

Context-Free Semantics¹

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1 Introduction

Modern work on context dependence in natural language has emerged from a tradition that combines formal and conceptual work. On the formal side, theorists like Montague (1968, 1970), Lewis (1970), and Kamp (1971) developed formal frameworks that successfully modeled the relevant aspects of natural language. On the conceptual side, theorists like Kaplan (1989a,b) and Lewis (1980) proposed ways to link the formal apparatus to notions that have an important role in philosophy of language, like reference and content.

David Kaplan's work in *Demonstratives* (1989a) has been particularly influential in shaping the way in which both philosophers and linguists think of context. Kaplan defends the idea that the semantics of natural language makes essential use of a context parameter, i.e. (roughly) a set of coordinates that constitutes an abstract representation of the situation of speech. According to Kaplan, this parameter plays two key roles, which set it apart from other coordinates (so-called index coordinates) used in the semantics. First, context contributes to determining the content expressed by an utterance. Second, having a notion of context in the semantics is crucial for defining an appropriate notion of logical consequence.

One by-product of Kaplan's views is that, while other coordinates in use in the semantics are routinely shifted by dedicated operators (such as tenses or modals), context is unshiftable. This claim has been challenged by a growing body of empirical research. A number of theorists have argued that a variety of languages involve context-shifting operators. The challenges come mostly from non-European languages (Schlenker 1999, 2003, Anand & Nevins 2004, Anand 2006, Sudo 2012, Deal 2014, 2017, among many), though some are also related to the semantics of English (Santorio 2011, 2012, Rabern 2013). This paper takes up the task of assessing the impact of these challenges on semantic theory.

¹ Thanks to Derek Ball, Jennifer Carr, Amy Rose Deal, Eliot Michaelson, and Anders Schoubye, and to audiences at the University of St. Andrews and the University of Oxford for useful feedback. Special thanks to Brian Rabern for extended email exchanges about the topic of this paper, both recently and over the years. Finally, I am heavily indebted to Robert Stalnaker and Irene Heim, who helped me develop my ideas on context dependence and indexicality while I was a PhD student.

I first propose a way of understanding the prohibition against context shift. I suggest that this prohibition is an empirical claim, and that hence it is appropriate to test it against evidence from various languages. Then I show that the fine-grained empirical details matter very much in this case. Some indexical-shifting semantics (for example, the ones in [Schlenker 1999, 2003](#)) are still compatible with the broad tenets of Kaplan's system. But others (for example, the one in [Anand & Nevins 2004](#)) involve a radical break with Kaplan. I point out that, given the evidence, semantics of the latter sort are required. This has substantial theoretical consequences, which so far have gone mostly unnoticed. In particular, Kaplan's distinction between context and index doesn't correspond to any difference in compositional behavior between parameters. Hence this distinction should be dropped, and we should revert to so-called multiple indexing frameworks that were developed previously to Kaplan.

Of course, I don't advocate that context should be expunged from our theories of meaning altogether. A notion of context is crucial at the stage of theorizing that John MacFarlane ([2003, 2005, 2014](#)) has called 'postsemantics'. This is the stage at which we define suitable notions of truth and validity. This stage comes after the compositional semantics has computed an overall semantic value for a sentence. Hence, our theories of meaning must include a notion of context, but it is a confusion of levels to locate that notion at the compositional stage. Context is a postsemantic notion.

I proceed as follows. §§2-3 build a Kaplan-style semantic theory, starting from a pre-Kaplanian multiple indexing system (in §2), and introducing the conceptual shift promoted by Kaplan (in §3). §4 links the semantic theory to more general issues about semantics and content. §5 discusses the prohibition on context-shifting operators, isolating a theoretically interesting version of it and arguing that it is an empirical rather than a conceptual claim. §6 surveys some recent evidence from semantic theory, focusing on context shift in non-European languages. §7 extracts theoretical conclusions from the empirical work, advocating a context-free compositional semantics. §8 shows how this semantics is still an appropriate backdrop for defining an appropriate notion of consequence.

2 Background: contextual parameters and multiple indexing

Over the next two sections, I present a simple semantic theory that captures (in modern notation) the functioning of Kaplan's theory in *Demonstratives*

(1989a, 1989b).² For presentational reasons, it's useful to break down the building of the theory into four steps. Steps 1 and 2 set up the basic formal scaffolding of the theory, while Steps 3 and 4 concern the conceptual shift promoted by Kaplan.

2.1 Indices

A semantic theory specifies a mapping from expressions to their denotations (usually called 'extensions') that respects compositional constraints. This mapping is formalized via an interpretation function, traditionally represented as ' $\llbracket \cdot \rrbracket$ '. Below are some sample denotation clauses for a name, a predicate, and a simple sentence. I will leave composition rules implicit; following standard practice, I use lambda-notation for functions.³

- (1)
- a. $\llbracket \text{Sarah} \rrbracket = \text{Sarah}$
 - b. $\llbracket \text{snores} \rrbracket = \lambda x. x \text{ snores}$
 - c. $\llbracket \text{Sarah snores} \rrbracket = 1$ iff Sarah snores

Semantic theories in the tradition of Montague (1968, 1970) or Lewis (1970) don't assign denotations to linguistic entities *tout court*. Rather, this assignment is relativized to an n -tuple of objects (a *point of evaluation*). Intuitively, a point of evaluation models a set of circumstances (for example: a time, a world, and a location) at which we may assess a sentence for truth and falsity.

In the formalism, we represent this relativization by superscripting the interpretation function with a sequence of parameters (the *index of evaluation*). Below are the entries in (1), updated with an index that includes a time and a world parameter.

- (2)
- a. $\llbracket \text{Sarah} \rrbracket^{t,w} = \text{Sarah}$
 - b. $\llbracket \text{snores} \rrbracket^{t,w} = \lambda x. x \text{ snores at } t \text{ and } w$
 - c. $\llbracket \text{Sarah snores} \rrbracket^{t,w} = 1$ iff Sarah snores at t and w

The parameters that appear in the index are supposed to capture features of the linguistic context that affect the truth value of a sentence. For the moment, it is irrelevant for us what parameters are part of the index.

In the early semantics literature, functions from indices of evaluation

² See Heim 2004 for a more extended introduction to a Kaplan-style semantics in a modern framework.

³ In the background, I assume a system with composition rules and variable binding mechanics in the style of Heim & Kratzer 1998.

to truth values were traditionally called *intensions*. But, following modern usage (going back to Lewis 1980), I call them *semantic values*.

SEMANTIC VALUE OF α (PRELIMINARY): $\lambda i. \llbracket \alpha \rrbracket^i$

Semantic values are assigned two roles in semantic theory. First, they can be seen as specifying a truth-conditional notion of meaning for a sentence, since they distinguish between the set of circumstances at which the sentence is true, and those at which the sentence is false. Second, they are used in the compositional computation of the meaning of complex sentences. At least some of the index parameters are manipulated by dedicated operators: for example, the time and world parameters are manipulated by tenses and modals. The meaning of these operators can be represented as shifting the value of the parameter at which the semantic value of the embedded clause is evaluated.

- (3) $\llbracket \text{Sarah snored} \rrbracket^{t,w} = \llbracket \text{PAST [Sarah snore]} \rrbracket^{t,w} = 1$ iff
 $\exists t' < t : \llbracket \text{Sarah snore} \rrbracket^{t',w} = 1$ iff
 $\exists t' < t$ such that Sarah snores at t' and w

In summary:

STEP 1: INDEXING. Interpretation is relativized to a number of contextual coordinates, collected in the index of evaluation. Natural language operators manipulate the value of index parameters.

