JASON STANLEY

CONTEXT AND LOGICAL FORM

ABSTRACT. In this paper, I defend the thesis that all effects of extra-linguistic context on the truth-conditions of an assertion are traceable to elements in the actual syntactic structure of the sentence uttered. In the first section, I develop the thesis in detail, and discuss its implications for the relation between semantics and pragmatics. The next two sections are devoted to apparent counterexamples. In the second section, I argue that there are no convincing examples of true non-sentential assertions. In the third section, I argue that there are no convincing examples of what John Perry has called 'unarticulated constituents'. I conclude by drawing some consequences of my arguments for appeals to context-dependence in the resolution of problems in epistemology and philosophical logic.

My purpose in this paper is to defend the thesis that all truth-conditional effects of extra-linguistic context can be traced to logical form.[1] But before the import of this thesis can be understood, a few distinctions must be clarified, and its opponents introduced.

By "logical form", I mean a special sort of linguistic representation, rather than the form of a non-linguistic entity such as a proposition or a fact. However, even in its linguistic sense, there is certainly no one uniform use of the expression "logical form". But there are two distinguishable senses underlying its many differing usages. It is only in the second of these two senses that the thesis I will defend is interesting and controversial.

Perhaps the most prevalent tradition of usage of the expression "logical form" in philosophy is to express what one might call the *revisionary* conception of logical form. According to the revisionary conception, natural language is defective in some fundamental way. Appeals to logical form are appeals to a kind of linguistic representation which is intended to replace natural language for the purposes of scientific or mathematical investigation. Different purposes may then give rise to different regimentations of natural language. For example, one might want to replace natural language by a notation in which there is some kind of isomorphism between the true sentences in the notation and the facts they describe (e.g., Russell (1985)). Alternatively, one might want to replace natural language

[1] By "context" in this paper, I will throughout mean extra-linguistic context. So, nothing I say bears on standard appeals to type-shifting principles, which involve the effects of linguistic context on interpretation.

Linguistics and Philosophy **23:** 391–434, 2000.

by a notation which explicitly reveals the hidden contribution of logical expressions, such as the language of the predicate calculus.

To say that all context-dependence is traceable to logical form in a revisionary sense of "logical form" might be taken to be the trivial claim that, for purposes of interpretation, one should replace natural language by a notation in which all context-dependence is made explicit in the favored notation. It is not in this sense that I intend the thesis.

According to the second tradition of usage, which one might call the *descriptive* conception of logical form, the logical form of a sentence is something like the 'real structure' of that sentence (e.g., Harman (1972)). On this approach, we may discover that the 'real' structure of a natural language sentence is in fact quite distinct from its surface grammatical form. Talk of logical form in this sense involves attributing hidden complexity to sentences of natural language, complexity which is ultimately revealed by empirical inquiry. It is in this sense that I intend the thesis that all context-dependence is traceable to logical form. What I shall defend is the claim that all truth-conditional context-dependence results from fixing the values of contextually sensitive elements in the real structure of natural language sentences.

SECTION I

In this paper, I focus, for clarity's sake, on the speech act of assertion. My goal will be to defend the claim that all effects of extra-linguistic context on the truth-conditions of assertions are traceable to logical form. Though ordinary language philosophers (e.g., Austin (1962)) held such generalizations to be illegitimate, I will nevertheless assume here that the arguments I advance for the case of assertion generalize to other speech acts. I will also assume that each successful assertion has a truth-condition. I will often call the truth-conditions of an assertion 'what is expressed by that assertion'. This usage must be sharply distinguished from the usage found in authors such as Bach (1994), where 'what is expressed' is allowed to denote something that is not a truth-condition.

At times in the course of this paper, I will speak of a truth-condition as a certain kind of thing, namely a *structured proposition*, an ordered sequence of objects and properties.[2] There are two reasons for this. First, many

[2] In his (1987), Scott Soames contrasts his structured proposition conception of semantics with a truth-conditional conception, and rejects the latter on the grounds that truth-conditions are too fine-grained to serve fundamental semantic purposes. However, these (important) issues are independent of the concerns of this paper. If one thinks of

philosophers think of a semantic theory for a language as primarily involving an algorithm which assigns structured propositions to sentences relative to contexts, and so are more familiar with the issues when couched in these terms. Perhaps also because of the first reason, appeal to talk of structured propositions makes the issues I discuss somewhat simpler to explain. For example, it allows us to speak of 'constituents' of what is expressed that correspond to constituents of sentences. It is slightly more difficult to avail ourselves of this useful metaphor on a straight truth-theoretic framework.[3] For these two reasons, I will occasionally speak in these terms, though nothing substantial rests upon my uses of this framework.

I will also assume, in this paper, that syntax associates with each occurrence of a natural language expression a lexically and perhaps also structurally disambiguated structure which differs from its apparent structure, and is the primary object of semantic interpretation. In accord with standard usage in syntax, I call such structures *logical forms*.

In this paper, I will repeatedly be using the terms "semantic" and "pragmatic". However, there are many different usages of these expressions. For example, according to one traditional use of the term "semantic", semantics is the study of context-invariant aspects of meaning. On this account, the semantic content of any two utterances of "I am tired" is the same, since their context-invariant meaning is the same. If one is using the term "semantic" in this sense, then there is a corresponding sense of the term "pragmatic". In this sense, pragmatics is the study of those aspects of linguistic communication that depend on context. For example, the study of how the meaning of indexical expressions changes with their context of use is, on this way of using the terms, part of pragmatics (cf. Bar-Hillel (1954)). Before the work of Paul Grice, this use of "semantic" and "pragmatic" was standard. For example, it seems to be the best explication of the usages of the terms in the work of Richard Montague.

This usage of the expressions "semantic" and "pragmatics" is very clear. However, it obscures important disanalogies. It is very natural to divide the process of linguistic interpretation into two phases. In the first phase, a hearer first assigns denotations to each element of the logical form produced by the speaker, denotations that are determined by the meanings of the elements of the logical forms plus perhaps contextual factors. The

structured propositions as more fundamental entities that determine the truth-conditions of an assertion, then one can take this paper to concern the proposition expressed by an assertion, and only derivatively the truth-conditions of an assertion.

[3] One cannot, in a truth-theoretic semantics, speak of the 'constituents' of what is expressed that correspond to the sentence. Rather, one must speak, more awkwardly, of the properties and objects mentioned in the statement of the truth-conditions that are introduced by rules assigning them to expressions of the object-language.

hearer then combines these values in accordance with the structure of the logical form to derive the interpretation of the logical form, relative to that context. In many cases, e.g., words like "I", "now", "this", and "she", the context-invariant meaning of an element in the logical form does not exhaust its denotation, but rather serves as a guide for the interpreter in this process of denotation assignment. In the second phase, the hearer evaluates the result of the first phase with respect to general conversational maxims, such as relevance, quality, or quantity. This second stage of interpretation is not linguistic in nature. It does not involve the assignment of values to elements of a structured representation produced by the speaker. Accordingly, the first stage of interpretation is "semantic", the second, "pragmatic".[4]

These two usages are very different. According to the first usage, what semantics interprets are expression types, simpliciter. On the first usage, there are no semantic differences between distinct uses of a sentence such as "I am tired". According to the second usage, on the other hand, what semantics interprets are rather *expressions relative to contexts*. If Hannah is the speaker in context c, and John is the speaker in context c', then there is a semantic difference between "I am tired", relative to c, and "I am tired", relative to c'.

There is a third very standard usage of "semantic" and "pragmatic". According to this third usage, semantics concerns truth-conditions, or propositions. There are many different usages of this familiar phrase (cf. Stalnaker (1970), for one such usage). However, the usage I have in mind is one according to which the phase of interpretation that is semantic is the one that results in truth-conditions (cf. Section II of Stanley and Szabó, forthcoming). It is this usage that underlies talk of "truth-conditional semantics". Pragmatics is then the study of those aspects of interpretation that take as input the truth-conditions of a linguistic act, and yield other propositions implicated by that speech act. This is the usage that is most clearly suggested by the work of Grice.[5]

[4] Bach (1999) gives a particularly clear explanation of this notion of "semantic".

[5] For example, Grice is very clear that his 'favored use' of "what is said" applies to utterances, or expressions in contexts, rather than expression types. Considering an utterance of "He is in the grip of a vice", made about some person x, Grice writes "... for a full identification of what the speaker said, one would need to know (a) the identity of x, (b) the time of utterance, and (c) the meaning, on the particular occasion of utterance, of the phrase 'in the grip of a vice'." (1989, p. 25) As this passage makes clear, there is also no reason to think that Grice thought that every element of what is said must be the value of something in the logical form, since he claims that the time of utterance is a determinant of what is said, but never suggests that it is named by a constituent of the sentence. It is what is said in Grice's favored sense that is, according to him, the input to pragmatics.

These three distinct usages do not come close to exhausting the different senses of "semantic" and "pragmatic" in the literature. To avoid debates that are at bottom terminological, it is important, in any discussion of issues involving context, to settle immediately upon one way of using these expressions. In this paper, I use the expressions "semantic" and "pragmatic" in the second of the above senses. That is, semantic interpretation involves the assignment of denotations to elements of a logical form relative to a context, and their combination. Extra-linguistic context enters in only when called upon by a linguistic rule governing an element. The result of semantic interpretation is some kind of non-linguistic entity, such as a proposition or a property, which is then the input to pragmatics.

However, if my claim in this paper is correct, then the second and third usages of "semantic" and "pragmatic" coincide. That is, if all effects of extra-linguistic context on the truth-conditions of an assertion are traceable to logical form, then the result of semantic interpretation in the second of the above usages will be the truth-conditions of the assertion, and hence the result of semantic interpretation, in the third sense of "semantic". One purpose of my paper is an attempt to bind together these two distinct usages of the term "semantic", and thereby justify talk of "truth-conditional semantics".

Now that we are clear about my future use of the term "semantic", I add a final assumption. The assumption is that composition rules do not vary as a function of extra-linguistic context. This assumption is entailed by every version of the principle of compositionality, which is a standard condition of adequacy on a semantic theory. According to one formulation of this principle, a semantic theory is compositional just in case, for each complex expression, there is exactly one way, determined solely by its structure, in which the meanings of its constituents are combined by the semantic theory to yield its meaning.[6] It follows from this principle that, although the meaning of a non-complex word may vary with context, the way in which the interpretation of a complex expression is derived from the interpretations of its parts cannot vary with context. For if a semantic theory allowed the way in which the interpretation of a complex expression is built from the interpretation of its parts to vary with context, then it would not correlate with each complex expression, a *unique* way in which the interpretation of its constituents combine to yield its interpretation.[7]

---

[6] On this characterization of compositionality, different syntactic constructions may be associated with different modes of semantic composition. For a useful discussion of different notions of compositionality and related principles, see Janssen (1997).

[7] It is worth mentioning that most semantic accounts of variable-binding are in tension with compositionality as I have stated it (though of course are consistent with my assump-

There are certain authors who reject the principle of compositionality, since they hold that the meaning of a complex expression may depend upon its *linguistic* context (e.g., Higginbotham (1986), Hintikka and Sandu (1997)). However, this position is fully consistent with the assumption I have made, that composition rules do not vary as a function of *extra-linguistic* context. This latter assumption is far weaker than compositionality. Since I am not aware of any author who is not an opponent of systematic semantics who has denied it, the assumption should be uncontroversial, and I presuppose it in what follows.

