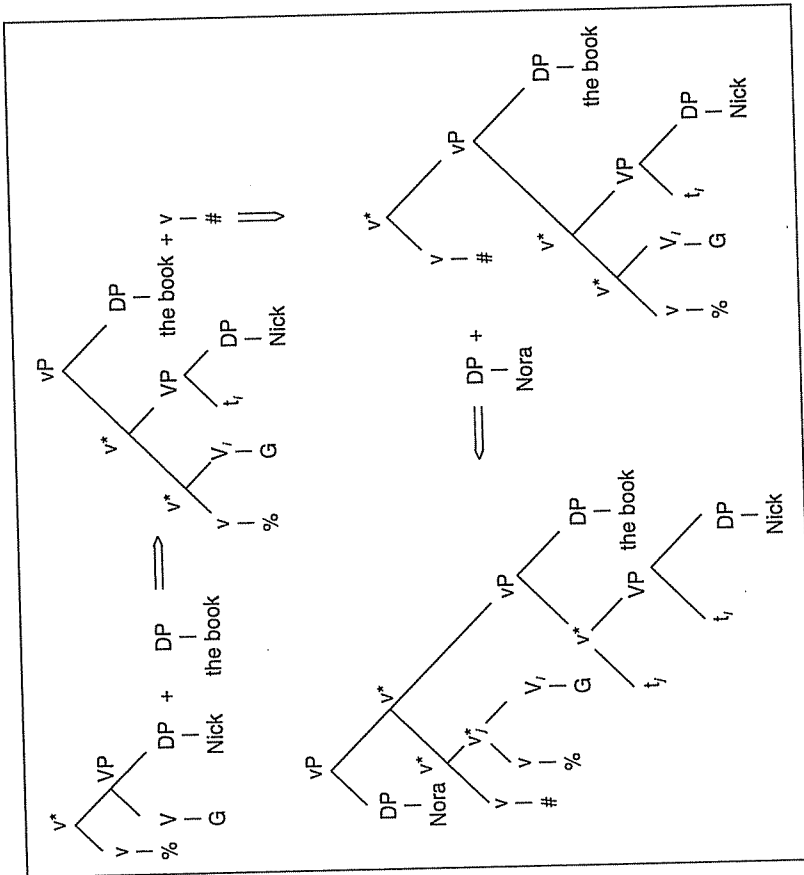


Figure 8.9

true of events that constitute a transfer to Nick of the book. If this is correct, Nora gave Nick the book iff: Nora was the Agent of an event e that terminated in an event f , such that the Theme of f was the book and f constituted an appropriate transfer of its Theme to Nick.⁹

One great advantage of this proposal is that it keeps the lexicon and the operation of Merge pleasingly simple. If one denies that there is a one-argument correlate of "hit," one must suppose that *from a purely syntactic perspective* there are at least two different kinds of verbs: those that merge with an argument, forming a unit (V^*) that can – and perhaps must – merge with a second argument; and those that merge with an argument, forming a unit (VP) that cannot merge with another argument. But not only does this diverge from minimalist ideals, by positing linguistic distinctions not needed to explain the phenomena, it effectively reintroduces the idea that transitive verbs create transitive sentential frames. If one allows this, one has no principled reason for not positing a third kind of verb: it merges with an argument, forming a unit (V^{**}) that merges with a second

is true of *states*, perhaps there is a hidden lexical item “*e*” that expresses a function from states to *changes* of states (i.e., events). If some (surface form) intransitive verbs have the structure indicated above, they would be true of events in which something came to be open. The corresponding (surface form) transitive verbs would be true of events that terminate in events in which something comes to be open. And note that verbs like “hit” and “shoot” do have adjectival forms – as in “I am shot_{Adj}/hit_{Adj}” which is distinct from the passive “I was shot/hit by someone.”¹⁰

3.4

I have been stressing a line of minimalist thought, based on the treatment of constituency, that supports appeal to hidden verbs. Let me turn briefly to a second line of minimalist thought, based on the treatment of transformations, that may explain why the overt verb in a causative structure must adjoin to the hidden verb (and why downstairs adjunction is incompatible with this).