2.2 Multiple indexing

So far, we have introduced indices of evaluation as sequences of parameters that track various features of context. The second step is triggered by the observation (from Kamp 1971⁴) that some contextual parameters need to be tracked multiple times.⁵ Consider the following sentences:

- (4) It will be the case that all the people who are now PhD students are professors.

⁴ Though Kamp's work on multiple indexing is referred to in earlier papers, e.g. Montague 1968.

⁵ Strictly speaking, Kamp's argument only establishes that we need double indexing, i.e. that we need to track the same contextual coordinate twice. But the argument generalizes, as was pointed out by Vlach 1973.

- (5) It is possible that in Pakistan, in five years, only those who are actually here now are envied. (Kaplan 1989a)

The indexical in (4) and (5) are in the scope of operators that manipulate the relevant parameters. Yet *now*, *actually*, and *here* are semantically unaffected by these operators. For example, the occurrence of *now* in (4) is unaffected by the presence of *will*: *now* picks out the time of utterance, despite appearing in the scope of an item that normally shifts the time parameter to the future. This suggests that we should track some contextual parameters more than once. In particular, to handle (4) and (5), we need two coordinates for the same parameter. One of these coordinates is manipulated by operators, the other is used to assign references to indexicals.

Technically, this just means that we have to enrich the index of evaluation with extra coordinates. For example, we may have a speaker coordinate, two time coordinates, and two world coordinates.

- (6) $\llbracket \text{It will be the case that I now snore} \rrbracket^{x_1, t_1, w_1, t_2, w_2} = \text{true}$ iff x_1 snores at t_1 in w_2

In summary:

STEP 2: MULTIPLE INDEXING. Some contextual parameters are tracked via multiple independent coordinates. One of these coordinates is exploited by indexicals (like *I*, *here*, and *now*) and is unaffected by ordinary operators (like modals and tenses) in natural language.

3 Context and monsters

From a formal point of view, all the parameters appearing in an index are treated on a par in multiple indexing systems. But Kaplan (1989a, 1989b) insists that there is an important conceptual distinction between two groups of parameters. Parameters in the first group — *context* parameters — invariably track features of the actual situation of speech. Conversely, parameters in the second group — *circumstance* or *index* parameters — are shifted by natural language operators. This distinction, according to Kaplan, is crucial to capture key facts about validity and semantic content for languages that contain indexicals. He gives two arguments for this claim.

3.1 Argument 1: propriety and validity.

Kaplan's first argument aims at establishing that the n -tuples of context coordinates need to be *proper*, i.e. need to always model circumstances of speech. I hasten to say that the argument is unsound, as has been remarked repeatedly in the literature.⁶ For reasons of space, I don't dwell on the problem now; I show how we can capture all the logical features Kaplan desires without propriety in §8.

Kaplan starts by considering:

(7) I am here now.

Kaplan points out that (7) has the ring of a logical truth, at least in the sense that it is true whenever uttered:

[(7)] is deeply, and in some sense, which we will shortly make precise, universally, true. One need only understand the meaning of [(7)] to know that it cannot be uttered falsely.

He argues that, to define a notion of logical consequence that captures this, we need a distinction between contexts and other coordinates. In the semantic systems that Kaplan is using, consequence is defined by quantifying over points of evaluation.⁷ Here is a simple definition:

$\phi_1, \dots, \phi_n \vDash \psi$ (ψ is a logical consequence of ϕ_1, \dots, ϕ_n) iff, for every index i such that ϕ_1, \dots, ϕ_n are true at i , ψ is true at i .

Logical validity is defined, as usual, as the zero-premise case.

$\vDash \phi$ (ϕ is logically valid) iff, for all i , ϕ is true at i .

Now, suppose that we allow points of evaluation that include all kinds of n -tuples of indexical-fixing parameters. In particular, suppose that we allow for *improper* n -tuples of context parameters — for example, assuming that context parameters form a quadruple $\langle x_i, l_k, t_j, w_m \rangle$, suppose we allow for quadruples where the individual x_i is not located at l_k at t_j and w_m . Then (7)

⁶ In fact, Montague 1968, who operated in a single indexing framework, was able to foresee and solve the problem posed by Kaplan, as pointed out by Israel & Perry 1996 and Rabern 2012b.

⁷ This is a simplification, which is harmless for our purposes. In Montague-style systems a full definition of consequence involves reference to *structures*, construed as triples $\langle \mathcal{D}, \mathcal{I}, g \rangle$ of a set of individuals, a set of indices, and an interpretation function. Logical consequence is truth at every point in every structure.

is predicted to be invalid, since at some points it is false that the individual denoted by *I* is at the location denoted by *here* at the time denoted by *now*.

Kaplan concludes that, if we want to define an appropriate notion of context, the component of the index that tracks context coordinates should only contain *proper n-tuples*, i.e. *n-tuples* that correspond to a possible situation of speech.

Conversely, *n-tuples* of index coordinates don't need to be proper. In fact, at least sometimes, they need to be improper. To see this, note that operators like *necessarily* and *always* shift one coordinate at a time. As a result, there is no guarantee that the set of circumstance coordinates at which we evaluate a clause will capture a proper *n-tuple*. An easy way to see this is to observe that the following sentences are false:

(8) Necessarily, someone exists.

The falsity of (8) shows that modal operators quantify over worlds that are not part of any context of speech, and indeed of any proper individual-time-world triple (i.e. any triple where the individual exists in the world).⁸

To sum up:

STEP 3: PROPRIETY. *n-tuples* of context parameters are invariably proper, while *n-tuples* of circumstance parameters are not.

3.2 Argument 2: Unshiftableity

Kaplan argues that there is a second, even more crucial difference between context parameters and index parameters. He claims that indexicals like *I*, *here*, and *now* are unshiftable, in the sense that no operators can affect what they contribute to truth conditions. Hence the context parameter, from which indexicals pick up their reference, must be unshiftable too. This sets context parameters apart from other parameters, which are shiftable at least in principle.⁹

⁸ For a more contemporary example, take:

- (i) I_1 would prefer PRO_1 not to exist. (Schlenker 2003; attributed to Irene Heim and Jay Rifkin)

On standard assumptions about attitude reports (see Chierchia 1989, Anand 2006), the infinitival clause in (i) (whose subject is the covert pronoun PRO) denotes a set of centered worlds. The observation is that, for (i) to be true, those centered worlds need to be improper.

⁹ The 'at least in principle' qualification captures the case in which a language does not include operators that shift the relevant parameters for contingent reasons. For example,

Are there such operators as ‘In some contexts it is true that’, which when prefixed to a sentence yields a truth if and only if in some context the contained sentence (not the content expressed by it) expresses a content that is true in the circumstances of that context? Let us try it:

(9) In some contexts it is true that I am not tired now.

For (9) to be true in the present context, it suffices that some agent of some context not be tired at the time of that context. [Example] (9), so interpreted, has nothing to do with me or the present moment. But this violates Principle 2 [i.e. the claim that indexicals are directly referential]! Principle 2 can also be expressed in a more theory-laden way by saying that indexicals always take primary scope. If this is true—and it is—then no operator can control the character of the indexicals within its scope, because they will simply leap out of its scope to the front of the operator. I am not saying we could not construct a language with such operators, just that English is not one. *And such operators could not be added to it.* (Kaplan 1989; numbering changed)

It’s useful to have an updated example of what a monstrous operator is supposed to be. Suppose that we had a monstrous variant of the English *say*, *say_{MONST}*, that shifts the context of evaluation of the embedded clause to the context of the reported speech act. The truth conditions of a sample sentence involving this verb, in (10-a), are in (10-b).

