How to theorize about subjective language:
A lesson from 'de re'

Pranav Anand (UC Santa Cruz) and Natasha Korotkova (University of Konstanz)

Abstract Subjective language has attracted substantial attention in the recent literature in formal semantics and philosophy of language (see overviews in MacFarlane 2014; van Wijnbergen-Huitink 2016; Lasersohn 2017; Vardomskaya 2018; Zakkou 2019b). Most current theories argue that *Subjective Predicates* (SPs), which express matters of opinion, semantically differ from ordinary predicates, which express matters of fact. We will call this view "SP exceptionalism". This paper addresses SP exceptionalism by scrutinizing the behavior of SPs in attitude reports, which, as we will argue, significantly constrains the space of analytical options and rules out some of the existing theories. As first noticed by Stephenson (2007a,b), the most prominent reading of embedded SPs is one where they talk about the attitude holder's subjective judgment. As is remarked sometimes (Sæbø 2009; Pearson 2013a), this reading is not the only one: embedded SPs may also talk about someone else's, non-local, judgment. We concentrate specifically on such cases and show that non-local judgment is possible if and only if SPs are used within a DP that is outside main predicate position and that entire DP is read *de re*. We demonstrate that the behavior of SPs in attitude reports does not differ from that of ordinary predicates: it follows from general constraints on intersective modification and intensional quantification (Farkas 1997; Musan 1997; Percus 2000; Keshet 2008). We argue that this unexceptional behavior of SPs in fact has unexpected consequences for SP exceptionalism. Precisely because SPs have been argued to be semantically different from ordinary predicates, not all theories correctly predict these less-studied data: some overgenerate (e.g. Stephenson 2007a,b; Stojanovic 2007; Sæbø 2009) and some undergenerate (e.g. McCready 2007; Pearson 2013a). Out of the currently available theories, only relativist accounts (Lasersohn 2005; MacFarlane 2014; Bylinina 2017; Coppock 2018) predict the right interpretation, and only that interpretation. We thus present a novel empirical argument for relativism, and, more generally, formulate a constraint that has to be taken into consideration by any view that advocates SP exceptionalism.

Keywords subjective language, predicates of personal taste, contextualism, relativism, attitudes, de re, semantic theory

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1 Introduction

1.1 Overview

Subjective language, which expresses matters of opinion rather than fact, has attracted substantial attention in the recent literature in formal semantics and philosophy of language (see overviews in MacFarlane 2014; van Wijnbergen-Huitink 2016; Lasersohn 2017; Vardomskaya 2018; Zakkou 2019b). In particular, most existing theories argue that there is a semantic difference between (i) ordinary, objective predicates, such as *acidic* or *decidious*[1] on the one hand, and (ii) *Subjective Predicates* (SPs), such as *adorable* or *delicious* on the other.[2] We will call this view "SP exceptionalism".

Ordinary predicates are typically analyzed as semantically dependent on the world of evaluation. The cornerstone of SP exceptionalism is the idea that, in addition to a world, SPs are semantically relativized to a special entity responsible for subjective judgment, or the *judge* as it has been called since Lasersohn (2005) (we use the term theory-neutrally and discuss different ways of conceptualizing judges in Section 2.3). Much of the current discussion about subjective meaning centers on the nature of the judge and on choosing the best implementation of SP exceptionalism based on various special properties exhibited by SPs, in contrast to ordinary predicates, e.g.: disagreement (Lasersohn 2005; Stojanovic 2007; MacFarlane 2014; Zakkou 2019b), retraction (MacFarlane 2014; Zakkou 2019a), embedding under *find* (Stephenson 2007b; Sæbø 2009; Coppock 2018) or genericity (Anand 2009; Moltmann 2010b, 2012; Pearson 2013a). In this paper, we take a different route.

The empirical focus of the paper is the range of interpretations of SPs in attitude reports (attitudes for short). When embedded SPs occupy main predicate positions, they talk about the attitude holder's subjective judgment (first noticed in Stephenson 2007a,b). When embedded SPs are within a DP that is outside main predicate position, they also may talk about someone else's, non-local, judgment (noted in passim in Sæbø 2009; Pearson 2013a) but if and only if that entire DP is read *de re*. We demonstrate that the behavior of SPs in attitudes does not differ from that of ordinary predicates: it follows from general constraints on intersective modification and intensional quantification (Farkas 1997; Musan 1997; Percus 2000; Keshet 2008). Intersective attributive modifiers cannot be evaluated at a world different from their head noun, which constrains the range of possible interpretations in attitudes for both DPs with ordinary modifiers (*a decidious tree*) and DPs with subjective modifiers (*a delicious tea*), but which has not been incorporated into accounts of SP exceptionalism.

The theoretical focus of the paper is a new taxonomy of analytical options for SPs and a novel argument for relativism about subjective meaning. We argue that the unexceptional behavior of SPs in attitudes in fact has unexpected consequences for SP exceptionalism and show that not all theories correctly predict the

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1. *Decidious* plants shed their leaves annually, as opposed to *evergreen* ones that retain their foliage.

2. Starting with the seminal work of Lasersohn (2005), a lot of research in this area has been focused on one class of subjective expressions, the so-called predicates of personal taste (PPTs), discussed later in Section 2.2. Distinctions between PPTs and other SPs will not play a role for the overarching goal of this paper, hence our broader term "subjective predicates".

less-studied data on embedded SPs outside main predicate position: some approaches overgenerate (e.g. Stephenson 2007a,b; Stojanovic 2007; Sæbø 2009) and some undergenerate (e.g. McCready 2007; Pearson 2013a). Out of the currently available theories, only relativist accounts (Lasersohn 2005; MacFarlane 2014; Bylinina 2017; Coppock 2018) predict the right interpretation, and only that interpretation.

Note that the paper is based on conditional reasoning. We do not argue for SP exceptionalism *per se*. Instead, we assume it with the rest of the literature on the topic and formulate a constraint that has to be taken into consideration by *any* view that advocates SP exceptionalism. With this caveat in mind, let us proceed to the core empirical observation.

1.2 The central observation

Consider two predicates, *depressing* and *uplifting*, both of which intuitively express an opinion rather than fact and thus can be classified as subjective (see Section 2.1 on diagnostics for subjectivity). It is well-established (Stephenson 2007a; Pearson 2013a) that the judge of an SP embedded under an attitude predicate is most typically interpreted *locally*, relative to the closest attitude holder (1).

(1) **Pascal**: **Mordecai** believes [that the documentary is **depressing**$_M$], even though it is **uplifting**$_P$.

In (1), *depressing* in the complement clause talks about Mordecai's subjective judgment, hence the Pascal-oriented *uplifting* in the follow-up is non-contradictory. However, the reading in (1) is not the only one available for embedded SPs, as they may also talk about someone else's, non-local, judgment. This is possible when one of the SPs is within a DP that is outside main predicate position in the complement clause, as *the uplifting documentary* in (2). As the reader can see for themselves, switching the order of predicates would not affect the interpretation.

(2) **Pascal**: **Mordecai** believes [that the **uplifting**$_P$ documentary is **depressing**$_M$].

In (2), the two SPs within the complement clause, *uplifting* and *depressing*, are evaluated from different perspectives, that of Pascal and that of Mordecai. If Pascal were to follow (2) with something like *and I think so, too, the film is depressing* would yield a contradiction.

For shortness, we will use the label "outside main predicate position" for SPs such as *uplifting* in (2). Crucially, it would not be accurate to use the familiar term "attributive position" across the board. First, SPs can be used attributively as part of the main predicate, as in *Mordecai believes that the film is an uplifting documentary*. Such cases only allow local judgment. Second, SPs can also be used non-attributively in relative clauses within non-main-predicate-position DPs, as in *Mordecai believes that the film that is uplifting is depressing*. Even though we restrict ourselves to attributive SPs contained within non-main-predicate-position DPs for the rest of the paper, our core argument applies more generally. We predict non-local judgment to be possible for SPs in relative clauses as well, hence the choice of terminology.[3]

The non-local reading in (2) sounds natural. At the same time, other combinations of SPs within one clause result in contradiction: when both are in main predicate position in the complement clause (3a), or when both are in attributive position in the complement clause (3b).

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3. As discussed in detail in Section 3.2, many SPs simply cannot be used non-attributively for independent reasons, but that fact does not affect the structure of the argument.

(3) a. #**Pascal**: **Mordecai** believes [that the documentary is **depressing**$_M$ and **uplifting**$_M$].

   b. #**Pascal**: **Mordecai** believes [that the depressing and uplifting documentary won an award].
      (i) …the **depressing**$_P$ and **uplifting**$_P$ documentary
      (ii) …the **depressing**$_M$ and **uplifting**$_M$ documentary

The only way to make (3a) and (3b) non-contradictory would be to evaluate *depressing* and *uplifting* from different perspectives, that of Pascal and that of Mordecai (in parallel to 2). However, this mixed reading is not available. The only available interpretation of (3a) is such that both *depressing* and *uplifting* are evaluated from Mordecai's perspective, which results in contradiction. In (3b), the predicates have to be evaluated either each from Pascal's perspective (3bi) or each from Mordecai's perspective (3bii), both interpretations yielding a contradiction. Two contrary SPs in a root clause also result in infelicity (4a-4c).[4]

(4) a. #The documentary is depressing and uplifting.

   b. #The depressing documentary is uplifting.

   c. #The depressing and uplifting documentary won an award.

While cases like (2) have not received deep scrutiny, they have been mentioned by Sæbø (2009:337) and Pearson (2013a:118, fn.15), both of whom suggest that such cases may involve *de re* interpretation of the DP containing the SP evaluated with respect to a non-local judge, namely, *the uplifting documentary* in (2). We will argue in Section 3 that such interpretation is possible if and only if the entire DP containing the SP is read *de re*, as our core case in (5) shows.

(5) **Pascal**: **Mordecai** believes [that the uplifting documentary is depressing].

   a. # …that the **uplifting**$_M$ **documentary** is **depressing**$_M$.   DE DICTO

   b. ✓…that the **uplifting**$_P$ **documentary** is **depressing**$_M$.   DE RE

   c. # …that the **uplifting**$_M$ **documentary** is **depressing**$_M$.   MIXED (*de re* noun)

   d. #…that the **uplifting**$_P$ **documentary** is **depressing**$_M$ MIXED (*de dicto* noun)

(5) can only describe the following situation, corresponding to (5b). Pascal and Mordecai watched a film that is a documentary in the non-local world, that Pascal knows to be a documentary, that he finds

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4. (2) contains a definite DP, and an anonymous reviewer brings our attention to the following contrast between definites and indefinites. Building on Musan (1997), Rapp (2015) notes that in unembedded contexts presuppositional determiner heads facilitate temporal independence from the main clause, while weak indefinite heads prohibit it. The reviewer notes that a similar contrast is possible with subjective predicates (i).

(i) ✓The/#An uplifting documentary is, in fact, depressing.

   Unlike the cases with non-subjective modifiers discussed by Rapp, the felicity of (i) with the definite in non-quotational uses depends on markers of contrastive judgment such as *in fact* or *actually*, which are known to ameliorate contradictions in general (and in its quotational use, *the "uplifting" documentary*, mixed quotation creates an intensional environment that may allow contradictions; Maier 2014). Sentences like (i) are likely to be felicitous when the determiner head allows the introduction of a distinct index, as is discussed in the literature on weak determiners and intensional evaluation (Musan 1997; Keshet 2010; Schwarz 2012; Keshet and Schwarz 2019). The contrast in (i) could then be seen as an another argument for SP judges correlating with indices of evaluation, though more work is needed to understand the precise contribution of contrastive markers (see Yalcin 2015 on *actually*). We note as well that for some English speakers, *a* is a weak indefinite and cannot appear with individual-level main predicates (i.e., *a documentary*). We come back to the contrast between definites and indefinites in embedded clauses in Section 3.1 and will stick to definite DPs until then.

uplifting and that Mordecai finds depressing. In other words, (5) is non-contradictory only if the noun *documentary* is interpreted *de re*, i.e. with respect to a non-local world, and the SP *uplifting* is interpreted with respect to a non-local judge, Pascal. (5a) is contradictory for the same reasons as (4): it ascribes contradictory beliefs to one person. The SP is interpreted with respect to a local judge, Mordecai, and there is a contrary predicate in main predicate position (here, *depressing*), also interpreted with respect to the same judge. The noun here is interpreted *de dicto*, with respect to one of Mordecai's belief worlds. This interpretation, with the SP *uplifting* anchored to a local judge, is allowed with a non-contradictory predicate in main predicate position (*Mordecai believes that the uplifting$_M$ documentary is recent*).

There could, in principle, be a disagreement between Pascal and Mordecai not only about the emotional—uplifting vs. depressing—effect of the film, but also about its nature. For example, it could be that Mordecai believes the movie to be a documentary, and a depressing one at that, while Pascal could think it to be a mockumentary (fictional work presented as a documentary), and an uplifting one. This is the intended meaning of (5d): Mordecai believes that the uplifting mockumentary, which he mistakes for a documentary, is depressing. However, as the infelicity of (5d) demonstrates, the sentence in (5) cannot describe such a situation. We will call interpretations as in (5d) mixed, with the noun interpreted with respect to a non-local world and the SP interpreted with respect to a local judge. (5c) a mirror image of (5d) (a local world for the noun, a non-local judge for the SP) and is likewise ruled out. Note that, unlike the situation with (5a), changing the main predicate from *depressing* to the non-contradictory *recent* would not improve the sentence, it would simply make the infelicity less apparent and more contextual support would be required to detect it (see detailed discussion in Section 3). As we will argue throughout the paper, the culprit with both (5c) and (5d) is the assignment of worlds and judges within the DP in question.[5]

At first blush, the pattern with SPs is unremarkable as it parallels the behavior of ordinary predicates. Two contrary non-SP predicates can be used in one clause without a contradiction only if one of them occurs outside main predicate position in the complement clause and the DP containing it is read *de re*, as in (6b). Other combinations result in a contradiction, as in (6a,c,d) and (7a-7e).

(6)   Mordecai believes [that the deciduous tree is evergreen].

    a.   # . . . that the **deciduous tree** is **evergreen**.   DE DICTO

    b.   ✓ . . . that the **decidious tree** is **evergreen**.   DE RE

    c.   # . . . that the **deciduous tree** is **evergreen**.   MIXED (*de re* noun)

    d.   # . . . that the **deciduous tree** is **evergreen**.   MIXED (*de dicto* noun)

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5. An anonymous reviewer suggests that what we call non-local readings may be instead readings where the judge is anchored to the speaker of an utterance or the narrator of a story. While we predict speaker/narrator readings to arise as well, non-local intermediate readings also exist and can be distinguished from speaker/narrator readings in cases of multiple embedding. It should be noted that intermediate non-local readings require substantial contextual support, since the perspective of one individual on another's attitudinal state needs to be justified. To help here, we consider (i) from the world of *Pride and Prejudice*, where that contextual support should be more readily available without elaborate backstory.