Recall that minimalists encode the existence of transformations by saying that some lexical items have features that are “attracted” by (or perhaps to) other lexical items. But the deeper explanation for movement is said to lie with constraints imposed by the auditory/perceptual and conceptual/intentional systems. Perhaps the former system is relevant in the case at hand.¹¹ But we have already seen a sense in which [v [boil y]] may be semantically uninterpretable. At the end of section 2, I noted that this structure could not be interpreted in a (strongly) compositional fashion, given a (standard) sentential semantic value for [y boil]. So perhaps [v [boil y]] must be transformed, because the C/I system interprets linguistic structures in a compositional manner. The Bakeresque structure below (figure 8.11) *can* be interpreted compositionally, in accordance with a simple eventish semantics, as indicated. I have indicated no interpretation for the trace of “boil.” For on a minimalist view, traces simply reflect derivational

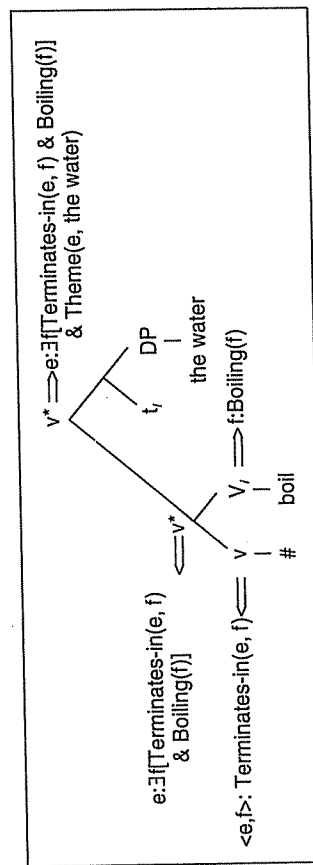


Figure 8.11

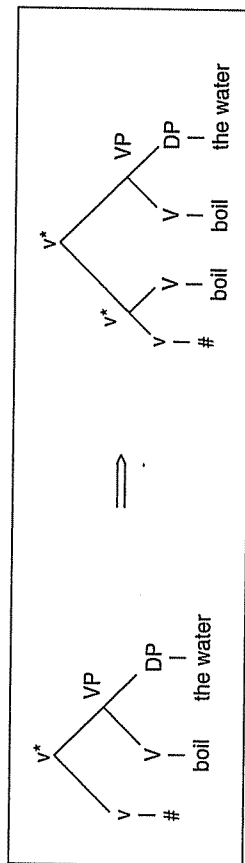


Figure 8.12

history. If the rationale for transformations is to ensure interpretability at the interfaces, then expressions are to be interpreted *where they end up*. (See Hornstein 1995 for defense.) One should *not* think of pre-transformation results of Merge as “deep structures” that determine the interpretation of sentences, with displacement occurring for semantically extraneous reasons. And if the trace of “boil” is ignored, “the water” is in the familiar theme (comp) position of the incorporated verb “#-boil.”

This idea of “ignoring” traces is best understood in the context of the minimalist mechanism for transformation: Copy and Delete. The first operation is required unless expressions literally *move* expressions from one site to another; and literal movement, if intelligible, would be very complex. So in addition to Merge, minimalists posit an operation – Copy – that can modify a tree as in figure 8.12. But leaving expressions in their original places is unlikely to improve interpretability at the interfaces. On the contrary, introducing second copies may create new problems of interpretability. We know that both copies are not pronounced. So minimalists posit an operation – Delete – that has the desired effect (see figure 8.13). The subscript and trace notation reflect the history of the derivation. Originally, “boil” was merged with “the water.” But the structure on the right does not contain a shadow of “boil” in the embedded VP. Indeed, the label “VP” ceases to have meaning (except as a reflection of derivational history), since its only constituent is the determiner phrase. And if

