

# Pluralism for Relativists: a new framework for context dependence

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## 1 Introduction

Relativism about truth can take various forms. The interesting relativism, according to MacFarlane, is what he calls *assessment-sensitivity*. To show that usual forms of relativism in semantics don't enter the interesting territory of relativism and thus to motivate assessment-sensitivity, MacFarlane puts considerable time distinguishing assessment-sensitivity from non-indexical contextualism. The difference is brought about by considering retraction data. For this paper, by considering retraction data, we argue that whether speakers think that they should retract a taste utterance they made in the past does not have a clear answer.<sup>1</sup> The intuition and the data suggest that some people do think it appropriate to retract a previously made taste utterance and some people don't. Given this variance, we suggest a framework for context-dependence, which makes room for both assessment-sensitivity and non-indexical contextualism. Whether a given utterance is relativist in the assessment-sensitive way or in the non-indexical contextualist way, we think, depends on the interpreter of the utterance. This accounts for the variance in the judgments concerning whether one should retract a past taste utterance or not. In this paper, we spend more

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<sup>1</sup>Although we expand on what sort of utterances we take to be taste utterances, we have in mind the usual utterances of personal taste like *Licorice is tasty*. Also note that although we primarily consider retraction data about predicates of personal taste and epistemic modals, the scope of this paper extends to all language for which a relativism of the two sorts can be argued for.

time in sketching a workable formalism for the proposal, and less time on philosophical underpinnings and implications of such a relativized relativism, so to speak.

In the process of cashing out the proposed formalism, we pay significant attention to what Belnap, Perloff, and Xu (2001) call *initialization*.<sup>2</sup> *Initialization* may be thought of as another word for determination of a parameter in the index of evaluation by the context. However, it highlights an important feature of the Kaplanian context-dependence picture: that before any shifting (of a parameter) occurs, there's an initial value of the parameter in the index of evaluation set by the context of utterance. We propose a formalization of initialization. Obviously, it doesn't hurt to make the theory more precise by formalizing an important step of meaning composition. In addition however we also present reasons to think that initialization is not just a way of speaking, but a process that requires formalization. We also highlight methodological reasons. Let's explicitly state the two aims of this paper:

- (1) Formalizing initialization
- (2) Proposing a formal model that makes space for both assessment-sensitivity and non-indexical contextualism in an overall semantic theory

If (1) and (2) were unrelated, then it would be strategically poor to discuss both in a short paper. We think that (2) crucially relies on (1). It is in our choice of model that we use for (1) that makes it amenable to the sort aims associated with (2).

***Plan for rest of the paper:*** In §2, we explain the basic Kaplanian picture of context-sensitivity in which both assessment-sensitivity ( $R$ ) and non-indexical contextualism ( $C$ ) are couched. In §3, we explain the difference between  $R$  and  $C$ . Here, we discuss the significance of retraction data. In §4, after reflecting on some retraction data, we suggest a pluralism that makes space for both  $R$  and  $C$ ; here we also motivate formalizing initialization. In §5, we sketch a formal model that achieves the aims outlined in §4.

## 2 Context-Sensitivity

The usual story with Kaplan's two-dimensional framework starts with interpreting each expression in language relative to a context and an index. What are contexts and indices? For Kaplan, context models the actual context of speech. Then, accordingly, a context is taken to include a speaker/author, a world, a time, a location, etc. More formally, a context  $c$  is taken to be a sequence of such parameters. Relativizing interpretation of each expression to a context formally amounts to relativizing the standard interpretation function  $[[\cdot]]$  to  $c$ , as in  $[[\cdot]]_c$ . This increases the expressive power of our semantic theory, as we can easily define a single unambiguous rule that determines reference of indexicals such as

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<sup>2</sup>Also see Belnap and Green 1994.

*I* and *now*.<sup>3</sup> However, modal and temporal displacements are key features of natural language. In easier terminology: we can use language to talk about what can be, what was, etc. instead of strictly talking about what actually obtains at present. Then, there should be some way of shifting the parameters of the context, which models the actual context of speech, to parameters which are relevant for interpreting a given utterance. All cool, one can say, and suggest that there are operators in language that can change a context  $c$  in such a way that the changed  $c'$  differs from  $c$  in its value for one of its parameters. In other words, one can simply suggest shifting say the time parameter of  $c$  to an earlier time for interpreting past utterances.

