# CONSTRUCTING ATTITUDES

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*Abstract*
*The singular term theory maintains that that-clauses are complex singular terms which designate propositions. Though extremely well-supported, the theory is endangered by the existence of oblique that-clauses; that is, that-clauses occurring in what appear to be non-argument positions (e.g., 'Lola was upset that Slick Willy had all the fun'). In this paper I argue that the best solution to the problem consistent with the singular term theory, invokes a construction-based grammatical theory. Such an approach challenges traditional views of semantic compositionality by rejecting a central dogma of semantics, namely, that linguistic constructions contribute only trivial logical or quasi-logical information to semantic interpretation (e.g., function-application relations).*

The received view in the philosophy of language is that finite clausal complements (paradigmatically, *that*-clauses) are sentential nominals which designate the semantic value of the embedded sentence.[1] Although the linguistic role of the complementizer *that* in such constructions is unsettled (see, e.g., Bolinger 1972), I will follow tradition and use the linguistically parochial idiom "*that*-clause" to refer to the relevant class of syntactic entities. Moreover, in the interest of brevity, I will call the semantic values of sentences *propositions*.[2]

With these terminological niceties in place, we can say that the *that*-clauses in (1.a, b) below are complex singular terms both of which designate the proposition indicated in (1.c), associating to the left:[3]

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[1] I will put nonfinite clausal complements to one side for the sake of manageability. I use the technical term "designate" to side-step the, in my view, peripheral question of whether or not any complex syntactic expression can properly be said to refer (see Neale 1993; Recanati 2000).

[2] On the understanding that, if the general ontological category to which sentence meanings belong contains other entities—for example, entities that are not expressible by any sentence of English—then they too will be counted as propositions. This terminological choice leaves open just what type of entity propositions are: they could be abstract Platonic entities, mind-dependent mental constructs, or even the sentences themselves (or sentences in the language-of-thought). Which of these possibilities is correct is not an issue that we will need to settle.

[3] An occurrence of the lexeme *t* in a sentence *S* is a singular term iff (i) *t* is the syntactic argument of some other linguistic unit $\tau$ of *S* and no syntactic unit $\tau^*$ of *S* is a syntactic argument of *t* and

1.a)   Lola believed that Slick Willy had all the fun.
   b)   Lola believed Slick Willy had all the fun
   c)   **believe**(**had fun**(**sw**))(**l**)

I will call this view the *singular term theory*. In one form or another singular term theory has been adopted by a very large number of philosophers of language and linguists (e.g., Vendler 1967; Cresswell 1973; Bealer 1979; Chierchia 1982; Barwise & Perry 1983; Anderson 1984; Salmon 1986; Soames 1987; Schiffer 1992; Asher 1993; Parsons 1993.) Nor is the widespread acceptance of the singular term theory simply a matter of philosophical fashion; the view is extremely well supported.

Despite this support, there exist familiar ordinary language constructions in which *that*-clauses occur in what appear to be extraneous non-argument positions (as in, e.g., 'Hilary was upset that Slick Willy had all the fun').[4] Constructions involving such oblique *that*-clauses (as I will call them), pose a serious *prima facie* challenge to the adequacy of the singular term theory. The problem is not that oblique *that*-clauses are syntactically anomalous, but that from the point of view of the singular term theory it is unclear how to explain the fact that such sentences express a coherent or unified propositional content.

In this paper, I will provide a detailed solution to this problem of oblique complement clauses.[5] There are two plausible avenues which the singular term theorist could take. The first (and the one most people will hit on first) is to posit a lexical expansion rule which allows one-place psychological predicates to be interpreted by associated two-place relations. In §2, I argue that this approach is not feasible. Specifically, I argue that

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(ii) $[\![t]\!]$ is the semantic argument of some item $\mu$ in a correct analysis of $[\![S]\!]$ and $[\![t]\!]$ does not itself take any arguments, and (iii) $[\![t]\!]$ is an object in the domain of discourse.

[4] The philosophical importance of these constructions has been independently noted in Graff (2000), Moffett (2001), and Moltmann (2003).

[5] In my opinion, the only other significant language-based objection to the singular term theory is what Friederike Moltmann (2003) calls the substitution problem. As Vendler (1967) noted, if in a given syntactic context a bare *that*-clause may be replaced by the definite description 'the proposition that p' then it may not (without altering the meaning of the verb) be replaced with the description 'the fact that p'; conversely, if a bare *that*-clause may be replaced by 'the fact that p' then it may not be replaced with 'the proposition that p'. (Related points hold for other descriptive phrases, such as 'the possibility that p'.) At the same time, however, we can often simultaneously quantify over objects of both verbs, as in the philosophical platitude 'Everything x knows, x believes' (see Harman 2003; King 2002). In Moffett (2003) I proposed a solution to this problem, at least for the pair *knows* and *believes*. Thus, taken together, this paper and that one constitute a fairly broad defense of the singular term theory.

we need a *syntactic* rather than *lexical* account of the existence of oblique *that*-clauses. In §3 I develop an alternative, construction-based solution to the problem. The key to this solution is to reject a certain dogma of semantic compositionality, namely, that linguistic constructions contribute only trivial logical or quasi-logical information to semantic interpretation (e.g., function-application relations). I call this latter view *constructional minimalism*. I argue that we ought to reject constructional minimalism as a general principle of semantics, in part because if we do, we can give a straightforward account of oblique *that*-clauses consistent with the singular term theory.[6]

One might, however, think that constructional minimalism, as a general principle of semantics, is more near and dear than any specific theory of *that*-clauses. And such a person may consequently prefer to hold on to constructional minimalism in favor of the singular term theory. For this reason I will begin with a general overview of the various positive arguments that have seemed to make the singular term theory inevitable.