Suppose my principal claim is true, that all effects of extra-linguistic context on the truth-conditions of an assertion are traceable to logical form. Then, the effects of context on the truth-conditional interpretation of an assertion are restricted to assigning the values to elements in the expression uttered. Each such element brings with it rules governing what context can and cannot assign to it, of varying degrees of laxity. The effects of extra-linguistic context on truth-conditional interpretation are therefore highly constrained. If this picture of truth-conditional interpretation is correct, then it is fundamentally different from other kinds of interpretation, like the kind involved in interpreting kicks under the table and taps on the shoulder.[8] We do not interpret these latter sorts of acts by applying highly specific rules to structured representations. Nor is the role of extra-linguistic context in interpreting these acts in any way constrained, as it is in the case of linguistic interpretation. Thus, if the interpretation of assertions in fact functions in the way I have sketched, one should be suspicious of views that assimilate it too quickly to the ways in which we interpret non-linguistic acts.

In recent years, there has been no shortage of philosophers of language, linguists, and cognitive scientists eager to reject the claim I have advanced. According to Kent Bach, Robyn Carston, François Recanati, Dan Sperber, Robert Stainton, Charles Travis, and Deirdre Wilson, among others,

tion). An example is the 'Predicate Abstraction Rule' discussed in Heim and Kratzer (1998, pp. 186ff). Essentially, Heim and Kratzer assume a syntax that involves structures such as: $[_{\alpha}\lambda x[_{S}[_{NP}[_{N}$ John]] $[_{VP}[_{V}$ offended] $[_{NP}[_{N}x]]]]]$. However, they assign no independent interpretation to 'λx'. So, on their account, interpreting the node α does not amount to combining the value of 'λx' with the semantic value of the open sentence "John offended x". Rather, they provide a non-compositional interpretation rule. This sort of violation of compositionality is fairly common, and should not raise any worries. Violations of compositionality only become worrisome from the standpoint of learnability when they involve an unlimited number of unrelated construction rules, as would be the case with context-dependent construction rules.

[8] Where the latter are not governed by explicit meaning-granting stipulations. This proviso should be tacitly understood in future references to interpretation of non-linguistic acts.

the truth-conditions of most assertions go well beyond what semantics can legitimately assign to the logical forms of the sentences uttered. Instead of assigning propositions, entities that are truth-evaluable, to logical forms, semantic interpretation only involves "fragmentary representations of thought" (Sperber and Wilson (1986), p. 193) "partially articulated conceptual representations" (Carston (1991), p. 49), or "propositional radicals" (Bach (1994), p. 127; cf. also Bach (1982)).[9] The examples motivating these theorists all concern the effects of context on what is expressed in assertions. According to these theorists, there is no way to 'constrain' the effects of context on what is expressed within the domain of semantic interpretation. In most cases, what the semantic interpretation of a sentence's logical form delivers is not what is expressed, but rather, in the words of Sperber and Wilson, "mental objects that never surface to consciousness"; these are then used in a *pragmatic* derivation of what is expressed.

If these theorists are correct, then semantics is not about truth-conditions. It would then be more apt to replace, as does Recanati, talk of truth-conditional *semantics* with talk of truth-conditional *pragmatics* (cf. Recanati (1993), Chapter 13).

Underlying these arguments against the picture of interpretation I advocate are two assumptions about semantic theory, both of which I accept. The first assumption these theorists make about what is semantically legitimate is:

> **First assumption**: In semantic interpretation, one may never postulate hidden structure that is inconsistent with correct syntactic theory.

According to some conceptions of semantics, the objects of semantic interpretation are not syntactic logical forms, but rather logical forms in some more revisionary sense of 'logical form'. With a revisionary conception of logical form, one is not constrained by the actual syntactic structure of the sentences under consideration. A theorist in this tradition could reject the first assumption, noting that her postulated hidden structures are not intended to be indicative of the actual syntactic structures of the sentences used. However, together with the advocates of truth-conditional pragmatics, I reject this conception of semantics. The objects of semantic interpretation are the actual logical forms of English sentences; the first assumption is simply a consequence of this.

[9] Note that the first two ways of speaking involve something like use/mention errors according to the usage of semantics at issue in this paper. To talk of semantic interpretation resulting in "representations" seems prima facie confused, for the reasons discussed in Section I of Lewis (1983).

The second assumption appears under various names in the literature, such as the "linguistic direction principle" (Carston (1991, pp. 38–9)) or the "criterion of close syntactic correlation" (Bach (1994, p. 137)):

> **Second assumption**: In deriving the semantic interpretation of a logical form, every feature of the semantic interpretation must be the semantic value of something in that logical form, or introduced via a context-independent construction rule.

This assumption is also clearly part of the conception of semantics I have articulated above.

Here is how the proponents of truth-conditional pragmatics use the two assumptions to argue that truth-conditions are not determined by semantics. First, some linguistic construction is provided whose truth-conditional interpretation is mediated by context. Then, it is argued that it is inconsistent with current syntactic theory to postulate, in the logical form of the relevant construction, expressions or variables the semantic values of which context could provide. So, by the first assumption, it follows that the information provided by context to the truth-conditional interpretation of the relevant construction is not the semantic value of anything in the syntactic logical form. By the second assumption, it then follows that the information provided by context to the truth-conditional interpretation of the construction is not a part of semantic interpretation at all. The conclusion is that, in such cases, semantic interpretation does not deliver truth-conditions.

Given these two assumptions, it is an empirical question whether there are constructions whose truth-conditional interpretation is not entirely a matter of semantics. However, it is an empirical question whose resolution has significant foundational consequences. If the advocates of truth-conditional pragmatics are correct, then the proper place to situate an account of the bulk of the truth-conditional interpretation of linguistic assertions is in whatever account one has of reasoning generally, regardless of its subject matter. If, by contrast, the truth-conditional interpretation of assertions is entirely a matter of semantics, then the truth-conditional interpretation of assertions is special in a way that other kinds of reasoning processes are not.[10]

There are essentially two lines of response available to the opponent of truth-conditional pragmatics. The first is to reject the conception of semantics I have adopted, allowing that semantic interpretation is not just

[10] For one discussion of the issues at stake, see the discussion of decoding processes versus inferential processes in Chapters 1 and 2 of Sperber and Wilson (1986).

interpretation of the words used. There are no doubt different ways to accomplish this. For example, according to J. L. Austin, it is statements, *acts* of asserting sentences, of which truth is ultimately predicated (cf. Austin (1979)). According to this alternative conception of semantics, championed by theorists such as Mark Crimmins and John Perry, it is utterances that are the ultimate objects of interpretation, rather than the sentences uttered in these acts. On this approach, since it is not logical forms relative to contexts that are the ultimate objects of interpretation, but rather speech acts, the second assumption is undermined. For on this view, the constituents of logical forms are only useful tools in guiding us to an interpretation of the utterance. There is no reason to think that an utterance's interpretation is constrained by them in the way suggested by the second assumption. However, I will not pursue this line of reply in this paper. Nor will I here explore alternative conceptions of semantics, which seek a middle ground between the conception of semantics I have articulated, and the radical Austinean approach.

Rather, the line of response that I wish to pursue involves the denial that there is good evidence for the existence of linguistic constructions of the sort discussed by the proponents of truth-conditional pragmatics. According to the view underlying this response, the effects of context on truth-conditions are indeed limited to resolving ambiguity and providing the values to constituents of the logical forms of uttered sentences.

It is often assumed that the objects of semantic interpretation, that is syntactic logical forms, are free of lexical and structural ambiguity.[11] However, sometimes the sounds we hear suffer from such ambiguity. One role context plays is in helping us to decide which logical form is the one that has been uttered. That is, we draw upon extra-linguistic context to help us decide what to interpret. This is the grammatical role of context. The fact that context has a grammatical role is uncontentious and unthreatening.

The grammatical role of context solves the equation:

$$\text{utterance} + X = \text{logical form}$$

However, there are of course other roles context plays in interpretation. For example, extra-linguistic context also solves the equation:

$$\text{logical form} + \text{meaning assignments} + X = \text{truth-conditions}.$$

This is the *truth-conditional role of context*.

[11] This assumption is challenged in so-called 'underspecification' approaches (cf. the essays in van Deeter and Peters (1996); cf. also the discussion of the "Scope Principle" in May (1985)).

For example, the truth-conditions of the sentence "I am a philosopher" vary from context to context. But we do not wish to count this as either a case of lexical or structural ambiguity. Rather, it is a case of indexicality. There is a broad use and a narrow use of the term "indexical", and hence also of "indexicality". Broadly construed, an indexical is any contextual parameter, by which I mean any primitive expression whose denotation is supplied entirely by context, perhaps guided by a linguistic rule.[12] In the narrow sense of "indexical", an indexical is a proper subset of context-sensitive expressions, one with the characteristics shared by words such as "I", "here", and "now", but not by "this", "that", "she", and "he", such as resistance to bindability by variable binding operators. One role context plays in the determination of truth-conditions is in the assignment of values to context-dependent primitive expressions, typically unambiguous expressions with impoverished linguistic meanings. In the broad sense of "indexicality", this is the role of context in resolving indexicality.

According to the truth-conditional pragmatist, there are truth-conditional roles of context other than the resolution of indexicality, broadly construed. If so, then not all truth-conditional effects of context are traceable to logical form. According to the second response to the truth-conditional pragmatist, there is no good reason for thinking that there are any truth-conditional roles of context aside from the resolution of indexicality, broadly construed.

My own view of the truth-conditional role of context is very conservative. First, there are expressions which are obviously indexicals in the narrow sense of the term, words such as 'I', 'here', 'you', 'now', and their brethren. Secondly, there are expressions which are obviously demonstratives, such as 'this' and 'that'. Third, there are expressions that are obviously pronouns, such as 'he' and 'she'. Overt expressions that are in none of these classes are not context-dependent. If the truth-conditions of constructions containing them are affected by extra-linguistic context, this context dependence must be traced to the presence of an obvious indexical, demonstrative, or pronominal expression at logical form, or to a structural position in logical form that is occupied by a covert variable.[13]

---

[12] I am using "expression" here also in a broad sense. As I use it here, it includes, for example, covert variables.

[13] I will assume, in this paper, a traditional syntax involving variables. However, there is an alternative conception of syntax and semantics, in which variables are eliminated in favor of operators. Such frameworks have been recently advanced by some linguists, who claim that it has methodological advantages over frameworks involving variables (e.g., Szabolcsi (1989), and more recently, Jacobson (1999)). I am not quite sure how the adoption of a variable free framework would affect the discussion in this paper. Many of the principles and theses of this paper would have be reformulated. However, though I

If this view is correct, then any contextual effect on truth-conditions that is not traceable to an indexical, pronoun, or demonstrative in the narrow sense must be traceable to a structural position occupied by a variable. Claims of unobvious context-dependence must therefore be accompanied by arguments for the existence of a corresponding formative in the logical form of the relevant constructions.[14] Therefore, in this paper, I will explore the second line of response against the proponents of truth-conditional pragmatics. That is, I will argue that we have been given no reason to abandon the thesis that the only truth-conditional role of context is the resolution of indexicality, broadly construed. If so, then we have been given no reason to rethink the view that semantics is about truth-conditions.

There are two sorts of cases I consider. The first are alleged cases of "non-sentential assertion"; utterances of expressions that do not appear to have sentential structure, yet appear to express full-blown propositions. The second concern utterances of expressions with sentential structure, which appear to express full-blown propositions, propositions that contain constituents which do not appear to be the values of any constituent in the logical form of the expression uttered.

SECTION II

The first set of examples involves non-sentential discourse. The linguistic importance of such constructions has been emphasized by several authors

will not argue the point here, I do not in the end think that these reformulations would affect either the substance of my claims or the soundness of my arguments. The reason for my optimism is as follows. Capturing readings of a context-dependent construction that contains no explicit variables, on a framework with variables, involves postulating hidden variables. However, it seems to me that on a variable free approach, to capture the relevant context dependence, one will have to postulate hidden operators or functional expressions (cf. Cresswell (1996)). My view can certainly be restated in these terms.