- (10) a. Mary says_{MONST} that I am hungry.
b. Mary says that she herself is hungry.

I will come back to more realistic examples (including operators that, by the lights of our best semantic analyses, are actually monstrous) in §6.

The ban on monsters yields our fourth and last step.

STEP 4: BAN ON MONSTERS (PRELIMINARY). No operators in natural language may shift context parameters.

The precise interpretation of the prohibition on monsters is controversial; I will provide a more precise formulation in §5.

MacFarlane (2014: pp. 83-4) imagines that a primitive language might not contain modal operators. As MacFarlane points out, as long as we identify contents and compositional semantic values (see §4), it is natural to still include a world parameter in the index of evaluation in a semantics for this language.

3.3 Taking stock

Over §§2–3, I have assembled a Kaplan-style semantic theory in four steps. In the rest of the paper, I’m going to argue that Steps 3 and 4 should be rejected, partially on conceptual grounds, and partially on empirical ones. This amounts to effectively undoing the conceptual shift promoted by Kaplan, and resetting the semantics of context dependence back to its pre-Kaplanian stage (i.e. ca. 1971, when the need for multiple indexing was recognized). Before doing so, though, I will start placing the prohibition on monsters in the broader picture of Kaplan’s views about semantics.

4 The one-tier theory and the two-tier theory

Our definition of semantic value needs to be updated in light of the conceptual distinction between context and index. One natural way to do so, and the one adopted by Kaplan, is to hold context fixed and define semantic values as functions from index parameters to truth values. Hence expressions are assigned semantic values relative to a context.

SEMANTIC VALUE OF α (RELATIVE TO c): $\lambda i. \llbracket \alpha \rrbracket^{c,i}$

Combined with the ban on monsters, this treatment captures the idea that semantic values are the formal objects in play in the compositional semantics.¹⁰

For Kaplan, however, semantic values don’t merely have a compositional role. Kaplan identifies semantic values with what he calls ‘what is said’, and what we nowadays call ‘content’. Contents are the objects that take center stage in a theory of speech act: they are the things that are asserted, registered on the conversational score, and believed as a result of successful assertion. One of the cornerstones of Kaplan’s theory of meaning is that semantic values and contents should be identified. More precisely: the semantic value of sentence S is identical to the content expressed by an utterance of S .

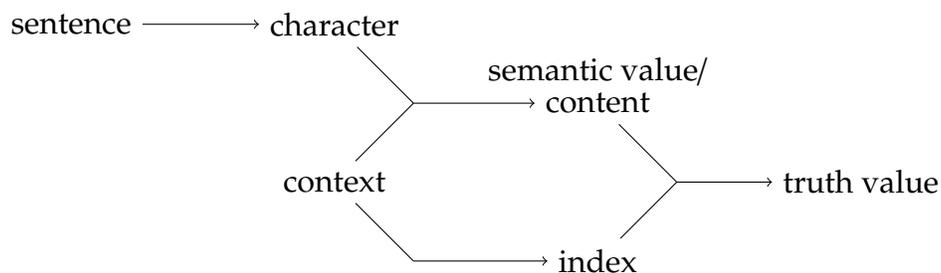
This identification of semantic values and contents carries heavy weight. If the objects that compose are also the objects that are asserted, we need a *two-tier theory*, i.e. a theory that uses two notions of meaning. One notion

¹⁰ There is a complication here. In *Demonstratives* (section VI), Kaplan also says that character is compositional, in the sense that characters of complex expressions are functions of characters of simple expression. But it is very clear just from his discussion of monsters that, according to him, no operator in natural language ever takes a character as argument. (Thanks to Eliot Michaelson for discussion here.)

(Kaplan's 'character') captures the stable meaning of a sentence, prior to any interaction with context. The second notion (Kaplan's 'what is said', or semantic value) is what does work in the compositional semantics.

Notice that, in the setup of the two tier-theory, context gets a special role in determining content. What an utterance says is in part determined by the relevant features of context. Conversely, index parameters don't contribute to content, but are just the circumstances at which the content is evaluated for truth and falsity.

Following custom, it's helpful to summarize the Kaplan picture in a diagram. From now on, switching to contemporary terminology, I use 'content' in place of 'what is said'.



The arrow from context to index represents the fact that context also fixes the value of the index parameters that are relevant for determining truth value. I return to this point when discussing the notion of truth at a context, in §8.

Let me emphasize that the two-tier theory is not mandated by any combination of: (i) multiple indexing; (ii) the distinction between context and circumstances; (iii) the claim that contexts are invariably proper; (iv) the prohibition on monsters. Rather, what drives Kaplan's choice is the identification of semantic value and content. Characters are too fine-grained to do work in a theory of assertion and update.¹¹ Conversely, semantic values, which are sensitive to a restricted set of coordinates, are close to the intuitive notion of a proposition, and hold promise of delivering the right result.¹²

11 Though some recent theories of asserted content use very fine-grained objects, structurally not dissimilar from characters: see e.g. [Ninan 2010a](#), [Ninan 2012](#); for a suggestive analogy, see also updates in dynamic theories of anaphora ([Heim 1982](#), [Groenendijk & Stokhof 1991](#)).
 12 [Lewis \(1980\)](#) makes an analogous point when describing the motivation behind the two-tier theory. He cites the following passage from [Stalnaker](#) as suggestive:

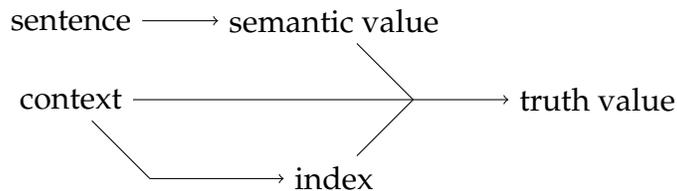
I need some argument for the necessity or desirability of the extra step on the road from sentences to truth values. This step is justified only if the

The identification of semantic values and contents has been questioned, in slightly different ways, since [Dummett 1973/1981](#), [Lewis 1980](#), and [Evans 1985](#), and it has come under heavy attack recently. I refer the reader to the literature for detailed discussion of the arguments.¹³ Here I just rehearse a simple line of thought from [Lewis 1980](#). The two notions are designed to serve different purposes within different theoretical enterprises. Semantic value is the key notion in a compositional theory of language, while content plays a role in theories of speech acts and attitudes. For reasons of economy, it would be convenient to use the same object to play both roles. But this is not something that we should in general expect, and certainly not something that we should take to be a constraint on our theorizing about meaning.

Once we deny that what composes needs to be identified with what is said, another option becomes available. We may use a single notion of semantic value, which maps n -tuples of context and index parameters to truth values.

$$\text{SEMANTIC VALUE OF } \alpha: \lambda \langle c, i \rangle. \llbracket \alpha \rrbracket^{c,i}$$

This notion of semantic value enters directly into compositional processes.



Lewis famously claims that the choice between the two-tier and the one-tier theory (in his words, the choice between variable-but-simple and constant-but-complicated semantic values) is not theoretically substantial. Both are admissible options.

middlemen — the propositions — are of some independent interest
 The independent interest in propositions comes from the fact that they are
 the objects of illocutionary acts and propositional attitudes. (Stalnaker
 1970)

(Stalnaker (p.c.) mentioned to me that he did not intend to motivate the endorsement of a Kaplan-style two-tier theory in this passage.)