## 1. Support for the Singular Term Theory

Widespread agreement over the singular term theory is hardly surprising, for a strong case can be made for it on a number of fronts. In this section, I will map out the considerations that speak most tellingly in its favor. These considerations break down naturally into three categories: (1) linguistic considerations concerning syntactic constituency, (2) logical considerations concerning the validity of arguments involving *that*-clauses, and (3) philosophical considerations grounded in the intentional theory of mind. These considerations are individually significant. However, taken as a group they provide a strong, mutually reinforcing case for the singular term theory.

*1.1. Linguistic Considerations.*

Linguists traditionally use of a number of informal "tests" to support judgments of syntactic constituency. These tests function by noting that uncontroversial syntactic constituents display a certain sort of grammatical behavior while no syntactic string that

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[6] Thus, a major secondary goal of this paper is to illustrate the philosophical relevance of construction-based linguistic theories.

is uncontroversially *not* a syntactic constituent displays the behavior. Difficult or controversial cases are then sorted on the basis of whether or not they exhibit the behavior.

In this subsection I will consider the results of such a test for syntactic constituency and argue on this basis that *that*-clauses constitute syntactic units. If this is correct, paradigmatic occurrences of *that*-clauses in propositional attitude reports must be analyzed along the following lines:

$$[_S [_{NP} x] \ [_{VP} [_V V\text{-}s] \ [_{CP} \text{that p}]]]$$

That is, the *that*-clause is a syntactic constituent distinct from the main verb.

*Wh- substitution*: The first test I will consider is the *wh*-substitution test (or *wh*-test, for short). Consider, the behavior of so-called *wh*-questions such as (2.a) below:

 2. a)  Who does *x* believe?

In response to (2.a), it would be entirely appropriate to say such things as 'John', 'the man in the park' or 'every evangelist', all of which are uncontroversial syntactic units. Moreover, it is never appropriate to respond with a syntactic string that is not a syntactic unit (e.g., * 'Man in park'). This suggests that our ability to give an expression $\alpha$ as an appropriate response to a *wh*-question is evidence that $\alpha$ constitutes a syntactic unit at some level of analysis. Given this, consider the following *wh*-question:

 2. b)   What does x believe?

It is most natural, and plainly appropriate, to respond to such a question with a *that*-clause (e.g., 'That Gore won Florida').  Thus, the *wh* test strongly supports the claim that *that*-clauses form syntactic units.

To the best of my knowledge, all other tests for syntactic constituency (e.g., left dislocation and ellipsis) result in equally clear cut judgments favoring the thesis that *that*-clauses form syntactic units. As a matter of syntax, this conclusion is hardly controversial. Indeed, as Parsons puts it, "The contrary view that eschews *that*-clauses in favor of combining 'that' with verbs and adjectives would involve complications in syntactic theory so far-reaching that they are not seriously contemplated in linguistics" (1993, 442).

Although this conclusion does not by itself imply the singular term theory, it is significant because it significantly weakens the standard syntactic analysis of a functor theory of *that*-clauses. According to the functor theory, the complementizer *that* is a logical particle which turns predicates like 'believes' into functors. These functors are then combined with a singular term (the sentential subject), which results in a one-place sentential operator (e.g., 'x believes that'). Clearly this view does not fit well with the standard structural analysis of standard propositional attitude constructions.

*1.2.  Logical Considerations.*

More direct support for the singular term theory derives from various logical considerations—in particular, the intuitive validity of natural language arguments involving *that*-clauses. In this subsection I will first consider support from arguments involving quantification and then substitutivity arguments involving proper names for propositions.

*Validity and Quantification.* Intuitively, arguments such as the following are valid (Bealer & Mönnich 1989; Schiffer 1996):

> Everything $x$ knows, $x$ believes
> $x$ knows that p
> _____
> Therefore, $x$ believes that p.

Arguably, the best explanation for the validity of such arguments presupposes that *that*-clauses are singular terms.[7] Specifically, if the quantification expressed in the first premise of this argument is simple first-order objectual quantification (as it seems to be on its face), the view that *that*-clauses are singular terms follows as a matter of course.[8] And the following considerations provide a solid argument that such quantifiers are objectual (Moltmann 2003). The upshot of her argument is that we can use unrestricted quantifiers like 'everything' and 'something' in contexts where substitution of a *that*-clause would be grammatically inappropriate. Consider, for example, the sentence:

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[7] I put to one side King's (2001) suggestion that *that*-clauses are best construed as quantificational phrases of some sort.

[8] Moreover, given our earlier observation that *that*-clauses are syntactic constituents, even if the quantification is substitutional in such arguments, the most natural classification of *that*-clauses is still as singular terms—though perhaps vacuous ones.

2. c)  Lola stated openly something I had merely thought about.

As Moltmann notes, if what Lola stated and what I had thought about was that I ought to become a dancer, then a substitutional account of the quantifier "everything" would require the truth of the following:

2. d) *  Lola openly stated that I ought to become a dancer and I had merely thought about that I ought to become a dancer.

But since (2.d) is clearly ungrammatical, no such substitution instance is available.

*Validity and Substitution.* Although substitution failure has been a central talking point in the philosophy of language for the last century, there are also important lessons to be learned from cases of successful substitution. Consider, for example, the following argument:

> x believes Gödel's Incompleteness Theorem.
> Gödel's Incompleteness Theorem is John's favorite theorem.
> _____
> ∴ x believes John's favorite theorem.

Despite deep differences in the syntactic and semantic structures of the first premise and the conclusion, this argument is sound.

Moreover, the soundness of the argument is extremely puzzling on theories of substitutivity *failure* that maintain that co-referential substitution of terms *within* a *that*-clause typically preserves semantic meaning. The reason is that such proposals usually take the *prima facie* change in meaning to be a function of the logical, syntactic or morphological differences between the complement terms. Yet the first premise and the conclusion exhibit those very same differences without any corresponding failure of substitutivity.

