

# Acquaintance content and obviation<sup>1</sup>

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**Abstract.** This paper is about what Ninan (2014) calls the *Acquaintance Inference* (AI): a firsthand experience requirement imposed by subjective expressions such as Predicates of Personal Taste (PPTs) (*delicious*). Typically, one is entitled to call something delicious only after trying it. This requirement can be lifted, disappearing in the scope of what we will call *obviators*. The paper investigates the patterns of AI obviation for PPTs and similar constructions (e.g., psych predicates and subjective attitudes). We show that the cross-constructural variation in when acquaintance requirements can be obviated presents challenges for previous accounts of the AI (Pearson, 2013; Ninan, 2014). In place of these, we argue for the existence of two kinds of acquaintance content: (i) that of ‘bare’ PPTs; and (ii) that of psych predicates, subjective attitudes and overt experienter PPTs. For (i), we propose that the AI arises from an evidential restriction that is dependent on a parameter of interpretation which obviators update. For (ii), we argue that the AI is a classic presupposition. We model both (i) and (ii) using von Fintel and Gillies’s (2010) framework for directness and thus connect two strands of research: that on PPTs and that on epistemic modals. Both phenomena are sensitive to a broad direct-indirect distinction, and analyzing them along similar lines helps shed light on how natural language conceptualizes evidence.

**Keywords:** evidentiality, firsthand experience, knowledge, predicates of personal taste, subjectivity.

- Cleveland. It’s a beautiful city.
- Yes?
- Yeah.
- It’s got a big, beautiful lake. You’ll love it there.
- Have you been there?
- No, no.

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*Stranger than paradise*  
JIM JARMUSH

## 1. Introduction

This paper is devoted to what Ninan (2014) (following Wollheim, 1980) calls the *Acquaintance Inference* (AI): a firsthand experience requirement imposed by several subjective expressions such as Predicates of Personal Taste (PPTs) (*tasty, fun*),<sup>2</sup> psych predicates (*look, sound*) and subjective attitudes (*find, consider*); see also (Stephenson, 2007; Anand, 2009; Pearson, 2013; Klecha, 2014; Ninan, 2014; Kennedy and Willer, 2016; Bylinina, 2017). Asserting the sentences in (1), the speaker is committed to having a relevant firsthand experience with the object in question: gustatory (1a), auditory (1b), or visual (1c).

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<sup>2</sup>For the purposes of this paper, we do not distinguish between predicates of taste proper and e.g. aesthetic predicates such as *beautiful*, as both types of predicates have the AI.

- (1) a. The puerh was **delicious**, #but I've never tasted it. PPT  
 b. The piano **sounded** out of tune, #but I've never heard it. PSYCH PREDICATE  
 c. I **consider** the dress blue and black, #but I've never seen it. SUBJECTIVE ATTITUDE

As (1) shows, the AI cannot be cancelled. It also survives under negation:

- (2) a. The puerh wasn't **delicious**, #but I've never tasted it. PPT  
 b. The piano **didn't sound** out of tune, #but I've never heard it. PSYCH  
 c. I don't **consider** the dress blue and black, #but I've never seen it. ATT

At the same time, even though the AI cannot be explicitly denied or negated, it may disappear in the scope what we will call *obviators*, exemplified with epistemic *might* in (3) below:

- (3) a. ✓The puerh **might have been delicious**, though I've never tasted it. PPT  
 b. ✓The piano **might have sounded** out of tune, though I've never heard it. PSYCH  
 c. ✓I **might have considered** the dress blue and black, though I've never seen it. ATT

The central puzzle of this paper—the Puzzle—is the contrast in (3) and (1): Why is obviation possible while explicit denial is not? A larger issue that is related to the epistemology of personal taste but that we are not going to discuss is why subjective expressions have the AI in the first place (see (Bylina, 2017; Muñoz, 2017) for ontological explanations). We concentrate instead on the status of the AI and the cross-constructional variation in AI obviation that poses challenges for previous accounts of the AI. Our verdict is that there are in fact two types of acquaintance content. With 'bare' PPTs (i.e., ones unmodified by *to/for* phrases), we propose that the AI arises from an evidential restriction that is dependent on a parameter of evaluation that obviators update. With psych predicates, subjective attitudes and overt taster PPTs (*tasty for me*), we argue that the AI is a classic presupposition. Section 2 introduces the empirical landscape. Section 3 discusses previous approaches to the AI (Ninan, 2014; Pearson, 2013) and their shortcomings. Section 4 presents our direct proposal couched in terms of von Stechow and Gillies's (2010) kernels. Section 5 concludes.

## 2. Empirical landscape

This section discusses what types of situations can constitute direct experience with different PPTs, categorizes contexts in which the AI disappears and talks about the patterns of AI obviation with different subjective expressions.

### 2.1. Directness

Before we proceed, a discussion of issues related to the nature of firsthand experience is in order. First of all, while some PPTs, such as *tasty* (1a) or *delicious*, dictate the type of experience, some others, such as *gorgeous* (4) or *beautiful*, exhibit more freedom, with sensory modality depending on the specific stimulus:

- (4) My blindfolded dance last night was **gorgeous**. I couldn't see what I was doing, but I could feel my body in each position.

What exactly counts as firsthand depends on a situation. First, the experience does not have to be complete: in fact, even smaller samples entitle the experiencer to a judgment about the stimulus (5a), which is in contrast with no experience at all (5b):

- (5) a. INCOMPLETE EXPERIENCE:  
✓I only watched { the trailer / the first five minutes }. This movie is **boring**.  
b. NO EXPERIENCE:  
#The new Allen movie is **boring**. I haven't watched it, but they are all the same.

Examples like (5b) above should not be confused with cases of type-token ambiguity (6):

- (6) a. Massaman curry is delicious, ✓I've tried it before at another restaurant. TYPE  
b. This Massaman curry is delicious, #but I haven't tried it yet. TOKEN

Second, the presence of an AI does not always imply immediate perception. For example, I am entitled to call the San Juans beautiful even if I have only seen a picture of the range. However, the boundary between firsthand and non-firsthand is not clear-cut, as evidenced in (7). Just looking at a picture does not make one entitled to a gustatory judgment (7a), but seeing other patrons ordering it might (7c), and judgments regarding (7c) and (7d) vary.