[14] Rizzi (1986) has argued that there are languages that allow understood elements that are not syntactically represented; in fact, English is one such language. The sort of examples that Rizzi has in mind are sentences such as "The sign cautions against driving over 30 mph" and "John ate". An utterance of the former expresses the proposition that the sign cautions everyone against driving over 30 mph, and an utterance of the latter expresses the proposition that John ate something. However, such examples do not threaten the thesis that any contextually provided element has to be syntactically represented. For Rizzi's examples are best understood as cases of (limited) ambiguity. What they show is that certain English verbs allow for limited type-shifting between relational, existential, and universal meanings. So, in English, "ate" is ambiguous between a two-place relation, and the result of existentially quantifying the second argument place. Similarly, "cautions" is ambiguous between a two-place relation and the result of universally quantifying the second argument place.

(cf. Yanofsky (1978), Barton (1990), and, more recently, Staintain ((1994), (1995), (1997), (1998))). By a sentence, I shall mean an expression with clausal structure, containing at least a noun phrase and a verb phrase, corresponding to the traditional grammatical categories of subject and predicate. Call an utterance *unembedded* if and only if it it is an utterance of an non-sentential expression, and it is not part of an utterance of a sentence in which that expression occurs as a constituent. So, an utterance in English of the word "water" alone (not within the context of a sentence) is an unembedded utterance. Call an utterance a *non-sentential assertion* if and only it is an unembedded utterance that is a successful linguistic assertion. In this section, I will argue that there are no clear examples of non-sentential assertions.

If there are non-sentential assertions, then context plays more truth-conditional roles than the resolution of indexicality, broadly construed. In a non-sentential assertion, the semantic values of the words uttered, relative to that context, only make up one part of the proposition thereby expressed. Context supplies the other constituents of the proposition expressed. But then context supplies constituents to propositions expressed in assertions not merely by assigning values to constituents of the expression uttered. Rather, it provides them directly to what is asserted. But this is a truth-conditional role of context distinct from the resolution of indexicality, broadly construed.

One might have thought that the claim that there are non-sentential assertions is fairly easy to establish. After all, there are many natural languages in which there appear to be clear, fully grammatical utterances of single words, which are taken to be assertions. Such is the case in Spanish, for instance, where "corre" can be used to assert the proposition that some contextually salient man runs. It might appear that such uses do not involve the utterance of an expression with sentential structure. However, according to recent syntactic theory, there can be no subjectless sentences. What appear to be subjectless sentences in natural language actually involve covert elements in their subject positions. This, at any rate, is the import of the Extended Projection Principle of Chomsky's Government and Binding Theory. Hence, utterances of "corre" in Spanish are not unembedded; their true structure involves a covert pronoun like element occupying the subject position. They are therefore not non-sentential assertions.

A similarly misleading set of examples involve cases like the following. Suppose that John asks:

(1) Who bought the bottle?

and Sarah responds by uttering

(2) Bill

In this case, Sarah's utterance may appear to be a non-sentential assertion. But it is not. Rather, it is a case of syntactic ellipsis. The proposition expressed by Sarah's utterance of (2) is plausibly taken to be the proposition that Bill bought the bottle. But the reason it is plausible to associate this proposition with Sarah's utterance is that it is plausible to maintain that the logical form uttered by Sarah actually contained the words "bought the bottle", only covertly. This is a case of syntactic ellipsis.

It should be noted at the outset that there are some theorists who would deny that (2) in this context is a case of syntactic ellipsis. Such theorists reject the existence of real syntactic ellipsis. My arguments in what follows unfortunately do not address such theorists. I assume, as does Stainton, that syntactic ellipsis is the correct theoretical account of certain ordinary linguistic phenomena. Responding to those who deny that there are any real cases of syntactic ellipsis is a foundational challenge for another time.

It is not very clear whether Yanofsky (1978) and Barton (1990) wish to establish that much of what is apparently non-sentential speech in fact consists of assertions; their explicit goal is rather to argue that not all such cases involve syntactic ellipsis, and (in the case of Barton), to supplant the syntactic ellipsis account with a novel pragmatic account of how we process non-sentential discourse. However, it is very clear that this is Stainton's desired conclusion, and it is the conclusion that is of concern in this section. In all of his papers, the way Stainton argues for the existence of non-sentential assertions is as follows. First, he produces a barrage of alleged examples of non-sentential assertions. Then, he considers a series of approaches to all of the examples he discusses. Each approach is general, in that it treats all alleged examples of non-sentential assertion in the same way. For example, one approach is to try to assimilate all alleged examples of non-sentential assertion to the case of Spanish utterances of "corre". Another approach is to try to assimilate all alleged examples of non-sentential assertion to the case of syntactic ellipsis. Finally, he rejects each strategy as at most adequate for some of the alleged examples.

The persuasiveness of Stainton's arguments is due in part to the tacit assumption that all alleged examples of non-sentential assertion must be treated by the same general strategy. However, there is no reason to accept this assumption. I do not believe that there is a uniform phenomenon underlying all apparent examples of non-sentential assertion. Many, on closer inspection, turn out to be cases of ellipsis. Others turn out not to be cases of linguistic assertion at all. Once the various examples are placed in their

distinct categories, we are left without a single unproblematic example of a non-sentential assertion. Or so I will argue.

The central argument that apparent cases of non-sentential assertion differ from genuine cases of syntactic ellipsis relies principally on the fact that elliptical expressions cannot appear in discourse initial position; this is the argument strategy of both Yanofsky (1978) and Barton (1990) (cf. Chapter 2), and Stainton follows them in this regard (cf. Stainton (1997, 63ff.), (1998, 323ff.)). According to these authors, many apparent cases of non-sentential assertion can appear in discourse initial position. If so, they are not cases of syntactic ellipsis.

Here is an example of this sort of argument. Consider the following discourse:

(3)a. Bill will bungee-jump.
b. John won't.

The second sentence in this discourse is a standard example of syntactic ellipsis. Now consider simply an utterance, at the beginning of a discourse, of:

(4) John won't.

Such an utterance seems unacceptable.

Now consider the following context. Suppose Bill walks into a room in which a woman in the corner is attracting an undue amount of attention. Turning quizzically to John, he arches his eyebrow and gestures towards the woman. John replies:

(5) A world famous topologist.

John has just uttered a phrase in isolation. It appears that John's utterance cannot be elliptical, since it occurred in a discourse initial position. Therefore, it is implausible to assimilate cases such as utterances of (5) to syntactic ellipsis.

This sort of argument forms the backbone of the thesis that most apparent cases of non-sentential assertion are not syntactic ellipsis. However, such arguments are seriously flawed. For only in an implausibly expansive sense of "discourse initial" does John's utterance of (5) count as discourse initial. It is true that syntactically elliptical sentences cannot felicitously occur in the absence of a linguistic antecedent. But explicitly providing a linguistic antecedent by mentioning it is only the simplest way to provide it. There are other methods of raising linguistic expressions to salience in a conversation without explicitly using them.

For example, suppose that a group of friends, including John and Bill, has gone bungee jumping. Every member of the group is watching Bill, who is the first to muster the courage to bungee jump. As Bill is standing eight stories above the water on the platform of a crane, ready to plummet into the water below, Sarah, aware of John's terror of heights, turns to one of the other friends and utters (4), shaking her head. Sarah's utterance is perfectly felicitous. But it would be wrong to conclude from this that explicitly elliptical expressions can occur without linguistic antecedents. In this case, the expression "bungee-jump" has been made salient by the utterance context, and can serve as a linguistic antecedent for the syntactic ellipsis.[15]

Given that linguistic expressions can be made salient in the context in other ways than by explicitly mentioning them, we need to be careful about the use of the expression "discourse initial". Constructions that require explicit linguistic antecedents, such as those involving syntactic ellipsis, can occur in contexts in which the linguistic antecedents have not been used, but have been made salient in other ways. This does not show that such expressions can be used discourse initially. It is considerably easier to make an expression salient by using it, but, with a sufficient amount of contextual cues, an expression can be made salient without using it. In evaluating the above sort of argument, we need to be certain that the alleged examples of non-sentential assertions can be used discourse-initially, where this means, felicitously used in an absolutely novel context, one in which we are assured that context has not raised any linguistic expression to salience.

To focus matters, let us consider an utterly standard example of a sentence that can be felicitously used at the beginning of a discourse:

(6) A man was walking through New York City.

[15] That a linguistic expression can be made salient in a context without being explicitly mentioned is neither a new nor a radical claim. For example, in the literature on E-type anaphora, it is standardly assumed that the differing acceptability of (a) and (b) demonstrate that E-type anaphora requires a linguistic antecedent:

(a) John has a wife and she hates him.

(b) ? John is married and she hates him.

(The minimal pair is due to Gareth Evans (cf. p. 147 of his 1985)). However, everyone is aware that, given sufficient linguistic context, (b) is perfectly acceptable. The conclusion to draw is not that E-type anaphora does not require a linguistic antecedent; the fact that (a) is always acceptable, and (b) is often not, by itself shows that it does. Rather, the natural conclusion is that an expression that requires a linguistic antecedent can be provided one by extra-linguistic context, though context needs to work hard to do so.

(6) can be used felicitously *even if no background context has been set up at all*. This is the notion of "discourse initial" that is common in the linguistics literature, the one that is familiar from, say, Discourse Representation Theory. A construction can occur discourse initially just in case it can occur with minimal previous background context, whether linguistic or non-linguistic. Obviously, such a notion of discourse initiality differs radically from the implausibly expansive one at work in the situation in the argument involving (5).

Now, it is true that syntactic ellipsis requires background context. Therefore, constructions involving syntactic ellipsis cannot occur discourse initially, in the standard sense of discourse initiality. However, neither can most apparent examples of non-sentential assertions. For example, a discourse initial utterance of (5) is completely infelicitous in the standard sense of "discourse initial". For an utterance of (5) to be felicitous, a large amount of background context needs to be provided. So, both constructions involving syntactic ellipsis and most apparent examples of non-sentential assertions cannot occur discourse-initially.

Furthermore, there is good reason to think that the background context required to license an utterance of (5) raises linguistic expressions to salience that can serve as antecedents for ellipsis. Recall the original example of syntactic ellipsis, Sarah's utterance of (2). In this case, the ellided material came from an explicit question. It is very common to respond to explicit questions by uttering what appear to be single words. However, it is plausible to suppose that the ellided material is the "standard answer schema" for the relevant question (cf. Section 2 of Higginbotham (1993)). For example, the standard answer schema for the question (1) would be:

(7) α bought the bottle.

Similarly, in the case of the world famous topologist, it is plausible to suppose that extra-linguistic context, such as Bill's gesture, and his quizzical glance at John, gave rise to the implicit question:

(8) Who is she?

John's utterance of (5) is then elliptical for "she is a world famous topologist" for the very same reason that Sarah's utterance of (2) is elliptical for:

(9) Bill bought the bottle.

I suspect that a great many apparent cases of non-sentential assertions are simply answers to implicit questions in the utterance context.[16] If so, then they are sentential after all.[17] However, many examples of apparent non-sentential assertions are clearly not cases of syntactic ellipsis. For some such cases occur discourse initially, in the standard sense of that phrase. Consider, for example, a thirsty man, who staggers up to a street vendor and utters:

(10) water

Clearly, this utterance occurs discourse initially in every sense. However, in this case, I doubt that the thirsty man has made a linguistic speech act.