¹³ See, among many, [Ninan 2010b](#), [Rabern 2012a](#), [Yalcin 2014](#). Interestingly, [Glanzberg & King 2017](#) defend the view that, as a matter of empirical fact, both roles are realized by theoretical entities of the same kind (i.e. propositions), but they still endorse the theoretical distinction between the two roles.

Below is a table summarizing Kaplan’s and Lewis’s positions.¹⁴

	<i>SV/content distinction</i>	<i>Monsters</i>	<i>One-tier vs two-tier</i>
KAPLAN	No	No	Two-tier mandated
LEWIS	Yes	No	Both admissible

5 Explicating the prohibition on monsters

5.1 The ban on monsters, made precise

The ban on monsters has generated substantial controversy. In part, this is because it is simply unclear what a monstrous operator, or context-shifter, is supposed to be. As [Predelli \(2014\)](#) points out, there are several conceptions of a monster, which are not in general equivalent (see also [Rabern & Ball 2017](#)).

I suggest that we characterize the prohibition on monsters in terms of what information the compositional semantics has access to during composition. Precisely:

- (BM) **BAN ON MONSTERS.** At any point in the compositional computation, the semantics has access to a full representation of the actual situation of speech. No sentential operator or other syntactic item may block access to this representation or alter it.

By ‘a full representation of the actual situation of speech’ I mean a set of coordinates that, together, uniquely identify the actual situation in which a speech act takes place. An example of such a representation would be a proper quadruple $\langle x_i, t_j, l_k, w_m \rangle$ of a speaker, a time, a location, and a world.

Let me make a few observations.

First, part of the debate about monsters focuses on why the notion of a monster is theoretically interesting.¹⁵ While this is obviously worth asking,

¹⁴ While I have not discussed this aspect of his system, [Lewis 1980](#) is very clear that he wants to hold on to the prohibition against monsters.

¹⁵ For example, [Schlenker 2003](#) spends substantial space linking the discussion about monsters to hyperintensionality; and [Rabern & Ball 2017](#) directly question the idea that the formal notion of a monster, defined simply as a shifter of a certain parameters, should have any theoretical interest: “It would make little sense for Kaplan to insist on banning formal monsters as such — why would anyone care whether natural language semantics requires a certain obscure technical gadget?”.

let me emphasize that BM seems an intrinsically interesting claim. Both philosophers of language and linguists should be interested in the link between linguistic representation and extralinguistic context, and on how the representation of context is handled in language.

Second, I am not claiming that BM is the unique correct way of construing Kaplan's claims in *Demonstratives*. In the end, it might be underdetermined what Kaplan exactly meant by 'monster'. I am singling out this characterization because it plays an important theoretical role, especially in light of recent empirical literature.

Third, the explicit talk of 'representation of the actual situation of speech' in BM aims at avoiding confusion. The noun 'context' may pick out either the concrete situation of speech or a representation thereof. On the former disambiguation, it is clear that there are no context shifters. Pieces of language are simply not the kind of things that may shift the physical circumstances of utterances. So it is obviously the latter disambiguation that is at stake in claims about monsters and context shift.

Fourth, *modulo* some qualifications¹⁶, BM is equivalent to the more standard characterization of the ban on monsters as a ban on 'context-shifters', or 'operators on Kaplanian characters'. In particular, BM is equivalent to:

BAN ON CONTEXT-SHIFTERS. Natural language contains no operators that display sensitivity to context parameters. I.e., for all expressions α and β such that $\llbracket O(\alpha) \rrbracket^{c,i}$ and $\llbracket O(\beta) \rrbracket^{c,i}$ are defined, and for all c,i , if $\lambda i'$. $\llbracket O(\alpha) \rrbracket^{c,i'} = \lambda i'$. $\llbracket O(\beta) \rrbracket^{c,i'}$, then $\llbracket O(\alpha) \rrbracket^{c,i} = \llbracket O(\beta) \rrbracket^{c,i}$.

I choose to use BM because it's simpler, and because it makes very clear that one of the central issues surrounding monsters is the semantics' ability to access information about the context.

Fifth, BM is a very weak way of construing the prohibition on monsters. It is compatible with the claim that lexical items that are normally considered indexicals — including *I*, *you*, or *here* — undergo shift. In fact, the semantic frameworks presented by Schlenker (1999, 2003) conform to BM, despite the fact that they are explicitly designed to produce indexical shift. It's helpful to go through a (simplified version of) one of Schlenker's systems to illustrate how this happens. I use the first system in Schlenker 2003.

Schlenker relativizes interpretation to a context and an assignment.

¹⁶ Strictly speaking BM is stronger, since the Ban on Context-Shifters allows that access to the c parameter could be blocked via some means other than items present in the syntax. I'm assuming that this is not a live option for the semantics of natural language.

(Following standard usage, I take an *assignment* to be a mapping of variable indices to objects.) Differently from Kaplan’s treatment, the semantic values of indexicals are not dependent directly on the context. Rather, Schlenker treats indexicals as functions from context-type entities to individuals, and stipulates that the language includes overt variables over contexts in the syntax. In addition, he postulates a distinguished context variable c^* , which is “set aside to refer to the actual context” (2003: p. 77). Some indexicals possess a special feature ‘+ c^* ’, which compels them (via a presupposition) to take as argument the dedicated variable c^* .¹⁷

(11) $\llbracket I \rrbracket^{c,s} = \lambda c' : c' = s(c^*)$. the speaker of c'

Just the presence of the distinguished context variable makes it the case that Schlenker’s semantics conforms to BM. The representation of the actual context remains accessible throughout the compositional computation.¹⁸

Part of the interest in focusing on BM is that, despite its weakness, it can be shown convincingly that it fails. This shows how far contemporary semantic work has taken us from Kaplan.

5.2 Stalnaker’s maneuver

On the face of it, BM seems an empirical thesis, focusing on the particular kind of information that is available in compositional processes in language. For my purposes, it is indeed crucial that it is an empirical claim. But a number of theorists (including, perhaps, Kaplan) have maintained that it is a kind of conceptual truth. Among them, Stalnaker (2014) has recently argued that we can rule out monsters on conceptual grounds. Let me turn to discussing Stalnaker’s argument, and showing why I believe it fails.

Stalnaker starts from the observation that, in semantic frameworks like Kaplan’s and Lewis’s (1980)¹⁹, the context parameters are simply defined as the parameters that cannot be shifted. We put in the index all shiftable parameters, and in the context all the rest. Hence the idea that we could have a shift of context is simply a confusion. Whenever we observe that a certain parameter is subject to shift, the right conclusion to draw is not that there is

¹⁷ Schlenker chooses a system of this sort because he wants to allow for some indexicals to shift, while others remain anchored to the actual context. As Deal 2017 convincingly argues, the empirical generalizations that have been unearthed after Schlenker suggest that a different system is preferable.

¹⁸ von Stechow 2002 also notices this point.

¹⁹ Stalnaker makes explicit reference to Lewis only, but it’s clear that for this purpose the divergences between Kaplan and Lewis are irrelevant.

context shift, but rather that that parameter belongs in the index. As a result,

The idea is that the index should include all of the "shiftable" elements. If one wanted to use a Lewisian context-index semantics to account for a language that shifted something that looked a lot like the abstract object that we use to represent context, then all we need to do is to put an object of this kind into the index ... There may be features of context that are not (also) elements of the index, and if there are, one cannot (in the Kaplan/Lewis semantics) have operators that "shift" those features. But one can always change the semantics by adding to the index features corresponding to them. (2014: pp. 27-8)

Hence, by performing this reclassification maneuver, we can hold on to the ban on monsters, which has the status of a conceptual truth.