- (7) That curry is **tasty**.  
a. # READING A RECIPE  
b. # LOOKING AT A PICTURE  
c. ? SEEING OTHER PATRONS ORDERING/EATING IT  
d. ? READING REVIEWS

Finally, world knowledge needs to be factored in. Different tasters will have different thresholds for what can be classified as firsthand. A professional photographer looking at a histogram or a professional musician looking at a string of notes would be entitled to make an aesthetic judgment, while a layperson would not.

The above issues related to the nature of firsthand experience are not unique to PPTs alone and arise with other natural language expressions dealing with evidence, including evidentials (Faller, 2002; McCready, 2015) and epistemic modals (von Stechow and Gillies, 2010). For example, different languages with grammatical evidentiality may conceptualize the same situation, such as inference from observable results, in different ways (Korotkova, 2016). While a thorough discussion is beyond the scope of this paper, the central observation still stands: PPTs encode a type of firsthand experience, however construed, and our direct knowledge proposal in Section 4 captures this intuition.

## 2.2. Obviators

As shown in Section 1, the AI is not always present and disappears in the scope of epistemic *might* (3). The list of what we call *obviators* is in fact broader and includes epistemic *must* (8a), epistemic adverbs (8b), futurate operators (8c) and predicates of clarity (8d) (cf. also Pearson, 2013; Klecha, 2014; Ninan, 2014).

- (8) The puerh ..... delicious, but I never tasted it.
- |  |                             |
|--|-----------------------------|
| a. ✓ <b>must/might</b> have been               | EPISTEMIC MODAL AUXILIARIES |
| b. ✓ <b>probably/possibly/maybe</b> was        | EPISTEMIC ADVERBS           |
| c. ✓ <b>will/is going to</b> be                | FUTURATE OPERATORS          |
| d. ✓ <b>obviously/certainly/apparently</b> was | PREDICATES OF CLARITY       |

Klecha (2014) argues that obviation diagnoses the presence of a modal operator. We propose instead that obviators convey *indirectness* of some sort (see also (Winans, 2016) on *will*) and thus do not commit ourselves to a theory where all obviators belong to the same semantic category (pace Klecha, 2014). Fittingly, grammatical markers of indirect evidentiality also follow the pattern, as illustrated with Turkish *miş* in (9) (see (Şener, 2011) on evidentiality in Turkish):

- (9) Turkish (Turkic: Turkey)
- |   |                       |
|---|-----------------------|
| a. #Durian güzel, ama hiç dene-me-di-m.<br>durian good, but ever try-NEG-PST-1SG<br>Intended: ‘Durian is good, but I’ve never tried it’.                              | BARE FORM             |
| b. ✓Durian güzel- <b>miş</b> , ama hiç dene-me-di-m.<br>durian good-IND, but ever try-NEG-PST-1SG<br>‘Durian is good, <i>I hear/infer</i> , but I’ve never tried it’. | EVIDENTIAL <i>miş</i> |

Additionally, hedges (10) and markers of emphatic certainty such as *I know* (11b) lift the AI:

- (10) I **assume/suppose/think** that the puerh was delicious, but I haven’t tasted it. HEDGES
- (11) a. #Climbing the Half Dome is amazing. We should do it. BARE FORM
- b. ✓ **I know** that climbing the Half Dome is amazing. We should do it. I KNOW

In the rest of the paper, we restrict our attention to clause-mate obviators to avoid potential confounds related to the syntax of parentheticals and clausal embedding.

## 2.3. Overt tasters: PPTs and otherwise

So far, we have been talking only about “bare” uses of PPTs, ones where the linguistic form does not make the relevant taster explicit. However, PPTs also admit overt tasters introduced by

prepositions *to* and *for* in English, such as in *tasty to me* or *to Hobbes* (see (Bylina, 2017) on cross-linguistic parallels). As (12) indicates, obviation patterns with covert<sup>3</sup> and overt tasters are distinct:

(12) OVERT TASTER PPs:

The puerh ..... delicious to me, but I never tasted it.

- |    |  |                             |
|----|--|-----------------------------|
| a. | <b>#must/✓might</b> have been                | EPISTEMIC MODAL AUXILIARIES |
| b. | <b>#probably/#possibly/#maybe</b> was        | EPISTEMIC ADVERBS           |
| c. | <b>✓will/✓is going to</b> be                 | FUTURATE OPERATORS          |
| d. | <b>#obviously/#certainly/#apparently</b> was | PREDICATES OF CLARITY       |

The AI of bare PPTs is lifted in the scope of *all* operators from (12). However, overt tasters impose much stricter conditions on obviation. Under many accounts of PPTs (see (Coppock, 2018) for a recent discussion), the possibility of having an explicit taster expressed via a PP is often treated as an argument for making PPTs dyadic predicates, with either an overt taster (via a PP with a semantically inert P) or a covert pronominal-like taster supplied for bare uses (a.o. Stephenson, 2007; Stojanovic, 2007; Pearson, 2013; Bylina, 2017). Such theories would thus predict that overt and covert tasters should behave the same with respect to obviation. As (12) shows, this prediction is not borne out, which can be used as an argument against theories that treat overt and bare uses on a par.

In the introduction, we have shown that other subjective expressions, namely psych predicates and subjective attitudes, also have an AI (1b, 1c) that disappears in the scope of *might* (3b, 3c). The overall obviation pattern with those expressions resembles that of PPTs vis-à-vis the presence of an overt experiencer. For psych predicates that do not have an overt perceiver, the AI can be lifted by obviators from Section 2.2, as shown in (13) below:

(13) PSYCH PREDICATE WITHOUT AN EXPERIENCER:

The puerh ..... delicious, but I never tasted it.

- |    |   |                             |
|----|---|-----------------------------|
| a. | <b>✓must/might</b> have looked                | EPISTEMIC MODAL AUXILIARIES |
| b. | <b>✓probably/possibly/maybe</b> looked        | EPISTEMIC ADVERBS           |
| c. | <b>✓will/is going to</b> look                 | FUTURATE OPERATORS          |
| d. | <b>✓obviously/certainly/apparently</b> looked | PREDICATES OF CLARITY       |

For cases where the experiencer is overtly present in the linguistic form, the obviation pattern is constrained in the same way it is with overt taster PPTs (12), as illustrated in (14) for psych predicates and in (15) for subjective attitudes:

<sup>3</sup>We are not committed to a view such that tasters are always represented in the linguistic structure and will use the term *covert taster* descriptively to refer to a situation when the taster is not introduced overtly.