Here are two reasons to doubt that the case of the thirsty man involves a linguistic speech act. First, linguistic speech acts must determinately be made with the relevant sort of force. That is, for an act to count as a speech act of kind *k*, it must determinately be performed with the force appropriate to acts of kind *k*. For example, if the thirsty man's utterance of (10) is an assertion, then it must be determinately made with assertoric force. However, I doubt that, in the case of the thirsty man's utterance of (10), it is determinate that there is assertoric force. It would be equally consistent with the thirsty man's intentions to suppose that the utterance was a request, or a command. That is, it is indeterminate what the force is with which (10) is uttered. It is therefore not a linguistic assertion, and indeed is not a genuine linguistic speech act.

Here is the second rather more complex reason why I do not believe it to be plausible that the case of the thirsty man is a linguistic speech act. Linguistic speech acts must not just be determinately made with the relevant sort of force. They also must express determinate contents.[18] And certainly, in the case of the thirsty man's utterance of (10), there is no

[16] For example, consider this case of Stainton's (1997, p. 72):

> It's fair to assume that 'Potato Digging' – the bare phrase, that is – could be used on its own: You might look quizzically at a pair of mud covered boys, out in a field. I could explain their sorry state by saying 'Potato Digging. All morning.'

It is clear, in this case, that the quizzical glance gives rise to the implicit question, 'What have they been doing?', to which the answer is 'they have been potato digging'.

[17] A version of the strategy I have pursued here is also defended in Fiengo and May (1996, pp. 139ff.). Indeed, as Fiengo and May put the moral of their discussion, "…verbalization is only tangentially related to the representations which underlie speakers' utterances."

[18] There are several places in the literature in which this claim is challenged, e.g., in the account of incomplete definite descriptions given in Blackburn (1988). However, I do

determinate content associated with the speech act. Suppose, for the sake of argument, that the speech act is an assertion. Then, the relevant sort of content is a proposition. But what proposition has thereby been expressed? The point is particularly acute if we assume that propositions are structured. Is the proposition thereby expressed the proposition that the thirsty man wants water? Is it the proposition that the vender should give the thirsty man water? The available facts simply do not determine a determinate propositional content for the alleged assertion. And when a communicative act lacks a determinate content, it is not a linguistic speech act.[19]

Of course, if this last point is correct, some communicative acts involving the use of language will not count as genuine linguistic speech acts. But this is to be expected. Ordinary discourse often involves the use of complex expressions which would be counted as ungrammatical even by the utterer's own lights. For example, some people regularly start a new sentence halfway through an utterance of another sentence. Such discourse involves few sentences that the utterers themselves would classify as grammatical. It is absurd to suppose that we should count such discourse as grammatical, and thereby modify syntactic theory to account for it, and this despite its (statistically speaking) relative normalcy. It is just as absurd to suppose that our conception of semantics should be modified to account for every communicative action which involves the use of language.

To say that non-sentential utterances are not linguistic speech acts, and hence not within the proper domain of study for syntax and semantics, is not to deny that they occur, or even that they are often used as vehicles of communication. A kick under the table, a tap on the shoulder, or a

not find his account compelling; there are better accounts of the context-dependence of quantification which are consistent with this claim (cf. Stanley and Szabó, (forthcoming)). The claim is not in conflict with the view advanced by Perry (1997), according to which an utterance is associated with a variety of truth-conditions. For Perry selects one notion of content to be the 'official' notion of content (what he calls 'content_C', cf. p. 601), which is essentially the notion of content assumed here.

[19] There are analyses of vagueness according to which sentences relative to contexts containing vague terms do not express unique propositions, but rather express sets of propositions. On such accounts, "That is a heap", pointing to a heap h, relative to a certain context, expresses the set of propositions $\langle h$ is an $F\rangle$, where "F" is a schematic letter replaceable by non-vague heap predicates. This analysis of vagueness is simply not in tension with the claim that linguistic speech acts have determinate contents. In the case of a vague utterance, all of the different propositions in the set are structurally isomorphic; they differ only in containing different precise properties corresponding to the occurrence of the vague predicate. To account for this, it is sufficient to modify the claim in the following manner. Linguistic speech acts must express determinate contents. If a speech act expresses a set of propositions, the different propositions must be structurally isomorphic.

frown are all frequently occurring communicative actions. Indeed, one can communicate something by saying nothing at all. There is no doubt much of interest to be said about how general knowledge is brought to bear in interpreting communicative interchanges of this sort. However, it would be an error to extend the domain of linguistic theory to account for them. Such interchanges lack the distinctive features associated with linguistic communication. It is not the task of linguists to explain how communication can be effected with their use, but rather the task of the psychologist interested in rationality and ordinary inference.

There is a final set of cases that can occur discourse initially, are clearly uttered with assertoric force, and have determinate unique propositional contents. One example given by Stainton (1995, p. 293) is an utterance of "nice dress", perhaps to a woman one passes by in the street. In this case, it is fairly clear that an assertion has been made, whose content is a singular proposition about the object in question, to the effect that it is a nice dress. However, it is intuitively plausible to suppose, in this case, that the speaker simply intended her utterance to be shorthand for "that is a nice dress". It is difficult to see how any of the resources of linguistic theory could be used to show that intuition misleads in cases of this sort.

Each and every alleged example of non-sentential assertion can be classified in one of the three ways I have described. The illusion that each strategy is unsatisfactory stems from the tacit assumption that, to be satisfactory, a stategy must work for each case of an alleged non-sentential assertion. This assumption presupposes that the 'phenomenon' of non-sentential assertion constitutes a natural kind. Once this presupposition has been abandoned, it is far less clear that there are any actual everyday examples of non-sentential assertion.

SECTION III

There is a different set of cases that have been exploited by advocates of truth-conditional pragmatics to argue that the effects of context on truth-conditional interpretation cannot be constrained by logical form. These sorts of examples involve the consideration of sentential utterances that clearly express unique propositions. However, in such cases, it appears that there are constituents of the propositions thereby expressed that do not correspond to anything in the structure of the sentence uttered. Such entities are called in the literature *unarticulated constituents*.[20]

[20] Places in which the notion of an unarticulated constituent is used in this manner include Chapter 4 of Sperber and Wilson (1986), Section 14.3 of Recanati (1993), and

Unarticulated constituents are elements supplied by context to the truth-conditions of utterances, elements which are not the semantic values of any constituents in the actual structure of natural language sentences. That is:

> *x* is an unarticulated constituent of an utterance *u* iff (1) *x* is an element supplied by context to the truth-conditions of u, and (2) x is not the semantic value of any constituent of the logical form of the sentence uttered.

If there are any unarticulated constituents of utterances, then context plays more truth-conditional roles than the resolution of indexicality, broadly construed. However, as I argue in what follows, the standard examples motivating the existence of unarticulated constituents are not persuasive.

My overarching purpose in this section is to show that, for each alleged example of an unarticulated constituent, there is an unpronounced pronominal element in the logical form of the sentence uttered, whose value is the alleged unarticulated constituent. I will argue for this conclusion by showing that the contested sentences have certain properties that are best explained via the supposition that their true structures contain unpronounced pronominal elements correlated with the alleged unarticulated propositional constituents. However, this argument emerges somewhat indirectly, during the course of criticisms of alleged examples of unarticulated constituency, and responses to objections.

My target is, in each of the examples I discuss, an *unarticulated constituent analysis* of the relevant construction. An unarticulated constituent analysis of a linguistic construction is an analysis according to which uses of that construction express propositions with unarticulated constituents. In each case, I begin by considering such an analysis. Since the supposed unarticulated constituent supplied by such an analysis is not the value of anything in the sentence uttered, there should be no readings of the relevant linguistic constructions in which the unarticulated constituent varies with the values introduced by operators in the sentence uttered. Operators in

Section 2 of Bach (1994). Chapter 1 of Crimmins (1992) also uses the notion of an unarticulated constituent against a version of the thesis that all context-dependence is traceable to structure. However Crimmins is substantially more cautious than the other advocates of unarticulated constituents. His target is not the view that all context-dependence is traceable to logical form, as I have presented this thesis, but the much more implausible view that contextual effects on truth-conditions are restricted to providing the values of expressions in the *apparent structure* of the sentence. Therefore, he should not be assimilated to my targets. A similar point does not hold of the article in which the vocabulary was introduced, Perry (1986), since, in his (1998), Perry is clear that the phenomenon of interest to him is what he calls a "truly unarticulated constituent", which is not the value of an unpronounced item in the actual structure of a sentence (cf. his footnote 4).

a sentence can only interact with variables in the sentence that lie within their scope. But, if the constituent is unarticulated, it is not the value of any variable in the sentence. Thus, its interpretation cannot be controlled by operators in the sentence.

The arguments I provide will also be sufficient, in each case, to refute what one may call a *narrow indexical* analysis of the relevant construction. In the narrow sense of the term "indexical", it applies to words such as 'I', 'here', 'you', and 'now'. The three central features of such words is, first, that they are primitive lexical items, second, that they are not bindable by operators, and, third, that their interpretation shifts from context to context. An unarticulated constituent analysis of an expression is closely related to the claim that the relevant expression is an indexical in the narrow sense of the term, a primitive lexical item whose content varies from context to context, and which is resistant to binding by a variable-binding operator with scope over it. My arguments against unarticulated constituent analyses of the constructions I discuss will also show that the relevant expressions are not indexicals.

The reason I extend my arguments to narrow indexical analyses of the constructions I discuss is not because such analyses have been proposed or defended for such constructions. It is rather because narrow indexical analyses of certain philosophical expressions, such as 'true' and 'knows' are common in the philosophical literature. If it can be shown that, in the non-philosophical areas of our speech, narrow indexicality is restricted to obviously indexical expressions such as 'I', 'here', and 'now', then the thesis that philosophically controversial expressions such as 'true' or 'knows' are narrow indexicals will thereby be placed into doubt. This is an additional benefit of the arguments of this section.

The first step in my arguments is to show that there are readings on which the interpretation of the alleged unarticulated constituent is controlled by an operator in the sentence. It follows that an unarticulated constituent analysis is incorrect. The second step is to draw the conclusion that there is in fact a variable in the logical form of the sentence uttered, whose value is the contextually supplied constituent.

The first step in the argument against an unarticulated constituent analysis is sufficient to refute a narrow indexical account of the relevant construction for the following reason. Showing that the interpretation of the alleged unarticulated constituent can be controlled by a higher operator is tantamount to showing that the contextually supplied element is the value of a bindable constituent in the logical form of the relevant construction. Since indexical expressions, narrowly construed, are not bindable, it fol-

lows that the context-dependence in question is not due to the presence of indexicality, narrowly construed.

The second of the above steps requires one methodological presupposition. Though it is a little unwieldy to state in detail, it is quite innocent. Roughly, the presupposition is that, for explicit quantifier expressions, within a clause, semantic binding and syntactic binding coincide. That is, bound readings within a clause are due to the existence of a variable binding operator standing in a certain structural relationship to a co-indexed variable in that clause.

Let me make this explicit. Suppose α is an explicit quantifier expression.[21] Let us say that α *semantically binds* β if and only if the interpretation of β systematically depends upon the values introduced by α. Then:

> **The Binding Assumption (BA)** If α and β are within the same clause, and α semantically binds β, then α either is, or introduces, a variable-binding operator which is co-indexed with, and stands in a certain specified structural relation to, a variable which is either identical to, or is a constituent of, β.[22]

BA is familiar from the syntax and semantics of first-order predicate logic, in which bound readings are due to the existence of variable-binding operators having co-indexed variables within their scope.[23] According to it,

[21] Among "explicit quantifier expressions", I include what David Lewis has called "adverbs of quantification", such as "always", "usually", and "sometimes".