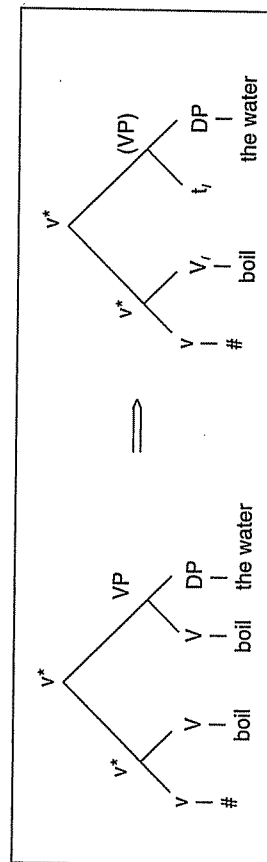


Figure 8.13

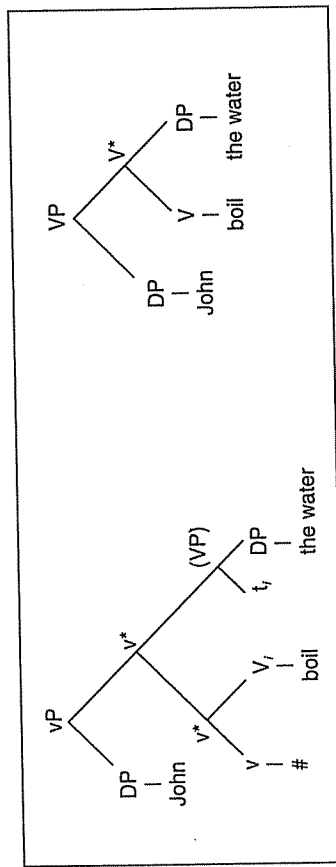


Figure 8.14

the incorporated verb is treated as a terminal node of the tree – see Uriagereka 1999 on the relation between adjuncts and “frozen units” in a minimal syntax – the result of transformation will mimic a transitive sentential frame (see figure 8.14).

So it is no surprise, on a minimalist account, that “x boiled y” has a transitive character. Indeed, it is not wrong to say that “boil” has a transitive form; and one can write “x boiled_t y” and “y boiled_t.” But the intransitive form is basic, in that “boiled_t y” is short for: [_v #-boil_t [_{VP} t_{DP} y]]]; where “boil” (i.e., “boil_t”) takes a single argument. Thus, it would be a mistake not to see “boil” in “boil_t y,” just as it would be a mistake not to see “boil” in “boil on Tuesday.” One can represent “y boiled” and “y boiled on Tuesday” as “βy” and “β*y.” But then one does not represent the inference from the latter to the former as valid; so one will be tempted to add the meaning postulate “V_y(β*y → βy).” But this merely reports a fact, instead of explaining it, which suggests that “βy” and “β*y” are theoretically inadequate representations of the natural language sentences. Similarly, I suggest, for “x boiled_t y” and “y boiled_t.”

A minimalist account of transformation also suggests that there would be something wrong with figure 8.15. One might wonder whether the original token of “boil” *can* delete. (The structure [_v [[_{LAP} on Tuesday]] seems to depend on its presence.) But if it does delete, the embedded VP is still left with two major constituents, “on Tuesday” and “the water”; hence, the VP node cannot be ignored, even for purposes of interpretation. So “the water” is *not* in the complement position of the incorporated verb. This is a problem, on the assumption that every argument (DP) must be assigned a thematic role. For as Chomsky notes, a plausible thought is that thematic roles are assigned by virtue of structural relations that obtain between verbs and arguments: head-comp for Theme; head-spec for Agent. For this reason, one might suggest that “boil” originally merges with “the water,” and that thematic relations are assigned in merger. In that case, the “downstairs adjunction” structure would be as in figure

