

# A Prospective Puzzle and a Possible Solution\*

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## 1 The Basics

- Kaqchikel is a K'ichean-branch Eastern Mayan language spoken in the Central Highlands of Western Guatemala near and around Lake Atitlán, by approximately 500,000 people (Richards 2003)
- Kaqchikel is verb initial and has ergative alignment in the form of verbal prefixes
- Frequent topic/focus movement leftward makes it difficult to tell that it really is V-initial—this is common in Mayan languages (Bennett et al. 2015)
- PRO-drop of arguments occurs regularly and freely
- The verbal complex has the following structure:

– T/A/M-SET B-SET A-VERB-SUFFIXES

- SET B and SET A refer to absolutive and ergative prefixes, respectively
- Ergative morphology doubles as possessive morphology on nominals
- 3rd singular absolutive morphology is null, although epenthetic vowels are common

### 1.1 The Puzzle

- If we make certain basic assumptions about tense and aspect (to be spelled out below), the following contrast found in Kaqchikel is unexpected

- (1) Chwa'q xk-i-muxan.  
tomorrow PROSP-B 1 S-swim  
'Tomorrow, I will/am going to swim.'

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(2) Wakami xk-i-muxan.  
today PROSP-B1S-swim  
'Today, I will/am going to swim.'

(3) # Iwir xk-i-muxan.  
yesterday PROSP-B1S-swim  
INTENDED: 'Yesterday, I was going to swim'

- (3) doesn't get any better if you add additional material, as in (4), (5), and (6)

(4) # Iwir xk-i-muxan, chuqa' x-i-muxan.  
yesterday PROSP-B1S-swim and PFV-B1S-swim  
INTENDED: 'Yesterday, I was going to swim, and I swam.'

(5) # Iwir xk-i-muxan, po' x-i-samäj.  
yesterday PROSP-B1S-swim but PFV-B1S-work  
INTENDED: 'Yesterday, I was going to swim, but I worked.'

(6) # Iwir xk-i-muxan ta, po' x-i-samäj.  
yesterday PROSP-B1S-swim IRR but PFV-B1S-work  
INTENDED: 'Yesterday, I was going to swim, but I worked.'

- Assuming that the prospective aspect in Kaqchikel is truly an aspect, we have an unexpected contrast—to see why, let's lay the groundwork

## 1.2 Assumptions about temporal reference

- I assume roughly the Kleinian (1994) semantics for tense and aspect
- That is, I assume there are (at least) three different times playing a role in determining the meaning of a sentence (characterized very informally below)
  - The Utterance Time (UT) is the time the sentence is asserted
  - The Reference Time (RT) is the time which the sentence is about
  - The Event Time (ET) is the time of the event or state you're talking about
- Tense encodes a relation between the UT and the RT—it locates the RT with respect to the UT
  - For example, a past tense in this system will encode that the RT precedes the UT ( $RT < UT$ ); a future tense will encode that the UT precedes the RT ( $UT < RT$ )
- Aspect encodes a relation between the ET and the RT
  - Perfective aspect will encode that the ET is contained the RT ( $ET \subseteq RT$ ); a prospective aspect will encode that the ET follows the RT ( $RT < ET$ )
- Mayan languages are typically assumed to be tenseless—that is, they do not grammatically encode the relation between the UT and RT (Henderson 2015)

- Kaqchikel is assumed to only grammatically encode aspect (García Matzar & Rodríguez Guaján 1997)

- Stout (2016) argues the ‘perfective’ (completive) and ‘imperfective’ (incompletive) aspects are just what we would expect then to be—fairly standard perfective and imperfective aspects
- The imperfective is compatible with past, present, and future RTs; the perfective is compatible with both past and future RTs<sup>1</sup>
- Stout also notes the same contrast in (1)-(3), and offers a few different possible solutions, which will be discussed below

- We can define the denotations for the semantic contribution of each aspect as follows<sup>2</sup>:

- (7) PERFECTIVE:  $\llbracket \mathbf{x-} \rrbracket^{g,c} = \lambda t \lambda P_{vt}. \exists e[\tau(e) \subseteq t \ \& \ P(e)]$   
(8) IMPERFECTIVE:  $\llbracket \mathbf{y-/-n-} \rrbracket^{g,c} = \lambda t \lambda P_{vt}. \exists e[t \subseteq \tau(e) \ \& \ P(e)]$   
(9) PROSPECTIVE:  $\llbracket \mathbf{xk-/-xt-} \rrbracket^{g,c} = \lambda t \lambda P_{vt}. \exists e[t < \tau(e) \ \& \ P(e)]$

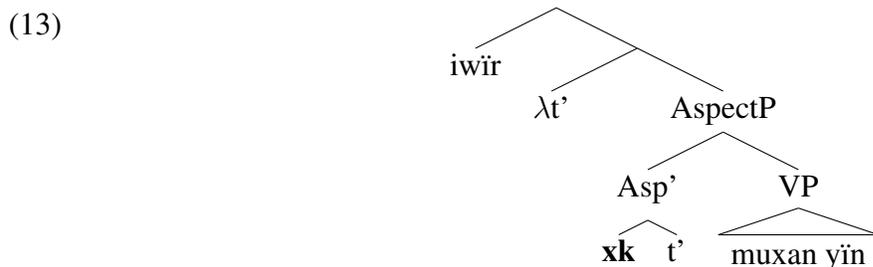
- The frame adverbials *tomorrow*, *today*, and *yesterday* constrain the reference time, and we can give the following (first-pass) denotations to these adverbials as below:

- (10)  $\llbracket \text{tomorrow} \rrbracket^{g,c} = \lambda t. t \subseteq \text{tomorrow}_c$   
(11)  $\llbracket \text{today} \rrbracket^{g,c} = \lambda t. t \subseteq \text{today}_c$   
(12)  $\llbracket \text{yesterday} \rrbracket^{g,c} = \lambda t. t \subseteq \text{yesterday}_c$

- These adverbials will combine in the current framework via Predicate Modification with a function from times to truth values (i.e. AspectP, of type  $\langle i, t \rangle$ )

- With all these assumptions, our problematic example in (3), repeated below, would have the following LF.

- (3) # Iwír xk-i-muxan.  
yesterday PROSP-B1S-swim  
INTENDED: ‘Yesterday, I was going to swim.’



- So, we could derive the following denotations for (1), (2), and (3):

<sup>1</sup>The perfective is not compatible with a present RT for pragmatic reasons.

<sup>2</sup>I am assuming a fully extensional system wherein silent variables ranging over times and worlds are in the object language syntax, and VPs are functions from eventualities to truth values, following Beck & von Stechow (2015).

- (14)  $\llbracket \text{Chwa'q xkimuxan} \rrbracket^{g,c} = 1$  iff  $\lambda t. t \subseteq \text{tomorrow}_c \ \& \ \exists e[t < \tau(e) \ \& \ \text{swim}(\text{sp}_e)(e)]$   
 (15)  $\llbracket \text{Wakami xkimuxan} \rrbracket^{g,c} = 1$  iff  $\lambda t. t \subseteq \text{today}_c \ \& \ \exists e[t < \tau(e) \ \& \ \text{swim}(\text{sp}_e)(e)]$   
 (16)  $\llbracket \text{Iwir xkimuxan} \rrbracket^{g,c} = 1$  iff  $\lambda t. t \subseteq \text{yesterday}_c \ \& \ \exists e[t < \tau(e) \ \& \ \text{swim}(\text{sp}_e)(e)]$

- There is nothing obviously strange about the truth conditions for (3) given in (16)<sup>3</sup>
- So what is the semantic contribution of the prospective aspect such that the infelicity of (3) is explained? Is it really an aspect?
- From now on, I will refer to the prospective aspect as simply the prospective in order to remain agnostic about its precise semantics

### 1.3 Possibilities

- Here are a few options for the semantics of the prospective which may underlie (3) and its infelicity
- The prospective could encode:
  1. Tense
  2. ‘Tense presupposition’ & aspect
  3. Modality (& tense/aspect)
- Another possibility is that it contributes just aspectual semantics, but is constrained via pragmatic principles
- In this talk, I will provide evidence against the possibility that the prospective is really a future tense, and suggest that pragmatics can’t be the whole story (though it may indeed be at work)
- I will provide some tentative evidence against the idea that the prospective presupposes the UT precedes the RT—though I will note that this evidence is inconclusive at this time
- I will provide evidence that the prospective is part modal, part aspect; furthermore, I will argue that this is in fact the reason (3) is infelicitous