So far as I can see, Stalnaker's argument begs the question. Of course, we might stipulate that the context should contain all and only unshiftable parameters. But Stalnaker seems to take for granted two key assumptions: (i) that there is always going to be a (non-empty) set of unshiftable parameters and (ii) that these parameters will invariably involve enough information to individuate uniquely a situation of speech. But (i) and (ii) are exactly what BM is supposed to establish.

To be clear: nothing prevents us from performing Stalnaker's reclassification maneuver and moving parameters to the index. But this might simply leave us with an empty set of context parameters, or anyway with a set that is insufficiently informative to identify a situation of speech. This would not be a vindication of Kaplan's picture in any interesting sense. (Moreover, as I point out in §7, if the context ended up empty we would get a collapse of the two-tier theory onto the one-tier theory.)

Hence, so far as I can see, Stalnaker's argument fails. The issue of whether the semantics can always access information about the speech situation cannot be settled on conceptual grounds. Rather, it is an empirical issue. This is unsurprising after all, given the large amount of attention that monsters have received in recent literature in linguistic semantics and typology. Moreover, as I'm going to point out, the fine-grained details of the semantics really matter in this case. As Schlenker's system shows, one can postulate a kind of indexical shift, and still be in compliance of BM. Let me now show why we have evidence for the existence of genuine context shift in natural language.

6 Natural language monsters

This section reviews some of the empirical arguments for the existence of monsters in natural languages, focusing on indexical shift in Zazaki (Anand & Nevins 2004, Anand 2006) and Nez Perce (Deal 2014).

6.1 Indexical shift in Zazaki

The contemporary literature on monsters spans a large variety of languages. Here I will focus on some examples concerning speech and attitude report verbs in non-European languages (see, among many, Schlenker 1999, 2003, 2004, Anand & Nevins 2004, Anand 2006, Sudo 2012, Deal 2014, Park 2017; for a thorough survey of the empirical literature, see Deal 2017). In particular, I focus on indexical shift in two sample languages, i.e. Zazaki and Nez Perce. But let me notice that the philosophy literature involves attempts at defending the presence of context shift in English, particularly in attitude reports and epistemic conditionals (Santorio 2011, 2012) and in the semantics of quantification (Rabern 2013).

Indexical shift in Zazaki has been discussed extensively by Anand & Nevins (2004: henceforth, A&N) and Anand (2006). A&N report that in Zazaki indexicals undergo a kind of optional shift in speech reports, specifically reports involving the verb *vano* (*say*). For example, sentence (12) has both the readings in (12-a) and (12-b).

- (12) Hεseni_j (mi_k-ra) va kε εz_{j/k} dεwletia
Hesen.OBL (I.OBL-to) said that I rich.be-PRES (A&N 2004)
- a. Hesen said that I am rich.
 - b. Hesen said that Hesen is rich.

The reading of interest is (12-b), where the first person pronoun *εz* picks out the producer of the reported speech act.

Prima facie, the data in (12) seems to involve context shift.²⁰ But, by itself, it is insufficient to establish the failure of BM. The fact that an indexical may be interpreted with respect to a shifted coordinate is still compatible with the availability of contextual information during composition. The argument

²⁰ One natural worry is that (12), at least on the relevant reading, might be interpreted as a direct, rather than an indirect speech report. But, as A&N point out, this hypothesis is ruled out by the fact that the clause embedded under *vano* can enter grammatical interactions with operators outside. For example, operators outside the clause can license NPIs inside the clause.

against BM requires a further observation.²¹

A&N notice that Zazaki indexical shift is subject to an important constraint. This constraint is observable in speech reports that embed other speech reports. A&N observe that indexical shift in the embedding speech report affects the interpretation of indexicals in the embedded speech report. In particular, if indexical shift happens in the higher clause, then indexicals in the lower clause cannot recover the actual coordinates of utterance. Once the context parameters are shifted once, the coordinates of the situation of speech are lost.

For illustration, consider the following scenario, adapted from A&N.

Andrew is the brother of the famous traitor Rojda. Understandably, he keeps this information secret from his new friends, Hesen and Ali. One day, Hesen finds out Andrew's secret and confronts him. Ali overhears, goes up to Andrew and says "Hesen said to you that you're Rojda's brother!"

Now consider (13), as uttered by Andrew:

- (13) Ali_A mi_U-ra va ke Hesen_H to_U-ra va ε_{Z{H,A,*U}} braye
 Ali me-to said that Hesen you-to said I brother
 Rojda-o
 Rojda-GEN
- Ali said to Andrew that Hesen said to Andrew that Hesen is Rojda's brother.
 - Ali said to Andrew that Hesen said to Andrew that Ali is Rojda's brother.
 - *Ali said to Andrew that Hesen said to Andrew that Andrew is Rojda's brother.

The crucial observation concerns (13-c), i.e. the reading where Andrew is reporting what Ali said in the relevant scenario. Notice that this is the reading where: (i) the second person indexical in the higher clause is shifted, picking out the addressee of the first reported speech act (i.e., Andrew); (ii) the first person indexical in the lower clause refers to the actual producer

21 Previously to A&N's paper, monstrous-seeming operators of sorts had been discovered for a variety of languages, including e.g. Amharic: see Schlenker 1999, 2003. Tellingly, though, it was unclear whether the kind of shift described by Schlenker should be properly considered monstrous; see Heim (2002) and von Stechow (2003, 2002), for attempts at capturing the Amharic data in a nonmonstrous system. As Deal (2017) observes, the features of indexical shift in language like Zazaki and Nez Perce create substantial problems for these early systems, and encourage the shift to A&N-style operator-based systems.

of the utterance. Differently from the other reading in (13), this reading is unavailable. Once we shift indexicals in the higher clause, we cannot have unshifted indexicals in the lower clause.²² To capture this, A&N suggest the following constraint.

NO INTERVENING BINDER

A shiftable indexical i_1 cannot pick up reference from a context c_1 if there is an intervening context c_2 which another indexical i_2 picks up reference from. (Anand 2006)

I will say more soon about how A&N predict No Intervening Binder. But, already at this stage, it is clear that NO INTERVENING BINDER is incompatible with BM.

Let me also highlight a second constraint applying to Zazaki indexical shift. This will be useful in the comparison with Nez Perce, as well as in the discussion in §7. This second constraint concerns the availability of shifted readings in clauses containing multiple indexicals. Zazaki indexical shift is optional, as I mentioned. But, when it happens, all indexicals in a clause have to shift together. We cannot have ‘mixed’ cases, in which a clause contains a shifted and an unshifted indexical. For an example, consider:

- (14) *Vizeri* *Rojda Bill-ra va ke ez to-ra miradiša*
 Yesterday *Rojda Bill-to* said that I *you-to* angry.be-PRES
- Yesterday *Rojda* said to *Bill*, “I am angry at you.”
 - Yesterday *Rojda* said to *Bill*, “AUTH(c^*) is angry at ADDR(c^*).”
 - *Yesterday *Rojda* said to *Bill*, “AUTH(c^*) am angry at you.”
 - *Yesterday *Rojda* said to *Bill*, “I am angry at ADDR(c^*).”