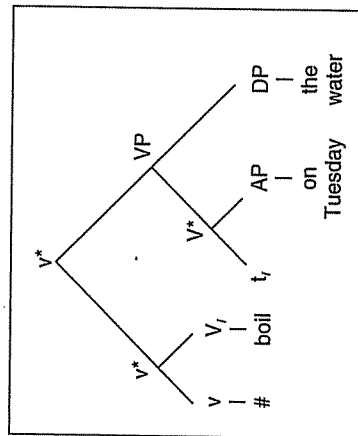


Figure 8.15

8.16. But even if “the water” is treated as a Theme, the meaning of the whole structure is not yet determined.

If Fodor’s nonambiguity objection is sound, the higher “v*” should be true of events e, such that: $\exists f[\text{Terminates-in}(e, f) \ \& \ \text{Boiling}(f) \ \& \ \text{Theme}(f, \text{the water}) \ \& \ \text{On-Tuesday}(f)]$. For this is the (relevant) nonexistent reading of “boiled the water on Tuesday.” But why suppose this interpretation, given the indicated semantic values for the lower “v*” and “VP”? If any eventish interpretation is assigned to the higher “v*”, one would expect it to be characterized by conjunction (or intersection). That is, one would expect the structure above to be true of those events e, such that: $\exists f[\text{Terminates-in}(e, f) \ \& \ \text{Boiling}(f)] \ \& \ \text{Theme}(e, \text{the water}) \ \& \ \text{On-Tuesday}(e)$. So even if this structure is generable – by Merge, Copy, and Delete – there is no reason to think it can bear an interpretation that would make “John boiled the water on Tuesday” ambiguous. Moreover, Chomsky (1995a: 329–34) argues against the possibility of the structure above on independent grounds; and Larson (1988) argues that adjuncts sit

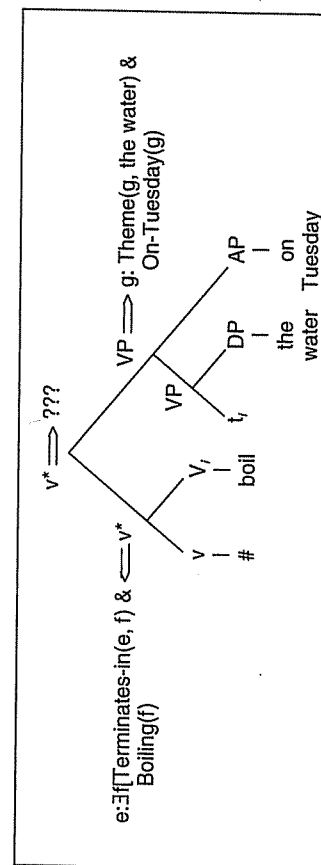


Figure 8.16

closer to verbs than arguments. (This last point coheres with the idea that "VP" reflects *saturation* of the verb – and so a *sentential* semantic value, absent subsequent movement.)

3.5

If the water is represented as Theme of the e-position event, which terminates in a boiling, one might wonder where that leaves us with respect to the validity of inferences like:

- (1) John boiled the water; so (2) the water boiled.

For consider: $\exists e\{\text{Agent}(e, \text{John}) \ \& \ \exists f[\text{Terminates-in}(e, f) \ \& \ \text{Boiling}(f)] \ \& \ \text{Theme}(e, \text{the water})\}$; so $\exists f[\text{Boiling}(f) \ \& \ \text{Theme}(f, \text{the water})]$. This inference is not valid. First-order logic does not guarantee that the Theme of an event that ends in a boiling is the theme of that very boiling. But this does not show that the *natural* language inference is invalid. It shows that the representation in our standard predicate logic fails to capture a semantically significant aspect of the *transformation* that is part of the *derivation* (via Merge, Copy, and Delete) of the transitive construction "John boiled the water." It is a familiar point that the inference "John ran, so someone ran" does not look valid if rendered as "P, so Q." We know that the propositional calculus is an impoverished tool for reflecting the semantically relevant structure of natural language inferences; and we are used to the idea that (first-order) predicate logic fails to capture the validity of at least some inferences.¹²

Correspondingly, the model-theoretic notion of validity is not tied to the resources of any particular formal system. It can be applied to structures like those in figure 8.17. If the proposal developed here is correct, linguistic structures