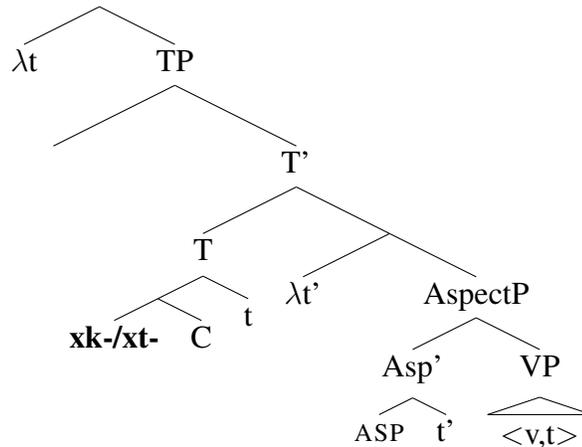
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<sup>3</sup>The truth conditions in (14)-(16) are likely too weak, though, since these truth conditions do not restrict my swimming event such that the run time is contained in yesterday. Similarly, the truth conditions for (1) are likely too weak—they are compatible with my swimming event not occurring on Sunday (i.e. tomorrow relative to the context of this talk), but rather on Monday (again, relative to the context of this talk). I do not have data shows that (1) is incompatible with such an interpretation, but I would be very surprised if it were. If my suspicion is correct, a potential solution would be to have the frame adverbials constrain not the reference time, but the run time of the event—whether or not this would work is left for future work.

## 2 Evidence that the prospective is not a tense (presupposition)

- A possibility for the semantics of the prospective that would account for (3) would be that it is a future tense
- To cache this out, and see why it cannot be correct, I will assume a structure for (3) as below

(17)



- In order to existentially bind the event variable of the embedded VP, I assume a null aspect head along the lines of Matthewson (2012)<sup>4</sup>

(18)  $[[ASP]]^{g,c} = \lambda t \lambda P_{vt}. \exists e[t = \tau(e) \ \& \ P(e)]$

- We can now define the prospective ‘tense’

(19)  $[[\mathbf{xk-/xt-}]]^{g,c} = \lambda C \lambda t \lambda P_{it}. \exists t'[t < t' \ \& \ C(t') \ \& \ P(t')]$

- The prospective will first take a covert domain variable  $C$  which restricts the times to those that are relevant, and then it will take a time variable  $t$ , and then an  $\langle i,t \rangle$  function (namely, the abstracted-over AspectP)
- The prospective, with this semantics, should be able to be coerced into having a future complete or a future progressive meaning
- This is because the future tense version of the prospective only cares about the RT and its relation to UT, not the temporal makeup of the event

(20) Doña Esperanza **will be making** dinner when Don Cornelio gets home.

(21) When Don Cornelio gets home, Doña Esperanza **will have eaten** (dinner).

- However, this isn’t the case!

<sup>4</sup>Matthewson motivates this for Gitksan (Tsimshianic) in part because aspects can be stacked, and as such aspects themselves cannot be responsible for existentially binding the event variable of the VP. I am appealing to such a head here largely so that there will be no free event variables, although Kaqchikel cannot stack aspects. If the prospective is really a future, then we would want to say that it necessarily co-occurs with this null ASP, which blocks any other aspect morphology from appearing in that position.

- Analogous to (20):

(22) Ya Esperanza n- $\emptyset$ -u-b'ën ri q'utu'n täq xt- $\emptyset$ -apon Ma  
 CLF Esperanza IMPRF-B3S-A3S-make DET food when PROSP-B3S-arrive CLF  
 Cornelio pa jay.  
 Cornelio PREP house

'Doña Esperanza will be making dinner when Don Cornelio gets home.'

(23) # Ya Esperanza xt- $\emptyset$ -u-b'ën ri q'utu'n täq xt- $\emptyset$ -apon Ma  
 CLF Esperanza PROSP-B3S-A3S-make DET food when PROSP-B3S-arrive CLF  
 Cornelio pa jay.  
 Cornelio PREP house

INTENDED: 'Doña Esperanza will be making dinner when Don Cornelio gets home.'