The natural conclusion to draw from these observations is that 'believes' and other propositional attitude verbs, just like all other natural language predicates, are fully extensional: they allow free substitution of co-referential terms in their argument posi-

tions.[9] But then consider the following argument involving the substitution of a *that*-clause for a proper name.

> *x* believes Gödel's Incompleteness Theorem.
> Gödel's Incompleteness Theorem is that mathematics is incomplete.
> _____
> ∴ *x* believes that mathematics is incomplete.

Given the extensionality of 'believes', by far the simplest explanation of the validity of this second argument is that the *that*-clause invoked in premise two is a singular term that is co-referential with the proper name 'Gödel's Incompleteness Theorem'.[10]

The conclusion is that the logical behavior of *that*-clauses, both in their quantificational behavior and in their capacity for substitution with singular terms, strongly supports the tenets of the singular term theory.

### 1.3. Philosophical Considerations.

Finally, the view that *that*-clauses are singular terms is supported by the intuitive appeal of the intentional theory of mind and, correspondingly, a relational theory of the attitudes (e.g., Fodor 1987).[11] On this view, propositional attitude verbs such as 'believe' express relations that hold between cognitive agents and intentional contents. If the relational theory of the attitudes is correct, it would be extremely natural to understand *that*-clauses as singular terms whose semantic value is the intentional content of the expressed relation, and, consequently, to take the objects of the attitudes to be propositions. Moreo-

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[9] But if propositional attitude verbs are extensional, then what gives rise to the phenomenon of substitutivity failure? The answer appears to lie in the nature of the *objects* of the attitudes themselves—belief is an extensional relation between individuals and *intensional entities*, namely, propositions (Bealer 1982).

[10] It is worth noting in passing that the possibility of belief reports involving syntactically unstructured complements raises serious problems for neo-Russellian multiple-relations analyses (e.g. Jubien 2001; Moltmann 2003). For, barring an ambiguity in 'believes', it would appear that the proper name "Gödel's Incompleteness Theorem" would have to contribute multiple referents to the resulting proposition.

[11] Some authors (e.g., Moltmann 2003) suggest that the appeal of the relational theory of the attitudes rests largely on the linguistic analysis of attitude reports. This seems to me quite mistaken. The appeal of the relational theory of the attitudes is rather that it captures in a straightforward way the intentional nature of cognition.

ver (as we saw in §1.2), the intuitive relationality of the attitudes is confirmed by the fact that they accept standard noun phrase complements (e.g., 'Gödel's Incompleteness Theorem').

Verbs expressing propositional attitudes, however, are only one of a number of verbs that are intuitively relational and that allow *that*-clauses as their objects. To communicate, for instance, is presumably to stand in a certain three-place relation to another person and a bit of information (the message). And just as the singular term theory predicts, the verb 'communicate' accepts both NP complements (2.f) and CP complements (2.g).

> 2. f)    *x* communicated *the message* to y.
>     g)    *x* communicated *that p* to y.[12]

Similar remarks hold for the dominant, relational theory of semantic meaning.

## 2. Troubles for the Singular Term Theory

The forgoing discussion provides some important, perhaps even decisive, considerations in favor of the singular term treatment of *that*-clauses. However, it is clear that the grammatical behavior of *that*-clauses in English is more complex than this discussion suggests. The problem, put generally, is that *that*-clauses frequently occur in syntactic positions that do not *prima facie* have any corresponding semantic arguments.

To see the nature of the problem in more detail, consider a standard psychological predicate such as 'be upset' or 'feel upset', as in (3.a, b):[13]

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[12] Some readers may wonder about the grammaticality of (2.g), preferring instead the inverse ordering of the objects: *x* communicated to *y* that p. However, because *that*-clauses are typically extremely long expressions, they are susceptible to what linguists call *heavy NP* [sic!] *shift*. Heavy NP shift is the often noted phenomenon that complex noun phrases are typically placed toward the end of a sentence or clause. For example, if the NP 'the message' in (2.f) were instead the longer 'the entire disgraceful and self-incriminating message', we would also prefer the inverse order (i.e., '*x* communicated to *y* the entire disgraceful and self-incriminating message'). If this is right, then we would expect short *that*-clauses to sound better in instances of (2.g) than long ones. This is indeed the case: compare '*x* communicated that he did it to *y*' with the awkward-sounding * '*x* communicated that of the many dozens of shark species only a relatively few are dangerous to man to *y*'.

[13] I will, hereafter, refer to the general class of psychological predicates in question as *mood adjectives*.
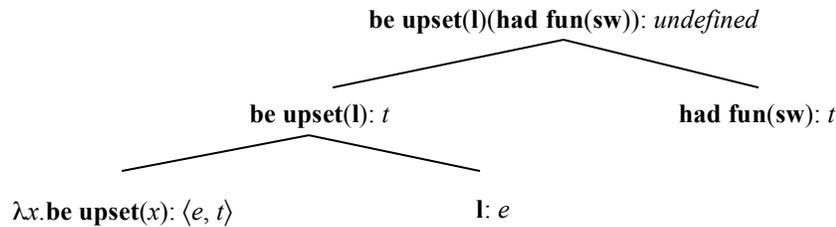
3. a)   Lola was upset.
   b)   Lola felt upset.

Although being (or feeling) upset is often causally dependent upon precipitating intentional states (for instance, on precipitating beliefs), we do not typically regard these feelings themselves as relational. Nor, indeed, should we. One can be (or feel) upset without being upset *about* anything.[14] This is why, for example, discourses like the following are not contradictory: "I was upset; not about anything, just upset." This strongly suggests that being upset is a psychological *property* (rather than a psychological relation).