(i) **Narrator**: **Collins** thought that **Elizabeth** believed his **perfect**$_{COL}$ patron was **mean-spirited**$_{ELI}$, when she **actually**$_{NAR}$ thought she was simply frightened.

  (i) imagines how a reader, or the narrator, of *Pride and Prejudice* might characterize the thoughts of William Collins, Elizabeth Bennett's cousin and former suitor, after Elizabeth meets his frosty and imperious patron, Lady Catherine de Bourgh, who Collins himself holds in the highest esteem. In the context of the novel, (i) does not commit the reader or the narrator to Lady Catherine's perfection. We take examples such as (i) to support our initial characterization of the reading in (2) as non-local and as evidence for the existence of non-local intermediate judges, completely in line with the existence of intermediate *de re* in multiple-embedding scenarios (Anand 2006).

(7) a. # Mordecai believes [that the tree is deciduous and evergreen].

b. # Mordecai believes [that the deciduous and evergreen tree grows on campus].

c. #The tree is deciduous and evergreen.

d. #The deciduous tree is evergreen.

e. #The deciduous and evergreen tree grows on campus.

(6b) is non-contradictory because the two contrary predicates, *deciduous* and *evergreen*, are evaluated with respect to different worlds. Embedded main predicate position items, such as *evergreen* in (6), must be evaluated with respect to the local world of evaluation introduced by the embedding intensional operator (Farkas 1997; Percus 2000). Items that are outside main predicate position, on the other hand, can be interpreted either *de dicto* (6a), or *de re* (6b). Intersective attributive modifiers, such as *deciduous* in (6), are always interpreted relative to the same world as their head noun (Keshet 2008), which excludes mixed interpretations in (6c,d). When the entire subject DP is read *de re*, it is interpreted relative to a non-local world, and hence no contradiction ensues. In all other cases, *deciduous* and *evergreen* are interpreted relative to the same world, thus leading to a contradiction (6a,7a-7e).

If SPs like *uplifting* and *depressing* had the same semantics as ordinary predicates, then the felicity of (5b), and the infelicity of (5a,c,d) and (4) could have been explained along the same lines as the felicity of (6b) and the infelicity of (6a,c,d) and (7a-7e), respectively. However, as we briefly discussed in Section 1.1 and will examine in detail in Sections 2.3 and 4, the literature overwhelmingly advocates SP exceptionalism: all accounts of SPs agree that a simple-minded objectivist analysis—one where SPs express matters of fact—does not hold water. In particular, it has been argued that SPs differ from ordinary predicates in that their semantics includes reference to a beholder, or a judge, in addition to reference to a world. The central question we address in this paper is how the observation about the unexceptional behavior of SPs in attitudes fits into theories of SP exceptionalism. We argue that any theory of SPs that postulates judges has to obey the JUDGE-INDEX correlation:

(8) JUDGE-INDEX correlation
     The judge of an SP correlates with the index of evaluation for the SP: if an SP is evaluated with respect to a judge j and an index i, then j and i must be introduced by the same operator.

The JUDGE-INDEX correlation means that the judge of an SP is constrained by the world of evaluation of the SP, and vice versa. Thus, because main predicate position items have to be evaluated at the local world introduced by the attitude (Farkas 1997; Percus 2000), judges in main predicate position will be constrained similarly to the local world, as shown in (1).[6] Likewise, having multiple judges within an embedded clause as in (2) and (3) will correspondingly require the two SPs to be evaluated at distinct worlds, which is possible if and only if one SP is outside main predicate position and the DP containing it is read *de re*, as we will argue is the case in (2), whose logically possible interpretations are enumerated in (5).

The novel observation about the behavior of SPs in attitudes, entirely expected in light of the constraints on the distribution of worlds (Percus 2000) and times (Musan 1997), went previously unnoticed in the literature on SPs. Our goal is to show that not all of the available theories on the market can naturally account for the principle in (8). We categorize the existing accounts into three classes: (i) MUST ASSOCIATE

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6. In Schwager (2009), Kaufmann discusses the possibility of *de dicto* interpretation for main predicate position elements. This does not affect our central claim. We predict that, if such readings are possible for SPs, they would be constrained in exactly the same way as for ordinary predicates.

(e.g. Lasersohn 2005, 2017; Egan 2010; MacFarlane 2005, 2014; Bylinina 2017), (ii) CAN DISSOCIATE (e.g. Stephenson 2007a; Stojanovic 2007; Sæbø 2009), and (iii) MUST DISSOCIATE (e.g. McCready 2007; Pearson 2013a). We argue that only accounts that belong to the first class easily predict the correlation we observe, precisely because they bundle together judges and worlds in indices of evaluation (accounts with no judges at all, such as Anand 2009, Kennedy and Willer 2016 and Coppock 2018, also predict our data). The accounts belonging to the second class overgenerate: they allow non-attested mixed readings such that a *de dicto* noun combines with a non-local judge, as in (5d). Finally, MUST DISSOCIATE theories, such as the account in Pearson (2013a), as well as indexical contextualism more generally, undergenerate as is: they allow *de re* readings of embedded SPs in conjunction with a scopal view of *de re* (which is independently problematic), but not with other approaches to *de re*. As we will show, more elaborated views about the semantics of SPs themselves, such as presuppositions about the relation between an SP judge and the world of evaluation for the SP, do not solve the problematic cases either. Out of the currently available theories, only the relativist approaches to subjective meaning make correct empirical predictions (but not all relativist approaches, as the account in Stephenson 2007a,b doesn't work). We thus take our data to be a new argument for relativism, which, we want to emphasize, relies on independently motivated constraints.

We proceed as follows. Section 2 provides a background on empirical diagnostics of subjectivity and an overview of analytical options that have been proposed for subjective meaning. In Section 3, we turn to the empirical justification for the JUDGE-INDEX correlation. Section 4 deals with implications of the correlation for existing theories and makes a case for the MUST ASSOCIATE version of relativism. Section 5 concludes.

2 Background

This paper is about theories of subjective meaning and how they can (or cannot) handle the behavior of SPs in attitudes. In this section we start by presenting the types of data that motivated theories of SP exceptionalism in the first place and the introduction of judges into semantics. We then briefly discuss a special type of subjective expression, predicates of personal taste, and conclude with an operational classification of approaches to SPs with respect to the distribution of judges and worlds.

2.1 Diagnosing subjectivity

How should we distinguish between subjective predicates, which express matters of opinion, and objective predicates, which express matters of fact? We will rely on the following two diagnostics of subjectivity: faultless disagreement and embedding under *find* (see discussion and references in Kennedy 2013; Bylinina 2017; Coppock 2018).

The first test is Faultless Disagreement (Kölbel 2004 and much later work; see recent discussions in MacFarlane 2014:118-137; Zakkou 2019b). A conversational exchange in (9) is about matters of fact. Only one of the interlocutors can be right as the property of being evergreen reflects the objective state of affairs and a tree cannot be both evergreen and deciduous at the same time.

(9) A.   The giant sequoia is an evergreen tree.

   B.   No, the giant sequoia isn't evergreen, it is a deciduous tree.

An exchange in (10), on the other hand, is different. It is about matters of opinion. Both interlocutors can be right insofar as each of them is giving a subjective judgment.

(10) A. The giant sequoia is an elegant tree.

  B. No, the giant sequoia isn't elegant.

The term *faultless disagreement* refers precisely to situations like the one in (10) as none of the parties is at fault: an object can be considered elegant by one party while being considered not elegant by another at the same time. The contrast between (9) and (10) is due to the difference between *evergreen* and *elegant*: the former is an ordinary predicate while the latter is a subjective predicate. All other SPs we discuss in this paper pass this test as well.[7]

The second test   is embedding under *find*. The so-called subjective attitudes, such as English *find* and its counterparts in other languages, only take subjective complements, in contrast to neutral doxastics such as *think* (Stephenson 2007b; Sæbø 2009; Bouchard 2012; Kennedy and Willer 2016; Coppock 2018).

(11) a. Magda thinks that the giant sequoia is an ✓elegant / ✓evergreen tree.

  b. Magda finds the giant sequoia an ✓elegant / #evergreen tree.

As the contrast in (11) shows, *find* (11a), but not *think* (11b), is sensitive to the subjective/objective divide and only allows complements that are matters of opinion, such as *elegant*. One could speculate that the contrast in (11) is in some way syntactic, as English subjective *find* only takes small clauses (unlike its discovery counterpart that also takes full clauses; Vardomskaya 2018). However, the contrast is easily replicated in other languages where subjective attitudes allow full clauses but only those that talk about subjective matters, e.g. French *trouver* (Bouchard 2012), German *finden* (Reis 2013), Norwegian *synes* (Sæbø 2009) or Swedish *tycka* (Coppock 2018).

Complements of *find*-verbs across languages allow only those expressions that give rise to faultless disagreement,[8] and in those languages where such verbs take full clauses, they can embed a variety of subjective expressions, such as appearance claims with *looks like* (independently argued to express matters of opinion; Rudolph 2020) or normative claims with *should* (see discussion in Sæbø 2009; Reis

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7. The cases of faultless disagreement have been argued to resemble meta-linguistic disagreement about definitions (Barker 2002; Plunkett and Sundell 2013), or to be reducible to a disagreement about contextual standards more generally (Glanzberg 2007). For example, one could argue that (a) Switzerland is a part of Europe, or that (b) Switzerland is not part of Europe, depending on whether Europe is understood as a geographical region, in which Switzerland is located, or as the European Union, of which Switzerland is not a member. The exchange in (i) below thus could be similar to (10):

(i) A. Switzerland is in the heart of Europe.

  B. No, Switzerland isn't a part of Europe at all!

The possibility of (10) being reducible to (i) has been discussed, and rejected, already in Kölbel 2004. The crucial difference is as follows. The disagreement in (i) is no longer faultless once the interlocutors agree as to what constitutes Europe: Switzerland either satisfies the adopted definition or it doesn't (cf. also a discussion on the complements of *consider* in Kennedy and Willer 2016). The same goes for disagreement about contextual standards more generally: once those are settled, the disagreement isn't faultless anymore. With *elegant* and other subjective expressions, on the other hand, the interlocutors may agree as to what constitutes elegance (say, being aesthetically pleasing to the beholder), but still faultlessly disagree about whether the relevant object possesses elegance according to each of them (MacFarlane 2014; Zeman 2017; Zakkou 2019b).

8. As discussed in detail in Kennedy 2013; Solt 2018, faultless disagreement alone carves out a wider set of constructions, not all which necessarily have a special, subjective, semantics. To this end, it is important to use both tests in conjunction.

2013; Coppock 2018). The primary focus of this paper is English, and all predicates that we classify as subjective, e.g. *depressing* and *uplifting* from Section 1.2, pass this test.

To sum up, subjective predicates give rise to faultless disagreement and can be embedded under *find*. Such linguistic behavior differentiates subjective predicates from ordinary predicates and has motivated theories of SP exceptionalism most of which argue that there is a semantic procedure, for any given expression, to tell whether it is subjective or objective. In particular, it has been argued that the beholder of an opinion expressed by SPs has to be referenced in their semantics, an approach we will call judge-dependence. The central claim of this paper concerns a restriction on the interpretation of SPs in attitudes that has nothing to do with their subjectivity but, as we will argue, it has to be taken into account in all theories of SP exceptionalism to avoid incorrect predictions.

2.2 Matters of taste

Starting with Lasersohn 2005, much of the research on subjective language has been focusing on one class, the so-called predicates of personal taste (PPTs). Textbook PPTs, such as *fun*, *tasty* and *delicious*, pass both of our tests, as the possibility of faultless disagreement (12) and of embedding under *find* (13) illustrate for *delicious*.

(12) A. This 10 year old pu-erh[9] is delicious.

  B. No, this pu-erh isn't delicious. It's disgusting and tastes like dirt.

(13) Magda finds this pu-erh ✓delicious / #fermented.

Philosophical literature often distinguishes between judgment about personal taste and, for example, aesthetic judgment, the latter playing an important role in debates on the subjective vs. objective nature of beauty (see discussion and references in Young 2017; Zangwill 2019). From the linguistic standpoint, however, both *delicious*—a taste predicate—and *elegant*—an aesthetic predicate—exhibit hallmarks of subjectivity, as our examples (10)-(13) demonstrate (though see Liao et al. 2016; McNally and Stojanovic 2017 on peculiarities of the linguistic behavior of aesthetic adjectives). To this end, it has been argued that all predicates expressing different types of value judgment—culinary, aesthetic, moral, normative—can be classified as subjective in the same way as *delicious* (Kölbel 2004; Anand 2009; Coppock 2018; Franzén 2018).

Linguistic literature often makes a distinction between (a) genuine PPTs, and (b) predicates that we will label "non-PPT SPs" (sometimes called "evaluative" in the literature), such as, for example, *authentic*, *lazy*, *mediocre*, *smart*, *unethical* (Bierwisch 1989; Kennedy 2013; Bylinina 2017; Solt 2018). As discussed in the literature, both types of expressions satisfy our tests, illustrated for *mediocre* by the possibility of faultless disagreement (14) and of embedding under *find* (15).[10]

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9. Pu-erh is a tea variety.

10. Predicates like *mediocre* and *smart* are often classified as gradable multi-dimensional, as there can be multiple dimensions of smartness in contrast to only one dimension for ordinary gradable predicates like *tall*. However, not all multi-dimensional predicates are subjective (for example, *healthy* and *sick* cannot be embedded under *find*), as only some types of multi-dimensionality give rise to semantic subjectivity (Sassoon 2013; Solt 2018).

(14)   A.   *Pina* is a mediocre documentary.

       B.   No, it isn't, it's extraordinary.

(15)   I find the movie mediocre at best with the only extremely good thing being the soundtrack and Joaquin Phoenix acting.   (A review on "Joker"; https://bit.ly/2DlFsj6)

In general, ferreting out which expressions are linguistic PPTs is an involved affair due to the lack of consistent diagnostics of PPT-hood, as opposed to general diagnostics of subjective meaning discussed in the previous section. It is often claimed (Bylinina 2017; Kaiser and Lee 2017, 2018) that only genuine PPTs semantically make reference to an experience (cf. also purely experiential approaches to PPTs in Gunlogson and Carlson 2016; Charlow 2019; Muñoz 2019). Thus, textbook PPTs (16a), unlike many non-PPT subjective predicates (16b), can express the judge overtly with a prepositional phrase that has been analyzed as an experiencer argument of the PPT (see discussion in Section 3.3).