- Analogous to (21):

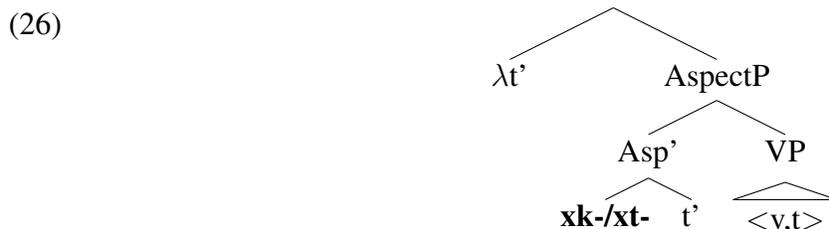
(24) Täq xt- $\emptyset$ -apon Ma Cornelio pa rochoch, Ya Esperanza  
 when PROSP-B3S-come CLF Cornelio PREP A3S.house CLF Esperanza  
 x- $\emptyset$ -way-in.  
 PRFV-B3S-eat-AP

'When Don Cornelio gets home, Doña Esperanza will have eaten.'

(25) # Täq xt- $\emptyset$ -apon Ma Cornelio pa rochoch, Ya Esperanza  
 when PROSP-B3S-come CLF Cornelio PREP A3S.house CLF Esperanza  
 xt- $\emptyset$ -way-in.  
 PROSP-B3S-eat-AP

INTENDED: 'When Don Cornelio gets home, Doña Esperanza will have eaten.'

- Both (23) and (25) are out on the intended reading; the only reading they can have is that Doña Esperanza's making dinner and eating will *start* when Don Cornelio gets home
- This suggests two things:
  1. That prospective is not a tense (or at least not as defined above)
  2. That the prospective does indeed encode aspect, since the interpretation of the prospective-marked verb is dependent on the RT established by the temporal adjunct
- This data provides some evidence against the idea that the prospective encodes tense
- A distinct possibility is that the prospective introduces a presupposition (independent of aspectual semantics it has) that restricts the RT to a time following the UT (Stout 2015)
- On this view, we could assume the following structure:





- The infelicity of (33) might be surprising, since (30) seems to be acceptable
- However, it's possible that the contexts for these cases have not been fixed in a precise enough way to rule in favor or against the presupposition analysis
- Interim conclusions
  - Obviously more detailed work is needed to definitely rule out whether there is some presupposition restricting the time to the future encoded in the prospective, but it seems reasonable to assume that it is not a tense
  - It *is* clear, however, that the prospective is in part aspect—the data in (22)-(25) point to this conclusion
- So what's going on with the prospective?

### 3 Some modal evidence

- I will suggest now via two diagnostics from Klecha (2014) that the prospective has, in addition to its aspectual semantic component, modal semantics

#### 3.1 Predicates of personal taste

- Predicates of personal taste (PPTs) like *be delicious* or *be tasty* come with a direct experience requirement—that is, one cannot felicitously utter:

(34) This food is delicious (#but I haven't tried it).

- High-scoping modals (along with evidentials) are in the class of expressions that obviate this requirement of PPTs, but temporal operators (like past tense) are not (Pearson 2013)

(35) This food might be delicious (but I haven't tried it).

(36) This food will be delicious (but I haven't tried it).

(37) This food was delicious (#but I haven't tried it).

- Below, we can see that the prospective indeed obviates the personal experience requirement

CONTEXT: Sandra is making a brand new dish for her family. She says,

(38) # Re q'utu'n re' jeb'ël, po man tij-on ta.  
 DET food DET delicious but NEG eat-AP IRR  
 'This food is delicious, but I haven't eaten it.'