There are principled reasons to resist the above move. Let's consider two such reasons briefly. It is argued (cf. Rabern and Ball 2019) that context for Kaplan has a theoretical role – that of generating content, where content is what one believes and asserts. Then a semantic theory must make space for a step in meaning composition where we obtain what we take to be the object of belief and speech acts. Secondly, Lewis (1980) notes that context is just not the sort of thing that one can shift. John can talk about matters before John was born, but if we were to shift the time parameter of such a context, we would get a context with a time before John was born with John in it. So, we come far away from the independent motivations of modeling the actual context of speech for which we posited  $c$  in the first place.

The more reasonable move to incorporate temporal and modal displacement in a semantic theory is to keep  $c$  as it is, but posit an artificial object, call it *index* ( $i$  for short), such that it is a sequence of those parameters of  $c$  that are shiftable. Now, we have two objects to relativize  $[[\cdot]]$  to, as in  $[[\cdot]]_c^i$ . Accordingly, we also get a division of labour between  $c$  and  $i$ , and a two step procedure to go from an expression to its extension.<sup>4</sup> To take an example, for a sentence  $S$ , at  $c$ , first a content is generated. What this content looks like will depend on what you take content to be, but for now, we can take it to be a set of world-time pairs.<sup>5</sup> Once this content is generated, at the time and world coordinate of the index, we get a truth-value; 1 iff the world-time pair that constitutes the index belongs to the content generated at  $c$  for  $S$ , 0 otherwise. In other words, some semantic rules (*character* for Kaplan) determine the content at  $c$ . Content in turn is a function that takes the index to some extension. Here, we don't spend any more time arguing for why this framework is preferable to other alternatives, but the above considerations serve to show at the very least that the Kaplanian picture is well-founded as a formalism with underlying theoretical and formal considerations.<sup>6</sup>

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<sup>3</sup>See Pickel et al. 2018

<sup>4</sup>Obviously, the two step procedure is not essential to context-dependence as Lewis (1980) argues; uncurrying the two functions gives us one function.

<sup>5</sup>cf. Lewis (1979) and Perry (1979).

<sup>6</sup>For a critique, see Santorio (2017). Also see Schlenker 2003, Anand & Nevins (2006), Deal (2020).

Both  $R$  and  $C$  are positions couched in the above framework. Before we shift our discussion to  $R$  and  $C$ , let us make a brief comment on the importance of initialization in a theory of context-dependence. Note that a compositional semantics for  $S^\square$ , a sentence with a modal or temporal operator, will require evaluation of the content of  $S^\square$  relative to a world or time determined by comparison to the world or time of the context. Thus, the values of the parameters of the index, before any shift, are set by the context. As these are the initial values of the index, we can say that the context initializes the parameter values in the index. This locution of *Initialization* comes from Belnap, Perloff, and Xu (2001). Not only, as we said, we provide a formalization of initialization, the notion is also important in understanding the difference between  $R$  and  $C$ . The above background on the Kaplanian context-dependence framework suffices to talk about MacFarlane’s co-opting of it for assessment-sensitivity.

### 3 Relativisms

Now, MacFarlane would insist on considering only assessment-sensitivity as the interesting relativism. Although we agree, we don’t think it is important for us to convince the reader of that for the purposes of this paper. Therefore, the title of this section *Relativisms* is meant to include both assessment-sensitivity and non-indexical contextualism. Here, we first sketch a picture of non-indexical contextualism, and then introduce assessment-sensitivity. This sets up the stage to bring out the differences in how each handles retraction data.

#### 3.1 Non-indexical contextualism

Now, it would help to introduce some data about predicates of personal taste. Take for instance, (3) and (4).

- (3) Licorice is tasty.
- (4) Licorice isn’t tasty.