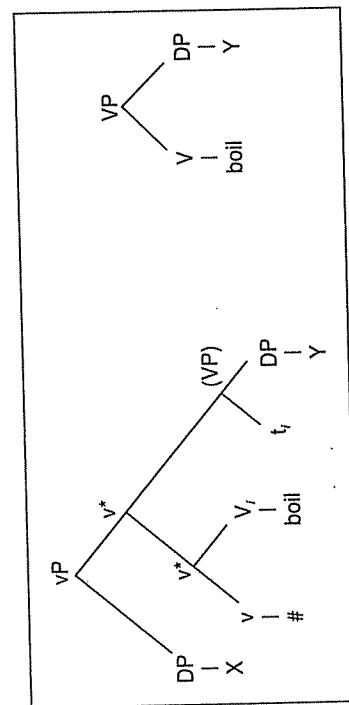


Figure 8.17

are assigned interpretations (in accordance with an eventish semantics), so that any interpretation that makes the structure on the left true also makes the structure on the right true. Given the semantic contributions of the various syntactic modes of combination – i.e., given the natural language equivalents of concatenation in predicate logic – the interpretation of the higher " v^* " on the left is (compositionally) determined by the interpretations of: " $\#$," "boil," and "Y." Given the semantic contribution of merging a verb with an argument, the interpretation of "VP" on the right is (compositionally) determined by the interpretations of: "boil" and "Y." In this sense, any interpretation of the structure on the left determines the interpretation of the structure on the right. For the set of lexical inputs to the process that generates the structure on the left – what Chomsky calls the "numeration" of the structure – is a *subset* of the set of lexical inputs to the process that generates the structure on the right. Given the semantic architecture of natural languages, this determination is also truth-preserving. And this is so, even though the incorporated verb is treated as a unit (and thus *like* a lexical item) *after* displacement of the overt verb. So *pace* Fodor and Lepore, the transitive character of "x boiled y" does not give us reason to treat "boil" as lexically ambiguous, as between "boil_r" and "boil_i" – at least not if the lexicon consists of semantically primitive items that (together with the semantically relevant syntactic modes of combination) determine the interpretations of all linguistic structures. On the contrary, if minimalist thinking is correct, the transitive character of "x boiled y" is best explained on the hypothesis that "boil" (like all verbs) takes a single argument.

This raises larger issues, about the relation of logical form to linguistic structures, that I leave for another occasion; see Pietroski 2002. But I hope to have illustrated that, in conjunction with the event analysis, minimalism offers an attractive framework for thinking about the relation of form to meaning. If all goes well, this program may even lead to productive hypotheses about the relation of human language to human thought. Indeed, Chomsky's talk of an LF-C/I interface suggests a way of pursuing the traditional analytic project in philosophy – that of investigating thought by investigating language – in a naturalistic mode that does not divorce philosophy from the rest of human knowledge. For perhaps we can use our best theories of syntax to frame, or at least constrain, hypotheses about what LFs interface with. (For example, one might speculate that the LF-C/I interface is trivial, and that expressions in the "language of thought" are structurally isomorphic to the LFs of natural language.) From this perspective, alleged analyticities will play their traditional role, as potential sources of evidence for claims about the structure of thought. Thus, the minimalist program offers the intriguing prospect (long hinted at by Chomsky) of using linguistic theory as a tool for investigating various aspects of human cognition.¹³

Chomsky's reply: pp. 304–7.