- (14) PSYCH PREDICATE WITH AN EXPERIENCER:  
 The puerh ..... delicious to me, but I never tasted it.
- a. **#must/✓might** have looked EPISTEMIC MODAL AUXILIARIES
  - b. **#probably/#possibly/#maybe** looked EPISTEMIC ADVERBS
  - c. **✓will/✓is going to** look FUTURATE OPERATORS
  - d. **#obviously/#certainly/#apparently** looked PREDICATES OF CLARITY

- (15) SUBJECTIVE ATTITUDE:  
 I ..... the puerh delicious, but I never tasted it.
- a. **#must/✓might** have found EPISTEMIC MODAL AUXILIARIES
  - b. **#probably/#possibly/#maybe** found EPISTEMIC ADVERBS
  - c. **✓will/✓is going to** find FUTURATE OPERATORS
  - d. **#obviously/#certainly/#apparently** found PREDICATES OF CLARITY

Examples (12), (14) and (15) demonstrate that expressions where the experiencer whose first-hand experience is tracked by the AI is overt all pattern together and allow obviation only in a limited set of contexts: under futurate markers *will* and *going to*, and under epistemic *might*. We suggest that such cases of obviation are simply instantiations of local accommodation in the scope of a future (or counterfactual) operator, which does not obviate the AI *per se* as much as temporally displaces it. Indeed, if one attempts to counter that displaced AI, contradiction results:

- (16) a. #Even if I hadn't tried the puerh, I might have found it delicious.  
 b. #Even though I am never going to try it, the puerh is going to be delicious to me.

Bare PPTs and psych predicates, on the other hand, are more liberal. These facts are summarized in Table 1 below.

OBVIATORS	COVERT EXPERIENCERS		OVERT EXPERIENCERS		
	PPT	Psych predicates	PPT	Psych	Subjective attitudes
<i>must</i>	✓	✓	#	#	#
<i>might</i>	✓	✓	✓	✓	✓
epistemic adverbs	✓	✓	#	#	#
predicates of clarity	✓	✓	#	#	#
futurate markers	✓	✓	✓	✓	✓

Table 1: Obviation facts

The next section is about previous approaches to the AI obviation. We will show that they are not fine-grained enough to account for the discrepancy in behavior between overt and covert tasters and that not all of them actually explain the main puzzle, namely the possibility of

obviation in the first place. In Section 4, we present our account and use obviation as a tool to adjudicate between different approaches to PPTs.

### 3. Previous approaches

#### 3.1. Pragmatics: Ninan (2014)

Ninan (2014) offers a pragmatic account according to which the AI arises due to an epistemologically grounded norm of assertion.<sup>4</sup>

(17) In order to know the truth of *o is tasty*, the speaker must have prior experience with *o*.

Asserting unmarked sentences typically assumes such knowledge, which results in the infelicity of explicit denials, as illustrated in (18, repeated from 1a):

(18) #The puerh was delicious, but I never tasted it.

If one were to assert that the puerh is delicious, one could do it only in case they have tried it, as per (17). However, the second conjunct states that the speaker has no experience with the tea, which yields a clash. Under this approach, (18) is odd not because of the semantics of PPTs but due to a conflict between what is said and what the speech act of assertion requires. Such an explanation is along the lines of a prominent account of Moore's paradox (Williamson, 2000). It predicts that, just like with Moore-paradoxical sentences, the oddness would go away in attitude reports, an environment that demarcates the divide between semantics and pragmatics. As the non-contradictory (19) shows, the prediction is borne out (as we discuss later in the paper, Ninan's is not the only way to account for the felicity of (19)):

(19) Jay thought that the puerh was delicious and that he has never tasted it.

Ninan (2014) correctly predicts that negated sentences with PPTs still carry an AI because linguistic negation does not affect knowledge requirements. Obviation, on the other hand, is possible because marked (e.g. modalized) propositions are not subject to the convention in (17). The pragmatic account therefore successfully explains the Puzzle. However, there are at least two challenges faced by this type of proposal.

The first problem is the cross-constructural variation in AI obviation. As shown in Section 2.3, obviation is limited with overt tasters, the relevant contrast repeated in (20) below:

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<sup>4</sup>As Ninan himself notes, the exact inventory of the norms of assertions is actively debated in epistemology and philosophy of language (Williamson, 2000; Lackey, 2007; Weiner, 2005), and it is not essential for his analysis whether assertions require knowledge rather than, say, justified belief.

- (20) a. ✓The San Juans must be beautiful, but I have never seen them. COVERT  
 b. #The San Juans must be beautiful to me, but I have never seen them. OVERT

Ninan does not discuss overt tasters, but it seems reasonable to assume that the convention in (17) would be insensitive to the linguistic form of the taster and apply to sentences with overt taster PPs just as well. It is then expected that obviation patterns with overt and covert tasters would be the same, contrary to fact.

The second problem for Ninan are the so-called non-autocentric uses (Lasersohn, 2005). Generally, PPTs describe the speaker's tastes. However, PPTs can be also used to talk about third party's judgments (cf. Stephenson, 2007):

- (21) Rotting flesh is delicious (to a vulture). (adapted from Egan et al., 2005)

Non-autocentric readings also have an AI (22a) that is subject to obviation (22b). Ninan's (2014) pragmatic approach rooted in the *speaker's* knowledge does not predict it.

- (22) EXOCENTRIC AI  
 a. Hobbes's new food is tasty, #but no cat has ever tried it yet.  
 b. ✓Hobbes's new food { **must** be / **obviously** is / **will** be } tasty, but no cat has ever tried it yet.

Based on the data from overt tasters and the non-autocentric AI, we conclude that Ninan's proposal undergenerates and does not fully account for AI obviation.

### 3.2. Semantics: Pearson (2013)

A different approach to the AI is due to Pearson (2013). The core components of her proposal relevant to our discussion here are an experience presupposition and first-person genericity (see (Bhatt and Pancheva, 1998; Keshet, 2005; Anand, 2009) and especially (Moltmann, 2010, 2012)). The formal details (in a simplified version) are laid out below.