Grant this. Then, if the singular term theory is correct, sentences such as (3.c, d) below will be extremely puzzling semantically:

3. c)   Lola was upset that Slick Willy had all the fun.
   d)   Lola felt upset that Slick Willy had all the fun.

Making use of extensional misrepresentations and letting (3.a) be our guide, we have the following labeled phrase structure tree for (3.c):

**be upset(l)(had fun(sw))**: *undefined*

**be upset(l)**: *t*            **had fun(sw)**: *t*

$\lambda x.$**be upset**(*x*): $\langle e, t \rangle$            **l**: *e*

Clearly these are incompatible type assignments. So, (3.c) ought to be semantically anomalous; but obviously it isn't.[15] Such sentences are not only acceptable, they are routine.

Of course, we could appeal to some sort of type-shifting principle (Partee & Rooth 1983, Partee 1986, Winter 2001) in order to account for the apparent mismatch. One op-

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[14] Here, and elsewhere, it might be useful to run through some other examples to convince yourself of the point. Consider, for example, the following: *be/feel grumpy, be/feel irritated, be/feel confident, be/feel uneasy, be/feel apprehensive.*

[15] The appeal to semantic types here (and elsewhere) is merely a heuristic to help make the point in a perspicuous way; nothing hinges on it. Alternatively, we could insert the *that*-clause as a sister to the predicate, in which case the semantic mismatch would occur immediately.

tion would be to propose a principle that raises the semantic type of *that*-clauses from *t* to $\langle\langle e, t\rangle, \langle e, t\rangle\rangle$. But even if this sort of linguistic *ad hoc*-ery were technically plausible in this case, it really doesn't solve the underlying semantic problem. What exactly *is* the property expressed by our newly minted adverb? The philosopher's response "*that p-ly*" doesn't satisfy.[16]

A more plausible proposal would raise the semantic type of 'be upset' so that it can take a propositional complement, thereby effectively making it into a nonbasic propositional attitude. On this proposal, 'be upset' would be interpreted as $\lambda x \lambda p.\textbf{be-upsets}(p)(x)$: $\langle t, \langle e, t\rangle\rangle$.[17] The natural way of developing this idea is to posit a lexical expansion rule of the following sort:

$$(ER) \quad \lambda x.\textbf{be adj}_{,}(x): \langle e, t\rangle \; \textbf{,} \; \lambda x \lambda p.\textbf{attitude}(p)(x): \langle t, \langle e, t\rangle\rangle$$

Roughly, (ER) tells us that we can interpret any mood adjective as a two-place (factive) propositional attitude.[18] Cleary the existence of such a rule would resolve the problem cases in a way that is consistent with the singular term theory. Consequently, if this sort of proposal were philosophically adequate, we could stop here.

Unfortunately, I don't believe the proposal is adequate. To see the worry, notice that (ER) tells us that we can interpret the predicate 'be upset', for instance, as expressing not its usual psychological property, but instead a corresponding relation. Which relation? As before, the philosopher's response, *being upset-that*, is little more than an evasion. But in this case we can give a more substantive answer as follows:

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[16] Moreover, it is easy enough to produce cases in which a problematic pronoun occurring in one of these contexts is anaphorically dependent on a *that*-clause occurring in the other. For example: Joan is happy that she won a million dollars but her husband doesn't yet believe it. Here the reference of the pronominal 'it' depends somehow on the semantic value of the antecedent *that*-clause. Such dependencies, however, might defy explanation unless we have a *uniform* semantic treatment of *that*-clauses in their occurrence as both grammatical objects and oblique complements.

[17] I use the technical term **be-upsets** here to distinguish it from, on the one hand, the property which I have been writing as **be upset** and, on the other hand, the *distinct* ordinarily language relation **upsets** (as in, 'That behavior upsets your mother').

[18] At this point it is worth noting that the phenomenon is not restricted to mood adjectives. For instance, the same point holds for predicates which we would not traditionally characterized as psychological predicates at all, such as 'be lucky'. Though, interestingly, we can construct the complex mood adjective 'feel lucky'.

**be-upsets** is that relation R such that *x* stands in R to φ iff$_{def}$ *x* is upset regarding (about) the fact/possibility that φ.[19]

Given this definition, we are now able to represent the meanings of (3.a) and (3.c) as in (3. a′) and (3.c′), respectively (associating to the left):

> 3. a′)  **be upset(l)**
> 3. c′)  **be-upsets(have fun(sw))(l)**[20]

Of course, (3.c′) is orthographically misleading because the property of being upset does not occur in the proposed analysis. This is no surprise as it was the intended consequence of introducing (ER) in the first place. It is reasonable, however, to be suspicious of this result, intended or not. For, at least at face value, 'be upset' has a univocal meaning in (3.a) and (3.c).

Though this judgment is admittedly delicate, it can be tentatively supported by cases in which there exist distinct lexical forms for the mood adjective and the corresponding emotive relation. Consider, for example the following sentences:

> 3. e)  That Slick Willy had all the fun maddened/angered Lola.
> f)  Lola was maddened/angered by the fact that Slick Willy had all the fun.
> g)  Lola was mad/angry that Slick Willy had all the fun.

Here, (3.f) is the passive of (3.e) and the predicate 'was maddened/angered (by)' clearly expresses a relation. Comparing (3.f) and (3.g) we see that the two sentences differ in their thematic configuration. Specifically, in (3.f), the fact that p is construed as the source or cause of Lola's anger; whereas, in (3.g) it is construed as the object or, better, the focus of her anger.

We can now see what is suspect about the relational treatment of mood adjectives. Intuitively we want to say that a *given* emotional state can (to put it metaphorically)

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[19] Generalizing, we get the following definition schema for all the derived attitudes associated with (ER):

**attitude** is that relation R such that *x* stands in R to φ iff$_{def}$ *x* is **be adj.** regarding (about) the fact/possibility that φ (where **be adj.** is the relevant psychological property).