Notes

- 1 This paper, written in 1998, has descendants that have preceded it (in particular, Pietroski 2002); and Pietroski (forthcoming), while maintaining the basic line of thought, modifies some of the details. But for obvious reasons, I have not revised the paper, apart from updating some references.
- 2 At the end of his paper, Quine suggests that even logical truths occupy no special place in our web of belief: there is no principled distinction between (5) and (6); we can rationally revise our attitude toward either conditional, since both are confirmed in the same (global and empirical) way. But I know of no good argument for this claim. As Rey (1998) discusses, one must take care to avoid fallacious inferences from: fallibilism to the revisability of logic; our capacity to revise how we express thoughts, to the revisability of what we think; and the claim that (beliefs represented by) logical truths can be justified by holistic/empirical methods, to the claim that logical truths can be justified *only* by such methods.
- 3 It is an empirical question whether (4) is analytic, and the corresponding knowledge is *a priori*. This should be unsurprising, absent the dogma that analyticity is transparent – i.e., that competent speakers can just “tell” that analyticities are such. As used here, “analytic” is a technical term introduced in the course of explaining phenomena that appear to be manifestations of linguistic competence. Compare “grammatical,” which is introduced in the course of explaining why speakers judge certain strings to be (un)acceptable.
- 4 The latter example is closer to Fodor’s: “x killed y by swallowing his tongue,” which lacks a reading had by “x caused y to die by swallowing his tongue.” Such cases are complicated by the empty subject of the “by”-clause: x caused y to die by *e* swallowing his tongue; perhaps “e” cannot be coreferential with “y,” even if the hidden-verb hypothesis is true. So I will focus on (18–19). Or consider “John caused the water to boil rapidly/twice,” which seems to be ambiguous in a way that “John boiled the water rapidly/twice” is not.
- 5 Note that “x caused y to boil” differs from “x heard y bark”: *“(x caused y boil),” *“(x heard y to bark.” If “y to boil” specifies a fact, and not an event, then accounting for the validity of “x caused y to boil, so y boiled” may be a complicated matter. (Cf. “x correctly believed y to be a thief, so y was a thief.”)
- 6 Let me stress: D grounds E, only if D and E are existing (occurring) events; and it is not my aim to provide an independent metaphysics of events. In particular, I am *not* saying that whenever one event causes another, there exists a third event that has the first two events as parts. On the contrary, I am inclined to reject such fusion theses. (See note 8 below.) In Pietroski (2002), I speak of one event *initiating* another, with “Initiator” and “Terminator” being treated as labels for relations between events (while “Agent” and “Theme” are labels for relations between events and participants). I assume that the water is the theme of the boiling, since it is saliently affected (and not an actor). This is even more plausible, if “y boiled” results from movement, and the argument is the verb’s logical *object*. (See Burzio 1986; Baker 1988: 46–7.) But one wants to know why “There boiled some water” and “There sank three ships” are less acceptable than similar expletive constructions like “There seems to be a mistake” and “There arrived three men.” (Cf. Belletti 1988; Haegeman 1994: 331–7.) In this