(14) contains two indexicals. Hence, in principle, it allows for four readings, depending on whether each of the two indexicals is individually shifted or not. However, only two of these four readings are actually observed: the reading where both indexicals shift, and the reading where neither shifts. The ‘mixed’ cases are ungrammatical. This suggests the following constraint:

SHIFT-TOGETHER

All indexicals within the same clause must pick up their reference from the same context.²³

22 Notice that we still have a choice: we can have the first person indexical refer to the producer of the first or the second utterance. I.e., the lower clause may either ‘inherit the context’ of the higher clause, or shift twice over.

23 More specifically, A&N speak not of a clause but rather of a ‘speech-context domain’, defined as “the scope of a verb-of-saying up to the scope of the next c-commanded verb-of-saying”.

6.2 Indexical shift in Nez Perce

It is worth looking at a second case study, namely Nez Perce (Deal 2014, 2017). Nez Perce mirrors Zazaki in a crucial respect: it vindicates No INTERVENING BINDER. Once an indexical shifts, the relevant contextual coordinate is not available any more (see Deal 2017: p. 30 for relevant evidence). At the same time, SHIFT TOGETHER fails in Nez Perce. When two indexicals appear in the same clause, it may be that one has a shifted reading and the other doesn't. The following example (from Deal 2014) shows a case where the first person indexical is shifted, but the location indexical *kíne* ('here') is not.

Context: my friend is calling me on his cellphone and describing his location. He is trying to make it to Lapwai, but he is lost.

- (15) pro_{subj} hi-hi-ce- \emptyset [pro_{subj} kíne
 pro 3SUBJ-say-IMPERF-PRES [pro here
 \emptyset -paay-ca- \emptyset] met'u weet'u pro_{subj}
1SUBJ-arrive-IMPERF-PRES] but not pro
hi-paay-ca- \emptyset kíne
3SUBJ-arrive-IMPERF-PRES here

'He says he is arriving here, but he is not arriving here.'

As a side note: as Deal emphasizes, indexical shift in Nez Perce is not fully unconstrained. Only some mixed cases are allowed: for example, it is impossible to have the converse case of (15), i.e. to shift the locative *kíne* but not the first person (see Deal 2014: p. 10 for relevant evidence).²⁴

6.3 Overwriting the context

The data that support No INTERVENING BINDER are hard to capture on a standard Kaplanian system. But, as A&N show, they can be predicted in a very elegant way by a system that allows for context shift. For the case of Zazaki, A&N suggest that indexical shift is performed by a 'context

²⁴ Deal claims that this is part of a much broader generalization concerning the availability of indexical shift. This generalization suggests that, across languages, indexicals are consistently arranged on a hierarchy of the form '1st person > 2nd person > locative'. Indexicals that appear later on in the hierarchy (i.e. to the right) may only shift in a clause if indexicals that are higher in the hierarchy (i.e. to the left) also shift.

overwriting' operator, which schematically has the following meaning:²⁵

$$\llbracket \text{OP } \alpha \rrbracket^{c,i} = \llbracket \alpha \rrbracket^{i,i}$$

Note that `OP` works by simply deleting the context and replacing its coordinates with index coordinates. As A&N points out, this immediately predicts `NO INTERVENING BINDER`: below `OP`, information about the actual situation of speech is lost once and for all. The case of Nez Perce can be dealt similarly—only, we have to assume that there is not one `OP`, but several of them, one for each of the indexicals that shift (see Deal 2017).

As I argue below, the contrast between Zazaki and Nez Perce is also instructive. The failure of `SHIFT-TOGETHER` illustrates that the semantics doesn't, in general, deal with contextual parameters 'in a bundle'. Rather, it manipulates contextual coordinates individually. This will turn out to be important in order to show that the compositional semantics doesn't manipulate a context parameter.

Finally, let me point out a further feature of indexical shift in Zazaki and Nez Perce.²⁶ In these languages, indexical shift is *global*. All indexicals are subject to shift (though, for Nez Perce, they don't necessarily all shift at the same time). This will also play an important role in the arguments below.

7 Context-free compositional semantics

This section draws theoretical conclusions from the facts surveyed in §6. The upshot is that the overall picture of semantic theory sketched in §4 should be overhauled. First, *contra* Kaplan, the one-tier view is not only permissible, but mandated. Second, contexts, understood as representations of proper situations of speech, don't figure among the parameters used by the compositional semantics. The notion of a context is not a compositional notion, but rather (in the terminology of MacFarlane 2003, 2005, 2014) a postsemantic notion, i.e. a notion employed at the level of theorizing at which we define truth and logical consequence.²⁷

²⁵ As A&N explicitly acknowledge, `OP` is a contemporary implementation of Stalnaker's (1978) celebrated 'dagger' operator.

²⁶ Possibly Korean is a third such language; see Park 2017.

²⁷ I should point out that my conclusions are in broad agreement with those drawn in Rabern 2012b, 2013. But I also have points of disagreement with Rabern. In particular, I disagree with the claim (in Rabern & Ball 2017) that no interesting notion of a monster can be extracted purely by looking at the formalism. Anand & Nevins' `OP` operator, which entirely wipes away all the context parameters, is exactly an example of a theoretically interesting monster.

7.1 Monsters and the two-tier theory: the basic argument

As I have mentioned in §4, Kaplan’s endorsement of the two-tier theory is not mandated by the prohibition on monsters. At the same time, the two claims are not independent: in particular, as Rabern (2012a, 2013) has emphasized, the failure of BM is in tension with the endorsement of the two-tier theory.

Recall that, on the two-tier theory, content plays double duty as the object that is asserted and the object that takes part in compositional interactions. Now, suppose that our language includes an operator O that is able to shift context parameters. The way to model this shift compositionally is to perform lambda-abstraction on the context parameter and use the functions from contexts to semantic values as the argument of O . As a result, the item that composes with O is the one-tier theory semantic value of its argument. Formally:²⁸

$$\llbracket O(\alpha) \rrbracket^{c,i} = \llbracket O \rrbracket^{c,i}(\lambda c. \lambda i. \llbracket \alpha \rrbracket^{c,i})$$

Hence, the object that we use in the compositional semantics is different from Kaplanian content. This undercuts the motivation for the two-tier theory.

In summary: the failure of BM provides us with a simple and powerful argument against the two-tier theory.

- (P1) A two-tier theory for natural language is viable only if BM is true.
- (P2) BM is false.
- (C) The two tier-theory is not viable.

7.2 Retreat to fine-grained contents?

The previous paragraphs set out the basic line of argument against the two-tier theory. Now I want to emphasize that the data in §6 allow us to establish this conclusion in a particularly robust way.

Its existence is the basis of the argument that I’m running in this section. Unfortunately, here I don’t have the space to address Rabern and Ball’s concerns in further detail here.

²⁸ In the background, I’m assuming a generalized composition rule that mirrors Heim & Kratzer’s (1998) Intensional Functional Application.

Monstrous Functional Application

If α is a branching node and $\{\beta, \gamma\}$ the set of its daughters, then, for any context c , index i , and assignment g : if $\llbracket \beta \rrbracket^{c,i,g}$ is a function whose domain contains $\lambda c'. \lambda i'. \llbracket \gamma \rrbracket^{c',i',g}$ then $\llbracket \alpha \rrbracket^{c,i,g} = \llbracket \beta \rrbracket^{c,i,g}(\lambda c'. \lambda i'. \llbracket \gamma \rrbracket^{c',i',g})$

For examples of such a rule, see the systems in Anand 2006: p. 73 and Santorio 2012.