- (23)  $\llbracket \text{tasty-to} \rrbracket^{c,i} = \lambda x \lambda o : x \text{ has tried } o \text{ in } \text{WORLD}(i). 1 \text{ iff } o \text{ is } \textit{tasty} \text{ to } x \text{ in } \text{WORLD}(i)$

The presupposition in (23) ensures that statements with PPTs are only felicitous when the taster  $x$  has firsthand experience with the stimulus  $o$ . It cannot be cancelled, which accounts for the infelicity of explicit denials (3), and projects out of negation, which explains why even negated PPTs trigger an AI (2).

Pearson argues that PPTs display the signature behavior of individual-level predicates (e.g. *tall*; (Carlson, 1980)) such as universal interpretations with bare plurals and infelicity in existential constructions. She further adopts Chierchia's (1995) analysis of individual-level predicates, wherein all such predicates are inherently generic, and argues that PPTs always come with

GEN:<sup>5</sup>

- (24) a. This is tasty.  
b. [ This<sub>*i*</sub> [ GEN *t<sub>i</sub>* is tasty ]

GEN binds the taster argument  $x$  and is restricted by quantificational domain restriction  $Dom$ :

- (25) [  $\forall \langle x, w' \rangle : x \in Dom$  ] [the puerh is tasty-to  $x$  in  $w'$ ]

The experience presupposition projects universally yielding the following:

- (26) [  $\forall \langle x, w' \rangle : x \in Dom$  ] [  $x$  has tried  $o$  in  $w'$  ]

Unlike Ninan (2014), Pearson can account for the non-autocentric AI. This is achieved in the following way. By default, the speaker is included in  $Dom$ , which reflects the intuition that most uses of PPTs are about the speaker's tastes. However, there are cases when the speaker's tastes are irrelevant. This is precisely the situation with classic non-autocentric uses of PPTs (21), where the speaker is not the "target audience" and thus not in  $Dom$  (Pearson does not specify when exactly the speaker can be irrelevant, which, as we will see below, is problematic). However, the presence of an AI does not depend on who the taster is because the presupposition is generic. This explains that even non-autocentric uses will have an AI (22a) that is no different from an autocentric one.

Pearson attempts to solve the Puzzle by using reasoning from indirectness (her discussion is based on *must*, but can easily be extrapolated to other obviators from Section 2.2). According to von Stechow and Gillies (2010); Lassiter (2016), *must* signals the lack of direct evidence for its prejacent. In case of statements with PPTs, it would mean that the speaker (in default cases) has no firsthand evidence for  $o$ 's tastiness. And if the speaker hasn't tried  $o$ , the speaker will be irrelevant and thus not in  $Dom$ . When the speaker is not in  $Dom$ , the generic presupposition does not apply to them and obviation is felicitous.

This type of proposal explains obviation, but, as pointed out by Ninan (2014), it overgenerates. Reasoning from indirectness should carry over to explicit denials. If the speaker can be irrelevant with *must*, which indicates that they have no firsthand experience, then by the same token the speaker should be irrelevant with explicit denials. However, obviation is allowed, while continuations in (1). So Pearson does not actually solve the Puzzle.

Her proposal faces further problems. It predicts that the speaker, when not in  $Dom$ , is necessarily irrelevant and is not committing to a judgment on  $o$  if/when they do try it. The prediction is false, since an explicit continuation as in (27) leads to contradiction.

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<sup>5</sup>Based a pattern of modification with temporal adverbials, Czipionka and Lauer (2017) argue against Chierchia's (1995) generic proposal for individual-level predicates. However, this specific worry is not important for our criticism of Pearson's approach as the generity of PPTs can be, and has been, formalized in a number of other ways, see (Bhatt and Pancheva, 1998; Keshet, 2005; Anand, 2009; Moltmann, 2010, 2012).

(27) Just look at it! The puerh { is / must be } delicious, #but I am going to find it disgusting.

We conclude that Pearson's proposal does not account for AI obviation. In the next section, we present an account that does.

#### 4. A direct proposal

We take the acquaintance content of PPTs to comment on direct evidential grounds for a proposition and model the AI following the account of directness proposed by von Fintel and Gillies (2010) (vF&G) for epistemic *must*.

##### 4.1. Framework for directness

von Fintel and Gillies (2010), and later Lassiter (2016), argue that epistemic *must* is sensitive to evidential grounds for a proposition. Their point of departure is as follows. Statements with epistemic *must* are infelicitous if the predjacent  $p$  was learned via immediate perception and felicitous if  $p$  was inferred, as the minimal pair in (28) and (29) illustrates:

- (28) *Looking out of the window and seeing a downpour:* PERCEPTION
- a. ✓ It is raining.
  - b. # It must be raining.
- (29) *Seeing people with wet umbrellas:* INFERENCE
- a. # It is raining.
  - b. ✓ It must be raining.

To account for the contrast between (28) and (29), vF&G propose that *must* can only target information that is not known directly. They assume an epistemological framework in which knowledge comes in (at least) two flavors: propositions that are known directly, e.g. via immediate perception, and propositions that are known but indirectly, e.g. via reasoning. This is formalized using *kernels* (30):

- (30) KERNELS
- a. A kernel  $K$  is a set of propositions that encode direct knowledge
  - b.  $K$  directly settles (whether)  $p$  iff  $\exists q \in K [ q \subseteq p \vee q \subseteq \neg p ]$
  - c. The proposition  $\bigcap K$  is a vanilla epistemic modal base: the set of worlds compatible with what is known directly and indirectly

Importantly,  $\bigcap K$  may entail  $p$  without  $K$  directly settling whether  $p$ .  $K$  directly settles whether it is raining in (28) but not in (29). Under the proposed analysis, *must* presupposes a lack of direct settlement (i.e., indirect evidence); this then accounts for the contrast in (28) and (29):

(31) MUST

- a.  $\llbracket \text{must } p \rrbracket^{c,i}$  is defined only if  $K$  does not directly settle  $\lambda i. \llbracket p \rrbracket^{c,i}$
- b. If defined,  $\llbracket \text{must } p \rrbracket^{c,i} = 1$  iff  $\bigcap K \subseteq \lambda i. \llbracket p \rrbracket^{c,i}$

Unlike what (28,29) would suggest, the licensing of *must* (and hence the notion of direct evidence) is hardly straightforward. For one thing, relative to context, it may even admit immediate perception. Professional epistemologists—trained to be skeptical of their own eyes—may use *must* even when they visually observe rain, and such cases have been used in the recent literature (Giannakidou and Mari, 2016; Goodhue, 2017) to argue that *must* tracks the lack of knowledge rather than the lack of directness. We believe that vF&G’s observation about the indirectness of *must* can be reconciled with recent criticisms once more research is done on the link between types of knowledge and evidence for claims. For the purposes of this paper, we maintain that *must* carries an evidential signal which can be formalized using kernels.