(16)   Overt judges

       a.   PPTs: ✓fun / ✓tasty / ✓delicious to Magda

       b.   Non-PPT SPs: #lazy / #mediocre / #smart to Magda

However, the characterization of PPTs, and only PPTs, as allowing overt judges is not uncontroversial (McNally and Stojanovic 2017). For example, *ugly*, often classified as a non-PPT SP (Bierwisch 1989 and later work), also takes judge PPs (17).[11]

(17)   So, no, it is not ugly in the sense that the Aztec was not ugly to the right kind of person. The problem is that there are very, very few of those people.

                                  (COCA, Corpus of Contemporary American English)

Crucially, delineating the natural class of PPTs and understanding finer-grained distinctions within the realm of subjective predicates aren't tasks relevant for us here for the following reasons. First, subjectivity has been argued to be semantically hard-wired both for PPTs and non-PPT SPs (Kennedy 2013; Bylinina 2017; Solt 2018), which fits squarely with approaches that advocate a unified semantic analysis for all complements of *find* (Stephenson 2007b; Sæbø 2009; Bouchard 2012; Coppock 2018).

Second, this paper zooms in on an unexceptional aspect of SPs. We demonstrate that SPs behave in attitudes precisely like ordinary predicates and that this behavior is only problematic in light of the widely postulated SP exceptionalism. To this end, we predict that our central claim about (2) can be replicated with non-PPT SPs as well. As the data below show, the prediction is borne out.

Examples with various combinations of SPs in (18)-(20) mirror the pattern we observed with *depressing* and *uplifting* in (2) and ordinary predicates in (6, 7): a non-local perspective is available only to non-PPT SPs that occur outside main predicate position (18a-b, 19a-b, 20a).

(18)   two non-PPT SPs

       a.   **Pascal**: **Mordecai** believes that the **mediocre**$_P$ pu-erh is **exquisite**$_M$.

       b.   **Pascal**: **Mordecai** believes that the **exquisite**$_P$ pu-erh is **mediocre**$_M$.

(19)   PPT + non-PPT SP[12]

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11. Aztec refers to a specific car model in (17).

12. We assume that *mediocre* and *delicious* are incompatible, therefore they count as contrary predicates for our purposes.

    a.   **Pascal**: **Mordecai** believes that the **mediocre**_P pu-erh is **delicious**_M.

    b.   **Pascal**: **Mordecai** believes that the **delicious**_P pu-erh is **mediocre**_M.

(20)   non-PPT SP + ordinary predicate

    a.   **Pascal**: **Mordecai** believes that the **mediocre**_P pu-erh is an oolong.[13]

    b.   **Pascal**: **Mordecai** believes that the oolong is a **mediocre**_M pu-erh.

As we will show in Section 3, a non-local judge for an SP is possible if and only if the entire DP containing it is read *de re*. We will argue in detail in Section 4 that the pattern follows from the JUDGE-INDEX correlation in (8), a general constraint that links the distribution of judges to the distribution of worlds. And if there were no judges in semantics, then there would be no need to postulate this constraint, as the relevant data would be predicted by constraints on worlds and intersective modification alone (Percus 2000; Keshet 2008). As such, the pattern is not affected by (a) the predicate itself being a PPT (2) or a non-PPT SP (18)-(20), or by (b) the predicate in question being contrasted to another SP (2, 18, 19) or to an ordinary predicate (20). In what follows, the distinction between PPTs and non-PPT SPs will not play a role and we will refer to both types of predicate as subjective (although we will talk about overt judges with predicates that allow them in Section 3.3, as there are theories that make incorrect predictions for such cases).

Before we move on to theories of SP exceptionalism, a brief comment on the data we consider in this paper is in order. In addition to SPs proper, English *find* can embed ordinary non-subjective gradable predicates in the comparative (Solt 2018) or with degree modifiers (Bylinina 2017). (21) below illustrates the contrast in the acceptability of *pink* under *find* in its positive form (21a) vs. modified by a degree operator (21b).

(21)   a.   #I find this paint pink.

    b.   ✓I can't think of a good reason to use flesh-colored paint. I find it too pink, too hot.

                                                                  (COCA)

Find also takes epistemic modal adjectives (Korotkova and Anand forth.), illustrated in (22) for *likely*:

(22)   I'll find it likely that we can imagine dark matter much better than the thick disk.   (COCA)

Both degree constructions (Bylinina 2017; Solt 2018) and epistemic modals (Egan et al. 2005; Stephenson 2007a,b; MacFarlane 2014) have been argued to be subjective and judge-dependent, so those data corroborate our use of tests for subjectivity. However, we will not consider such data in the main body of the paper for the sake of simplicity of representation.

Degree operators (Heim 2000) and modals are intensional: they shift the world of evaluation of their prejacent. What is *a likely cause of migraines* in a world may turn out not be a cause of migraines in the same world (such modifiers belong to the class of non-intersective non-subsective predicates; Morzycki 2016). At the same time, many theories of subjective meaning that we discuss in this paper are based exclusively on intersective non-intensional predicates like *delicious* and *depressing*: the meaning of *delicious*

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13. Oolong is a tea variety different from pu-erh.

food is, roughly, an intersection of delicious things in a world and things that are food in the same world.[14]

We suspect that our core generalization about the distribution of judges and worlds also applies to intensional predicates, but leave a thorough discussion of the semantic composition of such cases for future work. We thus concentrate only on non-intensional subjective predicates and will come back to a brief discussion of epistemic modals in Section 5.

2.3 Preview of the theoretical landscape

The central empirical observation of this paper is that SPs behave like ordinary predicates in attitudes: they allow non-local readings only when outside main predicate position and when the DP containing them is read *de re*. The central theoretical observation is that, in light of the widely accepted SP exceptionalism, additional constraints on the theory must be put in place in order to account for the empirical observation. In this section, we give an operational classification of current theories of subjective meaning with respect to our data. The discussion here will be rather informal, to give the reader a taste of different implementations of SP exceptionalism. We fully spell out our semantic assumptions and work out the details of different approaches, along with derivations of relevant examples, in Section 4.

We will use an extensional system in which indices are present at the logical form. We will assume that all non-logical predicates require an argument of type I (the precise nature of this type will be elaborated on in Section 4). The interpretation function is relativized to two parameters, a context c and an assignment function g. The context parameter is a tuple that specifies the context of utterance, such as the author, the world etc $c = \langle speaker, world ... \rangle$. The index is a tuple that specifies the circumstances of evaluation, and minimally includes a world $i = \langle w \rangle$ (we will ignore times in this paper for the sake of exposition). In unmodified matrix clauses, the world of the context and the world of the index are identical. The index is shifted by attitude verbs and other intensional operators. Let us illustrate (glossing over many compositional details, such as predicate modification and the interpretation of definite determiners).

(23)   a.   ⟦ evergreen ⟧^{c,g} $= \lambda x.\lambda i.$ 1 iff x is evergreen in WORLD(i).

    b.   ⟦ believe ⟧^{c,g} $= \lambda p.\lambda x.\lambda i.$ 1 iff $\forall i'$ compatible x's beliefs in WORLD(i), [p(WORLD(i'))=1].

Attitude verbs create a new intensional domain (23b) and any world-sensitive expression in their scope will be evaluated with respect to that domain. Thus, in (24) *evergreen* in the scope of *believe* gets interpreted with respect to belief worlds rather than the matrix world.

(24)   a.   Mordecai believes [that the tree is evergreen].

    b.   ⟦ (24a) ⟧^{c,g}
      $= \lambda i.$ 1 iff $\forall i'$ compatible with M.'s beliefs in WORLD(i), the tree is evergreen in WORLD(i').

Let us now consider examples with contrary objective predicates within one clause, as in (25).

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14. As Morzycki (2016:18-19,30-41) notes, some subjective predicates, e.g. *beautiful* and *excellent*, can have, in addition to an intersective, a subsective interpretation influenced by the head noun and syntactic position. However, the literature on subjective meaning has been focusing on SPs as the main predicate of a clause, which enforces an intersective reading for those predicates that are ambiguous. In what follows, we will assume for simplicity that SPs are intersective. The aspect crucial for us is that all such predicates are non-intensional and thus refer to the same world as their head noun, a fact that is true of subsective modifiers as well.

(25)   Mordecai believes [that the decidious tree is evergreen].   (=6)

     a.   #Mordecai believes that the **decidious tree** is **evergreen**.   DE DICTO
       ⟦ (25a) ⟧^{c,g}
       $= \lambda i.$ 1 iff $\forall i'$ compatible with M.'s beliefs in WORLD(i),
          the tree **decidious in WORLD(i')** is **evergreen in WORLD(i')**.

     b.   ✓Mordecai believes that the **decidious tree** is **evergreen**.   DE RE
       ⟦ (25b) ⟧^{c,g}
       $= \lambda i.$ 1 iff $\forall i'$ compatible with M.'s beliefs in WORLD(i),
          the tree **decidious in WORLD(i)** is **evergreen in WORLD(i')**.
      $\approx$ Mordecai believes that a particular tree is evergreen, but in fact this tree is deciduous.

As discussed in Percus 2000, only non-main predicate position items, such as *the decidious tree* in (25) can have two interpretations under attitudes, *de dicto* (25a) and *de re* (25b). The *de dicto* reading is such that the predicate is interpreted with respect to its local intensional domain, and it is infelicitous for (25): it commits Mordecai to contradictory beliefs about the tree being both deciduous and evergreen. The *de re* reading insulates the predicate in question from the closest intensional operator, and allows it to be interpreted with respect to a non-local intensional domain (we discuss mechanisms of such readings in Section 4 and in the Appendix). Thus, it is the only reading attested for (25) as it makes it possible to use *deciduous* and *evergreen* in one clause without a contradiction. Mixed interpretations such that *decidious* and *tree* are interpreted at different worlds (6c,d) are ruled out because items within the same DP have to be interpreted with respect to the same index (Keshet 2008). The same constraint also excludes two contrary predicates within the same DP (#*the deciduous and evergreen tree*), regardless of its syntactic position.

Let us now turn to our core cases where two contrary SPs occur within one embedded clause without a contradiction. Consider (26).

(26)   **Pascal**: **Mordecai** believes [that the uplifting documentary is depressing].   (=2)

     a.   #…that the **uplifting$_M$ documentary** is **depressing$_M$**   DE DICTO
      $\approx$ Mordecai finds a particular documentary depressing and uplifting.

     b.   ✓…that the **uplifting$_P$ documentary** is **depressing$_M$**   DE RE
      $\approx$ Mordecai finds a particular documentary depressing, but Pascal finds it uplifting.

As discussed in Section 1.2, the only felicitous reading of (26) is such that *uplifting* is evaluated with respect to Pascal's perspective and *depressing* from Mordecai's (26b), otherwise Mordecai is being attributed contradictory beliefs (26a). As we will argue in Section 3, this reading becomes available when the entire DP *the uplifting documentary* is read *de re*. This situation in (26) is parallel to the situation with ordinary predicates in (25). If *depressing* and *uplifting* were ordinary predicates with uncomplicated lexical entries along the lines of (27), the pattern would be amenable to the same explanation as we sketched above for (25).

(27)   ⟦ depressing ⟧$^{c,g} = \lambda i.\lambda x.$ 1 iff x is depressing in WORLD(i).

But neither *depressing* nor *uplifting* are ordinary predicates. As we discussed in Section 2.1, the linguistic behavior of subjective predicates across the board differs from that of ordinary predicates, which in turn led to theories of SP exceptionalism and the postulating of judges in the semantics of SPs. As

it turns out, SP exceptionalism isn't always equipped to deal with unexceptional aspects of the behavior of SPs. In the remainder of this section, we group theories of SP exceptionalism into three families based on how they handle our core data. We will show that, even though the pattern we discuss is itself not surprising, it creates problems for several types of approach to subjective meaning.

The crucial property that differentiates SPs from ordinary predicates is that they express an opinion, and most theories of SP exceptionalism incorporate the individual whose opinion is being expressed in the semantics of SPs as a judge. To this end, there are proposals that treat judges as, for example, implicit arguments (Bhatt and Pancheva 1998), evaluative coordinates (Lasersohn 2005, 2017; Stephenson 2007a,b; MacFarlane 2014; Bylinina 2017), or special anaphors (Stojanovic 2007; Sæbø 2009; Moltmann 2012; Pearson 2013a).

It is now common to divide the diverse landscape of contemporary PPT theories into two major camps based on how the judge is fixed, *contextualism* and *relativism* (see MacFarlane 2014 and Coppock 2018 for a recent discussion). Simplifying matters, the judge is determined by the context of utterance in a contextualist framework (Stojanovic 2007; Glanzberg 2007; Anand 2009; Moltmann 2010b; Schaffer 2011; Pearson 2013a; Zakkou 2019b) and by the circumstances of evaluation in a relativist framework (Lasersohn 2005, 2017; Stephenson 2007a,b; Egan 2010; MacFarlane 2014; Bylinina 2017). We will show that only relativist accounts (but not all of them) derive our generalization and take this to be a novel argument for relativism.[15] Based on the behavior of SPs in attitudes, we formulate the JUDGE-INDEX correlation (28).

(28) JUDGE-INDEX correlation   (=8)
      The judge of an SP correlates with the index of evaluation for the SP: if an SP is evaluated with respect to a judge j and an index i, then j and i must be introduced by the same operator.

We argue that any theory of SP exceptionalism that postulates judges, whether those are part of the context of utterance or the circumstances of evaluation, has to obey this constraint. For our purposes, the accounts of SPs fall into three classes: (i) MUST ASSOCIATE theories, which bundle together judges and worlds in indices of evaluation, (ii) CAN DISSOCIATE theories, which do not have a strict link between the distribution of judges and that of worlds, and (iii) MUST DISSOCIATE theories, in which judges for an SP are fully independent of the world of evaluation of the SP. In Section 4, we will demonstrate that only theories in the first group in fact obey the JUDGE-INDEX correlation. Below, we provide a preview of how those different options work. In all of those theories, subjective predicates have a judge argument in their semantics and the differences stem from the compositional source of judges.

MUST ASSOCIATE theories   include the judge of SPs into the index of evaluation $i = \langle j, w \rangle$ (Lasersohn 2005, 2017; MacFarlane 2014). A simplified lexical entry for the SP *depressing* is given below in (29).