To resist the argument, the two-tier theorist may mimic what I have called ‘Stalnaker’s maneuver’: we deny that there is context shift by relocating the offending shiftable parameter to the index. For concreteness, it’s useful to illustrate the point with a particular example. I choose the case of assignments, which has been the subject of debate lately.

On a classical picture, assignments are taken to be part of the parameters that determine content.²⁹ Take a sentence containing an assignment-sensitive item, like *she*:

(16) She₁ is hungry.

The content that is standardly associated to an utterance of (16) at *c* is a proposition that is true iff the individual denoted by *she*₁ at *c* is hungry. In other words, the assignment is standardly counted among the parameters that contribute to fixing content, and hence among the content parameters. As a result, the content of (16) is:³⁰

(17) Content of (16) at *c*: $\lambda w'. \llbracket \text{She}_1 \text{ is hungry} \rrbracket^{c,w',g_c}$

Rabern (2013) points out that a compositional treatment of assignments places them on a par with index parameters. Just like the world of evaluation parameter is shifted by modals, assignments are shifted by lambda-abtractors or quantifiers. Rabern concludes that the semantics of variables in standard systems is monstrous.

In response, the two-tier theorist has a retreat option: they may relocate the assignment in the index and, as a consequence, assume a more fine-grained notion of content.³¹ In the resulting system, the content of (16) is not a proposition, but rather a function from assignments to propositions.

(18) New content of (16) at *c*: $\lambda g'. \lambda w'. \llbracket \text{She}_1 \text{ is hungry} \rrbracket^{c,w',g'}$

One might have various qualms about fine-grained contents of this sort. But this is unimportant; given the data in §6, this strategy is simply a

²⁹ At least, this is what happens in Kaplan’s official Logic of Demonstratives (LD), as well as in implementations of Kaplan’s ideas in contemporary semantic frameworks. Kaplan makes some seemingly conflicting remarks in the *Afterthoughts* (1989b). See Rabern 2012b: ch. 1 for discussion of this point.

³⁰ Aside: Kaplan uses temporally neutral propositions, i.e. sets of world-time pairs. More recent writers in Kaplan’s lineage, e.g. King 2003, use standard possible worlds propositions.

³¹ Other lines of reply to Rabern are provided by Glanzberg & King 2017. Unfortunately, I don’t have the space to discuss Glanzberg and King’s arguments here. Let me just say that I can’t see how those arguments could be applied to recapture the Zazaki and Nez Perce data in a Kaplanian framework.

nonstarter. Languages like Zazaki and Nez Perce show that indexical shift can be global: all indexicals in the language are subject to shift. As a result, if we relocate to the index all shiftable parameters, we find ourselves with no context parameters. The context, understood as a set of parameters, is empty. In such a situation, semantic values simply coincide with Kaplanian characters; hence the two-tier theory collapses onto the one-tier theory.

Let me take stock. I have argued that the evidence in recent empirical literature makes a strong case that there are no unshiftable parameters in natural language. As a result, the one-tier theory is mandatory. This takes away from context one of its two special roles. In Kaplan's two-tier system, context parameters, differently from index parameters, contribute to fixing semantic values. In one-tier systems, all parameters are alike from the point of view of the compositional semantics. Semantic values are simply functions from context and index parameters to truth values.

The table below summarizes the classical views of Kaplan and Lewis, together with the view that a post-monsters theorist should hold.

	<i>SV/content distinction</i>	<i>Monsters</i>	<i>One-tier vs two-tier</i>
KAPLAN	No	No	Two-tier mandated
LEWIS	Yes	No	Both admissible
PM THEORIST	Yes	Yes	One-tier mandated

There is one more claim to establish in the route to a context-free semantics. Let me turn to that now.

7.3 Against propriety

The foregoing shows that one of the two special roles of context, i.e. fixing semantic values, needs to be dropped. But, recall, Kaplan claims that contexts also play a second key role: they are needed to generate the correct notion of logical consequence. In particular, Kaplan wants to capture the intuition that sentences like (7), repeated below, are a kind of logical truth.

(7) I am here now.

For (7) to count as a logical truth, the argument goes, we need the semantics to model the sequence of indexical-fixing parameters via proper n -tuples. Concretely: for (7) to count as a logical truth, we need the triple $\langle x_i, t_j, l_k \rangle$

that is used to fix the values of (respectively) *I*, *now*, and *here*, to be proper. But proper triples really are just representations of contexts; hence the compositional semantics should help itself to contexts.

For clarity: what the argument purports to establish is that the semantics needs context-type objects to handle indexicals. Hence, even if the prohibition on monsters fails, context-type objects — objects that model situations of speech — are a necessary feature of the semantics. This would show that, despite the failure of the prohibition on monsters, contexts still have a role to play in the semantics.

I already mentioned in §3 that Kaplan’s argument is unsound; I put off discussion of this point to the next section. For the moment, I want to notice that there is a direct route to establishing, *contra* Kaplan, that points of evaluation have to include improper *n*-tuples of context parameters. This route relies again on the data in §6.

The key evidence comes from languages that allow for context shifts but violate SHIFT-TOGETHER, like Nez Perce. Recall that, in Nez Perce, we may have in the same clause a shifted indexical and an unshifted one (with some constraints that are irrelevant here). Here is a key example, repeated from §6:

- (15) pro_{subj} hi-hi-ce- \emptyset [pro_{subj} kíne
 pro 3SUBJ-say-IMPERF-PRES [pro here
 \emptyset -paay-ca- \emptyset] met’u weet’u pro_{subj}
1SUBJ-arrive-IMPERF-PRES] but not pro
hi-paay-ca- \emptyset kíne
3SUBJ-arrive-IMPERF-PRES here

‘He says he is arriving here, but he is not arriving here.’

Crucially, in the clause embedded in the speech report, the first person indexical is shifted and the locative indexical is not. As a result, we have no guarantee that the two pick up their reference from a proper sequence of parameters. In fact, just for the case of (15), we can be certain that they won’t: the speech act that is being reported implies that the agent picked out by *I* is not yet at the location picked out by *here* in the relevant world.³²

This point generalizes. A large number of languages allow for individually shifted indexicals.³³ Whenever this happens, we have no guarantee that the

32 More precisely: the content of the speech report will involve quantification over improper *n*-tuples of context parameters. See Deal 2014 for the details of the semantics.

33 An incomplete list of languages that behave like Nez Perce in this respect includes: Amharic, Slave, Uyghur, Tamil. See Deal 2017 for a through overview of the literature.

parameters from which indexicals pick up their reference will form a proper sequence.