[20] It is crucial not to misread (3.c′) as the proposition we would express in English with "The fact that Slick Willy has all the fun upsets Lola." Nor, as we are about to see, should it be read as the passive of this sentence.

be either focused or unfocused, and that these are two distinct ways of being in *the same state*. This is why, for instance, we can say things like the following:

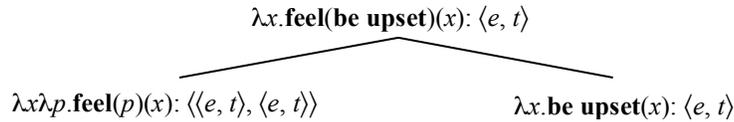> 3. h)     Lulu is angry and Lola is in *that same state* regarding the fact that Willy had all the fun.

Clearly there is very little, if any, semantic difference between the second conjunct in (3.h) and the meaning of (3.g). These commonalities are lost on the proposed expansion rule (ER). Thus, one problem with (ER) specifically, and semantic type-shifting principles generally, is that it generates ambiguities where none seem to exist.

Moreover, once we turn our attention from (3.a, c) and their ilk to (3.b, d), it becomes clear that reliance on lexical expansion rules is untenable. While this is not the place to attempt a detailed analysis of the auxiliary 'feel', a reasonable proposal is that its primary semantic function is to foreground the phenomenological characteristics of a given psychological property. Roughly, for any psychological property $\Psi$, one feels $\Psi$ iff one is in the type of phenomenological state one would be in if one were $\Psi$. Call the corresponding purely phenomenal property *phenomenal*-$\Psi$ or, more simply, $\Psi_p$ (*cf.* Chalmers 1996). Then 'feels' denotes a function from psychological properties to their corresponding purely phenomenological counterparts. (This makes sense of why we can say things like, "Well, I feel happy, but I am not sure that I am.") I will assume that something along these lines is correct and so will take **feels** to be of type $\langle\langle e, t\rangle, \langle e, t\rangle\rangle$.[21]

If this is correct, then it would appear to be essential that the occurrences of 'upset' in both (3.b) *and* (3.d) express the *property* of being upset.[22] This yields the following sub-tree for those sentences:

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[21] Note that one could substitute at this point a discussion of the related use of 'seems' in such contexts (as in, e.g., 'x seems upset'). In this case, however, we would take the corresponding properties to be complex physical-cum-behavioral properties, namely, those (stereo-)typically displayed by someone who possesses the associated psychological property (cf. ? 'I seem upset').

[22] One might try to argue that the relevant property in (3.d) is not the property of being upset, but the property of *being upset that Slick Willy had all the fun*. Unfortunately, this move is not available. This can be seen by looking at cases of ellipsis: "Lola feels upset that Slick Willy is fooling around, and Lulu, that Tricky Dick is." Such examples suggest that 'feels upset' is a syntactic constituent independent of the associated *that*-clause.

$$\lambda x.\textbf{feel}(\textbf{be upset})(x): \langle e, t \rangle$$

$$\lambda x\lambda p.\textbf{feel}(p)(x): \langle\langle e, t \rangle, \langle e, t \rangle\rangle \qquad \lambda x.\textbf{be upset}(x): \langle e, t \rangle$$

Moreover, it is grammatically implausible that the expression 'feels upset' is constructed *prior* to lexical insertion, which is the only point at which (ER) may apply. Together these facts imply that the hypothesized lexical expansion rule is not operative in (3.d). Nevertheless it is clear that (3.d) is every bit as troubling for the singular term theory as (3.c). Consequently, even if we do posit a lexical expansion rule such as (ER), we will still be left with seemingly intractable *that*-clause constructions.

Could this objection be handled by treating (ER) not as a *lexical* rule, but as a grammatical principle of some sort? My answer is a qualified yes. The qualification comes in two parts. First, as noted above, it seems to me to be a mistake to simply take over the ambiguity inherent in type-shifting approaches such as (ER). And second, because of the first qualification, we cannot simply posit some innocuous covert syntactic constituent that functions semantically to map us from the property to an associated relation. That is, we are not simply going to be able to define a function **exp** such that $\textbf{exp}(\lambda x.\textbf{be adj}_\bullet(x)) = \lambda x\lambda p.\textbf{attitude}(p)(x)$. Instead, we will need to add an *additional* relation not expressed by any syntactic constituent; and doing so will require us to be a bit more explicit about how this additional information is being infused into the semantics of oblique *that*-clause constructions.

## 3. A Construction-based Solution.

Taking a page from Frege, let us try working on the problem from a top-down perspective. Intuitively, (3.c), repeated here as (4.a), means roughly the same thing as (4.b):

4. a)    Lola was upset that Slick Willy had all the fun.
   b)    Lola was upset about (regarding) the fact that Slick Willy had all the fun.

Now positing (ER) was an attempt to get the relationality expressed by the 'about' in (4.b) by way of creative interpretation of the predicate. The idea is natural enough because we otherwise have no sense of where to locate the "aboutness" expressed in (4.a); the predicate appears to be the only syntactic constituent that can with any plausibility

handle the additional semantic load. But, as we have seen, the idea turned out to be a bust. And this puts as back at the beginning: we need some principled way of mapping the semantic constituents of the proposition explicitly expressed by (4.b) onto the syntactic constituents of (4.a) in such a way as to (i) preserve semantic compositionality, (ii) preserve a plausible lexical semantics for the terminal strings, and (iii) preserve a plausible syntactic structure for the sentence.