(39) Re q'utu'n re' ützt xt-∅-b'e-ël.  
 DET food DET good PROSP-A3S-DIR-leave  
 'This food will be delicious, lit. *This food will leave out/come out good.*'

- While this might not be a direct contrast, it is clear that the prospective aspect does obviate the personal experience requirement of PPTs
- We might then conclude that the prospective is modal, though a consistent (and weaker) is that it's within some larger class of expressions, which includes modals, that have whatever property obviates the direct experience requirement

### 3.2 Implicit conditionals

- I assume here that the *if*-clause of a conditional restricts a contextually salient modal domain (Kratzer 1986), and that modal subordination is covertly a conditional (Roberts 1989)
- Klecha shows that if some piece of morphology allows an implicit conditional reading across sentence boundaries (i.e. it is interpreted as another consequent of the previous conditional), then that morphology contributes modality, since it is anaphorically anchored to the restricted modal domain of the *if*-clause
- The prospective *does* allow such implicit conditional readings!
- So, you get equivalences like the following:

- (40) Wi Gloria xti- $\emptyset$ -b'e Panajachel, kiy xt- $\emptyset$ -löq'-pe. Rija'  
 if G. PROSP-B3S-go Panajachel much PROSP-B3S-buy-DIR she  
 xti- $\emptyset$ -b'ën-pe divertir ri.  
 PROSP-B3S-make-DIR amuse DET  
 'If Gloria goes to Panajachel, she'll buy lots. She'll have fun.'
- (41) Wi Gloria xti- $\emptyset$ -b'e Panajachel, kiy xt- $\emptyset$ -löq'-pe chuqa'  
 if G. PROSP-B3S-go Panajachel much PROSP-B3S-buy-DIR and  
 xti- $\emptyset$ -b'ën-pe divertir ri.  
 PROSP-B3S-make-DIR amuse DET  
 'If Gloria goes to Panajachel, she'll buy lots and she'll have fun.'
- (42) Wi Esperanza man n- $\emptyset$ -u-b'ën ta ri q'utu'n, Cornelio  
 if E. NEG IMPRF-B3S-A3S-make IRR DET food C.  
 xti- $\emptyset$ -pe num-pe. Rija' xti- $\emptyset$ -b'ison qa.  
 PROSP-B3S-DIR be.hungry-DIR he PROSP-B3S-be.sad DIR  
 'If Esperanza doesn't make dinner, Cornelio will be hungry. He'll be sad.'
- (43) Wi Esperanza man n- $\emptyset$ -u-b'ën ta ri q'utu'n, Cornelio  
 if E. NEG IMPRF-B3S-A3S-make IRR DET food C.  
 xti- $\emptyset$ -pe num-pe chuqa' xti- $\emptyset$ -b'ison qa.  
 PROSP-B3S-DIR be.hungry-DIR and PROSP-B3S-be.sad DIR  
 'If Esperanza doesn't make dinner, Cornelio will be hungry and he'll be sad.'

- The prospective aspect readily allows these implicit conditional readings, so we have some more evidence that the prospective is modal

### 3.3 A note on the pragmatic approach

- Stout (2016) appeals to a few pragmatic principles that guide the interpretation of the prospective (as well as perfective/imperfective) in order to account for issues like (3)
- These principles were proposed by Smith et al. (2007)

1. BOUNDED EVENT CONSTRAINT: bounded events are not situated in the present

2. THE DEICTIC PRINCIPLE: situations are located with respect to the speech time
  3. SIMPLICITY OF INTERPRETATION PRINCIPLE: choose the interpretation that requires the least information added or inferred
- [1] and [3] account for the fact that in Kaqchikel (and in many languages) the perfective is incompatible with present reference times (i.e. now), insofar as I cannot say *Wakami, xmuxan* if I intend to mean anything like ‘Now, I completed a swim.’
    - The logic runs like this: when you utter *Wakami, xmuxan*, [1] will tell you that since the event of my swimming is bounded in time (because of the semantics of the perfective), I cannot mean that contained in now is a completed event of my swimming
    - [3] will then tell you that the simplest interpretation of my statement is that earlier today there was a completed event of my swimming (though enough context will get you a future completive reading, presumably)
    - So, you’ll default to an interpretation of my sentence whereby I say that there is a completed event of my swimming earlier today
  - While the logic accounting for the perfective is clear, it is not clear how these principles would account for or predict the modal-like behavior of the prospective, assuming it just has the aspectual semantics given in the beginning of the talk

## 4 A possible solution

- Evidence seems to suggest that the prospective is modal nature (at least in part)
- How does this help us with the original puzzle, the infelicity of (3)?

(3) # *Iwir* xk-i-muxan.  
 yesterday PROSP-B IS-swim  
 INTENDED: ‘Yesterday, I was going to swim.’