#### 4.2. PPTs, kernels and obviation

The analysis advocated by vF&G puts epistemic modals in a loose category of linguistic expressions that deal with the divide between direct and indirect evidence. Grammatical markers of evidentiality come to mind first (see e.g. (Bybee, 1985; Izvorski, 1997; Matthewson et al., 2007) on the relation between epistemic modality and evidentiality), but the overall number of such expressions is larger. And if there are distinct phenomena such that their felicity conditions depend on the presence or absence of firsthand experience, then it is only natural to analyze them along similar lines. In this section we do precisely that.

We propose that the AI of PPTs and other subjective expressions is another instance of kernel-dependence. In doing so, we do not commit ourselves to a worldview such that all expressions that are “about” evidence must belong to the same semantic category. Instead, we use the concept of (in)directness to link those expressions and, as we will show, specific formal details vary even within PPTs. We use kernels as a convenient formal object that may be manipulated, with the above caveats that they may be incomplete or misguided.

We will treat kernels as interpretative coordinates, much like information states for Yalcin (2007) (cf. also Hacquard, 2006), and treat them as part of the context:  $\langle \dots, \text{kernel}_{\text{speaker}, \text{world}} \rangle$ . We also use the judge parameter, first proposed by Lasersohn (2005), to determine who the taster is in each particular situation. Indices of evaluation are thus minimally 3-tuples:  $\langle \text{world}, \text{judge}, \text{kernel}_{\text{judge}, \text{world}} \rangle$ . Note that our goal is to give a precise implementation for the AI and that we are largely agnostic about other aspects of the semantics of PPTs. The judges are here for purely representational reasons. It is easy to reformulate our insights within other theories (see (MacFarlane, 2014; Zakkou, 2015; Lasersohn, 2017; Coppock, 2018) for an overview).<sup>6</sup>

Our semantics for PPTs is given in (32):

<sup>6</sup>For presentational purposes, we notate via subscript the individual and world for a kernel  $K$  (like  $DOX_{x,w}$ ). We here assume that kernel and judge coordinates are “matched”. We suspect that this matching is a product of the fact that a person’s kernel will directly settle only propositions where that person is the judge.

- (32) a.  $\llbracket \text{tasty} \rrbracket^{c, \langle w, j, K_{j,w} \rangle} =$   
 $\lambda o : K_{j,w}$  directly settles whether  $o$  is tasty for  $j$  in  $w$ . 1 iff  $o$  is tasty for  $j$  in  $w$   
 b.  $K_{j,w}$  directly settles whether  $p$  iff  $\exists q \in K_{j,w} [q \subseteq p \vee q \subseteq \neg p]$

Applied to a sentence with a PPT (33a), such semantics yields (33b):

- (33) a. This puerh is delicious.  
 b.  $\llbracket \text{The puerh is delicious} \rrbracket^{c, \langle w, j, K_{j,w} \rangle}$   
 $= \lambda o : K_{j,w}$  directly settles whether puerh is delicious for  $j$  in  $w$ . 1 iff puerh is delicious for  $j$  in  $w$

The semantics in (32) and (33) says nothing about the judge having firsthand experience with the stimulus. We propose that the AI arises because, ontologically, the only way to directly settle whether something is tasty is for the relevant taster to try it. An unmodified sentence with a PPT will be undefined otherwise. Because we model the direct settlement requirement as a presupposition, the AI is predicted to be present in both affirmative and negative sentences (34, repeated from 2a):

- (34) The puerh wasn't delicious, #but I never tasted it.

Non-autocentric uses of PPTs are unproblematic under this view. The judge does not have to be the speaker even in root clauses, and the presence of an AI will not depend on who the judge is.

The explanation of the Puzzle is done in two steps. The first step is to exclude explicit denials (35, repeated from 1a):

- (35) The puerh was delicious, #but I never tasted it.

Per (32), PPTs like *delicious* are only defined if  $K_{j,w}$  directly settles whether the stimulus is tasty to the judge. And this can be settled just in case the judge has tried the stimulus. The second conjunct explicitly states that the judge hasn't tried the tea. The first conjunct will not be defined whenever the second one is true, which correctly predicts that explicit denials would be infelicitous.

The second step is to account for obviation, illustrated in (36, repeated from 8a):

- (36) ✓The puerh must have been delicious, but I never tasted it.

We propose that the contrast between obviation and explicit denials stems from grammatical facts about obviators, an approach that allows us to avoid problems faced by Ninan (2014) and Pearson (2013). Specifically, we propose that epistemic modals and other markers of indirectness update the kernel (like attitudes for Yalcin (2007)). The mechanics is exemplified in (37) below with epistemic *must*.

We treat *must* a context-sensitive element dependent on the speaker's kernel.<sup>7</sup> We further propose that *must* eliminates the direct-indirect distinction in its scope by overwriting  $K$  with  $\{\bigcap K\}$  (37a), which turns direct settlement into a requirement that the relevant information state is decided on the prejacent (37b).<sup>8</sup>

- (37) a.  $\llbracket \text{must } p \rrbracket^{\langle \dots, K_{sp,w}, \dots \rangle, \langle w, j, \mathbf{K}_{j,w} \rangle} = \llbracket \text{must} \rrbracket^{\langle \dots, K_{sp,w}, \dots \rangle, \langle w, j, K_{j,w} \rangle} (\llbracket p \rrbracket^{c, \langle w, j, \{\bigcap \mathbf{K}_{j,w}\} \rangle})$   
 b. Given the semantics for PPTs:  
 $\llbracket \text{must [PPT]} \rrbracket^{\langle \dots, K_{sp,w}, \dots \rangle, \langle w, j, K_{j,w} \rangle}$  is defined  
 iff  $\{\bigcap K_{j,w}\}$  directly settles whether  $p$   
 c. vF&G's semantics for *must*:  
 $\llbracket \text{must} \rrbracket^{\langle \dots, K_{sp,w}, \dots \rangle, \langle w, j, K_{j,w} \rangle}$   
 $= \lambda p : K_{sp,w}$  does not directly settle whether  $p$ . 1 iff  $\bigcap K_{sp,w} \subseteq p$