7.4 Return to multiple indexing

In summary: recent empirical work on monsters shows that there is no theoretical difference between parameters that fix the reference of indexicals and standard index parameters. In the first place, they are all shiftable; moreover, they are all individually shiftable. The conclusion that I suggest is that, from the point of view of their functional role in the compositional semantics, all parameters are alike. The distinction between context and index is a distinction without a difference, and we should drop it. We don't have a context and an index; rather, we have a large index that contains multiple parameters of the same kind (for example, multiple time parameters). This means returning to the multiple indexing theories that were formulated before Kaplan.³⁴

To be clear, I am not suggesting that we simply remove from the compositional semantics the parameters that we used to track in the context. Rather, I am suggesting that we pack those coordinates in an extended sequence, exactly as it happened in multiple indexing systems. Hence, for example, the new form of a semantic clause is:

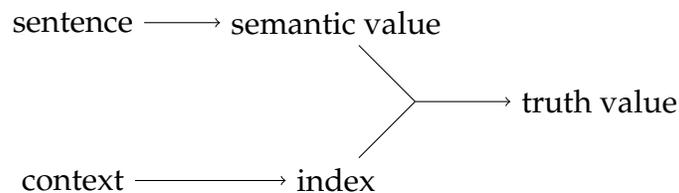
$$(19) \quad \llbracket \alpha \rrbracket^{\langle x_1, t_1, w_1, t_2, w_2, \dots \rangle} = \text{true iff } \alpha \text{ is true at } x_1, t_1, w_1, t_2, w_2, \dots$$

Accordingly, the shift from multiple indexing that Kaplan promoted did not amount to introducing some extra parameters. Rather, Kaplan's key suggestion was that some of these parameters should be assigned a special theoretical role within semantic theory. I am questioning precisely the claim that these parameters should have a special role.

Let me also remark that I'm not proposing that we expunge context from our semantic theorizing altogether. Context still plays a role in fixing the initial values of index parameters. But semantic values are purely functions

³⁴ Here I'm skirting over a further reason why we might need a context after all. Lewis claims contexts to be indispensable because in semantics we need to recover information about "indefinitely many features of contexts" (1980: p. 87), and (for some suitable modal flavor of 'cannot') we "cannot expect to recover" all the relevant information from a sequence of parameters. I find this argument extremely puzzling. I don't see why it should be theoretically impossible to encode all the relevant information in a sequence of parameters. In fact, it seems that the relevant information may be tracked perfectly adequately by the assignment parameter, which is already part of all standard semantic setups.

from indices to truth values.³⁵



In the next section, I try to be more precise about the role of context in the theory.

8 Contexts and postsemantics

In §7 I have argued that the compositional semantics makes no use of a notion of context, understood as a sequence of parameters that are interestingly different from index parameters. I still owe an explanation of how we can hold this view and still capture the notion of logical truth that Kaplan defines in his Logic of Demonstratives.

To start, recall the problem posed by (7):

(7) I am here now.

We need our overall theory to register the fact that (7) "is deeply, and in some sense ... universally, true". At the same time, we should make sure we don't end up overgenerating validities.

It is helpful at this stage to consider (a simplified version of) Kaplan's own definition of validity in his Logic of Demonstratives. The first step is defining the notion of truth of a sentence relative to a context. In modern notation, here is Kaplan's definition (assuming an arbitrary index i).³⁶

Truth at a Context (classical)

Sentence ϕ is true at context c iff $\llbracket \phi \rrbracket^{c, i_c} = \text{true}$.

(where, for $i = \langle w_i, t_j, l_k, \dots \rangle$, i_c is the sequence $i = \langle w_c, t_c, l_c, \dots \rangle$ of the values of index parameters fixed by the context)

³⁵ This picture is already hinted at in Santorio 2012, though there the only argument to support it is an argument from simplicity and economy of theory.

³⁶ The mechanics of Kaplan's official formulation is somewhat different: Kaplan appeals to the notion of the content of a sentence at a context and it exploits universal quantification over assignments, in the style of Tarski 1936. The difference is irrelevant for our purposes.

From here, Kaplan defines validity in terms of truth at a context.³⁷

Kaplan Validity

$\models \phi$ (ϕ is valid) iff, for every context c , ϕ is true at c .

This notion of validity declares (7) a logical truth, as desired.

Now, can this result be replicated if we start from a compositional semantics that makes no use of a notion of context? Let me start by emphasizing a crucial feature of Kaplan's definition of truth at a context. That definition uses the context to fix the values of index parameters to the relevant circumstances of the context. This restricts the points of evaluation that we check for validity. To see why this is crucial, suppose that we use as points of evaluation n -tuples $\langle w_i, x_j, l_k, t_l \rangle$ consisting of a world, a speaker, a location, and a time; and now consider again (7). Since (7) contains no modal indexicals, the world that we use to evaluate it has to be the world determined by the index. Now, if we didn't restrict consideration to proper points of evaluation, we would have to consider also points $\langle w_i, x_j, l_k, t_l \rangle$ where x_i is *not* at l_k at t_l in the relevant world w_i . Hence (7) would not be predicted to be valid.

For another illustration: the same restriction mechanism is responsible for the fact that Kaplan's Logic of Demonstratives declares valid also sentences that don't contain indexicals and are not first-order valid. One example is (see Kaplan 1989a: section XIX):

(20) Someone exists.

Despite the absence of indexicals, (20) is valid. The reason is that, to check its validity, we only check proper points of evaluation; all proper points of evaluation include a speaker, hence it is true that someone (namely, the speaker) exists at those points.

At this point, it's easy to see how we can define a notion of validity that is analogous to Kaplan's, even in a context-free semantics.³⁸ We can simply

³⁷ This is a simplification. As usual in formal logic, Kaplan uses a notion of a structure, which he defines as a sequence of contexts, worlds, individuals, locations, times, and an interpretation function. Validity is defined as truth at all contexts in all structures. This difference is irrelevant for our purposes.

³⁸ Notice: 'analogous' does not necessarily mean 'extensionally equivalent', though for reasons that are orthogonal to our concerns here. The reason is that all the monstrous semantics we are considering allow for shifts of context in speech and attitude reports. Kaplan's official Logic of Demonstratives doesn't contain speech reports or attitude verbs (see section XX of Kaplan 1989a for some informal remarks), hence we don't have any precise verdicts about what sentences involving speech and attitude verbs may come out valid. But, for those cases, we might expect divergences between the validities generated by a Kaplan-style

adapt Kaplan's definition of truth at a context, letting truth at a context be truth of a sentence relative to the circumstances of the context.

Truth at a Context (new)

Sentence ϕ is true at context c iff $\llbracket \phi \rrbracket^c = \text{true}$.

From here, we may simply go on to use Kaplan's own definition of validity. It is easy to check that sentences like (7) and (20) are still valid on the new notion. It is also easy to check that this notion does not overgenerate, invalidating sentences like

(8) Necessarily, someone exists.

Let me close with two considerations. First, my suggestion about validity is hardly new. Montague (1968) already suggested that we can define validity for a language involving context dependent items just by restricting consideration to an appropriate set of points of evaluation. Second, the new definition of truth at a context illustrates in a very concise way what the right place for context is. Context does not belong in the compositional semantics. Rather, context is a postsemantic notion, i.e. a notion that is essential for defining, starting from the compositional semantics, appropriate notions of truth and validity.

9 Conclusion

Kaplan argued that the context parameter plays two key roles, which set it apart from other coordinates used in the compositional semantics. First, context contributes to determining the content expressed by an utterance. Second, contexts, understood as proper n -tuples, are crucial for defining an appropriate notion of logical consequence. One by-product of these special roles is that, while other semantic coordinates are routinely shifted by dedicated operators, context is unshiftable: a representation of the situation of speech is available at any point in the compositional process.

I have argued that, in light of recent work about context shift, we should revise this picture. Context parameters are subject to shift, exactly like all other parameters; moreover, exactly like other parameters, they can be shifted one at a time. So, from a compositional point of view, there is nothing special about context. Hence we should revert back to a multiple indexing theory, on which all parameters are treated on a par. To be sure, context still plays

semantics and a monstrous semantics.

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an important role at the postsemantic stage, in the definitions of truth and validity. But the compositional semantics for natural language is context-free.

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