[22] I am appealing here to a broader notion of variable than the one corresponding to the use of the term "variable" in the theory of Government and Binding. For example, a widely adopted definition of the term occurs in Koopman and Sportiche (1982/3), in which a variable is defined as any expression in an A-position that is locally A-bar bound. In the sentence "[Every woman]$_i$ t_i loves her$_i$ mother", "her$_i$" is a variable in the broad sense, but not in this latter sense. One can define variable-hood in the broad sense in terms of the concepts of Government and Binding Theory as follows. Let the antecedence relation be that relation that holds between α and β if and only if α is the immediate antecedent of β. γ is a variable in the broad sense if and only if it stands in the weak ancestral of the antecedence relation to a variable in the technical sense of GB theory.

[23] This assumption is also consistent with the logical tradition that descends from the final section of Kazimierz Ajdukiewicz's (1967). According to this tradition, there is only one sort of variable-binding operator, what Ajdukiewicz, following Russell, calls the circumflex (Ajdukiewicz, p. 227), David Lewis (1983, p. 211) calls a "binder", and Max Cresswell calls a λ-abstractor. If one assumes obligatory syntactic quantifier raising, the assumption is sound in such a framework, because each raised quantifier expression introduces an occurrence of one of the variable-binding operators. This is also the treatment of Heim and Kratzer (1998).

binding within a clause is fundamentally a syntactic phenomenon.[24]

BA is natural in a semantics involving structured propositions. Structured propositions contain objects and properties of various sorts. One natural treatment of binding within such a framework is to suppose that quantifiers are associated with variable-binding operators. When the quantifiers undergo quantifier movement, they introduce variable-binders, which bind any variables within their scope. The effect of such variable binders is to transform open sentences into names of properties, or alternatively, propositional functions. The property named, together with the quantifier denotation, are then elements of the structured proposition expressed (cf. Salmon (1986, p. 157)). Such a treatment of binding in a structured proposition framework is in accord with the above assumption.

According to most semantic frameworks, including the one just discussed, bound variables do not have independent denotations. However, one might adopt a more liberal conception of structured propositions, according to which they do not contain just objects, properties, and quantifier denotations, but also contain elements which correspond to the occurrence of bound variables. Bound readings would then result from the semantic interactions between these elements and the denotations of the corresponding variable binders. Motivations for such a treatment of binding can come from a variety of sources; for example, a desire to maintain a particularly severe form of compositionality (cf. Lewis (1983, p. 212)), or a desire to preserve a "strong sort of semanticism about logic" (Varzi (1993)).

This framework suggests a way of avoiding commitment to BA.[25] Assuming such a framework, one could simply reject the thesis that bound variables must always exist in the syntax for a bound reading to occur. On this account, the semantic elements corresponding to bound variables can be supplied by the semantics, with no corresponding syntactic element denoting them.

---

[24] Certain special sentential expressions, such as the modal expressions "necessary" and "possible", are often treated as expressions that semantically bind expressions without the mediation of variables. However, the class of such expressions is (or should be) highly restricted. Such a treatment of modal expressions is justified on the assumption that it is appropriate to take possible worlds as entities relative to which the truth of propositions is evaluated, rather than parts of the contents of propositions. In contrast, I do not think it is plausible to take temporal expressions as operators of this kind. First of all, times are generally assumed to be a regular part of the content of propositions. Furthermore, there a host of independent objections to the treatment of temporal expressions as operators rather than as predicates of times. Be that as it may, the existence of a highly restricted class of expressions of this sort is consistent with the arguments that follow, as long as this class does not contain the standard quantifiers.

[25] I am grateful to Jeff King for emphasizing this possibility out to me.

However, given her commitments, the advocate of truth-conditional pragmatics should not accept this latter possibility. For advocates of truth-conditional pragmatics hold that each element of the proposition expressed must either be the value of some element in the syntactic structure, or provided by pragmatic mechanisms. It is easy to see how an object or a property could be provided by pragmatic mechanisms; it need only be made salient in the context either by the speaker's intentions, or contextual cues, depending upon one's account of salience. However, denotations of bound variables are odd, theoretically complex entities. It is difficult, if not impossible, to see how, on any account of salience, such an entity could be salient in a context. Certainly, neither it, nor instances of it, could be perceptually present in the context. It is equally difficult to see how speaker intentions could determine reference to such an entity.

An entity such as a denotation of a bound variable is a theoretical posit, part of the machinery of a particularly complex semantic theory. It is not something about which we have beliefs or intentions. They are therefore not supplied by pragmatic mechanisms. Given that such entities are not supplied by pragmatic mechanisms, then, they must be part of semantic interpretation. But, given the commitments of the advocates of truth-conditional pragmatics, if an account of binding involving such entities is adopted, they must then be the values of elements in the syntactic structure of sentences. The entities which denote them, of course, are variables. Therefore, this way of avoiding commitment to the Binding Assumption is not available to the advocate of truth-conditional pragmatics. Indeed, I suspect that the advocate of truth-conditional pragmatics is in the end committed to BA. This is not in itself worrying, of course, since standard treatments of binding are fully consistent with BA. However, as I now show, BA, together with some empirical facts, poses serious difficulties for those who believe in the existence of unarticulated constituents.

Here is an argument for the existence of unarticulated constituents, due originally to John Perry. [26] Consider the sentence:

[26] cf. Perry (1986), Section 1. Perry's motivation for introducing unarticulated constituents is to argue that each of us is an unarticulated constituent of our own thoughts at the level of "the most basic kind of self-knowledge" (Ibid., p. 138). Perry's aim is thereby to justify the Humean claim that we have no representation as of ourselves. However, I do not believe that there are convincing reasons in favor of the Humean claim. The claim derives its initial appeal from an overly restrictive sense of "representation". We certainly do not have representations of ourselves that are closely analogous to our representations of entities external to our bodies that are perceived through visual or auditory means. But this does not provide evidence that we have no representation as of ourselves. It simply leads to the thesis that our representations of ourselves have special features. For a recent development of this line of thought, see Cassam (1997).

(11) It's raining.

According to this argument, it is plausible that (11) contains a covert temporal variable, so that its true representation is more like:

(12) It is raining (t).

But what an utterance of (11) asserts is not just that it is raining at a certain contextually provided time. Rather, it asserts that it is raining at a certain contextually provided time at a certain contextually provided place. But surely it is implausible to posit a place variable in addition to a temporal variable. It is surely more plausible to supply the place to the truth-conditions of an utterance of (11) directly, without mediation of a variable.

Informally, here are a few of the relevant details of an unarticulated constituent analysis of (11). Suppose 't' is a variable ranging over times, and 'l' a variable ranging over locations. The interpretation of 'rains' would then be:

> Den("rains") relative to a context c = that function f that takes $\langle t, l \rangle$ to True if it is raining at t and l, where l is the contextually salient location in c, takes $\langle t, l \rangle$ to False if it is not raining and t and l, where l is the contextually salient location, and is undefined otherwise.[27]

According to the unarticulated constituent analysis, the structure of (11) is as in (12). Therefore, its truth-conditions would be given by a clause such as:

> R: "It is raining(t)" is true in a context c if and only if the denotation of "rains" takes $\langle t, l \rangle$ to the True, where l is the contextually salient location in c.

Clause R is a standard unarticulated constituent clause. It captures the intuition that the place variable is supplied directly by context, rather than first to a variable in the logical form of (11).

However, it is incorrect. Consider the sentence:

(13) Every time John lights a cigarette, it rains.

[27] So, the function expressed by "rains" relative to a context c is undefined for all $\langle t, l \rangle$ such that l is not the contextually salient location in c.

One natural interpretation of (13) is:

(14) For every time t at which John lights a cigarette, it rains at t at the location in which John lights a cigarette at t.

The problem this examples raises for an unarticulated constituent analysis is as follows. There is no way to derive this interpretation of (13) with the use of this sort of analysis. Rather, the only reading predicted by an unarticulated constituent analysis is:

(15) For every time t at which John lights a cigarette, the denotation of "rains" takes $\langle t, l \rangle$ to the True, where l is the contextually salient location in the context of utterance of (13).[28]

If one postulated, in addition to the temporal variable, a variable in the logical form of the embedded sentence "it rains", whose value is the location at which it rains, one can capture both readings. Surely, what the evidence suggests is that this account is preferable to any unarticulated constituent analysis. If so, then the location is the value of a variable in the logical form after all.

There are several ways to capture these readings of (13). One is to replace the assumption that "rain" introduces a hidden temporal variable with the assumption that it introduces a hidden situation or event variable, which can either be bound, as in (14), or free, as in (15). The situation variable brings with it information about the time and place at which it occurs. Alternatively, one may suppose that when "rain" occurs in a sentence, it co-occurs with a temporal node and a locational node. Occupying the phrases are variables, some of which may either occur bound, as in (14), or free, as in (15).

According to this latter account, in the logical form of (11), "rain" occurs with two open positions. Each open position is filled by a term of the form '$f(x)$'.[29] The first function maps entities to times, and the second function maps entities to locations. Context supplies the value of the function variables 'f' and 'g'. In the usual case, context supplies the

[28] Due to pragmatic factors, (15) is not a particularly salient reading of (13). However, suppose that John is a mad scientist, who has established a connection between his cigarette lighter and a certain location l, such that whenever he lights a cigarette with it, it rains at location l. In this situation, standing at location l, (13) may be uttered with the interpretation as in (15).

[29] Similar appeals to covert function variables which have first-order variables as arguments occur in the analysis of functional readings of wh-questions (cf. Engdahl (1986), Chierchia (1993)). Chierchia (1995, pp. 225–27) provides evidence for the syntactic reality of such functional variables by appeal to weak crossover considerations.

identity function to these function variables. So, in the usual case, the value of 'x' and '$f(x)$' is the same, and the value of 'y' and '$g(y)$' is the same. But in examples such as (13), context supplies a function different from the identity function to one of the higher-order variables. In the case of (13), the temporal node contains a complex variable '$f(t)$' and the locational node contains a complex variable '$g(t)$'. When (13) is evaluated with respect to a context, 'f' is assigned the identity function, and 'g' is assigned a function from times to locations. In the case of a sentence such as "Every place John goes, it rains", 'g' is assigned the identity function, and 'f' is assigned a function from locations to times.

However, the further details of these accounts need not detain us. For our purposes, it is not important to decide between competing accounts which both involve variables; it is only important to note the failure of the unarticulated constituent account. The problem with the unarticulated constituent analysis is that it only predicts one of the two available readings for (13). In contrast, an account involving the postulation of a location variable predicts both readings. For variables can either be bound or free. An account involving variables, therefore, predicts there to be two readings of (13), one in which the value of the relevant variable is supplied by context, as in (15), and one in which it is bound, as in (14). As we have seen, this prediction is borne out by the facts.

The above considerations also generalize to undermine the narrow indexical analysis of "rain". The standard analysis of the semantics of indexical expressions is due to David Kaplan (1989). According to it, there are two levels of semantic content. In the first instance, word types are associated with what Kaplan calls "characters", which are functions from contexts to the second sort of semantic content, which Kaplan calls, simply, "content". The content of non-indexical, demonstrative, and pronominal expressions are not sensitive to context, and so their characters are constant functions from contexts to contents. Indexicals and unbound pronouns and demonstratives do, by contrast, have a content that varies with context. As a result, the character of such an expression is a non-constant function from contexts to contents. For example, the character of "I", on this account, is a function from contexts to contents. Given a context, it yields a constant function from possible worlds and times to the speaker in that context.

One can give a narrow indexical analysis of "rains" to account for the truth-conditional variation exhibited by different uses of (11). On this account, "rain" is an indexical expression, narrowly construed. Therefore, it is associated with a non-constant character. Given a context, the character of "rain" yields a function from possible worlds and times to truth-values. This function is the content of "rain" in that context. The content yielded

by the character of "rain" relative to a context *c* is that function from worlds and times to truth-values that yields Truth if it is raining at that world at that time in the salient location of c, and yields False otherwise.