I take it that condition (iii) rules out the possibility of getting around the problem by positing an unarticulated syntactic constituent ⟨*about*⟩ in the LF of (4.a).[23] The problem here isn't with positing unarticulated constituents *per se*, but rather with positing unarticulated constituents in an *ad hoc* and otherwise unmotivated manner to "make-up" the semantic distance between our intuitive understanding of what a sentence means and what we would project it to mean on the basis of our semantic understanding of the overt lexical items. More specifically, an analysis that turns on positing an unarticulated terminal string ⟨*about*⟩ faces the following puzzle. At what point in the syntactic derivation is this string inserted? Assume something like the standard divisions between deep structure (DS), surface structure (SS), logical form (LF) and phonetic form (PF), and assume that SS structures feed independently into LF and PF. Then it would be natural to treat "⟨*about*⟩-insertion" as an operation on SS (this would, e.g., provide a straightforward account of its covert nature). But if so, then it is difficult to see why the SS representation would be grammatically well-formed. Conversely, if "⟨*about*⟩-insertion" occurs at DS, then it is difficult to understand what non-*ad hoc* account can be provided for the fact that the string is phonetically null.

But if we can neither push the relationality of (4.a) onto the predicate nor sneak it in by way of covert syntactic structure, then how can we possibly do it? The answer, I suggest, is to abandon a well-entrenched dogma of semantic theorizing, what I call constructional minimalism. In its most extreme form, constructional minimalism is simply the thesis that syntactic constructions do nothing more than indicate function-application (or predication) relations and do not themselves contribute any substantive semantic infor-

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[23] I put to one side the rest of the "added" material, namely, *the fact*. I will assume that its presence in (4.b) is simply a consequence of the semantically uninteresting fact that the preposition 'about' selects for NPs and not CPs.

mation to the meaning of a sentence. In its less extreme versions, constructional minimalism allows constructions to contribute a more robust (but still rather circumscribed) set of logical or quasi-logical operations into the semantic interpretation of sentences.[24] This is the view that I propose to abandon. And it is the rejection of this dogma that is, in my opinion, the key innovative force behind recent work in Construction Grammar (Goldberg 1995; Fillmore, Kay, Michaelis, & Sag *forthcoming*).[25]

The basic semantic insights behind construction-based linguistic theories may be motivated by way of a familiar observation: a mere string of words does not have a determinate interpretation even if the words themselves do. The reason, of course, is that a mere specification of a sequence of words plus an interpretation of the atomic constituents in the sequence does not tell us how the semantic values of the atomic constituents are to relate to one another. This is familiar enough from examples such as the following:

    5.a)  a R b.

Depending on how one chooses to structure the grammar of the language, (5a) could mean either (reading from left to right) that a is related to b by R or (reading from right to left) that b is related to a by R. Obviously, what is needed is some specification of how the "form" of the sentence (in this case, e.g., the order of the words) contributes to the meaning of the sentence.

In model-theoretic semantics, this component of the interpretation "piggy-backs" on the formation rules for the sentences of the language. For instance, if we have a formation rule that tells us that we can concatenate any one place predicate P and any term t to produce a formula, P(t), we will have a corresponding semantic rule which tells us to interpret formulas *of this form* as predicating the property expressed by the predicate of the entity denoted by the term.

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[24] Even as far back as Geach (1972) this more moderate form of minimalism seemed necessary. For a recent discussion, see Kratzer & Heim (1998). As noted, however, few authors who abandon the extreme version of constructional minimalism venture very far down the road to a robust constructional semantics, typically only deviating from the minimalist perspective by positing a few additional logical connections (e.g., logical conjunction or function composition) as part of the construction-based semantic contributions.

[25] In what follows I do not attempt to give a comprehensive overview of Construction Grammar and its formalism, but only attempt to indicate those characteristics of the theory that have direct bearing on the semantics of oblique *that*-clauses.

We can capture this pairing of the formation rule and its interpretation concisely in the following notation:

$$S \rightarrow P^1 \in D_1(t \in D) ; [\![P^1 \in D_1(t \in D)]\!] \Rightarrow \textbf{pred}_s \langle \phi, e \rangle$$

where $[\![P^1 \in D_1]\!] = \phi$ and $[\![t \in D]\!] = e$ and $\textbf{pred}_s$ is the operation of singular predication (Bealer 1982), which I include here in order to make the semantic contribution of the construction explicit. The pair $\langle \phi, e \rangle$ may be thought of as a product type argument (i.e., an argument of type $\langle \rho \times \delta \rangle$, where $\rho$ and $\delta$ are types) and $\textbf{pred}_s$ is a function from product types to propositions (i.e., of type $\langle \langle \rho \times \delta \rangle, t \rangle$). More explicitly, we assume a multi-sorted domain $D = \{D_{-1}, D_0, D_1, D_2, \ldots, D_n\}$, where $D_{-1}$ is the subdomain of particulars, $D_0$ is the subdomain of propositions, and for each $n > 0$, $D_n$ is the the subdomain of $n$-ary relations-in-intension. Then the predication function $\textbf{pred}_s$ takes pairs whose first member is in $D_1$ and whose second member is any element of $D$ and maps them onto some element in $D_0$, in particular, a proposition which is true iff $e$ is in the extension of $\phi$.

There are two points worth emphasizing about this simple example. First, there is nothing untoward about the fact that the construction introduces semantic information not carried by the lexical items; in particular, this fact in no way jeopardizes semantic compositionality. Since even constructional minimalists are committed to this possibility, the general principle that constructions can introduce semantic information should not be controversial.[26] What distinguishes construction-based grammars from constructional minimalism is simply the *amount* of semantic information that constructions can introduce.

Moreover, there is no principled difference between the introduction of "trivial" semantic information and the introduction of "substantive" semantic information that would in any way affect the possibility of providing a compositional semantics for the language. The mechanics are identical in both cases. Consequently, if constructional minimalism is true, this is an entirely contingent fact about natural languages (or the human language faculty), not a conceptual fact about the nature of languages.