Before we dive into the formalism, the conceptual point of non-indexical contextualism can be illustrated by considering a speaker, say John, who likes licorice. Now, *inter alia*, John constitutes a context. Non-indexical contextualist would further say that the context of utterance of (3) or (4) also includes a taste standard ( $g$  (gastronomic) for short) as a parameter. Then, where  $\langle w, t, g \rangle$  is an index comprising a world, time, and taste parameter, one can define a compositional semantics for *tasty* as in (5).

$$(5) \quad \llbracket \textit{tasty} \rrbracket_c^{\langle w, t, g \rangle} = \lambda x. x \text{ is tasty according to } g \text{ at } t \text{ in } w$$

Given the compositional semantics in (5), the content expressed at  $c$  is a set of world-time-standard triples. So, in addition to worlds and times, we can let contents be sensitive to taste standards as well. The step that follows is evaluation of this expressed context at  $c$  with respect to a set of parameters of a given

index, which, without any shift, constitute the world, time, and taste standard of  $c$ , the context of utterance. We can call such an index – one containing initial values of a set of parameters – the index of the context. (3) comes out true in  $c$  as the taste standard  $g$  of  $c$  is such that licorice is tasty according to  $g$  in  $w$  at  $t$ . Given the above sketch, we can arrive at a definition of truth of a proposition in such a picture.<sup>7</sup>

- (6) A proposition  $p$  is true as used at a context  $c$  iff  $p$  is true at  $\langle w, t, g \rangle$ .

This looks like a good picture capturing context-sensitivity of contents to taste.<sup>8</sup> Now, we turn to assessment-sensitivity.

### 3.2 Assessment-sensitivity

As we see it, what distinguishes assessment-sensitivity from non-indexical contextualism, on a formal level, are (7), (8), and (9).

- (7) Positing two contexts relevant for initialization of the index.
- (8) Defining the truth of a proposition/sentence w.r.t. two contexts.
- (9) Letting the role played by one of the two contexts in (8) to be associated with assessment of the proposition/sentence.

In what follows, we expand on (7)-(9), and then by considering retraction data, bring out the differences in predictions between non-indexical contextualism and assessment-sensitivity. Let's consider (7)-(9) now.

Let's introduce two contexts as being relevant to a given proposition/sentence. One of these contexts is the context of use, where the proposition or sentence is used to make an utterance. The other relevant context is that of assessment, where the utterance is assessed for truth. Now, given that we have two relevant contexts, a natural question about the parameter values in the index arises. Remember that in the Kaplanian framework, a given sentence is interpreted with respect to a context and an index, and we let the index comprise parameters whose values are initialized by the context. Now that we have two posited contexts, it doesn't make sense to say that the parameter values in the index are

<sup>7</sup>This definition of truth of a proposition is stated in the style MacFarlane adopts in his 2014 (cf. MacFarlane 2014, 105).

<sup>8</sup>Note that both non-indexical contextualism and assessment-sensitivity assume contents to be simple in that they are evaluated with respect to taste standards. The more traditional contextualism (cf. Kratzer (1977), DeRose (1996), Soames (2002), Stanley (2004)), which MacFarlane calls *indexical contextualism* would let contents be such that before evaluation occurs, they are already specified with regards to the parameter that the non-indexical contextualist would consider relevant for evaluation of the expressed content. In other words, under the traditional contextualism about taste predicates, the content expressed by (3) would be a set of world-time pairs. Whether contents are complex or not is an interesting question, but one too complicated to be considered for the purposes of this paper. For a comparison between the two positions, see MacFarlane (2009). Also see Cappelen & Hawthorne (2009).

initialized by *the* context. This is where MacFarlane thinks we enter the interesting territory of relativism; we can now let the parameter values according to which the truth of a content is evaluated be initialized by the context of assessment. Whether one does that or not for a particular parameter  $\sigma$  makes one relativist in the interesting sense for  $\sigma$ . In less loaded terms, we can say that such a decision makes one to propose assessment-sensitivity for  $\sigma$ . For instance, if one lets the taste parameter be initialized by the context of assessment, then one is considered assessment-sensitive about taste. Moreover, one is also considered to propose assessment-sensitivity for an expression if the compositional semantics for that expression makes reference to a parameter for which one lets its value be initialized in the index by the context of assessment. What we have in mind here is epistemic modals like *might* and the parameter information state, to which reference is made in some compositional semantics.<sup>9</sup>

Now that in the assessment-sensitivity framework, two contexts are posited, and a proposition is evaluated with respect to an index that can comprise parameters initialized by either the context of utterance or context of assessment, we need to rethink the definition of truth of a proposition/sentence as in (6). MacFarlane presents an assessment-sensitive definition of truth of a proposition as in (10).