However, examples such as (13) show that the narrow indexical analysis of "rains" is incorrect. In cases such as (13), a variable in the location parameter is bound. But if the location parameter is a contextual parameter, as it is if the narrow indexical analysis is correct, then it is simply not accessible for binding, any more than the speaker coordinate is. Therefore, the narrow indexical analysis of "rains" is incorrect.[30]

Both philosophers and linguists have used comparative adjectives to motivate the notion of an unarticulated constituent (e.g., Bach (1994, p. 128), Heim and Kratzer (1998, p. 71)). Consider the sentence:

(16) Sherman is small.

The truth-conditions of (16) vary with context. Suppose Sherman is six feet tall. If what is at issue in the context of an utterance of (16) are professional basketball players, then that utterance expresses a true proposition. However, in a context in which what is at issue are junior high-school students, an utterance of (16) expresses a falsehood. However, one might think, for whatever reason, that the actual structure of (16) does not contain a 'hidden' variable whose value is the contextually relevant comparison class. If so, then one should seek a semantic rule which provides the comparison class 'directly', without mediation of a variable.

The rule that would be required to supply the full truth-conditional interpretation of utterances of (16), on an unarticulated constituent view, would be roughly as follows:

> Rule C: Den("small") relative to a context *c* is the set of things of size less than *s*, where *s* is the standard made salient in *c*.

However, Rule C is incorrect, and for a similar reason as clause R. The sentence:

(17) Most species have members that are small.

[30] As Maria Bittner pointed out to me, there is one theoretical option remaining if one wishes to deny that sentences such as (11) and (13) involve covert variables hidden in their logical form that are accessible to binding. According to this option, "rains" is itself a variable, that in a sentence such as (13) is bound. More precisely, "rains" is a pronominal expression. Pronouns are ambiguous between deictic and bound readings. In a sentence such as (11), we see the deictic reading of "rains". In a sentence such as (13), we see the bound reading of "rains". I will not pursue this option here.

has the readings given in (18) and (19):

(18) Most species *S* have members that are small for *S*.

(19) Most species *S* have members whose size is below *s*, where *s* is the standard made salient by the utterance context.

Rule C only allows for the derivation of (19), and not for the equally natural (18). Therefore, an unarticulated constituent approach to comparative adjectives is incorrect. Comparison classes are the values of contextual variables correlated with comparative adjectives.

These considerations also can be generalized to refute a narrow indexical analysis of comparative adjectives. However, at this point, laying out the details is merely a formal exercise, the details of which I leave to the reader.

Another example one could give to argue for the existence of unarticulated constituents involves sentences containing quantifier expressions. Consider the sentence:

(20) Every bottle is green.

Relative to different contexts, (20) has different truth-conditions. Relative to one context, (20) could express the proposition that every bottle recently purchased by Bill is green; relative to another, the proposition that every bottle in the house is green. Thus, context supplies a property that restricts the quantification. However, one might think that there is no variable in the logical form of (20) whose value is the required property.

Here are some of the informal details of an unarticulated constituent account of quantifier domain restriction. On this account, nouns such as "bottle" are treated as denoting different sets in different contexts.[31] For example, the denotation of "bottle" would be given by a rule such as:

(21) Den("bottle") relative to a context *c* = the set of bottles that are in the domain salient in the context *c*.

Given a rule such as (21), one can account for the differences in truth-conditions between different utterances of (20). Relative to a context in which the salient domain is the set of things in the house, (20) will express the proposition that every member of the set of bottles in the house is green, whereas relative to another context, it will express a different proposition.

[31] Quantifier domains actually are better treated as more intensional entities, such as properties (cf. Section 6 of Stanley and Szabó (forthcoming)). But treating them as sets does not affect the point I am making here.

However, this account of quantifier domain restriction is unsatisfactory. Consider the following sentences:

(22)a. In most of John's classes, he fails exactly three students.[32]
b. In every room in John's house, he keeps every bottle in the corner.
c. Whatever office you go to, the supervisor is always unavailable.
d. Whatever John does, most people turn up late for the experiment.[33]

In none of these cases does the unarticulated constituent analysis of quantifier domain restriction yield the correct result. Consider (22a). One natural interpretation of this sentence is:

(23) In most of John's classes x, he fails exactly three students in x.

However, the unarticulated constituent analysis only predicts the absurd reading:

(24) In most of John's classes x, he fails exactly three students in the domain salient in the context of utterance of (22a).

The unarticulated constituent analysis of quantifier domain restriction is therefore unsatisfactory.[34] An exactly similar point holds for the examples (22b–d).

In fact, the examples in (22) are more complex than is needed. Suppose that in a certain school, students have been regularly failing their History and English classes, a situation which has caused some consternation

[32] This sort of example is discussed at length in von Fintel (1994, Section 2.2.2).

[33] These last two examples are from Cooper (1996). Cooper uses these examples to argue for the existence of bound resource situation variables. However, I do not think that the situation semantic treatment of quantifier domain restriction is satisfactory, essentially for the reasons given in Soames (1986).

[34] Kent Bach suggested to me the possibility that in (22a) and (22b) the initial prepositional phrase has undergone movement from a structure such as:

(a′) He fails exactly three students in most of John's classes.

However, this analysis is easily refuted. (a′) is ungrammatical if 'he' and 'John' are co-indexed. The explanation for its ungrammaticality is that it is a violation of Principle C of the Binding Theory. If (22a) were derived from (a′) via movement, we would therefore expect a strong crossover violation in (22a). But (22a) is perfectly grammatical. Therefore, (22a) is not derived from (a′). A similar point holds for (22b). Furthermore, no similar account is even remotely possible in the case of (22c) and (22d).

among the parents. Trying to reassure them, the principal of the school reminds them about how well everyone is doing in Mathematics, by saying:

(25) The math classes are going well. Nobody has failed anybody the entire year.

Relative to this context, the second sentence in (25) may express the proposition that no one x has failed anyone y such that y is in x's math class. The second sentence may express a truth, even if the math teachers have failed students in other, non-math related classes that they teach. So, the added complexity of the examples in (22) is not necessary to make the point.[35]

In each of the cases we have discussed, the domain of the second quantified expression varies with the values introduced by the initial quantifier expression. Therefore, given what we have been assuming about the relation between semantic binding and syntactic binding outlined above, it follows that there are bindable variables in the logical form of sentences containing quantifier expressions whose values are quantifier domains.

As in the case of 'rains', the evidence suggests that the unpronounced constituent in the logical form of quantified sentences that is responsible for quantifier domain restriction contains a term of the form '$f(x)$'. The function provided to 'f' by context maps individuals onto quantifier domains (cf. von Fintel (1994, Section 2.2.2)). In the case of a sentence such as (25), context provides a function mapping an individual to the set of students in that individual's math class.

Another favorite example of unarticulated constituents comes from "relational expressions", such as "home", "enemy", or "local" (e.g., Crimmins (1992, p. 151), Bach (1994)). Consider the sentence:

(26) David is at home.

What an utterance of (26) expresses is the proposition that David is at the home of N, where N is a contextually salient person (possibly David himself). Similarly:

(27) John visited a local bar.

(28) Bob faced an enemy.

express, respectively, the proposition that John visited a bar that is local to N, where N is a contextually salient person, and the proposition that Bob

[35] Thanks to Ernie Lepore (p.c.) for the example.

faced an enemy of N, where N is a contextually salient person. However, one might think that it is implausible to postulate variables in the logical form of these sentences whose values, relative to contexts, are contextually salient persons.

Here is an interpretation for "home" that would provide the contextually salient person as an unarticulated constituent:

(29) Den ("home") relative to c = the home(s) of N, where N is the contextually salient person in c.

Let us suppose that there is a temporal variable in the logical form of a sentence such as (26). Then, the truth-conditions of (26), on an unarticulated constituent view, are as follows:

> "x is at home (t)" is true in a context c if and x is at the home of N at t, where N is the contextually salient person in c.

However, (29) is an incorrect interpretation rule. Consider the sentence:

(30) Everyone is at home.

Ignoring the context-sensitivity of "everyone", (30) has two possible interpretations:

(31) Everyone x is at the home of x.

(32) Everyone x is at the home of N, where N is the person made salient by the utterance context.

However, (29) only allows for the derivation of (32), and not for the equally natural (31). Therefore, (29) is an incorrect interpretation rule. The word "home" is accompanied in logical form by a contextual variable which is accessible to binding by a higher operator.

A similar point holds for other relational expressions. For example:

(33) Every newspaper reporter went to a local bar to hear the news.

has, among its different readings, the one given in (34):

(34) Every newspaper reporter x is such that x went to a bar local to x to hear the news.

Similarly:

(35) Every warrior faced an enemy.

has the reading given in (36):

(36) Every warrior x faced an enemy of x.

None of these readings would be available if the contextually supplied elements relevant for the truth-conditions of (27) and (28) were unarticulated constituents.[36]

It is also worth emphasizing that there is other good syntactic evidence for the existence of variables in constructions involving relational expressions. For example, such constructions give rise to weak crossover effects.[37] What this shows is that the variable element in relational expressions has the syntactic properties of explicit pronouns. Consider, for example, the following minimal pairs. In each of them, the relational expression has the same binding properties as the corresponding explicit pronoun:

(37)a. *Her$_i$ local bar sponsored [every reporter]$_i$.

b. *A local bar sponsored every reporter. (where the bar is the reporter's local bar)

(38)a. ?Her$_i$ trip home made [every reporter]$_i$ nervous.

b. ?The trip home made every reporter nervous. (where the home is the reporter's home).

Similarly, in generic contexts, weak crossover is relaxed both for explicit pronouns and for the variable element in relational expressions:

(39)a. [Her]$_i$ trip home makes [every reporter]$_i$ nervous.

b. The trip home makes every reporter nervous. (where the home is the reporter's home)

This evidence strongly suggests the existence of a covert pronominal element in relational expressions.[38]

---

[36] For extensive discussion of relational expressions, see Mitchell (1986) and Partee (1989).

[37] I am indebted to discussion here with Jim Higginbotham, who emphasizes this point in his (ms.). Higginbotham's purpose differs from mine, in that he does not use the binding facts to argue for the existence of explicit formatives. Rather, he is operating with a more abstract conception of syntactic representation than the one at work in this paper (cf. Williams (1995) for a similar conception of syntax).

[38] Peter Culicover and Ray Jackendoff challenge this sort of argument in their (1995). In particular, they first argue (Section 2.6) that the element with a variable interpretation

The sorts of arguments I have given above generalize to a host of other cases. For example, consider:

(40) There is enough beer in the house.

The truth-conditions of an utterance of (40) depend on context.[39] If there are twenty bottles of beer in the house, then there is enough beer in the house for a small dinner party, but not a raucous gathering. However, higher operators can control the interpretation of the context dependent element, as in:

(41)a. There is always (usually/sometimes) enough beer in the house.
b. Whenever John visits, there is not enough beer in the house.

Several other cases of this sort are discussed in Cresswell's important (1996), albeit in his variable free framework.[40] In all of these cases, an unarticulated constituent analysis is not tenable.

Here is a possible response to the above arguments. I present the response with the argument involving "home", though it should be clear how it generalizes to the other arguments I have given. Consider again:

(26) David is at home.

(30) Everyone is at home.