(29) $[\![$ depressing $]\!]^{c,g} = \lambda x. \lambda i.$ 1 iff x is depressing to JUDGE(i) in WORLD(i).

(30) schematically shows how the *de re* interpretation of our core example is derived in this type of framework.

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15. Two recent theories we will not discuss are the accounts in Kennedy and Willer 2016 and in Coppock 2018. Both account advocate SP exceptionalism that distinguishes between subjective and objective propositions, but do so does without postulating an individual argument responsible for subjective judgment in the semantics of SPs. These accounts do not predict any non-trivial differences between SPs and ordinary predicates in intensional environments essentially treating the former along the lines we sketched in (27). They thus encounter no problems in capturing our core data.

(30) **Pascal**: **Mordecai** believes   DE RE
  [that [the **documentary in** WORLD(i) **uplifting to** JUDGE(i) **in** WORLD(i)]
      is **depressing to** JUDGE(i') **in** WORLD(i')].

Main predicate position items are always evaluated in the local intensional domain, so *depressing* is relativized to the index i' introduced by the attitude. Because judges are part of the index, *depressing* is also relativized to the local judge JUDGE(i'), which is by default the attitude holder, Mordecai. The mechanism responsible for *de re* makes *uplifting* relativized to the non-local index i. Again, because the judge for *uplifting* will be part of the same index, *uplifting* will be anchored to the non-local judge JUDGE(i). In matrix clauses, the judge is by default anchored to the speaker, so *uplifting* is Pascal-oriented in (30). The *de dicto* reading in (31) is derived in the same way, except that both *depressing* and *uplifting* will be relativized to the same judge of the same index, which results in contradiction.

(31) **Pascal**: **Mordecai** believes   DE DICTO
  [that [the **documentary in** WORLD(i') **uplifting to** JUDGE(i') **in** WORLD(i')]
      is **depressing to** JUDGE(i') **in** WORLD(i')].

Crucially, because the distribution of judges is intrinsically connected to the distribution of worlds, MUST ASSOCIATE theories derive all, and only, interpretations that are available for embedded SPs. We discuss this type of approach in Section 4.2.

CAN DISSOCIATE theories   are similar to the MUST ASSOCIATE ones in that judges are part of the index of evaluation but the overall semantics of SPs is more flexible (Stephenson 2007a,b; Stojanovic 2007; Sæbø 2009). The opinion holder can be directly referential to the judge coordinate of the index (29) or it can be a free variable (32):

(32)   ⟦ depressing ⟧$^{c,g}=\lambda y.\lambda x.\lambda i.$ 1 iff x is depressing to y in WORLD(i).

In this type of framework, the derivation for the *de re* reading of our core cases and the contradictory *de dicto* reading proceeds in the same way as in (30) and (31), respectively. However, CAN DISSOCIATE theories overgenerate and predict an unattested mixed interpretation for embedded SPs. Because SPs can be anchored to a free variable, it is predicted that the judge of an SP outside main predicate position can be anchored to a non-local judge even if the entire DP containing the SP is read *de dicto* (33).

(33) **Pascal**: **Mordecai** believes   MIXED (*de dicto* noun)
  [that [the **documentary in** WORLD(i') **uplifting to Pascal in** WORLD(i)]
      is **depressing to** JUDGE(i') **in** WORLD(i')].

As we discuss in detail in Section 4.3, the reading in (33) is a major problem for CAN DISSOCIATE theories, as it isn't attested for SPs nor intersective modifiers more generally.

MUST DISSOCIATE theories   instantiate various forms of indexical contextualism (McCready 2007; Schaffer 2011; Pearson 2013a; Bylinina et al. 2014; Zakkou 2019b). The crucial difference from theories we have introduced so far is that the judge in this type of framework is a dedicated coordinate of the context of utterance $c = \langle$ *speaker, world, **judge** ...* $\rangle$, rather than the index, as (34) illustrates.

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(34) $[\![$ depressing $]\!]^{\langle\ speaker, world, judge...\ \rangle, g} = \lambda x.\lambda i.\ 1$ iff x is depressing to JUDGE(c) in WORLD(i).

A system like (34) makes no explicit connection between SP judges, provided by the context, and SP worlds, provided by the index. The interpretation of SPs is straightforward in root clauses because, as we discussed earlier, the world of the index and the world of the context are the same in such cases. However, this very move creates compositional problems for the interpretation of SPs in attitudes. Expressions that get their value entirely from context normally remain intact in the scope of intensional operators, as such operators only manipulate the index and not the context. Therefore, we end up with a situation such that an embedded SP is evaluated with respect to a non-local judge and a local world, which we argue to be impossible. There are mechanisms to shift the context as well, from c to c', and they unproblematically derive the contradictory *de dicto* reading of our core cases. However, even with those mechanisms in place deriving the *de re* interpretation of an SP is only possible under the Scope Theory of *de re* (Russell 1905), namely, when the entire DP is interpreted outside the scope of the attitude at LF (35).

(35)   **Pascal**: [the **documentary** **in** WORLD(i) **uplifting** **to** JUDGE(c) **in** WORLD(i)]$_1$ DE RE
        Mordecai believes
            [that t_1 is **depressing to** JUDGE(c') **in** WORLD(i')].

Mechanisms responsible for *de re* did not matter for our discussion so far, but in fact scopal theories of *de re* have been proven to be independently problematic (see discussion in Charlow and Sharvit 2014; Keshet and Schwarz 2019). To this end, because MUST DISSOCIATE theories must be coupled with a scopal view on *de re* in order to capture our data, they ultimately do not derive our generalization in a satisfying way. In Section 4.4, we discuss in detail two approaches of this type, an indexical contextualist view along the lines of (34) and a more sophisticated version in Pearson 2013a. We show that each of them undergenerates, and surmise that any contextualist version of SP exceptionalism will have the same problem. In the Appendix, we further substantiate this claim by looking at the JUDGE-INDEX correlation in the concept generators framework (Percus and Sauerland 2003), which is one of the standard mechanisms for *de re*.

We thus conclude the overview of our argument. We have shown that SPs are linguistically different from ordinary predicates and have given an overview of analytical options with respect to the JUDGE-INDEX correlation. We have briefly demonstrated that only MUST ASSOCIATE theories (or, for that matter, theories that have no judges at all) unproblematically handle our data and obey the generalization. All other theories face problems, either by overgenerating, as is the case for CAN DISSSOCIATE theories, or by undergenerating, as is the case for MUST DISSOCIATE theories. Before considering such issues in detail, however, we need to demonstrate that multi-judge sentences indeed allow multiple judges—but only if the embedded subject is read *de re*. In the next section, we turn to the empirical heart of the paper and provide extensive justification for the JUDGE-INDEX correlation across linguistic environments.

3   The empirical generalization

This section provides factual evidence for the central empirical claim of the paper, the JUDGE-INDEX correlation. Here is how our examples are structured.

First, we have been tacitly assuming that judges are atomic individuals. The literature suggests that they may be non-atomic entities (Lasersohn 2005), that they may be generic (Bhatt and Pancheva 1998; Moltmann 2010a; Pearson 2013a), or that judges as individuals (or groups of individuals) should be

altogether replaced with standards of taste (MacFarlane 2014; Coppock 2018). Here, we confine ourselves to scenarios with two distinct atomic individuals whose opinions are salient.

Second, it has been argued that SPs with different judges can be predicated of the same entity, provided that the SPs in question describe different dimensions of a given object and are thus *relatively non-contrary* (Anand 2009). In (36) below, *delicious* and *well-packed* reflect the cat's and the speaker's judgment, respectively:[16]

(36)   My cat's food was **delicious**_{CAT} and {✓**well-packed**_{SPEAKER}, #**disgusting**_{SPEAKER} }.

In order to avoid this potential confound, in what follows we will only consider relatively contrary PPTs, such as *uplifting* and *depressing* in Section 1.[17]

Third, we will also focus on simple sentences of the form schematized in (37) below, where the clause of interest contains a copular clause with a single nominal phrase subject. We will call that single nominal the SUBJECT and the main predicate of that clause MAINPRED. This template is meant to include attributive SPs within the SUBJECT as well as SPs inside relative clauses. However, as we stated in Section 1, we will only focus on attributive uses.

(37)   … [[_{SUBJECT} ... SP …] be [_{MAINPRED} … SP …]]

Finally, alongside our discussion surrounding the semantics for attitude predicates, we want to ensure initially that we are dealing with 'reported autocentric' cases, where the attitude holder serves as the local judge. We will thus construct contexts where the attitude holder's perspective is relevant (to the attitude holder). We will revisit this simplifying assumption in Section 3.4.

3.1   The claim

The central empirical question is what construals of the SUBJECT are allowed in multi-judge environments. We will show below that only *de re* construals are possible (*de dicto* is possible but contradictory). One suggestive piece of evidence for this claim emerges when we examine who is committed to the documentary being uplifting for Pascal in (38). Intuitively, for this sentence to be sensible, Pascal must himself be committing to finding the documentary uplifting: fixing the judge of the SUBJECT SP *uplifting* as the speaker (=Pascal) would also fix the world of evaluation for the SP to the actual world.

(38)   **Pascal**: **Mordecai** believes that the **uplifting**_P documentary is **depressing**_M.   (=2)

We can sharpen this intuition by constructing cases where the status of other predicates in the SUBJECT nominal may differ between the speaker and the attitude holder. Consider a case where two friends are together choosing stuffed animals from a catalog. Again, they may differ both on their evaluation of the aesthetics of a toy as well as in what kind of toy it is, e.g. a dog or a fox. As in the case of (38), the judge of the SUBJECT SP *adorable* correlates with the choice of nominal. Fixing the speaker as the

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16. The use of *delicious* in (36) is an instance of the so-called non-autocentric perspective discussed in detail in Section 3.4.
17. Insofar as (36) is grammatical, it speaks against accounts that treat the judge as an atomic individual. Intuitively, what (36) suggests is that we consider relevant individuals' perspectives. These cases may thus be taken as an argument either for some form of contextual domain restriction as pursued by Pearson (2013a) or the more abstract standards approach advocated for by MacFarlane (2014) and Coppock (2018). In this paper, we side-step this debate, though MacFarlane's (2014) discussion of SPs in counterfactuals that we exemplify in (91) is additional evidence against treating the judge as an atomic individual.

judge of *adorable* is only possible in concert with *dog*, the correct nominal in the actual world (39a) and impossible with *fox*, the *de dicto* nominal (39b).[18]

(39) *Context: **Sue** and **Mary** are debating several stuffed animals in a Steiff catalog. They happen on an item that Sue believes is an **adorable dog** and Mary an **ugly fox**.*

   a. **Sue**: **Mary** thinks that an **adorable**$_{\text{SUE}}$ **dog** is **ugly**$_{\text{MARY}}$ DE RE

   b. **Sue**: # **Mary** thinks that an **adorable**$_{\text{SUE}}$ **fox** is **ugly**$_{\text{MARY}}$.   MIXED (*de dicto* noun)

Turning now to cases where Mary forms a mistaken belief about Sue's opinion on a toy, consider a scenario where Mary incorrectly takes Sue to think the toy is both a dog and adorable while Sue actually thinks that the toy is a dog and average. Mary herself thinks the toy is an ugly fox. In such a scenario, Sue can report that Mary thinks a fox (*de dicto*) (40a) is ugly or a dog (*de re*) is ugly (40b). However, adding the SP *adorable* in the SUBJECT with Sue as the judge renders the sentence infelicitous, regardless of the nominal is being *de dicto* (40c) or *de re* (40d), because *adorable* isn't how Sue characterizes the object in question. Adding the SP *average* to the *de re* nominal, on the other hand, is fine, as it reflects Sue's actual opinion (40e).

(40) *Context: **Sue** and **Mary** are debating several stuffed animals in a Steiff catalog. Mary happens on an item she takes to be an **ugly fox** and asks Sue's opinion. Sue mistakenly describes another nearby toy, leading Mary to believe Sue thinks that the item she asked about in the first place is an **adorable**$_{\text{SUE−ACCORDING−TO−MARY}}$ **dog**. Sue actually thinks it's an **average dog**.*

   a. **Sue**: ✓**Mary** thinks that a **fox**$_{\text{MARY}}$ is **ugly**$_{\text{MARY}}$.   DE DICTO

   b. **Sue**: ✓**Mary** thinks that a **dog**$_{\text{SUE}}$ is **ugly**$_{\text{MARY}}$.   DE RE

   c. **Sue**: #**Mary** thinks   MIXED (*de dicto* noun)
        that an **adorable**$_{\text{SUE−ACC−TO−MARY}}$ **fox** is **ugly**$_{\text{MARY}}$.

   d. **Sue**: #**Mary** thinks   MIXED (*de re* noun)
        that an **adorable**$_{\text{SUE−ACC−TO−MARY}}$ **dog** is **ugly**$_{\text{MARY}}$.

   e. **Sue**: ✓**Mary** thinks   DE RE
        that an **average**$_{\text{SUE}}$ **dog** is **ugly**$_{\text{MARY}}$.

Let us dwell on this for a moment. By scenario design, *adorable* with Sue as the judge forces a *de dicto* interpretation of the SP, because Sue herself does not consider the toy adorable. In principle, this could still be compatible with a relatively contrary SP in MAINPRED position, since that will likely be interpreted with the attitude holder as the judge. However, the sentence is infelicitous regardless of the nominal chosen (40c,d), even with the relatively uncontroversial *toy* in (41) below.

(41) **Sue**: #**Mary** thinks that an **adorable**$_{\text{SUE−ACC−TO−MARY}}$ toy is **ugly**$_{\text{MARY}}$.

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18. An anonymous reviewer wonders whether the fact that we are considering stuffed dogs and stuffed foxes could have a role here. We doubt that it does. Considering scenarios where Sue and Mary are judging actual animals—such as if they are attending a reenactment of a fox hunt—does not change our intuitions or judgments of those we have consulted with, nor does replacing *dog* with *stuffed dog* and *fox* with *stuffed fox*.

The pattern in (40) and (41) is in line with the behavior of intersective nominal modifiers in general (Keshet 2008). As we have already seen in Section 1.2 with ordinary predicates like *evergreen* (6,7), an embedded clause with two contrary predicates is sensible only if those two predicates occupy different syntactic positions. Crucially, when one contrary predicate is in MAINPRED position, it forces the entire SUBJECT nominal to be evaluated relative to the matrix world of evaluation. Thus, the only sensible interpretation of (42) requires the speaker to commit to there being baby Martians:[19]

(42)   **Mary** thinks [**a baby Martian**]_{SPEAKER} is **an adult**_{MARY}.