- (10) A proposition  $p$  is true as used at a context  $c_1$  and assessed from context  $c_2$  iff  $p$  is true at  $\langle w_{c_1}, t_{c_1}, g_{c_2} \rangle$ .

Given (10), the story from character to extension goes like this: first a compositional semantics as in (5) is proposed which makes reference to some parameter in its right hand side clause. This in turn specifies a content, or a proposition, so to speak. This proposition is then evaluated with respect to an index that comprises parameters s.t. their values can be initialized by either the context of use or context of assessment. Further, note that the non-indexical contextualist can embrace the two contexts, and also embrace that a proposition  $p$ 's truth is defined at a context of use and context of assessment. All that the non-indexical contextualist about a parameter  $\sigma$  needs to do to keep assessment-sensitivity at bay is to propose that  $\sigma$  gets initialized by the context of use in defining the truth of a proposition. For clarity, let's summarize non-indexical contextualism and assessment-sensitivity about taste below.

- (11) Non-indexical Contextualism for  $g$ : A proposition  $p$  is true as used at a context  $c_1$  and assessed from context  $c_2$  iff  $p$  is true at  $\langle w_{c_1}, t_{c_1}, g_{c_1} \rangle$ .
- (12) Assessment-sensitivity for  $g$ : A proposition  $p$  is true as used at a context  $c_1$  and assessed from context  $c_2$  iff  $p$  is true at  $\langle w_{c_1}, t_{c_1}, g_{c_2} \rangle$ .

Now, questions about significance of proposing assessment-sensitivity may arise. The most relevant one for MacFarlane, and for us in this paper, is: do the two

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<sup>9</sup>See Yalcin 2007, MacFarlane 2011, 2014 for such semantic theories. We mention these just as one type of semantic theory for epistemic modals. See Ninan (2018) and Mandelkern (2019) for interesting and independent critiques.

positions differ in their predictions about some data? If they do, and Assessment-Sensitivity makes better predictions, then one can see merit in adopting MacFarlane’s framework. In the next section, we focus our attention to retraction, where non-indexical contextualism and assessment-sensitivity come apart in the predictions they make.<sup>10</sup>

## 4 Retraction

### 4.1 Non-indexical Contextualism vs Assessment-sensitivity

As we intend to refer to the two theories frequently here, we choose to abbreviate them as  $C$  for non-indexical contextualism and  $R$  for assessment-sensitivity. For MacFarlane, retraction becomes important in the context of constitutive norms for speech acts. For reasons of space and appropriate audience, we avoid discussion of constitutive norms for assertion and retraction. Instead, we try to make sense of the difference between  $R$  and  $C$  in the context of retraction, assuming that speakers retract past utterances that they take to be false.

Consider the example of Bano who found licorice tasty when she was 10 years old. She is 25 now, and hates the taste of licorice. Bano had uttered (3), i.e. *Licorice is tasty* in 2005. Asked about it now, she takes it back. Now, take  $C$ . If it is the context of use that initializes the taste parameter,  $g$ , in the index of evaluation, then there’s no reason for Bano to take (3) back. At her context of assessment in the present, (3) is still true, as it is still evaluated w.r.t.  $g$  of the context of utterance, whose  $t$  is a moment in 2005. That doesn’t explain why Bano feels the urge to take back her utterance given her changing tastes.

$R$  has a different story to tell. As  $g$  is determined by the context of assessment under  $R$ , (3) in the present time is evaluated to be false. As an utterance that was made in 2005 is now taken to be false by Bano, she retracts it. It seems like  $R$  has a story to tell about retraction that  $C$  misses. We think that although this is a major achievement of the assessment-sensitivity framework, retraction itself isn’t that simple.

### 4.2 Variance to remedy strength

We think that MacFarlane’s views about retraction are too strong. Taken from a descriptive perspective, MacFarlane seems to propose that speakers will retract their past utterances about taste if their tastes change, as in the Bano example above. MacFarlane (2014, 141) comments: “Our account should explain why speakers will retract (rather than stand by) an earlier assertion that something was tasty, if the flavor the thing had at the time of the assertion is not pleasing to their present tastes—even if it was pleasing to the tastes they had then.”