The full derivation is given in (38) (we do not take tense into account):

- (38) a. The puerh must be delicious.  
 b.  $\llbracket \text{must [the puerh is delicious]} \rrbracket^{\langle \dots, K_{sp,w}, \dots \rangle, \langle w, j, K_{j,w} \rangle}$   
 $= \llbracket \text{must} \rrbracket^{\langle \dots, K_{sp,w}, \dots \rangle, \langle w, j, K_{j,w} \rangle} (\llbracket \text{the puerh is delicious} \rrbracket^{c, \langle w, j, \{\bigcap K_{j,w}\} \rangle})$   
 $= \bigcap K_{sp,w} \subseteq (\text{puerh.delicious}),$  if defined; and  
 defined iff  $\{\bigcap K_{j,w}\}$  directly settles whether puerh is delicious to  $j$  in  $w$  and  
 $K_{sp,w}$  does not directly settle whether puerh is delicious to  $j$  in  $w$ .

Given that the default perspective of PPTs is autocentric, the judge in (38b) is in fact the speaker. Per (37b), the directness requirement of PPTs disappears under *must*: it is only required that the prejacent is known, but it does not matter whether it is known directly or indirectly. Therefore, continuations that explicitly state that the judge has no firsthand experience, as in (36), are felicitous. (*must*'s general exclusion of direct knowledge in (37c) accounts for the fact that is odd to utter (39)):

- (39) # I tried the puerh. It must be tasty.

We propose that other obviators follow the scheme in (37), but leave precise details for future research.<sup>9</sup>

<sup>7</sup>We do not follow vF&G to the letter here. In line with their analysis, we make *must* sensitive to context rather than index (cf. also von Stechow and Gillies, 2008). However, we make the knower explicit by anchoring *must* to the speaker. It is well-known since at least (DeRose, 1991) that epistemic modals do not always track the speaker's exclusive knowledge. Our move is a simplification and is done for the sake of explicit representation. Another analytical option would be to anchor both *must* and PPTs to a judge (cf. Stephenson, 2007; McCready, 2007). In general, precise modeling of interactions between PPTs and *must*, as well as indirect markers at large, should be analyzed within an epistemic logic for multi-agent systems. We leave it for future work.

<sup>8</sup>Note that compositionally,  $\llbracket \text{must} \rrbracket$  should take  $\lambda \langle w, j, \{\bigcap K_{j,w}\} \rangle. \llbracket p \rrbracket^{c, \langle w, j, \{\bigcap K_{j,w}\} \rangle}$  as an argument; we suppress the intensional type-shifter here, but note that it is responsible for transmitting the new kernel argument.

<sup>9</sup>In addition, while we follow vF&G in treating *must* as a marker of epistemic necessity, this aspect of their analysis is not crucial for us. The strength of *must* is a matter of a debate (see discussion in (Lassiter, 2016)) and one can easily recast our approach to obviation within theories that treat *must* as weak, e.g. along the lines of classic Kratzerian semantics (Kratzer, 1981, 1991).

### 4.3. Overt tasters

As we have shown in Section 2.3, obviation is subject to cross-constructural variation. When the taster is covert, which is the case for ‘bare’ uses of PPTs and psych predicates, obviation is allowed with different markers of indirectness such as epistemic modal auxiliaries, epistemic adverbs, futurate operators and predicates of clarity (Section 2.2). However, obviation is highly restricted with overt tasters, i.e., PPTs with *to* phrases, psych predicates, and subjective attitudes. The contrast is illustrated in (40) and (41, repeated from 20):

(40) PRESENCE OF AN AI

- a. The San Juans are beautiful, #but I have never seen them. COVERT
- b. The San Juans are beautiful to me, #but I have never seen them. OVERT

(41) AI OBVIATION

- a. ✓The San Juans must be beautiful, but I have never seen them. COVERT
- b. #The San Juans must be beautiful to me, but I have never seen them. OVERT

The facts in (40) and (41) present challenges for the accounts of the AI that do not differentiate between two types of acquaintance content. Such cases or overt tasters in general are not discussed explicitly by either Ninan (2014) or Pearson (2013), but based on the overall shape of their respective theories, we think that neither of them predicts our data.<sup>10</sup>

Furthermore, the new data from obviation allow us to formulate a constraint on theories of PPTs (without taking a stand as to which one is correct). The existence of overt tasters is often taken as evidence that PPTs always take a taster argument (a.o. Stephenson, 2007; Stojanovic, 2007; Pearson, 2013) whose semantics is the same in both covert and overt realizations. Such theories do not predict the contrast in (40) and (41). On the other hand, theories with a disjoint treatment of bare vs. overt uses (cf. Lasersohn, 2005; MacFarlane, 2014) do not face this problem. Therefore, obviation facts support such treatment.

We extend our analysis of ‘bare’ uses to overt tasters DPs and propose that overt judges depend on the DP’s kernel (42):

- (42)  $\llbracket \text{delicious to } \alpha \rrbracket^{c,i} = \lambda o : \text{the kernel of } \llbracket \alpha \rrbracket^{c,i} \text{ in } w \text{ at } t \text{ directly settles whether } o \text{ is delicious for } \alpha \text{ in } w. 1 \text{ iff } o \text{ is tasty for } \alpha \text{ in } w$

For non-obviated cases, the semantics (43) is the same as with ‘bare’ uses in (33) (modulo the judge) and the AI arises because of the direct settlement requirement:

<sup>10</sup>As discussed in Section 3.2, Pearson’s (2013) account of obviation relies crucially on the presence of a generic operator and on the possibility of the taster to be excluded from its quantificational domain. With overt taster PPs in mind, she briefly mentions that not all uses of PPTs may be generic, but a further elaboration would be needed to see how this approach fares with respect to the cross-constructural variation in AI obviation.

- (43) a. The puerh is delicious to me.  
 b.  $\llbracket$  the puerh is delicious to me  $\rrbracket^{c, \langle w, j, K_{j,w} \rangle}$   
 is defined iff  $K_{spkr(c),w}$  directly settles whether puerh is delicious for *speaker(c)* in  $w$ .  
 If defined, 1 iff puerh is delicious for *speaker(c)* in  $w$ .