Given these facts, it is thus unsurprising that in cases where the SUBJECT SP is evaluated in the matrix world we observed that the SUBJECT nominal predicate must be as well (39). What is important, however, is that using relatively contrary SPs in the SUBJECT and MAINPRED positions behaves like choosing contrary predicates (40c,d). The fact that SPs are judge-dependent does not provide a way out of contradiction: it is not possible to evaluate an SP at a world different from the world of its head noun, which, again, follows the pattern with intersective modifiers, which disallow mixed readings such that the modifier is evaluated at one world and the noun at another.

Let us recap what the data in (38)-(41) suggest. We asked whether we have evidence that the SUBJECT nominal must be read *de re* in sentences like (37) when the two SPs differ in their intended judges. To help fix things, we limited ourselves to cases where the two SPs were relatively contrary, which would *force* multiple judges. We considered two cases where the covert judge of the SUBJECT SP was linked to the speaker. In the first, where the world of evaluation for the SP was linked to the actual world, the rest of the SUBJECT descriptive content was forced to be read *de re*, i.e. it was forced to also be evaluated in the actual world (39a). When the world of evaluation for the SP was linked to the doxastic alternatives of the attitude holder, multiple judges were simply not possible (40c,d). This is, however, a reading that CAN DISSOCIATE theories predict to be possible, a fact that we mentioned in Section 2.3 and that we discuss in detail in Section 4.3.

In the next section we go over several environments that have been argued in the literature to empirically block *de re* construals. We show that, indeed, in such environments multi-judge instances of the schema in (37) are ungrammatical, and thus provide more evidence for our central claim without relying on complex scenarios presented in this section.

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19. An anonymous reviewer observes that in sentences like (42) with an indefinite in the SUBJECT position the indefinite has to have a specific reading, as in *a certain baby Martian*, for the entire subject DP to be interpreted *de re*. The reviewer wonders if the same is true for our sentences containing subjective predicates. It looks like the addition of subjective predicates does not affect judgments appreciably, and the scenarios in (39) and (40) support that characterization. However, we disagree that *de re* interpretation of an indefinite requires specificity (or any other presupposition) across the board. As we discuss in section 4.2, it's possible to have the so-called 'non-specific' *de re* interpretations, where the witness for a *de re* indefinite varies across the worlds of the attitudinal operator (i).

(i) Mary wants to buy an ugly tent.

It may be argued that uses such as (i) still involve a presuppositional indefinite determiner (e.g., a covert partitive), just not a specific indefinite. To that end, we note that the acceptability of (i) does not change with a cardinal determiner (*buy (at least) 4 ugly tents*) instead. Likewise, bare plurals do not prohibit *de re* readings (ii), regardless of whether there is a subjective predicate inside the DP (*delicious* vs. *large*) or whether the main predicate is individual- or stage-level (*pomelos* vs. *available*).

(ii) a. Mary thinks that delicious/large grapefruits are pomeloes.

    b. Mary thinks that delicious/large grapefruits are available at the market.

Such data show that there can be non-specific indefinites read *de re*, regardless of the presence of an SP inside the relevant DP.

3.2 *De re* blocking environments

Research on constructions that require identity of intensional parameters identifies a number of empirical tests that diagnose *de re* readings. We are going to use them to further support the central empirical claim of the paper: for a judge to be non-local, the DP containing it must be interpreted *de re*. Specifically, we show below that multi-judge cases are impossible in environments independently known to be allergic to *de re*.

Free Indirect Discourse (FID)   FID is a narrative technique that reports speech and thoughts of the main protagonist (Banfield 1982; see recent discussion in Eckardt 2014). Unlike ordinary quotation, FID preserves the narrator's perspective when talking about tense and personal indexicals, which in the respective literature is typically taken as evidence of its hybrid status (though see Maier 2015 for a quotational analysis of FID). We concentrate on the property that direct discourse and FID share (noticed already in Banfield 1982, see discussion in Sharvit 2008): a block on *de re* interpretations. As (43) shows, a definite description in an FID environment can only be read *de dicto*. If John thinks that the dean is the president, then this person must be referenced by the definite in FID. The same is true with names and pronominal gender.

(43) FID:

Context: *John is constantly confusing President Ipsum and Dean Lorem at his university. Glancing at a school newspaper, he sees a picture of Lorem under the headline "Resigned".*

   a. ✓{The president, Ipsum, he} finally resigned today, thought John.   DE DICTO

   b. #{The dean, Lorem, she} finally resigned today, thought John.   DE RE

The behavior of FID is in contrast with bona fide indirect discourse, which allows both *de dicto* (a) and *de re* readings (b).

(44) Regular indirect discourse:

Context: *John is constantly confusing President Ipsum and Dean Lorem at his university. Glancing at a school newspaper, he sees a picture of Lorem under the headline "Resigned".*

   a. ✓John thought that {the president, Ipsum, he} finally resigned today.   DE DICTO

   b. ✓John thought that {the dean, Lorem, she} finally resigned today.   DE RE

Thus, FID serves as a simple test for multi-judge sentences. If the SUBJECTs of such sentences are obligatorily interpreted *de re*, then they should be contradictory in FID environments, regardless of the scenario. This is precisely what we find. When we embed versions of (2) and (39) in FID, they are ungrammatical, as shown in (45a,45c).

(45) a. #One **uplifting**$_{SPEAKER}$ documentary he watched was **depressing**$_M$, thought **Mordecai**.

      b. ✓One documentary he watched was **depressing**$_M$, thought **Mordecai**.

      c. #One **adorable**$_{SPEAKER}$ dog she saw was **ugly**$_M$, thought **Mary**.

      d. ✓One dog she saw was **ugly**$_M$, thought **Mary**.

Existential *there* Building off observations by Musan (1997), Keshet (2008) identifies the existential *there* construction as an environment where nominals must be interpreted *de dicto*. In other words, both the pivot and coda must be evaluated against the world introduced by the modal operator. Thus, assuming that *professor* and *in college* are contrary, yoking the two together in the existential engenders a contradiction (46a), while making a copular claim does not (46b).

(46) a. #Mary thinks there are three professors (still) in college.   THERE

       b. ✓Mary thinks three professors are (still) in college.   COPULA
                                                                   (Keshet 2008:48)

Testing the behavior of SPs in this environment is less straightforward than in the case of FID. As shown by Milsark (1979), *there* codas classically permit only stage-level predicates (ones that describe temporary properties) and ban individual-level predicates (ones that describe more permanent properties; terminology and distinction from Carlson 1980):

(47) a. ✓There were three people sick / smiling.   STAGE-LEVEL

       b. #There were three people smart / tall.   INDIVIDUAL-LEVEL

Unfortunately, we cannot construct existential *there* sentences containing relatively contrary SPs across the pivot and coda, as all of the subjective predicates we have tested are ungrammatical in the coda of a *there* existentials to begin with (48).

(48) #There was a fountain adorable / depressing / excellent / ugly.

On the basis of similar distributional restrictions, Pearson (2013a) argues that textbook PPTs (of the type discussed in Section 2.2) are individual-level predicates. The ungrammaticality of examples like (48) suggests that all subjective predicates are,[20] though an anonymous reviewer reminds us that *there* codas exclude some stage-level predicates as well (Jäger 2001).

Regardless of the ultimate explanation, this means that we cannot consider cases with two relatively contrary SPs, but must consider again the appropriateness of a sentence in a specific scenario where the *de dicto* reading of the relevant nominal would be false. Consider the scenario below, where Mary speculates that Sue would like a stuffed dog Mary saw in a catalog (and Mary herself hated). In such a case, it is only felicitous to use *ugly* in an existential pivot, but not *adorable* (49).

(49) *Context: **Mary** tells **Sue** about several stuffed animals she saw in a Steiff catalog. She describes one dog she saw, which Mary herself found ugly, but believes would be liked by Sue (i.e. adorable for Sue). Sue later sees it herself and agrees that it is ugly.*

    Sue: **Mary** thinks that there is an #**adorable**$_{SUE}$ / ✓**ugly**$_{MARY}$ **dog on sale**.

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20. As we mentioned before in fn. 14, some SPs allow subsective interpretations, as in *a beautiful writer* (=one who writes beautifully). But even when subsective and event-based, SPs do not have stage-level readings. Nominals that enable such interpretations of SPs are typically generic on their own and the modifiers apply to all instances of the event in question, thus yielding an individual-level like interpretation (formally, this interpretation has been argued to arise from the modifier scoping below the covert generic operator inside the nominal in question; Larson 1999, Morzycki 2016:38-39).

Have *Have* constructions constitute yet another environment that blocks *de re* readings (Keshet 2008). In those constructions, both the nominal and the predicate following it should be interpreted with respect to the same world, which forces the nominal to be read *de dicto* under intensional operators and leads to a contradiction in case of two opposite predicates in one clause (50a). With a regular copular construction, the DP can be read *de re* and no contradiction ensues (50b).

(50) a. #Mary thinks I have an infant daughter in college.   HAVE (Keshet 2008:49)

b. ✓Mary thinks my infant daughter is in college.   COPULA

Similarly to the existential *there* construction, testing SPs in this environment is tricky as the post-nominal clauses of *have* constructions only permit stage-level predicates (51a) and ban individual-level predicates (51b):

(51) a. ✓The zoo had three tigers sick / attacking people.   STAGE-LEVEL

b. # The zoo had three tigers big / aggressive.   INDIVIDUAL-LEVEL

Given the restriction above, we can only use SPs in the nominal argument of *have* but not in the post-nominal clause. In (52) below (modeled in the same way as 49), the DP cannot contain the SP *adorable* if it is meant to be read *de re* and reflect Sue's perspective.

(52) *Context: Mary tells Sue about several stuffed animals she saw in a Steiff catalog. She describes one dog she saw, which Mary herself found ugly, but believes would be liked by Sue (i.e. adorable for Sue). Sue later sees it herself and agrees that it is ugly.*

Sue: Mary thinks that the store has a #adorable$_{SUE}$ / ✓ugly$_{MARY}$ dog on sale.

Let us take stock again. We have considered three environments that have been argued in the literature to grammatically disallow *de re* readings for nominals: Free Indirect Discourse, existential *there* pivots, and the nominal complements of *have* constructions.[21] In FID, we find that multi-judge sentences with relatively contrary SPs are incoherent, as would be expected if felicitous uses of such cases force a *de re* interpretation of the nominal containing the SP. In the case of the existential pivots and *have* nominals, independent restrictions prevented us from pitting two relatively contrary SPs against each other. However, we found that when the attitude holder has a judgment contrary to that expressed by the SP, such sentences were infelicitous, even if the context provided support for the speaker having the SP judgment in the world introduced by the intensional operator. Thus, a *de dicto* interpretation of the nominal also forces a 'local' SP judge, namely, the attitude holder. If stage-level subjective predicates exist and are allowed in *there* codas, we predict that putting two such contrary predicates together inside a *there* construction, one as a coda and one as a pivot, would lead to a contradiction along the lines of (46a). The same predictions holds for have constructions.

To summarize these results, what we see is that the world of evaluation and the judge of the PPT correspond: a local world of evaluation requires a local PPT judge and a long-distance world requires a long-distance judge. In other words, we observe the JUDGE-INDEX correlation, which we stated in (8): the judge of an SP correlates with the index of evaluation for the SP.

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21. Keshet (2008) also discusses depictives (*She came home full of joy*) but such constructions ban individual-level predicates, including SPs we have considered, and thus are not useful here.

3.3 Overt judges

There is one important caveat to our discussion above. Alongside what we might call *bare* uses, many SP adjectives in English permit *overt judges*, prepositional phrases like *to/for* that make the judge of the SP explicit, as in (53) below (like elsewhere in the paper, we use the term judge in a theory-neutral way and do not commit ourselves to any particular analysis of such PPs).

(53) a. The first tea created for dogs […] is a vet-approved combination of chamomile, gingerroot, fennel seed, skullcap, and calendula that is **tasty for** canines.

   b. The rite also includes the placement of […] food that is **tasty to** telluric beings but repugnant to human beings.

                              (COCA)

The ability of some SPs to have overt judges is widely discussed in the literature on implicit arguments (Partee 1984; Bhatt and Pancheva 2006). It is often taken to be one of the definitional characteristics of PPTs as opposed to other subjective predicates (Schaffer 2011; Pearson 2013a; Bylinina 2017; though see McNally and Stojanovic 2017) and can be treated as evidence that *all* uses of genuine PPTs have an experiencer argument in their semantics (cf. Glanzberg 2007; Bylinina 2017). As we stated in Section 2.2 when we first mentioned overt judges, potential distinctions within subjective predicates are not central in this paper and we remain agnostic about their argument structure. Of importance for us is the difference in behavior between covert vs. overt judges for those predicates that allow them (which itself is a matter of controversy, as there seems to be inter-speaker as well as cross-linguistic variation; Bylinina 2017).

As we show below, overt judges differ from covert judges with respect to our cases. Specifically, overt judges do not have to be anchored to the attitude holder even in main predicate position, as in (54).

(54) a. **Mary** thinks that Montmorency is **adorable to Sue**.

   b. **Mary** thinks that Montmorency is **ugly**_{MARY} but **adorable to Sue**.

Examples like (54) show that the overt judge PP *to Sue* insulates the SP *adorable* from being interpreted with respect to the local judge, Mary. This, in turn, makes it possible for a bare use SP and an overt judge SP to share the same index, that introduced by the attitude, but end up interpreted with respect to different judges, hence the lack of contradiction in (54b). Note that in both cases Montmorency is judged as adorable for Sue only in Mary's doxastic worlds. For all we know in the actual world, Sue could have never seen, and thus may have no opinion about, the dog.

We thus predict that overt judges are exempt from the JUDGE-INDEX correlation. Using our empirical diagnostics from Section 3.2, we show below that overt judge SPs do not require the *de re* reading of the DP containing them and are thus felicitous in *de re* blocking environments. In FID (55), the presence of an overt judge makes it possible to use contrary SPs without attributing contradictory beliefs to the attitude holder:[22]

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22. As discussed in detail by Sharvit (2008) (though see Maier 2015), personal indexicals such as *I* always refer to the narrator, so *to me* does not refer to Mary in (55). An anonymous reviewer helpfully notes that first person pronouns may generally sound unnatural in FID, it being a literary genre. Consider (i) in the context of a typical Sherlock Holmes story, narrated by Watson in the first person. (i) is non-contradictory due to the presence of an overt judge, thus confirming our main point.

(i) **Watson**: Several cases **interesting to me** were **boring**_{HOLMES}, thought **Holmes**.