The second point is that the information encoded in the phrase structure rules may be quite extensive and may include semantic as well as syntactic information. In the

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[26] In fact, as far as I can tell, this is a universal principle of semantics.

above example, for instance, we have encoded not only the fact that the first lexeme is a one-place predicate, but also that its semantic value is a property. (Whether or not the specific informational configuration above is needed, or even wanted, is not my present concern; the example is purely illustrative.) The idea that semantic information might be invoked in the statement of phrase structure rules is familiar enough from recent work in unification grammars such as GPSG (1985) and HPSG (1994) among others. One advantage to including such information is that it allows a natural way of fine-graining constructions which, on a classical view, would have to be assimilated.[27]

This brings us to the heart of construction-based grammars: linguistic strings exhibit abstract syntactic-cum-semantic forms and these forms are uniformly associated with particular semantic interpretations. The primary task for the grammarian is to identify some finite set of these forms and give an account of their semantic interpretations. But if Construction Grammar is going to get beyond constructional minimalism, we need some principled way of identifying novel constructions that contribute more semantically than the standard stock of logical operations already on offer.

While it is neither necessary nor sufficient for isolating constructions, one crucial consideration in this regard is what might be called top-down/bottom-up comparisons. These comparisons proceed as follows. First, we make an intuitive assessment of the meaning of a given sentence (or family of sentences). The result of this assessment can be thought of as the target proposition. We then attempt to generate that proposition on the basis of our understanding of the atomic lexical items plus previously posited constructions. If we get a mismatch between the target proposition and the projected proposition (that is, if we can't generate the target proposition) then we must either reassess our

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[27] To see why this might be valuable, consider a language which has two general types of terms, those that denote objects directly (as in direct reference theories) and those that are descriptive, expressing individual concepts (as in Church's 1951). Expressions involving directly referring terms will need a different semantic treatment from those involving descriptive terms. For instance, let $t_r$ be a directly referring term and let $t_d$ be a descriptive term. We would want the interpretation of a sentence such as $P(t_r)$ to express a proposition which will be true iff $[\![t_r]\!] \in$ the extension of EPF (this is the role of singular predication defined above). But we will not want that interpretation for a sentence $P(t_d)$ involving a descriptive term. Instead, we will want the resulting proposition to be true iff the unique individual in the extension of $[\![t_d]\!]$ is also in the extension of $[\![P]\!]$ (see Bealer 1993 for a detailed discussion of this sort of descriptive predication). It would be very natural to capture this difference by encoding the semantic distinction between the terms into the phrase structure rules and then providing different semantic interpretations (singular vs. descriptive predication, respectively) for the resulting strings.

intuitive judgment about the meaning(s) of the sentence(s), or reassess our semantic understanding of the atomic lexical items and/or previously posited constructions, or posit a new construction to account for the semantic difference. Thus, whenever a general syntactic-cum-semantic pattern is consistently associated with a particular semantic interpretation and that interpretation cannot be plausibly derived from previously postulated constructions plus the meanings of the atomic lexical items, we have reason to posit a distinct, new construction in the language.[28]

My proposal is to apply this sort of approach to the occurrence of oblique *that*-clauses. As we have already seen by comparison to (4.b), sentences like (4.a) have a richer *prima facie* meaning than we can account for on the basis of the meanings of the constituent expressions plus traditional predication relations. We have also seen that this difference cannot be plausibly accounted for by fiddling with the lexical semantics of the predicate or with the semantics of the complement clause. Moreover, the semantic shortfall in question is not simply an isolated or idiomatic phenomenon, but occurs with a very wide range of basic and derived predicates.

Thus, it seems that we have reasonably strong grounds for positing a new construction, which I will call the Ψ-comp Construction. Schematically, the interpretative side of this construction can be represented as follows:

$$\text{EVP}_{\psi+}\ \text{CP}_F\ \Rightarrow\ \lambda x.\mathbf{about}(\mathbf{\Phi})(\mathbf{p})(x)$$

where $[\![\text{VP}_\psi]\!] = \mathbf{\Phi}$, $[\![\text{CP}]\!] = \mathbf{p}$, and the subscript ψ+ represents the semantic information that the predicate expresses a psychological property of a certain sort. Clearly the relation **about** contributed by the Ψ-comp Construction must be of type $\langle\langle e, t\rangle, \langle t, \langle e, t\rangle\rangle\rangle$; that is, it is a function from properties to functions from propositions to properties (ignoring intensional indices).

Correlative with the Ψ-comp Construction is an associated phrase structure rule. Roughly, that rule is the following:

$$[\text{R}]\qquad \text{VP}_{\psi-}\ \rightarrow\ \text{VP}_{\psi+}\ \text{CP}$$

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[28] I take it that there are, in general, no hard and fast rules for deciding between these various options. The court of last appeal must surely be something like inference to the best explanation.

This rule blocks the possibility of iterating *that*-clauses by positing that the resulting VP is no longer positively marked for the feature $\Psi$. If this were not so, then we would be able to generate strings such as (4.c):

4. c) *    Lola was upset that Slick Willy had all the fun that gumdrops look like marbles.

Thus, running a predicate through rule [R] affects its syntactic combinatorial properties and this is reflected by shifting its $\Psi$-value from + to –.