According to this response, the occurrence of "home" in (26) is a different *word* than the occurrence of "home" in (30). What is phonetically realized as "home" is in fact ambiguous. In (26), "home" does not have an argument place for contextually salient individuals. The truth-conditionally relevant entity is added via an unarticulated constituent rule in the semantics or the pragmatics. In (30), by contrast, "home" does have an argument place

in "something else" does not obey Principle C of the Binding Theory. Then, they assume without argument that all other implicit arguments pattern like "something else" (Section 4.1). However, their evidence that the variable element in "something else" does not obey Principle C is weak, and is equally evidence for the hypothesis that "something else" has an underlying syntactic structure similar to that of "something other than α". They consider this objection, but misconstrue it as the implausible proposal that "something else" is to be reconstructed as "something other than α" at logical form. This is simply not the objection. On the natural view, what the evidence shows is that "something else" already has the syntactic structure of "something other than α", due to the presence of covert empty elements. No reconstruction is needed.

39 I am grateful to Delia Graff for supplying the example.

40 For examples involving modal accessibility relations, cf. Cresswell (1996, pp. 56–7). For examples involving degrees of comparison, cf. Cresswell (1996, p. 59–60).

for individuals, that is bound by the quantifier "everyone". If so, then the argument I have given does not show that the occurrence of "home" in sentences such as (26) brings with it a variable whose value is supplied by context. Rather, all it shows is that there is a phonetically similar word which brings such a variable with it.

However, this response is unsatisfactory. Consider the following discourse:

(42) David is at home. In fact, everyone is.

There are two interpretations of the second sentence in (42):

(43)a. everyone x is at x's home.
b. everyone x is at the home of N, where N is the contextually salient person in the utterance context of (42).

If the response we are considering were correct, (43b) would not be an available reading at all.

Here is why reading (43b) would not then be available. The second sentence in (42) is a case of syntactic ellipsis. According to standard theories of ellipsis, the material following the copula "is" in the first sentence of (42) is either copied or reconstructed in the logical form of the second sentence.[41] If the response we are considering is correct, then the predicate in the first sentence of (42) would not contain a variable, and so the occurrence of "at home" in the logical form of the second sentence of (42) would then also not contain a bindable variable. Thus, the second sentence of (42) would not permit a bound reading of a variable, as in (43b), since there would be no variable there to bind. But it does. Therefore, the first sentence of (42) contains a variable of the relevant sort after all.

Of course, the distinction between the readings in (43a) and (43b) is just the familiar "strict/sloppy" dichotomy found whenever overt pronouns interact with ellipsis. For example, the sentence:

(44) John likes his brother, and Bill does too.

is ambiguous between:

(45)a. John likes John's brother, and Bill likes John's brother.
b. John likes John's brother, and Bill likes Bill's brother.

[41] The argument to follow does not depend upon a copy theory of ellipsis; it would work equally well under the assumption that ellipsis amounts to PF deletion under a parallelism requirement, as suggested in Chomsky (1995, pp. 125ff.).

The standard theoretical account of the distinction between these two readings is that, in the first case, the 'strict' reading, the pronoun 'his' is free, whereas in the second case, the 'sloppy' reading, the pronoun 'his' is bound. The fact that there are strict/sloppy ambiguities in ellipsis involving relational expressions is fully explained by the supposition that there are pronominal elements in these constructions. Furthermore, if there are no such elements, the existence of strict/sloppy ambiguities is left unexplained. Therefore, the existence of such ambiguities is powerful additional evidence for the existence of a pronominal element in relational expressions.

Furthermore, this dialectic generalizes to every construction we have discussed so far. Sentences such as

(46) Bill dislikes three people. John does too.

demonstrate that there are strict/sloppy ambiguities in the case of quantifier domain restriction. It is clear that there is a 'strict' reading of (46), where the quantifier domain restriction for "three people" is the same in the first clause as it is in the ellided one. However, there is also a sloppy reading of such constructions. Suppose that someone is arguing that many men have troubled relations with their families, and is using Bill and John as evidence. With respect to such a context, (46) can express the proposition that Bill dislikes three people in Bill's family, and John dislikes three people in John's family.

Similarly, consider:

(47) John is too old. Jill is too.

It is clear that there is a strict reading of (47). However, there is also a sloppy reading. Suppose that John, a forty-two year old professional swimmer and Jill, a twenty three year old professional gymnast, have decided to wed. Shocked at their age difference, I ask Bill how John and Jill can relate to one another, to which he replies by uttering (47). Relative to this context, (47) can express the proposition that John is too old for his sport, and Jill is too old for hers. Thus, in all of the examples we have discussed, we see behavior that is best explained by the postulation of a covert pronominal element.

A second objection to my arguments is as follows.[42] Consider again:

(26) David is at home.

According to the unarticulated constituent account, what the semantics assigns to (26) is a property, which is then "enriched" into a proposition.

[42] I owe this objection to an anonymous referee.

My arguments have shown that there is a variable associated with "home" in constructions such as (26), which is required to account for constructions such as (30). However, the defender of unarticulated constituents may maintain that this is not all the hidden syntactic structure associated with (26). Rather, she may say that the true syntactic structure of (26) is:

(48) λx (David is at home x)

In this way, the defender of unarticulated constituents can both maintain her thesis that the semantic content of (26) relative to a context is a property, rather than a proposition, and account for sentences such as (30).

However, this objection is simply not open to the advocate of truth-conditional pragmatics. The argument that the semantic content of (26) is a property rests on the thesis that it is always illegitimate to postulate structure on semantic grounds. It is thereby deemed illegitimate to postulate a variable in the syntactic structure of (26) on purely semantic grounds. But this objection requires the postulation, not just of a variable, but *also* of a hidden lambda-abstractor, all in the service of rescuing the semantic thesis advocated by the defender of truth-conditional pragmatics. The objection is therefore inconsistent with the justification for truth-conditional pragmatics.

Furthermore, there are positive reasons to reject this proposal. Consider:

(49) David is at home. Bill is too.

Consider the reading of the first sentence of (49) in which David is at his own home. In this case, there are two readings of the second sentence of (49):

(50)a. Bill is at Bill's home.
b. Bill is at David's home.

According to the standard explanation of this ambiguity, the distinction between these two readings is due to whether a variable in the ellided constituent is bound or free. In this case, the standard explanation would account for the ambiguity by the hypothesis that when the variable element in "at home" is controlled by "David", we obtain reading (50a), and when it is free, and assigned David by the context, we obtain reading (50b). However, if the true logical form of the first sentence of (49) were (48), then the variable in the ellided constituent would always be bound by the lambda abstractor. We should therefore not expect reading (50b). The

presence of strict readings in constructions of this sort therefore provides a decisive refutation of this proposal.

Here is a final objection to my arguments. In two recent discussions of relational expressions, Partee (1989) and Culicover and Jackendoff (1995), the existence of bindable interpretations for relational expressions is discussed at length, but an account of the phenomena that posits empty elements in syntactic logical forms is rejected. However, the rejection of the account in terms of empty elements is based upon the rejection of a premise that has a high degree of plausibility. The premise in question is that the objects of semantic interpretation are syntactic logical forms, where these are understood as the final representations produced by the best syntactic theory. Partee rejects an account of the phenomena in terms of empty elements in actual logical form, because she thinks that what semantic theory interprets are discourse representation structures (DRSs), and it is on this representational level that the phenomenon of bound relational expressions is explained. Culicover and Jackendoff reject an account in terms of empty elements in actual logical form, because they hold that the object of semantic interpretation are what they call "conceptual structures" (CSs). The phenomenon of bound relational expressions is to be explained, according to them, by the existence of empty elements in conceptual structure. According to these theorists, the binding of relational expressions is not to be explained by the existence of empty elements in standard syntactic structures, but rather via the existence of empty elements in alternative formal levels of representation.

There are two ways of understanding such claims. According to the first, the suggestion is that syntactic theory produces syntactic logical forms, which are then jettisoned in favor of other structures, which are the input to semantic interpretation. In the case of Partee, these second structures are DRSs, and in the case of Culicover and Jackendoff, they are CSs. This picture of interpretation is *prima facie* difficult to accept. According to it, the interpretative process involves the production of an interpretively superfluous level of representation, namely the output of the syntactic mechanism. We would need a massive amount of empirical and methodological motivation to justify the added complexity such an interpretive process involves over straightforwardly applying a semantic interpretation to the output of our best syntactic theory. An evaluation of our grounds for this added complexity goes well beyond the scope of this paper.

Though claims of the sort made by Partee and Culicover and Jackendoff are usually presented in the first manner, they are perhaps better understood in a second way. Both Discourse Represention Structures and Conceptual Structures are syntactic levels of representation, themselves in need of

interpretation. Another way to construe Partee's suggestion is that Discourse Representation Structure is the correct syntactic representation of natural language sentences; *mutatis mutandis* for Culicover and Jackendoff and CS. On this reading, what all these authors reject is the thesis that the bindability of relational expressions should be captured in terms of empty elements in syntactic logical forms, *where syntax is conceived of as it standardly is*. Rather, the bindability of relational expressions should be captured in terms of empty elements in their own favored syntactic representations.

I do not myself believe that Discourse Representation Structure is the best account of natural language syntax, and I find Culicover and Jackendoff's talk of Conceptual Structure mysterious at best. Nonetheless, I have, in this paper, been as neutral as possible about what the correct syntactic theory of natural language is. All of these theorists account for relational expressions in terms of variables in their favored syntactic representations. Thus, besides a no doubt serious, though for these purposes irrelevant, disagreement about what counts as a suitable syntactic framework, there is, despite surface appearances, no dispute between these authors' conclusions and my own, construed in this second way.

CONCLUSION

I have defended the thesis that all effects of extra-linguistic context are traceable to logical form. However, the considerations I have used are not always dependable. For example, it does not in general appear that possessive constructions, such as "John's book", involve a bindable variable whose values in different contexts are different salient relations. For example, "In most ways, John's book is nice" does not have a reading according to which the interpretation of the phrase "John's book" varies with the values introduced by the quantifier expression "most ways".[43] There are also other contextual phenomena, in particular focus, which need to be incorporated into a final account of these matters. But these are topics about which we are in any case in the dark. It would not do to rest an argument for the existence of unarticulated constituents on constructions the outlines of the ultimate analyses of which are unknown.[44] The argument for the existence of unarticulated constituents is only persuasive if it can

[43] Surprisingly, possessives in post-copular position do seem to allow a bound reading, such as in "In most ways, that is John's book".

[44] Furthermore, it is not at all clear that the best syntactic and semantic theory for possessive relations will not postulate an empty element whose value is the possession relation. For example, in the best work on Possessives known to me, namely Barker (1995),

be shown that it is methodologically implausible, for a range of different context-dependent constructions, to postulate variables in the logical form, the values of which are the desired contributions to truth-conditions. If so, then what we have seen is that no persuasive argument for the existence of unarticulated constituents has been provided.

Here is another consequence of the above discussion. Philosophers often turn to claims of hidden indexicality when faced with a philosophical quandary. For example, according to Tyler Burge's well-known account of the strengthened liar paradox, the truth-predicate in fact is an indexical expression, whose extension varies from context to context. In the course of deriving instances of the strengthened liar paradox, context shifts in such a manner as to change the extension of the truth-predicate, and thereby vitiate the derivation. It is absolutely crucial to Burge's account that attributions of truth are due to the indexicality of "true", rather than the presence of a bindable variable in logical form, since otherwise the strengthened liar paradox could simply be reproduced.[45]

Similarly, according to one version of a contextualist response to skepticism, the word "know" is in fact an indexical expression, whose content varies from context to context. Relative to non-sceptical contexts, its content is a relation that holds between persons and those true propositions they believe, for which they have some minimal epistemic position. Relative to skeptical contexts, by contrast, it expresses a relation which holds only between persons and those true propositions they believe, with respect to which their epistemic position is very strong. According to leading proponents of contextualism, it is important to the doctrine that the epistemic standards are provided by the context of use, and not by the subject of the knowledge-ascription. It is therefore important to the doctrine that the word "know" is an indexical, rather than a non-indexical expression correlated with a variable in logical form that can be bound by a quantified expression in the subject position of a knowledge attribution.[46] An additional consequence of the arguments I have given in the last section is to undermine the force of such appeals to 'hidden' indexicality. If philosophically loaded expressions such as "true" and "knows" really were indexicals in

possessive constructions involve an empty determiner in English, whose value in different contexts is a function of the possession relation salient in that context. So, on this account, possession relations are indeed traceable to an empty element in logical form.