With obviators, things differ. Obviators update the  $K$  coordinate, but overt tasters ignore that coordinate. The presupposition triggered by the PPT is thus unaffected, and it projects. This means that when the overt taster is the speaker, contradiction (or a sense of forgetfulness, at least) will typically arise, as in (44):<sup>11</sup>

- (44) a. # The puerh must be delicious to me.  
 b.  $\llbracket$  must [the puerh is delicious to me]  $\rrbracket^{\langle \dots, K_{sp,w}, \dots \rangle, \langle w, j, K_{spkr(c),w} \rangle}$   
 $= \llbracket$  must  $\rrbracket^{\langle \dots, K_{sp,w}, \dots \rangle, \langle w, j, K_{j,w} \rangle} (\llbracket$  the puerh is delicious to me  $\rrbracket^{c, \langle w, j, \{\cap K_{j,w}\} \rangle})$   
 $= 1$  iff  $\cap K_{spkr(c),w} \subseteq (\textit{puerh.delicious})$ , if defined; and  
 defined iff  $K_{spkr(c),w}$  directly settles whether puerh is delicious to *speaker(c)* in  $w$   
 and  $K_{spkr(c),w}$  does not directly settle whether puerh is delicious to *speaker(c)* in  $w$ .

As shown in (44), the PPT requires direct settlement by the speaker's kernel. *must*, on the other hand, requires the opposite. Those contradictory requirements explain why obviated sentences with first-person overt tasters are infelicitous.

Our analysis correctly predicts that modification with obviators will be possible with third-party overt tasters (45a). In such cases, *must* is anchored to the speaker while the PPT is dependent on the DP's kernel, therefore no contradictions ensue (45b).

- (45) a. ✓ The puerh must be delicious to Mo.  
 b.  $\llbracket$  must [the puerh is delicious to Mo]  $\rrbracket^{\langle \dots, K_{sp,w}, \dots \rangle, \langle w, j, K_{j,w} \rangle}$   
 $= \llbracket$  must  $\rrbracket^{\langle \dots, K_{sp,w}, \dots \rangle, \langle w, j, K_{j,w} \rangle} (\llbracket$  the puerh is delicious to Mo  $\rrbracket^{c, \langle w, j, \{\cap K_{j,w}\} \rangle})$   
 $= 1$  iff  $\cap K_{spkr(c),w} \subseteq (\textit{puerh.delicious})$ , if defined; and  
 defined iff  $K_{Mo,w}$  directly settles whether puerh is delicious to Mo in  $w$  and  $K_{spkr(c),w}$   
 does not directly settle whether puerh is delicious to Mo in  $w$ .

Though we have only provided a semantics for PPTs here, we assume that other subjective expressions behave similarly: the AI stems from a presupposition sensitive to a kernel-coordinate, which obviators overwrite; in turn, overt tasters pick out a distinct kernel, leading to a classic presupposition.

## 5. Conclusions

This paper explores the nature of the Acquaintance Inference, a firsthand experience requirement present with several subjective expressions across affirmative and negated sentences. The

<sup>11</sup>This is exactly the behavior that the presuppositional analysis in (Pearson, 2013) predicts for 'bare' PPTs. While Ninan (2014) rightly criticizes it for 'bare' PPTs, it makes the right predictions for overt forms.

AI cannot be explicitly denied, which indicates that it is not an implicature, but can be sometimes lifted, a phenomenon we call obviation. We formulate the novel empirical generalization that covert and overt experiencers behave differently across obviation contexts.

Our analysis is rooted in research on (in)directness. We argue that PPTs and other AI-triggering subjective expressions comment on the evidential grounds for a proposition. We show that obviation is possible with linguistic elements that convey indirectness, including epistemic modals and futurate markers in English as well grammatical markers of indirect evidentiality in languages like Turkish. A consequence of this approach is that obviation should be treated as a diagnostic of indirectness, not modality (pace Klecha, 2014).

We further argue that obviators collapse the distinction between direct and indirect knowledge, which in turn makes it possible to use a PPT in their scope even in situations when the taster has no prior experience with the stimulus. To formalize our claims, we use von Stechow and Gillies's (2010) kernels. Beyond the formal appeal, the broader goal of the paper is to highlight a connection between PPTs and epistemic modals, and hence to shed light on how natural language conceptualizes evidence in general. In future work, we hope to push this idea further by investigating the interaction of subjective expressions with *bona fide* markers of direct evidentiality and their relation to other expressions with similar restrictions, such as English copy-raising constructions (Asudeh and Toivonen, 2012; Rett, Hyams, and Winans, 2013) and expressions dealing with internal states across languages, e.g. egophoricity (Coppock and Wechsler, 2018).

We also hope to examine the properties of obviators more closely. Though here we consider only clause-mate obviators, our semantics can extend to attitude verbs to predict that they, too, act as obviators (cf. Yalcin, 2007), which accounts for (19). But, by treating obviation as elimination of the direct-indirect distinction, we predict that (46a) and (46b) should be synonymous.

- (46) a. I'm certain it is raining.  
b. I'm certain it must be raining.

That they are not suggests that more must be said about how indirectness and obviation interact, a task we leave to future work.

## References

- Anand, P. (2009). Kinds of taste. Ms. UCSC.
- Asudeh, A. and I. Toivonen (2012). Copy raising and perception. *Natural Language and Linguistic Theory* 30(2), 321–380.
- Bhatt, R. and R. Pancheva (1998). Genericity, implicit arguments, and control. In *Proceedings of Student Conference in Linguistics* 7.
- Bybee, J. (1985). *Morphology: A study of the relation between meaning and form*. Amsterdam: John Benjamins.
- Bylinina, L. (2017). Judge-dependence in degree constructions. *Journal of Semantics* 34(2), 291–331.
- Carlson, G. N. (1980). *Reference to Kinds in English*. New York: Garland.