(55) One dog **adorable to me** was **ugly**_{MARY}, thought **Mary**.   FID

Likewise in the existential *there* and *have* constructions, an overt judge SP can be used to express a judgment that is contrary to that of the attitude holder, as in (56a) and (56b), respectively.

(56) *Context: Mary tells Sue about several stuffed animals she saw in a Steiff catalog. She describes one dog she saw, which Mary herself found ugly, but believes would be liked by Sue (i.e. adorable to Sue). Sue later sees it herself and agrees that it is ugly.*

a. **Sue**: **Mary** thought that there was a dog **adorable to me**_{SUE} on sale.   THERE

b. **Sue**: **Mary** thought that the store had a dog **adorable to me**_{SUE} on sale.   HAVE

The data in (54)–(56) suggest that the distribution of overt judge SPs differs from bare uses, a fact also pointed out by Anand and Korotkova (2018) with respect to evidential requirements associated with certain SPs.[23] These data provide evidence against theories that treat covert and overt judges on a par (Stephenson 2007a,b; Stojanovic 2007; Pearson 2013a) and support theories with a special semantics for overt judges (Lasersohn 2005; MacFarlane 2014). That said, our goals in this paper are to concentrate on the way covert judges are fixed compositionally (including for SPs that do not take overt judge PPs, such as *mediocre* or *smart*) and to decide between theories of subjective meaning based on that. In the rest of the paper, we concentrate on bare uses of SPs.

3.4   Non-autocentric uses

Our discussion so far has been focusing on the so-called autocentric cases, ones where the covert judge of an SP is anchored to the speaker in matrix clauses. As shown in the previous section, many SPs allow overt judges and in those cases, the so-called exocentric perspective becomes possible. But an exocentric perspective is possible with covert judges as well, and Egan et al. (2005) and Stephenson (2007b) discuss examples where a non-human species under discussion facilitates this reading. (57) illustrates.

(57) **Lorelai**: [The bridge] was sturdy and strong, made of this Japanese maple wood, which, it turns out, is exactly the kind of wood that attracts **beetles**. [...] Now we're gonna make it out of less **delicious**_{BEETLES} wood.

(American TV series *Gilmore Girls*, Season 7, Episode 9)

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23. Like other complex or heavy modifier phrases in English (Cinque 2010), overt judge SPs can only be postnominal (#*an adorable to me dog*). At the same time, predicates that can be used both pre- and postnominally have been argued to only have stage-level readings in the postnominal position (an observation that goes back to Bolinger 1967), cf. *visible stars* (=visible in general) vs. *stars visible* (=e.g. visible tonight) (Larson and Marušič 2004). One may wonder if the reported contrast between covert vs. overt judges is due to this property (or a different syntactic structure of post-nominal modifiers, as per Cinque), rather than the overtness of the judge, as we argue. However, heavy post-nominals in fact can have an individual-level interpretation, as the non-contradictory (i) with two post-nominal modifiers shows:

(i) The stars visible to me aren't visible tonight.

Unfortunately, we cannot construct a similar contrast with SPs, as all SPs we examined are not allowed in postnominal position when bare (#*a dog adorable*), which would be unsurprising if they are uniformly individual-level, as we discussed in Section 3.2. We thank an anonymous reviewer for bringing up this issue.

Likewise, we have assumed that the embedding attitude necessarily introduces a 'reported autocentric' perspective, and most of our examples are designed so that there are, in principle, two relevant perspectives, one of which is the attitude holder's. However, as first noted in Lasersohn 2005:678, embedded exocentric readings are also possible (58).

(58) **She** took **his** oats upstairs and heated them for a few minutes in the oven before she fed him. **She** didn't think ice-cold oats were **appetizing**_{HE}. **The horse** enjoyed the warmed oats.

<div align="right">(Betty Smith, A Tree Grows in Brooklyn)</div>

While it may be highly preferable to interpret a MAINPRED SP judge 'autocentrically' as co-referent with the attitude holder, the data in (58) demonstrate that this is not obligatory. As an anonymous reviewer notes, with this alteration, the term 'local judge' does not necessarily mean the attitude holder. It simply means the judge introduced by the local index, which is often the attitude holder, but may be some other salient perspective. However, reported exocentric readings become sharply degraded when a contrary SP is added, as in (59) below.

(59) *Context: **Mary** tells **Sue** that the new tea house has several flavors that adventure-seeking Sue would love, but which offend the sensibility of traditionalist Mary. Sue hasn't been there yet herself and has no opinion.*

    a. **Sue**: #**Mary** said that the new tea house sells only **disgusting**_{MARY} tea sorts, { and/but } that there are a ton of **delicious**_{SUE} sorts there.

    b. **Sue**: #**Mary** said that there are a ton of **delicious**_{SUE} tea sorts paired with some **disgusting**_{MARY} ones.

We suggest that introducing a contrary SP in (59) matters so much because it prevents exocentric readings like those in (58). As we discuss in Section 4.2, the data fall out naturally only in MUST ASSOCIATE theories, in which each index can only introduce one judge, either autocentric or exocentric. What is not allowed by the formalism, however, is having an autocentric and an exocentric judge simultaneously. Summing up, we see that even exocentric cases obey the JUDGE-INDEX correlation, even if the actual value of the judge is not the attitude holder of the embedding predicate. In the remainder of the paper, we will focus principally on reported autocentric readings in main predicate position, understanding that with a sufficiently rich context, another judge could be the introduced by the attitude.

4   Consequences for theories of subjective meaning

The previous sections provide empirical evidence for the JUDGE-INDEX correlation. In this section, which comprises the theoretical heart of the paper, we use this correlation to adjudicate between existing theories of SP exceptionalism that postulate judges in the semantics of SPs. As we already discussed in Section 2.3, we categorize the existing theories into the following three classes depending on how judges and worlds are connected: (i) MUST ASSOCIATE theories, which obligatorily yoke judges and worlds together, (ii) CAN DISSOCIATE theories, which allow for a certain flexibility in how judge-world combinations are chosen, and (iii) MUST DISSOCIATE theories, which obligatorily disjoin judges and worlds.

We will argue that any theory in the first class will straightforwardly account for the data presented in the paper. The argument here is thus parallel to the one offered by Keshet (2008) for why worlds and

times of evaluation need to be merged: they pattern together. We will show that while accounting for our data in theories from other classes is not impossible, it would require building in constraints that undermine the initial goal of unbundling the judge and the evaluation index. We want to emphasize again the following point. If there were no judges at all, SPs would be predicted to trivially follow Keshet's constraints along with other ordinary predicates. However, as we discussed extensively in Section 2, most theories that deal with SPs postulate SP exceptionalism and among theories of SP exceptionalism most postulate judges in the semantics (with the exception of Anand 2009 and Coppock 2018). Therefore, any theory with judges has to make sure that judges and worlds pattern together.

We start by presenting a basic extensional framework in Section 4.1, which we will further connect with an extensional theory of *de re*. Section 4.2 talks about MUST ASSOCIATE theories exemplified by an extensionalized version of Lasersohn 2005.[24] Section 4.3 talks about the overgeneration problem of CAN DISSOCIATE theories (Stephenson 2007a,b; Stojanovic 2007; Sæbø 2009). Section 4.4 discusses two MUST DISSOCIATE proposals, indexical contextualism along the lines of McCready 2007; Bylinina et al. 2014 (Section 4.4.2) and the logophoric binding approach in Pearson 2013a (Section 4.4.3). We show that such theories crucially depend on a scopal view of *de re*—which in and of itself is problematic (Section 4.4.1)—to derive our cases as is, or require significant elaboration of the technology in question. Section 4.5 goes over a possible alternative implementation of the logophoric binding approach and shows that it does not solve the problem either.

4.1 Semantic assumptions

In Section 2.3, we introduced the basics of the extensional framework we are using in the paper. While an intensional systems treats indices as elements of evaluation sequence, we treat indices as present in the logical form and assume that all non-logical predicates require an argument of type I. Lexical entries for *dog* and *brown* in (60) illustrate.

(60) a. $[\![\text{dog}]\!]^{c,g} = \lambda x \lambda i. \ 1$ iff x is a dog in $\text{WORLD}(i)$.

b. $[\![\text{brown}]\!]^{c,g} = \lambda x \lambda i. \ 1$ iff x is brown in $\text{WORLD}(i)$.

The final I-type arguments of non-logical predicates will be filled by silent I-type bound variable pronominals present in logical form (indicated as i_n variables), and the the binders over these index variables are introduced by intensional operators such as attitude predicates as well as at the root node (Cresswell 1990; Percus 2000 and later work). The logical forms for the sentences *Montmorency is brown* and *Mary thinks Montmorency is yellow* are given below:

(61) a. $\lambda_0 \ i_0$ Montmorency is brown

b. $\lambda_0 \ i_0$ Mary thinks that
$\qquad [\ \lambda_1 \ i_1 \ $ Montmorency is yellow $]$

Expressions are evaluated relative to an assignment and a context, which we will assume for now is an element of the Cartesian type $D_\kappa = D_e \times D_s$, corresponding to the author and world of the context. We assume the rules of Function Application, Predicate Modification, and Abstraction (Heim and Kratzer 1998):

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24. For our purposes, related proposals in Lasersohn 2017 and in Lasersohn 2005 work the same.

(62) For any context c and assignment g, and for any branching node α with daughters β and γ:

    a. **Function Application**:
       If $[\![\,\beta\,]\!]^{c,g}([\![\,\gamma\,]\!]^{c,g})$ is defined, then $[\![\,\alpha\,]\!]^{c,g}=[\![\,\beta\,]\!]^{c,g}([\![\,\gamma\,]\!]^{c,g})$.

    b. **Predicate Modification**:
       If $[\![\,\beta\,]\!]^{c,g}$ and $[\![\,\gamma\,]\!]^{c,g}$ are of type $\langle e,t\rangle$, then $[\![\,\alpha\,]\!]^{c,g}=(\lambda x_e.[\![\,\beta\,]\!]^{c,g}(x)=[\![\,\gamma\,]\!]^{c,g}(x)=1)$.

    c. **Abstraction:**[25]
       If β is of the form λ_n, then for any variable η not free in α $[\![\,\alpha\,]\!]^{c,g}=\lambda\eta.[\![\,\gamma\,]\!]^{c,g[n/\eta]}$.

With this set of assumptions, the semantics for (61a) is as follows:

(63) $[\![\,\lambda_0\,i_0\text{ Montmorency is brown }]\!]^{c,g}$
     $=\lambda x.[\![\text{ brown }]\!]^{c,g[0/x]}\,([\![\text{ Montmorency }]\!]^{c,g[0/x]})([\![\,i_0\,]\!]^{c,g[0/x]})$
     $=\lambda i.\,1$ iff Montmorency is brown in WORLD(i).

Thus, the interpretation of a declarative sentence relative to a context and assignment is a proposition, and we define truth at a context (and assignment) as the evaluation of that proposition relative to the world of the context (64).

(64) **Truth in a context:**
    α is true in context c (relative to assignment g) iff $[\![\,\alpha\,]\!]^{c,g}(\text{WORLD}(c))=1$.

While we assume that the index argument of a non-logical predicate in main predicate position is supplied by a bound variable high in the clause, a nominal or adjectival predicate inside a DP requires some additional assumptions to fill its index argument. We will assume for explicitness here that determiners themselves compose with index variables, which they pass on to their complements (though nothing hinges on this implementational detail). (65) is the form for the indefinite determiner a:

(65) $[\![\,a\,]\!]^{c,g}=\lambda i.\lambda P_{e,It}.\lambda Q_{e,It}.\lambda i'.\,1$ iff $\exists x\,[\,P(x)(i)=1\wedge Q(x)(i')=1\,]$.

We now consider the interpretation of the sentence *A brown dog is a yellow fox*, (66a). We assume the logical form in (66b) which involves movement of the subject DP *a brown dog*. (67) sketches the interpretative process, where $g'=g[0/x]$.

(66)   a.   A brown dog is a yellow fox.

       b. $\lambda_0\,i_0\,[_\beta$ a i_0 brown dog $]$
                $[_\gamma\,\lambda_3\,t_3$ is a yellow fox $]$

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25. $g[n/\eta](m)=\begin{cases}\eta, & \text{if } m=n\\ g(m), & \text{otherwise}\end{cases}$

(67) a. $[\![$ brown dog $]\!]^{c,g'}$
$= \lambda x \lambda i.$ 1 iff x is a dog in WORLD$(i) \wedge x$ is brown in WORLD(i).

b. $[\![$ $[_\beta$ a i_0 brown dog $]$ $]\!]^{c,g'}$
$= \lambda Q_{eIt} \lambda i'.$ 1 iff $\exists x$ [x is a dog in WORLD$(g'(0)) \wedge x$ is brown in WORLD$(g'(0))$
$\wedge Q(x)(i')=1$].

c. $[\![$ $[_\gamma$ $\lambda_3 t_3$ is a yellow fox $]$ $]\!]^{c,g'}$
$= \lambda x \lambda i.$ 1 iff x is a fox in WORLD$(i) \wedge x$ is yellow in WORLD(i).

d. $[\![$ $\lambda_0 i_0 \beta \gamma$ $]\!]^{c,g}$
$= \lambda i.$ 1 iff $\exists x$ [x is a dog in WORLD$(i) \wedge x$ is brown in WORLD(i)
$\wedge x$ is a fox in WORLD$(i) \wedge x$ is yellow in WORLD(i)].

The resulting truth conditions of the sentence in (66a) are, as desired, contradictory, a result of the fact that *dog* and *fox* are contraries (as, presumably, are *brown* and *yellow*). Importantly, when (66a) is embedded, as in (68), the sense of a contradiction vanishes:

(68) Mary thinks a brown dog is a yellow fox.

Because *think* is an intensional operator, it introduces another intensional binder, per (69).

(69) $[\![$ think $]\!]^{c,g} = \lambda p_{It} \lambda x \lambda i.$ 1 iff $\forall i' \in DOX_{x,i}$ [$p(i')=1$].
(where $DOX_{x,i}$ is a set of indices compatible with what x believes at i)

While this yields four potential logical forms combinatorially, we assume that the two expressed in (70a) and (70b) are ruled out by empirically motivated constraints that require clausal index variables to be bound by the closest binder (Farkas 1997; Percus 2000). Note that based on the rule for intersective modification applied in (67a), even in intensional environments we don't have mixed interpretations such that *brown* and *dog* inside the DP *a brown dog* are interpreted with respect to different worlds.