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<sup>10</sup>MacFarlane seems committal only about his views on how retraction is handled by assessment-sensitivity. Disagreement takes center stage for MacFarlane, only for him to conclude that it’s messy, or at least that’s how we interpret him. For discussion on disagreement, see MacFarlane (2014, §6).

Note that MacFarlane makes the *a priori* judgment that speakers *will* retract an earlier assertion. This seems like a strong judgment. Taken from a less descriptive, and more normative perspective, as Ninan (2016, 445) notes MacFarlane’s “Relativist Retraction Rule obliges A to retract the assertion she made in *c*.”

What if one doesn’t retract? What if one thinks that one need not retract? Or what if Bano thinks that it isn’t appropriate for her to retract (3) in the present? Given its reliance on strong views about retraction, *R* doesn’t seem like the panacea we thought it to be anymore. But what about *C*? *C*, as MacFarlane noted, wouldn’t make sense of why speakers do retract. The dialectic here might seem confusing, but we are simply noting the fact that some speakers would retract and some wouldn’t. In cases where they do, *R* seems like a good theory, and in cases where they don’t, *R* doesn’t seem like a good theory. We propose building a framework that can handle such variance. Our assumption here is simply that whether a speaker retracts an earlier assertion depends on whether that speaker considers it appropriate for her to retract the earlier assertion. Now, there are many questions to be answered here. Firstly, how do we build a space in our formalism for appropriateness judgments, upon which we would take retraction patterns to rely? Second, and more importantly, how should we build a model that can be true to the Kaplanian picture of context-sensitivity that has a plethora of theoretical and formal virtues, while incorporating insights by both *R* and *C*. We present a sketch below.

## 5 Pluralism

### 5.1 Motivations

Let’s state our motivations and assumptions explicitly. What motivates the picture here is the variance in retraction patterns. It is quite clear that there’s a speaker, as MacFarlane presents the example of Joey (2014, 109), who would retract an earlier assertion of (3) in the present where his taste standards have changed. It is also true that there’s a speaker who would not retract an earlier assertion of (3) in the present where her taste standards have changed. Moreover, we can imagine a speaker standing by their previous assertion of (3), by finding it odd if an interlocutor asks them to take back their previous assertion. Suppose that Bano and Joey are friends who are meeting after ten years. Joey liked licorice so much as a kid that he wrote a document expressing his love for it. On being offered licorice by Bano in the present, the following exchange occurs.

- (13) Joey: I won’t have licorice. I can’t stand it.  
 Bano: Wow! I still remember that document. So, you wrote it, just to take back all of it?  
 Joey: I don’t take it back; after all, I liked licorice.

If the above exchange doesn’t qualify as illustrating Joey standing by his assertion, then we invite the reader to think up of an explicit statement of what



standing by would amount to; we think that there’s a speaker who would assert such a statement, even when their tastes have changed.

By considering examples like (13), we are simply noting that to enforce a blanket judgment about retraction on behalf of all speakers is not warranted. (13) is not to be understood as data that suggests that speakers don’t retract their past assertions about taste. We agree with MacFarlane insofar as in thinking that at least some speakers do retract their past assertions. Our goal is to ignore neither of the two judgments. We intend to explain more data than  $R$  or  $C$  can explain on their own. Let’s start with our sketching a way to achieve this interesting task.

## 5.2 Pluralism for variance

We embrace MacFarlane’s assessment-sensitivity framework. More specifically, we make important use of the two contexts to state our thesis. Taking this as point of departure, we think that there is a choice for the agent of the context of assessment in how they interpret a taste utterance. We can state this more systematically as in (14):

- (14) Pluralism: For a proposition  $p$ , which is evaluated relative to a parameter  $\sigma$ , given  $c_1$ , context where the assertion of  $p$  is made, and  $c_2$ , context where the assertion of  $p$  is assessed,  $\sigma$  in the index can be initialized by either  $c_1$  or  $c_2$ .