- Here is a sketch of a solution:
- Not only is the prospective a modal operator, it is an epistemic modal operator (though see Copley (2009) for an analysis of future-oriented expressions wherein such operators are metaphysical modals)
- Following Condoravdi (2002) and Hacquard (2006)<sup>5</sup>, I assume that epistemic modals cannot scope under past temporal operators
- Since *iwir* ‘yesterday’ is such an operator, and it has scope over the entire clause in (3), we account for the judgments that (3) is no good
- The data is parallel with English *might* and future-oriented expression *will*:

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<sup>5</sup>Pace von Fintel & Gillies 2008.

(44) # Yesterday, I might swim.

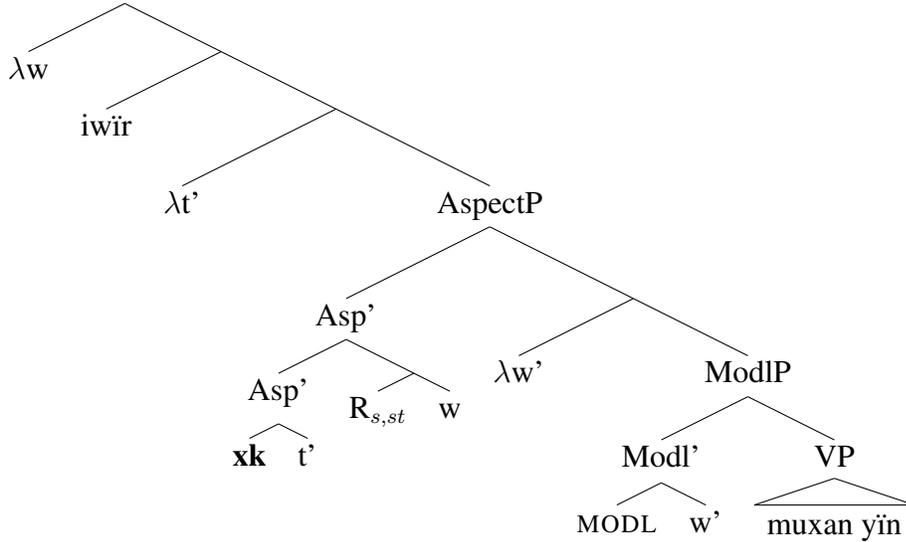
(45) # Yesterday, I will swim.

- Thus, (3)'s infelicity comes down to a clash between the frame adverbial *iwir* and the prospective aspect's partly modal semantics
- A possible semantics we could give, then, is as in (46); this necessitates some changes to the system described here
- There is an additional new functional head  $\llbracket \text{MODL} \rrbracket$ . Following Beck & von Stechow (2015), I assume this is responsible for locating the event in a world. It is a  $\langle v, t \rangle$  function, combining with the VP via PM; it must be situated below  $\llbracket \text{ASP} \rrbracket$ , since that functional head existentially closes the event variable of the VP. Its semantics is given in (47)
- I assume that  $R$ , the accessibility relation, is supplied contextually, and that the prospective is only compatible with epistemic accessibility relations
- With all this, we would have the structure as in (48), and would derive truth conditions as in (49)

(46)  $\llbracket \mathbf{xk-} \rrbracket^{g,c} = \lambda t \lambda q_{st} \lambda P_{s,vt}. \forall w' (q(w') \rightarrow \exists e [t < \tau(e) \ \& \ P(w')(e)])$

(47)  $\llbracket \text{MODL} \rrbracket^{g,c} = \lambda w \lambda e. e \leq w$

(48)



(49)  $\llbracket (48) \rrbracket^{g,c} = \lambda w'' \lambda t. t \subseteq \text{yesterday}_e \ \& \ \forall w' (R(w'')(w') \rightarrow \exists e [t < \tau(e) \ \& \ e \leq w' \ \& \ \text{swim}(sp_c)(e)])$

- Moving forward, there are some obvious questions to address, and issues to pursue:
  - Investigating the quantificational force of the prospective, as well as its modal flavor and more fine-grained semantics
  - Comparing the prospective to other constructions in Kaqchikel that are future-oriented
- Overall, however, I hope to have provided some evidence that the prospective aspect in Kaqchikel is indeed modal in nature

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