- chapter, I do not discuss views according to which the meaning of the intransitive verb is specified in terms of the transitive verb; see, e.g., Levin and Rappaport (1995).
- 8 By hypothesis, the alleged complex event would not be a *boiling*; and if it would not satisfy any ordinary event sortal, one cannot simply assume that the alleged event exists. Nor can one assume that if E and F are events, then the fusion of E and F is an event. Like Hornsby (1986), I am inclined to reject this thesis. (Is there an event whose parts include the falling of a tree and subsequent changes in the auditory system of some squirrel? Cf. Thomson 1977.) But perhaps fusion theorists can restrict my proposed thesis about Agents, along the following lines: α is the agent of E, if α performs an action that grounds E, and E satisfies some nonfusion condition for being a “genuine” event. If some fusions of events are not (genuine) events, one might wonder why not. But it is not the job of a *semantic* theory to tell us which particulars exist (occur); and “terminates-in” expresses a relation between existing events. Note that appeal to complex events accounts for the one-way entailment, from “x boiled y” to “y boiled,” without replacing “cause” with a notion whose extension is a *subset* of the extension of “cause” (i.e., “cause in the right way”). Correspondingly, one need not take on the (futile) task of specifying some condition M, such that x boiled y, iff: x performed an action that caused a boiling of y, and M. Semantic decomposition does not require analysis in this sense, *pace* Fodor and Lepore.
 - 9 See Larson 1988 and Baker 1997 on the “thematic hierarchy” <Agent <Theme <Goal>>>. One might wonder if small verbs have *any* substantial meaning of their own, or whether they simply provide a mechanism by which thematic roles are assigned in a minimalist syntax. I do not address this issue.
 - 10 Let me mention one of Hale and Keyser’s (1993) cases, addressed by Fodor and Lepore (1999). If Nora saddled the horse, Nora is the Agent of a complex event that terminated in a certain change of state – namely, a change in which the saddle came to be (appropriately) on the horse. So one might appeal to a functional item that transforms nouns into adjectives: $[_{AP} [_{A'} (en)] [_{N} saddle]]_{DP}$ the horse]], with the verb phrase being derived as described in the text. (This suggestion differs, in the details, from Hale and Keyser’s own.) Verbs like “count,” however, pose a difficulty for minimalists: if Nora counted the children, then *Nora* counted; and Nora is the *Agent* of the counting. Chomsky endorses Hale and Keyser’s suggestion that an apparently intransitive verb is really a hidden transitive, if its overt argument represents the role of Agent. One might take this as endorsement of the following analysis of “X counted”: $X[_{AP} [_{A'} \#-count] [_{VP} t_i (Y)]]$; where “(Y)” is unvoiced. But this structure would presumably be interpreted as meaning that X counted *something*, and one can count without counting anything (cf. “sing” and “dream”). So perhaps “(Y)” is deleted prior to interpretation at the interface. Or maybe the underlying form of “X counted” is: $X[_{AP} [_{A'} \#-count] [_{VP} t_i]]$; where this is the result of originally merging “count” with the small verb “#” (which is associated with the role of Agent) and it is an idiosyncratic property of “count” that it can merge directly with “#.” In any case, a small verb analysis is motivated by the minimalist explanation of Burzio’s generalization, if the subject in “Nora counted” is assigned accusative case. (Compare “There arrived/*counted three men.”)
 - 11 In languages with overt causative morphemes, raising may be required (at PF) for pronounceability; even in English, the difference between “raised” and “rose” is suggestive. On a minimalist view, LFs and PFs share some derivational history; and

they may diverge *after* the overt verb has moved, with such movement reflected at LF, even though the movement was for the benefit of the AP system.

- 12 See Pietroski (forthcoming) for related discussion and defense, via Tenny (1994), of the following claim: Theme(e, x) & Terminates(e, f) $\rightarrow$ Theme(f, x).
 - 13 For helpful comments and discussion, my thanks to: Mark Baker, Susan Dwyer, Jerry Fodor, Norbert Hornstein, Ernie Lepore, Jim McGilvray, Juan Uriagereka, audiences at Carleton University and the University of Maryland.
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In Defense of Public Language

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a notion of "common, public language" that remains mysterious . . . useless for any form of theoretical explanation . . . There is simply no way of making sense of this prong of the externalist theory of meaning and language, as far as I can see, or of any of the work in theory of meaning and philosophy of language that relies on such notions, a statement that is intended to cut rather a large swath.

Chomsky 1995: 48–9

It is a striking fact that despite the constant reliance on some notion of "community language" or "abstract language," there is virtually no attempt to explain what it might be.

Chomsky 1993: 39

either we must deprive the notion communication of all significance, or else we must reject the view that the purpose of language is communication . . . It is difficult to say what "the purpose" of language is, except, perhaps, the expression of thought, a rather empty formulation. The functions of language are various.

Chomsky 1980: 230

I have yet to see a formulation that makes any sense of the position that "the essence of language is communication."

Chomsky 1980: 80 (see also 1992b: 215)

At frequent intervals over the years, Professor Chomsky has inveighed against both commonsense and technical notions of public language or "externalized language," claiming that they are confused, ill-defined, or of no scientific interest. As a scientist, he would be interested in public language only if it were a "real object of the real world" (Chomsky 1993: 39) rather than an "artifactual" and "arbitrary" notion (Chomsky 1985: 26). I propose to articulate such a notion of public language for him. Chomsky has also denounced the notion that the purpose of language is communication. I will argue, on the contrary, that a primary function of the human language faculty is to support linguistic conventions, and that these have an essentially communicative function.