(70) Logically possible LFs for (68)

a. * $\lambda_0 i_0$ Mary thinks that
$[_\alpha \lambda_1 i_0$
$[_\beta$ a i_0 brown dog $]$
$[_\gamma \lambda_3 t_3$ is a yellow fox $]$ $]$

b. * $\lambda_0 i_0$ Mary thinks that
$[_\alpha \lambda_1 i_0$
$[_\beta$ a i_1 brown dog $]$
$[_\gamma \lambda_3 t_3$ is a yellow fox $]$ $]$

c. $\lambda_0 i_0$ Mary thinks that
$[_\alpha \lambda_1 i_1$
$[_\beta$ a i_0 brown dog $]$
$[_\gamma \lambda_3 t_3$ is a yellow fox $]$ $]$

d. $\lambda_0 i_0$ Mary thinks that
$[_\alpha \lambda_1 i_1$
$[_\beta$ a i_1 brown dog $]$
$[_\gamma \lambda_3 t_3$ is a yellow fox $]$ $]$

This leaves only the last two forms, (70c) and (70d). Assuming the interpretation of *think* is as in (69), the logical form in (70d) attributes to Mary a belief with the contradictory truth conditions in (67d).

In contrast, the form in (70c) yields a sensible interpretation, crucially because the witness for the existential is a brown dog not in i' but in the (bound) matrix world—that is, because it is interpreted *de re*:

(71) a. $[\![[_\alpha \lambda_1 i_1 [_\beta \text{ a } i_0 \text{ brown dog }][_\gamma \lambda_3 t_3 \text{ is a yellow fox }]]]\!]^{c,g[0/i]}$
$= \lambda i'.\ 1 \text{ iff } \exists x\ [\ x \text{ is a dog in WORLD}(i) \wedge x \text{ is brown in WORLD}(i)$
$\wedge\ x \text{ is a fox in WORLD}(i') \wedge x \text{ is yellow in WORLD}(i')].$

b. $[\![\lambda_0 i_0 \text{ Mary thinks } \alpha]\!]^{c,g}$
$= \lambda i.\ 1 \text{ iff } \forall i' \in DOX_{Mary,i}\ [\ \exists x[\ x \text{ is a dog in WORLD}(i) \wedge x \text{ is brown in WORLD}(i)$
$\wedge\ x \text{ is a fox in WORLD}(i') \wedge x \text{ is yellow in WORLD}(i')]].$

4.2 MUST ASSOCIATE theories

The framework we introduced in the previous section sets the stage for a detailed discussion of SP exceptionalism in its various versions. As we have discussed in Section 2, the literature treats SPs as being semantically relativized to a perspective, or a judge. There are different ways to fix judges compositionally, and in this section, we take a closer look at MUST ASSOCIATE theories.

The basic tenet of such theories, first proposed in Lasersohn 2005 is the addition of a special JUDGE coordinate, responsible for storing the evaluative perspective, to the index of evaluation (which we previously assumed consisted simply of a world of evaluation, hence of type D_s). Thus, indices are of Cartesian type $D_I = D_e \times D_s$ where the entity coordinate of an index $i = \langle j,w \rangle$ encodes JUDGE(i), the judge of the index. (72) illustrates the semantic difference between ordinary vs. subjective predicates.

(72) a. $[\![\text{brown}]\!]^{c,g} = \lambda y \lambda i.\ 1 \text{ iff } y \text{ is brown in WORLD}(i).$ ORDINARY PREDICATE

b. $[\![\text{adorable}]\!]^{c,g} = \lambda y \lambda i.\ 1 \text{ iff } y \text{ is adorable for JUDGE}(i) \text{ in WORLD}(i).$ SP

In this way, the truth conditions of some predicates are determined "relative to" an additional component of evaluation beyond worlds, and systems that involve something like a JUDGE coordinate of the index are now known as *relativist* (see MacFarlane 2009, 2014 for discussion).

At the root level, the judge coordinate is conventionally set to a value supplied by the context, in parallel to the convention for worlds, as in (64). Thus, in this system contexts are of type $D_\kappa = D_e \times D_s \times D_e$, corresponding to the author, world, and judge of the context. Lasersohn argues that in default cases SPs in a root declarative clause have what he calls an *autocentric* perspective: JUDGE(c) is set to AUTHOR(c), the speaker. As we already discussed in Sections 3.3 and 3.4, in certain circumstances a third-party or a generic perspective is also possible. For now, we confine ourselves to autocentric and reported autocentric cases.

Following Stephenson (2007a), we will assume for now that attitudes quantify over indices such that the judge argument is co-referent with the attitude holder.[26] This means that what we observed for worlds of evaluation holds for judges as well. SPs that are interpreted *de dicto* in the scope of an attitude predicate are evaluated with respect to the attitude holder of that predicate, just as *de dicto* predicates in the scope of intensional operators are evaluated with respect to the worlds introduced by those operators (73).

(73) a. **Mary** thinks that a dog is **adorable**$_{\text{MARY}}$.

b. $[\![\lambda_0 i_0 \text{ Mary thinks that } \lambda_1 i_1 \text{ a } i_1 \text{ dog is adorable}]\!]^{c,g}$
$= \lambda i.\ 1 \text{ iff } \forall \langle \text{Mary},w' \rangle \in DOX_{Mary,i} \exists x[x \text{ is a dog in WORLD}(\langle \text{Mary},w' \rangle)$
$\wedge\ x \text{ is adorable for JUDGE}(\langle \text{Mary},w' \rangle) \text{ in WORLD}(\langle \text{Mary},w' \rangle)]$
$= \lambda i.\ 1 \text{ iff } \forall \langle \text{Mary},w' \rangle \in DOX_{Mary,i} \exists x[x \text{ is a dog in } w' \wedge x \text{ is adorable for Mary in } w'\ ].$

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26. Note that in many systems, this is a centered counterpart to the attitude holder (Stephenson 2007a; Moltmann 2010a; Pearson 2013a). We leave this aside at present.

In contrast, if the index argument for an SP is interpreted *de re* (i.e., bound by a non-local binder), then the world of evaluation will switch. Correspondingly, in multi-judge sentences like (74), this account predicts patterns of felicity to align with whether the nominal containing the attributive adjective is read *de re*. (74) illustrates. (While in our scenario there is a specific dog, note that *de re* indefinites don't have to be specific, see Fn. 19 and Section 4.4.1. We assume that the difference is not a matter of scopal distinctions.)

(74) a. **Sue**: **Mary** thinks an **adorable**$_{\text{SUE}}$ **dog** is **ugly**$_{\text{MARY}}$.   DE RE

b. $[\![\lambda_0\, i_0$ Mary thinks that $\lambda_1\, i_1$ an i_0 adorable dog is ugly $]\!]^{c,g}$
$= \lambda i.\ 1$ iff $\forall \langle \text{Mary},w' \rangle \in DOX_{Mary,i}$
$\quad [\ \exists x[\ x$ is a dog in $\text{WORLD}(i) \wedge x$ is adorable for $\text{JUDGE}(i)$ in $\text{WORLD}(i)\ ]$
$\quad\quad \wedge [x$ is ugly for $\text{JUDGE}(\langle \text{Mary},w' \rangle)$ in $\text{WORLD}(\langle \text{Mary},w' \rangle)]]$
$= \lambda i.\ 1$ iff $\forall \langle \text{Mary},w' \rangle \in DOX_{Mary,i}$
$\quad [\ \exists x[\ x$ is a **dog in** $\text{WORLD}(i) \wedge x$ is **adorable for Sue in** $\text{WORLD}(i)$
$\quad\quad \wedge [x$ is **ugly for Mary in** $w'\ ]].$

In (74), *an adorable dog* is read *de re* and evaluated with respect to i_0, therefore, *adorable* also evaluated with respect to i_0 and the matrix judge (by assumption, the speaker). If *an adorable dog* were read *de dicto*, the SPs *adorable* and *ugly* would be evaluated at the same index, the embedded i_1. This would mean that they would be evaluated with respect to the same world and the same judge (by assumption, Mary), yielding a contradiction.

In order for (74) to be non-contradictory, *adorable* and *ugly* have to be evaluated with respect to either (i) different worlds: the same object can be adorable for the speaker in the actual world and ugly for the speaker in someone's doxastic alternatives, or (ii) different judges: the same object can be adorable for the speaker and ugly for Mary in the same world. An important empirical prediction of Lasersohn's theory is that judges and worlds pattern together, since they are both part of the index. One cannot evaluate *adorable* with the speaker as the judge in (74) without evaluating it in the matrix world, which prevents mixed non-attested readings which we have seen in (40) and to which we come back in the next section. This is the JUDGE-INDEX correlation, and it follows naturally from the architecture of Lasersohn's system.

Note that this type of framework also easily handles exocentric uses discussed in Section 3.4. For example, in line with Lasersohn 2005, we may model this by adding an argument to the denotation of attitude predicates for the embedded judge (75).

(75) $[\![$ think $]\!]^{c,g} = \lambda j \lambda p_{It} \lambda x \lambda i.\ 1$ iff $\forall w' \in DOX_{x,i}\ [\ p(\langle j,w' \rangle) = 1\ ].$

For the lexical entry in (75) we assume the judge element is a free variable implicit argument of the attitude, and hence may (a) be bound by the subject, to derive a report of an autocentric judgment, or (b) be free, to produce exocentric readings without requiring a non-local world of evaluation. Crucially, each index introduces only one judge, and all SPs relative to an index will be relativized to the judge of that index. This ensures that even exocentric readings obey the JUDGE-INDEX correlation.

The above logic makes use of the mechanisms of *de re* interpretation, and hence could be dependent on the details of a particular account. Within the extensional theory we have been developing, *de re* interpretation is done by non-local binding of an index variable. Another (more traditional) approach pursued within intensional approaches is the Scope Theory (Russell 1905; Montague 1973; Cresswell and Stechow 1982). In such an approach, *de re* interpretation involves a logical form in which the *de re* nominal has moved from its base position to one above the attitude predicate, as in (76) below:

(76) $[\,\lambda_0\ i_0\ [_{DP}$ an i_0 adorable dog $]$
       $[\,\lambda_3\ [$ Mary
           $[\,$thinks
               $[\,\lambda_1\ i_1\ \ t_3$ is a ugly fox $]\,]\,]\,]\,]\,]$

As the nominal is outside the scope of the intensional operator, its index variable cannot be bound by the intensional operator, and hence must be bound by the matrix binder. The Scope Theory thus allows us to derive the non-local interpretive effects of *de re* without requiring non-local binding (it is for this reason that the Scope Theory is used by many intensional systems, since many cannot capture something like non-local binding otherwise). As we shall observe, some theories of judge-dependence disallow non-local judges (particularly, the approaches in Stojanovic 2007 and in Pearson 2013a), and so such theories will require some version of the Scope Theory if non-local judges are available.

Relativist frameworks in Egan 2010, MacFarlane 2014 and Bylinina 2017 work very similarly to Lasersohn 2005 with respect to our data. In these approaches, evaluation indices reserve a coordinate for the judge, which various perspectival expressions are sensitive to. Because of this bundling, such theories will straightforwardly derive the correlation we have observed, parallel to how they would derive Keshet's (2008) original time-world correlation.[27] In the next sections, we will argue that all extant contextualist approaches fail to do the same. Our data thus provide a novel argument for a relativist semantics for subjective meaning.

4.3   CAN DISSOCIATE theories

A spate of more recent theories have reacted to the original relativist position by dissociating judges and evaluation indices. Here, we will consider theories that fall under the umbrella of what we will call *implicit variable* approaches: the mixed contextualist/relativist framework of Stephenson (2007a) and the mixed contextualist/variable-free framework of Sæbø (2009), which builds off the contextualist theory of Stojanovic (2007).

Despite different conceptual underpinnings, those accounts share the following formal property. They provide two routes for the specification of an SP judge, treated as a pronominal element with a bound interpretation and or a free interpretation. In case of the former, the judge is linked to the evaluation index, much like in Lasersohn 2005. However, in the latter, "free", case, the bare use judge can pick up any referent. We will show momentarily that the "free" route predicts the existence of *de dicto* non-local judge interpretations that are systematically absent for multi-judge cases. We will thus claim that the implicit variable theories of SPs are too weak in their current form and predict unattested readings. We start by discussing the account in Stephenson 2007a and then show that the proposal in Sæbø 2009 is the same as far as our data are concerned.

Stephenson (2007a) assumes alongside Lasersohn (2005) that indices contain a JUDGE coordinate, which attitude verbs shift as in (69) in Section 4.1. In addition to that, all SPs are treated as dyadic predicates:

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27. Strictly speaking, the approach advocated in MacFarlane (2014) assumes that indices are world-time-'taste' tuples, where a taste is the standard of taste of a judge at a particular point in time that may be different from the index' time of evaluation. This distinction does not bear on the question of bundling judges and indices, but rather on the nature of the judge. For our purposes, MacFarlane's (2014) version of relativism is strongly in the MUST ASSOCIATE camp. See our discussion in Section 4.5.

(77) $[\![$ adorable $]\!]^{c,g} = \lambda z\lambda y\lambda i.$ 1 iff y is adorable for z in WORLD(i).

Two kinds of implicit variables can fill the z judge role.[28] In autocentric cases, the judge argument is filled by the distinguished pronominal PRO$_J$ that picks out the JUDGE coordinate of the index of evaluation. The result in (78c) is identical to Lasersohn's (2005), given in (63).[29]

(78) a. $[\![$ PRO$_J$ $]\!]^{c,g} = \lambda P_{eeIt}\lambda y\lambda i.$1 iff $P($JUDGE$(i))(y)(i)$.

   b. $[\![$ adorable PRO$_J$ $]\!]^{c,g} = \lambda y\lambda i.$ 1 iff y is adorable for JUDGE(i) in WORLD(i).

   c. $[\![$ λ_0 i_0 Montmorency is adorable PRO$_J$ $]\!]^{c,g}$
       $= \lambda i.$ 1 iff Montmorency is adorable for JUDGE(i) in WORLD(i).

However, in addition to autocentric uses, SPs also allow non-autocentric readings, as we discussed in 3.4. How such cases are handled constitutes one of the crucial differences between the approach in Lasersohn 2005 and the one in Stephenson 2007a. For Lasersohn, non-autocentricity arises purely due to pragmatics. Because SPs are semantically judge-dependent in the same way across the board, the judge, autocentric or not, is always linked to the index of evaluation, which is all that matters for our cases. For Stephenson, however, there is a semantic difference between autocentric and non-autocentric uses. In this system, non-autocentric readings arise when the z role is filled by a free variable, pro_i:

(79) $[\![$ adorable pro_z $]\!]^{c,g} = \lambda y\lambda i.$ 1 iff y is adorable for $g(z)$ in WORLD(i).