- Chierchia, G. (1995). Individual-level predicates as inherent generics. In G. N. Carlson and F. J. Pelletier (Eds.), *The Generic Book*, pp. 125–175. University of Chicago Press.
- Coppock, E. (2018). Outlook-based semantics. *Linguistics and Philosophy* 41(2), 125–164.
- Coppock, E. and S. Wechsler (2018). The proper treatment of egophoricity in Kathmandu Newari. In K. Jaszczolt and M. Huang (Eds.), *Expressing the Self: Cultural Diversity and Cognitive Universals*. Oxford: OUP: Oxford University Press.
- Czypionka, A. and S. Lauer (2017). ‘#Tall this week’: experimental evidence for a false-implication account. Ms., University of Konstanz, version of September 19, 2017.
- DeRose, K. (1991). Epistemic possibilities. *Philosophical review* 100, 581–605.
- Egan, A., J. Hawthorne, and B. Weatherson (2005). Epistemic modals in context. In G. Preyer and G. Peter (Eds.), *Contextualism in philosophy: Knowledge, meaning and truth*, Chapter 6, pp. 131–169. Oxford University Press.
- Faller, M. (2002). *Semantics and pragmatics of evidentials in Cuzco Quechua*. PhD dissertation, Stanford.
- von Fintel, K. and A. S. Gillies (2008). CIA leaks. *Philosophical review* 117(1), 77–98.
- von Fintel, K. and A. S. Gillies (2010). Must ... stay ... strong! *Natural Language Semantics* 18(4), 351–383.
- Giannakidou, A. and A. Mari (2016). Epistemic future and epistemic must: Nonveridicality, evidence, and partial knowledge. In D. K.-J. Joanna Blaszczak, Anastasia Giannakidou and K. Migdalski (Eds.), *Mood, Aspect, Modality Revisited: New Answers to Old Questions*, pp. 75–117. University of Chicago Press.
- Goodhue, D. (2017). Must  $\phi$  is felicitous only if  $\phi$  is not known. *Semantics and Pragmatics* 10.
- Hacquard, V. (2006). *Aspects of modality*. Ph. D. thesis, MIT.
- Izvorski, R. (1997). The present perfect as an epistemic modal. In A. Lawson (Ed.), *Semantics and Linguistic Theory (SALT)* 7, pp. 222–239. CLC Publications.
- Kennedy, C. and M. Willer (2016). Subjective attitudes and counterstance contingency. In M. Moroney, C.-R. Little, J. Collard, and D. Burgdorf (Eds.), *Proceedings of the 26th Semantics and Linguistic Theory Conference*, pp. 913–933.
- Keshet, E. (2005). A matter of taste. Ms.
- Klecha, P. (2014). Diagnosing modality in predictive expressions. *Journal of Semantics* 31(3), 443–455.
- Korotkova, N. (2016). *Heterogeneity and universality in the evidential domain*. PhD dissertation, UCLA.
- Kratzer, A. (1981). The notional category of modality. In H.-J. Eikmeyer and H. Rieser (Eds.), *Words, Worlds, and Contexts*, pp. 38–74. de Gruyter.
- Kratzer, A. (1991). Modality. In A. von Stechow and D. Wunderlich (Eds.), *Semantics: An International Handbook of Contemporary Research*, pp. 639–650. de Gruyter.
- Lackey, J. (2007). Norms of assertion. *Noûs* 41(4), 594–626.
- Lasnik, P. (2005). Context dependence, disagreement, and predicates of personal taste. *Linguistics and Philosophy* 28(6), 643–686.
- Lasnik, P. (2017). *Subjectivity and Perspective in Truth-Theoretic Semantics*. Oxford: Oxford University Press.
- Lassiter, D. (2016). Must, knowledge and (in)directness. *Natural Language Semantics* 24(2), 117–163.
- MacFarlane, J. (2014). *Assessment sensitivity: relative truth and its applications*. Oxford

University Press.

- Matthewson, L., H. Davis, and H. Rullman (2007). Evidentials as epistemic modals: Evidence from St'át'imcets. In J. van Craenenbroeck (Ed.), *Linguistic Variation Yearbook*, Volume 7, pp. 201–254. Amsterdam: John Benjamins.
- McCready, E. (2007). Context shifting in questions and elsewhere. In E. Puig-Waldmuller (Ed.), *Proceedings of Sinn und Bedeutung 11*, pp. 433–447.
- McCready, E. (2015). *Reliability in pragmatics*. Oxford: Oxford University Press.
- Moltmann, F. (2010). Relative truth and the first person. *Philosophical Studies* 150(2), 187–220.
- Moltmann, F. (2012). Two kinds of first-person-oriented content. *Synthese* 184(2), 157–177.
- Muñoz, P. (2017). Deriving direct experience effects from adjectival lexical semantics. Talk presented at the workshop *Subjectivity in language and thought*, University of Chicago.
- Ninan, D. (2014). Taste predicates and the acquaintance inference. In T. Snider, S. D'Antonio, and M. Weigand (Eds.), *Proceedings of Semantics and Linguistic Theory 24*, pp. 290–309. LS.
- Pearson, H. (2013). A judge-free semantics for predicates of personal taste. *Journal of Semantics* 30(1), 103–154.
- Rett, J., N. Hyams, and L. Winans (2013). The effects of syntax on the acquisition of evidentiality. In S. Baiz, N. Goldman, and R. Hawkes (Eds.), *BUCLD 37: Proceedings of the 37th annual Boston University Conference on Language Development*, Volume 1, pp. 345–357.
- Şener, N. (2011). *Semantics and Pragmatics of Evidentials in Turkish*. Ph. D. thesis, UConn, Storrs.
- Stephenson, T. (2007). Judge dependence, epistemic modals, and predicates of personal taste. *Linguistics and Philosophy* 30(4), 487–525.
- Stojanovic, I. (2007). Talking about taste: Disagreement, implicit arguments, and relative truth. *Linguistics and Philosophy* 30(6), 691–706.
- Weiner, M. (2005). Must we know what we say? *The Philosophical Review* 114(2), 227–251.
- Williamson, T. (2000). *Knowledge and Its Limits*. Oxford: Oxford University Press.
- Winans, L. (2016). *Inferences of will*. Ph. D. thesis, UCLA.
- Wollheim, R. (1980). *Art and Its Objects*. Cambridge: Cambridge University Press.
- Yalcin, S. (2007). Epistemic modals. *Mind* 116(464), 983–1026.
- Zakkou, J. (2015). *Tasty contextualism*. Ph. D. thesis, Humboldt University of Berlin.