Traditionally in Construction Grammar, these two faces of constructions are treated simultaneously by means of feature structures such as the following:

| | | |
|---|---|---|
| Syntax: | Form: $\langle[1], [2]\rangle$ | |
| | Cat: V | |
| | Max: + | |
| Semantics: | $\lambda x.\textbf{about}([3])([4])(x)$ | |
| | Dom: $x \in D_1$ | |
| | $\Psi$: – | |

| Syntax: | Form: [1] | | Syntax: | Form: [2] |
|---|---|---|---|---|
| | Cat: V | | | Cat: S |
| | Max: + | | | Max: + |
| Semantics: | Dom: $x \in D_1$ [3] | | | Mrkr: (*that*) |
| | $\Psi$: + | | Semantics: | Dom: $x \in D_0$ [4] |

Here, the two inner boxes specify the syntactic and semantic (and phonological) demands on the daughter nodes. For instance, the left daughter must be a VP or V′ (Cat: V, Max: +) whose interpretation is a psychological[+] property (Dom: $x \in D_1$; $\Psi$: +); similarly, the right daughter must be a CP that designates a proposition. Any syntactic string (itself understood as a complex feature structure) that is going to be involved in the $\Psi$-comp Construction must be able to *unify* with these feature specifications; that is, it must have compatible external features.[29]

The larger box provides us with the "output" information associated with the mother node. The important point for our purposes is that the semantic output of the con-

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[29] For an introductory discussion of feature unification, see (Shieber 1986); a more technical presentation may be found in Carpenter (1992). External features are those listed in the outside box.

struction will be that property we arrive at by applying the **about** relation first to the semantic value of the left daughter (indicated by the [3]) and then to the semantic value of the right daughter (indicated by the [4]).[30] The Ψ-comp Construction thus provides a coherent semantic interpretation for oblique *that*-clauses.

Below are a few of the predicates involved in the sentences discussed in the previous section together with a sketch of their associated semantic interpretations (all of type $\langle e, t \rangle$):

4. d)    be upset that p.
         λ$x$.**about**(**be upset**)(**p**)($x$)
4. e)    feel upset that p.
         λ$x$.**about**(**feel**(**be upset**))(**p**)($x$)

These results satisfy all the desiderata that were tabled above. First, unlike the lexical expansion rule (ER), the analysis does not require any ambiguity in the meaning of 'upset', it expresses *exactly* the same property whether it co-occurs with a *that*-clause complement or not. This is especially telling when we compare the interpretation of (4.e) with the one we would supply for the more complex predicate involved in (4.b) above (i.e., "be upset about (regarding) the fact that p"), which clearly does involve an adjunct specification of the content. The two interpretations are identical, or nearly so. Indeed, since natural languages have developed to expedite human communication, it is really not all that surprising that over time they should develop these sorts of linguistic "shortcuts (i.e., abbreviated syntactic forms conventionally associated with an otherwise inexplicably rich semantics).[31]

Moreover, while the proposal does require us to broaden our semantic horizons, it otherwise depends only on independently motivated linguistic and cognitive mechanisms (e.g., complex feature structures and pattern recognition). For this reason, I conclude that the Ψ-comp Construction is at least as linguistically plausible as Construction Grammar itself (or, indeed, any grammar that makes use of complex feature structures).

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[30] The bracketed numbers indicate token identical features that occur in more than one place in the feature structure. Such features are standardly referred to as *reentrant* features; see Shieber (1986).

[31] Arguably, for example, this is the best way to understand ellipsis in natural languages.

As discussed above, the proposal also preserves semantic compositionality. Thus, the Ψ-comp Construction in effect allows us to construct a wide range of emotive attitudes without forcing us (implausibly) to regard mood adjectives as inherently relational and/or ambiguous.[32]

Finally and most crucially, on this proposal, the propositions designated by the problematic *that*-clauses have *no semantic effect beyond their roles as arguments* to the binary relation $\lambda p \lambda x.\textbf{about}(\boldsymbol{\Phi})(p)(x)$. Consequently, the proposal is able to preserve the fundamental components of the singular term analysis of *that*-clauses without loss. And given the range of independent support for the singular term theory (reviewed in §1), this might well be seen as a major plus for the proposal.

## 4. Conclusion

We began by noting that the singular term theory offers an extremely plausible treatment of finite complement clauses. However, we also noted that the existence of oblique *that*-clause complements raised questions about its cogency. Yet abandoning the theory would not be a light or passing matter. For, despite a great deal of creative technical work, no alternative is nearly as compelling or well-integrated with the bulk of philosophical theory. In the preceding section, however, I argued that oblique *that*-clauses do not in any event compel us to abandon the traditional view.

However, in the course of my defense, it proved necessary to abandon another widely accepted semantic thesis, constructional minimalism. In so doing, we have followed Frege part way—but only part way—down the path to sentential holism. For, while we have admitted the need to give a certain amount of epistemic priority to the meanings of whole sentences, we have rejected the correlative requirement (reflected in Frege's so-called Context Principle) to make lexical meaning dependent upon sentence meaning. Frege was forced to this unhappy position because (qua constructional minimalist) he had no recourse but to reinterpret subsentential expressions whenever the meaning

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[32] Further support for such a construction is provided by what might be called the Jabberwocky Test, in honor of Lewis Carroll's poem. Consider the following nonsense sentence: *x* was dreezy that he jiba waed. Consistent with our proposal, we can determine that 'dreezy' is a one-place psychological predicate and that *x* possesses the psychological property expressed by it about a certain fact.

of a sentence outstripped its projected meaning.[33] But having rejected constructional minimalism, lexical reinterpretation is not our only recourse; we can, if the evidence warrants, allow the construction itself to carry a greater part of the semantic load.

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[33] Frege's position is unhappy because it leads directly to what I call the Semantic Allocation Problem. Put generally, the problem is that the components of an analysis of a given proposition (or class of propositions) do not uniquely determine a mapping from those elements to the corresponding morpho-syntactic elements.

Of course, it may be (though I personally doubt it) that some sort of abductive inference will always determine a unique best mapping for a given range sentences. But even if this is true in something like a "completed" theory of language, it seems that methodologically we ought to reject Frege's Context Principle and, instead, let semantic constraints on mapping derive from both our intuitions about the structure of propositions and from our intuitions about the meanings of lexical items in isolation.

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