Pluralism can be resisted if one goes a pragmatic route to explain the aberrant data while espousing one of  $C$  or  $R$ . Then, at the very least, our proposal is a semantic explanation for variance. Now, we want to implement (14) formally. Two immediate questions that we face are: (i) how do we build this choice of initialization; (ii) where in the formalism should we build this choice? In other words, is there any space in the Kaplanian framework, supplemented with MacFarlane’s two contexts, to include a feature underlying (14)? We think that there is space if we look closely. Note that we don’t have a formalization for initialization in the context-dependence frameworks we work within. So, we propose to formalize initialization.

## 5.3 Formalizing Initialization

Let’s first motivate our formalization. Why do we think that initialization requires formalization? To answer this, let’s first state how we perceive initialization.

- (15) Initialization of  $\sigma$ : the process of populating the index of evaluation with  $\sigma$  where  $\sigma \in c_1$  or  $\sigma \in c_2$ .

There is nothing controversial or new that we have said about initialization so far. Probably, the only thing that we have added is our conception of it as a process. Suppose that  $c_{u_1}$  and  $c_{u_2}$  are both contexts of utterance that differ in

their value for  $\sigma$ , and  $\sigma$  in the index is initialized by the context of utterance. Now, the value of  $\sigma$  in the index for evaluation of a proposition is determined by whether we take  $c_{u_1}$  or  $c_{u_2}$  to be the context of utterance. What this simple fact motivates is that initialization is to be thought of as a process that populates the index with a parameter, while obeying the constraint that this parameter comes from the context of utterance (if the parameter is initialized by the context of utterance). In other words, the match between the initialized parameters of the index and features of the context is to be obeyed. Moreover, there's independent motivation to formalize initialization in that it would make our theory of context-dependence more precise. The precision is to be valued independently, but if one doesn't lean that way, then the value of precision can be found in its potential benefits. The benefits we have in mind are those that we get when Farkas and Bruce (2010) pay attention to and formalize the proposal bit in Stalnaker's (1978) account of assertion. Then, at the very least, there is some motivation to at least pay a bit more attention to initialization in a theory of context-dependence. So, how should we model it?

#### 5.4 The model

Here, we build a model for Pluralism as stated in (14). Note that we are building on the Kaplanian framework, supplemented with MacFarlane's two contexts and his definition of truth of a proposition. We conceive the context of utterance and context of assessment together to determine an initialization procedure. We understand *procedure* in a computationally loaded sense (cf. Suppes 1979) and take it to be instantiated by a finite state automaton.

Let  $M_1$  model the initialization procedure at a given context of use and a context of assessment.  $M_1$  is a 5-tuple  $(\Sigma, Q, q_0, \{q_3, q_4\}, \delta)$  such that:

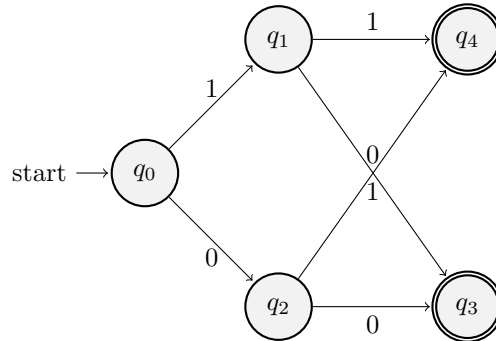
$$(16) \quad \Sigma: \{0, 1\}$$

$$(17) \quad Q: \{q_0, q_1, q_2, q_3, q_4\}$$

$$(18) \quad q_0 \text{ is the start state}$$

$$(19) \quad \{q_3, q_4\} \text{ is the set of accept states}$$

$$(20) \quad \delta \text{ is the transition function for } M_1 \text{ which can be read off from the state diagram below:}$$



In the above model, we presume that there are two relevant parameters for evaluation of sentences in natural language. This feature is not essential to our model. We choose the number ‘two’ to not make the model too complex, while illustrating that it works for initialization of more than one parameter. Let’s try to make the picture clearer. Formally, there are four sequences that this model generates. Each of these sequences is of length 2. We can pair up these sequences with corresponding indices containing two parameters.