45 "The indexical-schematic character of semantical predicates cannot be formally obviated by adding an argument place – relativizing them to a language, a level, a context, or a viewpoint. For quantification into the argument place will provide an open sentence just as subject to paradox as the 'naive' truth-predicate formalization." (Burge (1979), p. 192).

46 This is how I construe the emphasis on the importance of the "attributor" aspect of contextualism in DeRose (1999, Section 4).

the narrow sense of the term, then we should expect to find examples of such unobvious indexicality in the philosophically uncontroversial parts of our speech. However, what we have seen is that the vast number of cases of uncontroversial context-dependence do not involve indexicality, narrowly construed. Of course, obvious indexical expressions are indexicals, narrowly construed. But if words such as "true" and "knows" were hidden indexicals, then we should expect to discover cases of uncontroversial context-dependence that are best explicated in these terms. The fact that we do not provides some evidence that narrow indexicality is restricted to words such as 'I', 'here', and 'now'.

My central purpose in this paper has been to explain and defend the thesis that all truth-conditional effects of context are traceable to logical form. If this thesis is correct, then, after disambiguation, the process of interpreting a linguistic assertion has significant disanalogies with non-linguistic interpretation. Extra-linguistic context only can affect what is expressed in a linguistic assertion if its contribution can be traced to a constituent in the expression uttered. In contrast, the effects of extra-linguistic context on non-linguistic interpretation are constrained only by general considerations of relevance and rationality. Furthermore, we can maintain this strong distinction between linguistic and non-linguistic interpretation, without retreating from the thesis that semantic interpretation produces the full truth-conditions of utterances. Given their differences, we should therefore be suspicious of attempts to forge philosophically significant analogies between the different processes underlying the interpretation of linguistic and non-linguistic acts.[47]

REFERENCES

Ajdukiewicz, K.: 1967, 'Syntactic Connexion', in Storrs McCall (ed.), *Polish Logic*, Clarendon Press, Oxford, pp. 207–31.

Austin, J.: 1970, *How to Do Things With Words*, Harvard University Press, Cambridge.

Austin, J: 1979, 'Truth', in J. L. Austin (ed.), *Philosophical Papers*, Oxford University Press, Oxford, pp. 117–133.

[47] I am grateful to Kent Bach, Lenny Clapp, Chris Collins, John Collins, Michael Glanzberg, Delia Graff, Richard Heck, Jim Higginbotham, Larry Horn, Jeff King, Ernie Lepore, Peter Ludlow, Stephen Schiffer, Robert Stalnaker, Zoltán Gendler Szabó, Achille Varzi, and Timothy Williamson for comments and/or discussion. Comments by two anonymous referees for *Linguistics and Philosophy* also improved the paper considerably. I am also grateful to audiences in the Philosophy department at the University of Michigan, the Linguistics Department at Rutgers University, and the Conference on Methods at the New School, where portions of this paper were presented.

Bach, K.: 1982, 'Semantic Nonspecificity and Mixed Quantifiers', *Linguistics and Philosophy* **4**, 593–605.
Bach, K.: 1994, 'Conversational Impliciture', *Mind and Language* **9**, 124–162.
Bach, K.: 1999, 'The Semantics Pragmatics Distinction: What it is and Why it matters', in Ken Turner (ed.), *The Semantics-Pragmatics Interface from Different Points of View*, Oxford, Elsevier, pp. 65–84.
Bar-Hillel, Y.: 1954, 'Indexical Expressions', *Mind* **63**, 359–79.
Barker, C.: 1995, *Possessive Descriptions*, CSLI Publications, Stanford.
Barton, E.: 1990, *Nonsentential Constituents*, John Benjamins, Amsterdam.
Van Benthem and Ter Meulen (eds.): 1997, *Handbook of Logic & Language*, MIT Press, Cambridge.
Blackburn, W. K.: 'Wettstein on Definite Descriptions', *Philosophical Studies* **53**, 263–78.
Burge, T.: 1979, 'Semantical Paradox', *The Journal of Philosophy* **76**, 169–98.
Carston, R.: 1991, 'Implicature, Explicature, and Truth-Theoretic Semantics', in Stephen Davis (ed.), *Pragmatics*, Oxford University Press, Oxford, pp. 33–51.
Cassam, Q.: 1997, *Self and World*, Clarendon Press, Oxford.
Chierchia, G.: 1993, 'Questions with Quantifiers', *Natural Language Semantics* **1**, 181–234.
Chierchia, G.: 1995, *Dynamics of Meaning*, University of Chicago Press, Chicago.
Chomsky, N.: 1995, *The Minimalist Program*, MIT Press, Cambridge.
van Deemter, K. and Peters, S. (eds.): 1996, *Semantic Ambiguity and Underspecification*, CSLI, Stanford.
Cooper, R.: 1996, 'The Role of Situations in Generalized Quantifiers', in Lappin (1996), pp. 65–86.
Cresswell, M.: 1973, *Logics and Languages*, Metheun, London.
Cresswell, M.: 1996, *Semantic Indexicality*, Kluwer Academic Publishers, Dordrecht.
Crimmins, M.: 1992, *Talk about Beliefs*, MIT Press, Cambridge.
Culicover, P. and R. Jackendoff: 1995, ' 'Something else' for the Binding Theory', *Linguistic Inquiry* **26**, 249–275.
DeRose, K.: 1999, 'Contextualism: An Explanation and Defense', in John Greco and Ernest Sosa (eds.), *The Blackwell Guide to Epistemology*, Blackwell, Oxford, pp. 187–205.
Engdahl, E.: 1986, *Constituent Questions*, Reidel, Dordrecht.
Evans, G.: 1985, 'Pronouns, Quantifiers, Relative Clauses (I)', in Gareth Evans (ed.), *Collected Papers*, Clarendon Press, Oxford, pp. 76–152.
Fiengo, R. and R. May: 1996, 'Anaphora and Identity', in Lappin (1996), pp. 117–44.
von Fintel, K.: 1994, *Restrictions on Quantifier Domains*, University of Massachusetts Dissertation.
Grice, Paul: 1989, 'Logic and Conversation', in *Studies in the Way of Words*, Harvard University Press, Cambridge, pp. 22–40.
Harman, G.: 1972, 'Deep Structure as Logical Form', in D. Davidson and G. Harman (eds.), *Semantics of Natural Language*, Reidel, Dordrecht.
Heim, I. and A. Kratzer: 1998, *Semantics in Generative Grammar*, Blackwell, Oxford.
Higginbotham, J.: 1996, 'Davidson's Program in Semantics', in E. LePore (ed.), *Truth and Interpretation: Perspectives on the Philosophy of Donald Davidson*, Blackwell, Oxford, pp. 29–48.
Higginbotham, J.: 1993, 'Interrogatives', in K. Hale and S.J. Keyser (eds.), *The View from Building 20: Essays in Honor of Sylvan Bromberger*, MIT Press, Cambridge, pp. 195–227.

Higginbotham, J.: ms. 'A Plea for Implicit Anaphora'.
Hintikka, J. and G. Sandu: 1997, 'Game Theoretical Semantics', in van Benthem and Ter Meulen (1997), pp. 361–410.
Jacobson, P.: 1999, 'Towards a Variable-Free Semantics', *Linguistics and Philosophy* **22**, 117–184.
Janssen, T.: 1997, 'Compositionality', in Van Benthem and Ter Meulen (1997), pp. 417–473.
Koopman H. and D. Sportiche: 1982/83, 'Variables and the bijection principle', *The Linguistic Review* **2**, 139–60.
Lappin, S. (ed.): 1996, *The Handbook of Contemporary Semantic Theory*, Blackwell Press, Oxford.
Lewis, D.: 1983, 'General Semantics', in David Lewis (ed.), *Philosophical Papers, Volume 1*, Oxford University Press, Oxford, pp. 189–232.
May, R.: 1985, *Logical Form: Its Structure and Derivation*, MIT Press, Cambridge.
Mitchell, J.: 1986, *The Formal Semantics of Point of View*, Unpublished University of Massachusetts Amherst Doctoral Dissertation.
Partee, B.: 1989, 'Binding Implicit Variables in Quantified Contexts', *Proceedings of the Chicago Linguistics Society* 25, University of Chicago Press, Chicago, pp. 342–65.
Perry, J.: 1986, 'Thought without Representation', in *Supplementary Proceedings of the Aristotelian Society* **60**, 137–52.
Perry, J.: 1997, 'Indexicals and Demonstratives', in Hale and Wright (eds.), *A Companion to the Philosophy of Language*, Blackwell Press, Oxford, pp. 586–612.
Perry, J.: 1998, 'Indexicals, Contexts and Unarticulated Constituents', in Aliseda, van Gabeek, and Westerståhl (eds.), *Computing Natural Language*, CSLI Publications, Stanford, pp. 1–11.
Recanati, F.: 1993, *Direct Reference*, Blackwell Press, Oxford.
Rizzi, L: 1986, 'Null Objects in Italian and the Theory of Pro', *Linguistic Inquiry* **17**, 501–57.
Russell, B.: 1985, *The Philosophy of Logical Atomism*, Open Court, LaSalle.
Salmon, N.: 1986, *Frege's Puzzle*, MIT Press, Cambridge.
Soames, S.: 1987, 'Direct Reference, Propositional Attitudes, and Semantic Content', in *Philosophical Topics* **14**, 47–87.
Soames, S.: 1986, 'Incomplete Definite Descriptions', *Notre Dame Journal of Formal Logic* **27**, 349–75.
Sperber, D. and D. Wilson: 1986, *Relevance*, Harvard University Press, Cambridge.
Stainton, R.: 1994, 'Using Non-Sentences: An Application of Relevance Theory', *Pragmatics and Cognition* **2**, 269–284.
Stainton, R.: 1995, 'Non-Sentential Assertions and Semantic Ellipsis', *Linguistics and Philosophy* **18**, 281–96.
Stainton, R.: 1997, 'Utterance Meaning and Syntactic Ellipsis', in *Pragmatics & Cognition* **5**, 51–78.
Stainton, R.: 1998, 'Quantifier Phrases, Meaningfulness 'In Isolation', and Ellipsis', *Linguistics and Philosophy* **21**, 311–340.
Stalnaker, R.: 1970, 'Pragmatics', *Synthese* **22**, 272–89.
Stanley, J. and Z. Szabó: 'On Quantifier Domain Restriction', forthcoming in *Mind and Language*.
Szabolcsi, A.: 1989, 'Bound Variables in Syntax (are there any?)', in Bartsch, van Benthem, and van Emde Boas (eds.), *Semantics and Contextual Expression*, Foris, Dordrecht, pp. 295–318.

Varzi, A.: 1993, 'Do We Need Functional Abstraction?', in J. Czermak (ed.), *Proceedings of the 15th International Wittgenstein-Symposium*, H'older-Pickler-Tempsky, Vienna, pp. 407–15.

Williams, E.: 1995, *Thematic Structure in Syntax*, Linguistic Inquiry Monograph Twenty Three, MIT Press, Cambridge.

Yanofsky, N.: "NP Utterances", *Papers from the Fourteenth Regional Meeting of the Chicago Linguistics Society*, Chicago Linguistics Society, Chicago, pp. 491–502.