(21) 00:  $\langle g_1, s_1 \rangle$

(22) 01:  $\langle g_1, s_2 \rangle$

(23) 10:  $\langle g_2, s_1 \rangle$

(24) 11:  $\langle g_2, s_2 \rangle$

Here, each sequence is paired up with a unique index. Generation of each sequence then corresponds to and models initialization of two parameters. However, note that each sequence is associated with a distinct initialization pattern. For instance, if it is (23) that is generated, then the taste parameter,  $g$ , is initialized by the context of assessment, while the information state parameter,  $s$ , is initialized by the context of use. Moreover, if it is (23) that is generated, we make sense of why Bano retracts her assertion of (3). (23) also explains why a speaker can retract her previous taste assertions, while not retracting their previous assertions of the form *might p*. As other sequences can be generated as well, say (21), a speaker can stand by an assertion of (3), even if their tastes have changed (see discourse in (13)). We can explicitly state a few facts about the model below.

(25) For any two parameters  $\sigma$  and  $\tau$ ,  $\sigma$  can be set by  $c_1$ , while  $\tau$  is set by  $c_2$ .

(26) A discrete step in the computation models initialization of a parameter by one of the contexts.

There are two further questions that we intend to answer about the model.

(27) Does our model explain why the context of assessment (or of utterance for that matter) initializes the parameter it does in a given situation?

(28) What do 0 and 1 encode?

We think that the two questions are related. Let’s start with (28). Take two speakers  $A$  and  $B$  who assert (3), i.e. *licorice is tasty*. Later both experience changes in their taste standards such that neither likes licorice anymore. The difference between the two is that  $A$  retracts her assertion, while  $B$  doesn’t. Given this variance in their retraction patterns, we can claim that while  $A$  finds it appropriate to retract,  $B$  doesn’t. We let 0 and 1 encode the absence and presence of such an appropriateness judgment. Now consider  $A$  for whom such judgment about assertions of taste is present, and such judgment about assertions of *might p*-type utterances is absent. Then, this is encoded as the string 10, which is paired up with (23). What we eventually generate is the index of evaluation,  $\langle g_2, s_1 \rangle$ . To answer (27), we can say that whether a context of assessment or

context of utterance initializes a given parameter depends on the presence or absence of the appropriateness judgment of the speaker talked about above. This concludes our discussion the formal model that captures Pluralism, and comes out to have more empirical coverage than non-indexical contextualism or assessment-sensitivity taken on its own.

## 6 Taking stock

What we have presented above is a model that tries to make room for variance as explained above, and relies crucially on a formalization of initialization. Here, we want to stress that this is to be considered a part of the usual Kaplanian context-dependence picture. In other words, we have presented a way to think about what the initial values of the index of evaluation can be. We haven't revolutionized shifting etc. so all the shifting by operators occurs in the usual way.

From the relativist's perspective, the Pluralism and the accompanying model should be a welcome result. If what distinguishes non-indexical contextualism and relativism is retraction, and the jury is still out to judge this difference (cf. Ninan 2016) and there's data like (13), then our model provides respite for the relativist. Furthermore, our model vindicates MacFarlane's positing of a separate context as essential to relativism.<sup>11</sup> We argued that contexts of assessment are essential to a theory of context-dependence more generally, as we build our model on the assumption that there are two relevant contexts for evaluating truth of a given proposition.

The model presented might have implications for issues other than the ones we were concerned with in this paper. To conclude our discussion, we touch on one such issue. Suppes (1979) critiques set-theoretical semantics by stating that the psychology of the speakers is "barely touched" by set-theoretical semantics (cf. Steinhert-Threlkeld & Icard 2013). Psychology of the speakers as in their appropriateness judgments underlying retraction patterns do find a home in our model. Whether this captures the psychology of the speakers in some substantial way, or only barely touches it is a question we haven't explored here. Nonetheless, we do think that we have taken a step in the right direction. However, we should note that our model differs from the sort of models that try to capture psychological processes like verification of quantified sentences more directly, where one sees a direct correspondence between the form of the model and the psychological processing.<sup>12</sup> Our automaton doesn't seem to have any such direct correspondence.

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<sup>11</sup>See Lasersohn 2005 and Stephenson 2007 for relativisms without contexts of assessment.

<sup>12</sup>See van Benthem (1986), Steinhert-Threlkeld & Icard 2013 for such models. See McMillan et al. 2005, Szymanik 2007, and Szymanik and Zajenkowski 2010 for experiments and comments on such experiments.

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