Importantly for our purposes, the account in (79) overgenerates in attitude reports.[30] Due to the lack of restrictions on the distribution of pro_i, nothing prevents a speaker-oriented SP from combining with a *de dicto* nominal in the SUBJECT position in the complement clause. However, as shown in (80) (=39), such reading is not attested (cf. also 33 in Section 2.3). A derivation for the non-attested mixed reading (80b), which is not ruled out by Stephenson (2007a), is given in (81):

(80) *Context: **Sue** and **Mary** are debating several stuffed animals in a Steiff catalog. They happen on an item that Sue believes is an **adorable dog** and Mary an **ugly fox**.*

   a. **Sue: Mary** thinks that an **adorable**$_{\text{SUE}}$ **dog** is **ugly**$_{\text{MARY}}$.   DE RE

   b. **Sue:** #**Mary** thinks that an **adorable**$_{\text{SUE}}$ **fox** is **ugly**$_{\text{MARY}}$.   MIXED (*de dicto* noun)

(81) $[\![$ Mary thinks that λ_1 i_1 an i_1 adorable pro_{10} fox is ugly $]\!]^{c,g}$ MIXED (*de dicto* noun)
      $= \lambda i.$1 iff $\forall\langle$Mary,$w'\rangle \in DOX_{\text{Mary},i}$
              $[\,[\,\lambda i'.$1 iff $\exists y\,[$
                 y is a fox in WORLD(i')
                    $\wedge$ y is adorable for $g(10)$ in WORLD(i')
                       $\wedge$ y is ugly for JUDGE(i') in WORLD$(i')\,]\,](\langle$M,$w'\rangle)=1\,]$
      $= \lambda i.$1 iff $\forall\langle$Mary,$w'\rangle \in DOX_{\text{Mary},i}$
              $[\,\exists y\,[\,y$ is a fox in w'

$$\wedge \; y \text{ is } \underline{\textbf{adorable for}} \; g(10)(=\underline{\textbf{Sue}}) \text{ in } w'$$
$$\wedge \; y \text{ is } \underline{\textbf{ugly for Mary}} \text{ in } w' \,]\,].$$

A similar problem, albeit for a different formal reason, arises in the account originally advocated in Stojanovic 2007 and argued for in Sæbø 2009. In this account, predicative and attributive uses differ in their semantic composition in attitudinal environments, which leads to overgeneration, as we will show below.

SPs are treated as dyadic and there is a distinguished variable of the assignment reserved for the judge, e.g., x_{100}. In Sæbø's (2009) version of the proposal, the judge argument of the SP is not the first argument. Here, for compositional simplicity, we will assume it is the last, after the index argument:

(82)　$[\![\text{ adorable }]\!]^{c,g} = \lambda y \lambda i \lambda z. \, 1 \text{ iff } y \text{ is adorable for } z \text{ in } \textsc{world}(i).$

This induces an interesting compositional difference for SPs depending on whether they are in MAIN-PRED position or in attributive position. In MAINPRED position, composition with the first argument of the SP will yield a property of SP judges, as below:[31]

(83)　$[\![\; \lambda_1 \, i_1 \; \text{ a } i_1 \; \text{ dog is adorable }]\!]^{c,g}$
　　$= \lambda i \lambda z. \, 1 \text{ iff } \exists y \, [\; y \text{ is a dog in } \textsc{world}(i) \wedge y \text{ is adorable for } z \text{ in } \textsc{world}(i) \,].$

Attitude verbs in this framework take such a property argument, feeding in both judge and index of evaluation in succession (as we shall see, this is similar to the compositional process for Pearson (2013a)):

(84)　a.　$[\![\text{ think }]\!]^{c,g} = \lambda P_{eIt} \lambda x \lambda i. \, 1 \text{ iff } \forall \langle x,i' \rangle \in DOX_{x,i} \, [\; P(x)(i') = 1 \,].$

　　b.　$[\![\; \lambda i_0 \, i_0 \; \text{ Mary thinks that } \lambda i_1 \, i_1 \; \text{ a } i_1 \; \text{ dog is adorable }]\!]^{c,g}$
　　　$= \lambda i. \forall \langle \text{Mary}, w' \rangle \in DOX_{\text{Mary},i}$
　　　　$[\; y \text{ is a dog in } w' \wedge y \text{ is adorable for Mary in } w' \,].$

While (84b) can be treated as a notational variant of Lasersohn's (2005) approach, things are different for attributive SPs. In such cases, there is an obvious type clash between a dyadic SP like *adorable* and the monadic noun *dog*. To solve this clash, attributive SPs directly reference the distinguished variable.

(85)　$[\![\text{ adorable } x_{100}]\!]^{c,g} = \lambda y \lambda i. 1 \text{ iff } y \text{ is adorable for } g(100) \text{ in } \textsc{world}(i).$

However, the distinguished variable is not mandatorily updated in the scope of intensional operators, which creates an opportunity for two different judges to emerge in intensional environments, precisely in configurations like (80). Specifically, MAINPRED SPs will leave an unsaturated judge argument for the intensional operator to fill in and attributive ones will use x_{100}. It is thus possible for $g(100)$ to be autocentrically linked to the speaker while a MAINPRED SP is compositionally linked to the attitude holder. This, in turn, allows an unattested interpretation, such as the one in (80b) above. Like Stephenson's, Sæbø's system predicts that the end result of (81) is a valid interpretation of the sentence in question. We should note that Sæbø (2009:337-338) in fact discusses such cases explicitly but does not exclude the unattested interpretation.[32]

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31. Note that for this composition to proceed, the indefinite determiner will need to be able to take arguments of type $eeIt$, in addition to ones of type eIt.

32. Sæbø discusses the following example:

To summarize, the accounts of Stephenson (2007a), Stojanovic (2007) and Sæbø (2009), despite their differences, share a flexibility with respect to the relation between judges and intensional operators. This flexibility allows MAINPRED and SUBJECT SP judges to differ in attitudinal environments irrespective of whether the SUBJECT DP is read *de re*. By assimilating SP judges to ordinary pronouns, these accounts essentially predict that SPs with bare use judges, at least in some cases, should behave like SPs with overt judge PPs. Because such SPs are no longer judge-dependent, they should be insulated from any effects of intensional quantification. However, as we have shown in Section 3.3, bare use judges and overt judges do behave differently, which is a problem for implicit variable approaches.

It is worth asking what could be done to make these accounts work. As far as we can tell, the only way to do so would be to more closely link the implicit variables (x_{100} and pro_n) to the index of evaluation. One possible way to do this would be to invoke the so-called *Acquaintance Inference*, or the AI. Several researchers have discussed the fact that assertions of some autocentric SPs come with an evidential requirement for the judge to have a certain type of perceptual experience of the object, such as tasting a cake for asserting that it's delicious, or viewing (some part of) a movie for asserting that it's boring (Stephenson 2007b; Pearson 2013a; Ninan 2014; Bylinina 2017; Anand and Korotkova 2018; Muñoz 2019).[33] For Pearson (2013a), this restriction is encoded as a presupposition, which is adapted for Stephenson's (2007a) proposal in the example below (see Muñoz 2019 for a similar constraint):

(86) $[\![$ adorable $]\!]^{c,g} = \lambda z \lambda y \lambda i : z$ has direct perceptual acquaintance with y in WORLD(i). 1 iff y is adorable for z in WORLD(i).

In principle, such a presupposition has the potential to restrict the possible judges for an SP in the following way. Multiple judges could be disallowed when the SUBJECT DP is read *de dicto* since it could be that the referent of the implicit variable fails to have acquaintance with the object in the doxastic alternatives. However, we do not believe that such a move will rescue the examples constructed above. (87) repeats (80b) from above, with the LF argued to be impossible:

(87)   *Context:* **Sue** *and* **Mary** *are debating several stuffed animals in a Steiff catalog. They happen on an item that Sue believes is an* **adorable dog** *and Mary an* **ugly fox***.*

  a.   **Sue**: #**Mary** thinks that an **adorable**$_{\text{SUE}}$ **fox** is **ugly**$_{\text{MARY}}$.   MIXED (*de dicto* noun)

  b.   [Mary thinks [that λ_1 i_1 an i_1 adorable pro_{10} fox is ugly]]

Given (86), in order for the LF in (87b) above to be felicitous, it must be the case that $g(10)$ (i.e., Sue) has visual experience of the stuffed animal in question in the belief indices of Mary that are quantified over

_____

(i)   **The mother snipe** thinks that the **ugliest** baby birds are **beautiful**$_{\text{MOTHER SNIPE}}$.   (Sæbø 2009:337, ex. 23)

   However, just like our test cases, the example above is infelicitous in a *de re* blocking environment such as FID, which suggests that it also requires a *de re* interpretation and is thus in line with our central observation:

(ii)   #?The ugliest baby birds were beautiful, the mother snipe thought.

33. The AI has been typically associated with textbook predicates of personal taste, and the presence of an experiential event has been argued to be one of the diagnostics of PPT-hood (Bylinina 2017). As discussed in detail in Korotkova and Anand forth., not all subjective predicates give rise to the AI, for example, predicates like *authentic* or *important* do not. In this section, we consider the AI for those predicates that have it and show that even with this restriction in place CAN ASSOCIATE theories would overgenerate. So, as we discussed in Section 2.2, the distinction between PPTs and non-PPT SPs does not matter for the purposes of our paper.

(where the actual indices quantified over may depend on assumptions of how the presupposition projects out of the attitude quantifier). But this is, in fact, quite easy to satisfy; since Mary and Sue are looking at, and discussing, the catalog together, it is natural that Mary would believe that Sue has seen the object they are discussing. Moreover, the *de dicto* reading is possible with an overt judge in the same scenario (Section 3.3). Assuming that the AI holds for overt judges as well (shown in Anand and Korotkova 2018), it seems unlikely that the lack of a *de dicto* reading for the bare use SP is due to an unmet presupposition.

Beyond the immediate issue of this example, it is worth noting that there are independent empirical problems with the idea that SPs semantically encode a restriction requiring the judge to have a certain perceptual experience. The AI is present in simple positive and negative assertions, but when embedded under several kinds of operators, including epistemic modals, indirect evidentials and attitudes compatible with indirect evidence, it disappears (Klecha 2014; Ninan 2014, 2020; Anand and Korotkova 2018; Cariani 2021):

(88) a. This tea {is, isn't} delicious, #though I haven't tried it.

    b. This tea must be delicious, though I haven't tried it.

    c. I think / am sure this tea is delicious, though I haven't tried it.

It is thus possible to construct cases where the judge not only doesn't have perceptual experience, but could not. In (89), for example, the SP object went extinct before the speaker could try it, hence violating the AI presupposition for an autocentric judge.[34]

(89) I suspect silphium[35] was delicious. It's a shame we'll never know.

While we believe that (89) is acceptable with an autocentric judge, it is admittedly possible that the acceptability stems from an exocentric judge (i.e., some group of humans contemporaneous with silphium). In (90a) and (90b), we attempt to control for this, by choosing an object that went extinct long before mammals existed (90a) and an event that ceased before life existed (90b), and hence could not be visually apprehended with current astrophysical techniques.

(90) a. I wonder if Psaronius leaves[36] were delicious. It's a shame we'll never know.

    b. I'm sure the birth of the solar system was a glorious sight.

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34. SPs that have an AI have been argued to have an experiential semantics (Bylinina 2017; Charlow 2019; Muñoz 2019), and one may wonder what happens with canonical experiencer predicates (*annoy, frighten, like*). Even though they, too, have an AI (ia), there are in fact two kinds of acquaintance content (Anand and Korotkova 2018): that of bare use SPs in (88,90), and that of experiencer predicates in (ia,b) and overt judge SPs (ic,d); one must control for independent parameters like the possibility of future-shifting (under *will* and *might* but not *must*). Thus, data from experiencer predicates are not instrumental in understanding the behavior of bare use SPs.

(i) a. I ✓might / #must like this tea, though I haven't tried it.

    b. #I suspect I must have liked silphium. It's a shame we'll never know.

    c. #This tea must be delicious to me, though I haven't tried it.

    d. #I suspect silphium was delicious to me. It's a shame we'll never know.

35. A now-extinct aromatic popular during classical antiquity.
36. Psaronius is a tree fern that went extinct during the Permian period.

Similarly, building on contrasts discussed by MacFarlane (2014), we can observe that SPs can be used inside counterfactuals without requiring that the judge be acquainted with the SP object in the counterfactual worlds. This is most easily observable in cases where the counterfactual premise explicitly denies any acquaintance with the SP object, as in (91a), or the existence of the judge, as in (91b):

(91)   a.   I wish I could take credit for my students' success, but I can't. Even if I never knew them or knew of them, they would still be brilliant.

        b.   Even if people never existed and selectively bred them, tulips would be beautiful.

Despite the lack of any acquaintance, in both cases in (91) we believe that there is nevertheless a salient autocentric interpretation, where the judgement of brilliance or beauty is that of the speaker. These cases thus furnish a crisp argument against treating the AI as a uniform requirement of some kind of relation between the judge and the SP object.

The few accounts of the AI that attempt to deal with the above facts end up eliminating it from embedded SPs altogether. For Ninan (2014), the AI is not hard-wired to the semantics of SPs but is due to the pragmatics of SP assertions, thus not affecting the interpretation of embedded SPs. Anand and Korotkova (2018) model the AI as a presupposition, but one that is designed to be trivially satisfied under epistemics, certain attitudes and other operators that affect evidentiary grounds for a claim (as Anand and Korotkova 2018 discuss, it is only those markers that allow or require indirect evidence, but not intensional operators across the board; see also Ninan 2020; Cariani 2021). To sum up, we should expect the AI—whatever its precise etiology—to not be operative for most attitude complements, and hence not something we could invoke to rule out multi-judge *de dicto* readings. We conclude that CAN DISSOCIATE theories do not capture our data, after all.

4.4   MUST DISSOCIATE **theories**

We now turn to two MUST DISSOCIATE theories, the context-shifting account sketched by McCready (2007); Bylinina et al. (2014) and the logophoric binding account of Pearson (2013a). We observed above that CAN DISSOCIATE theories incorrectly predict that multi-judge sentences should allow nominals to be read *de dicto* (without apparent contradiction). As we will see, both of the MUST DISSOCIATE theories correctly prevent *de dicto* nominals in multi-judge sentences, principally because they do not allow non-local judges.

The question of *de re* nominals in multi-judge sentences is more complex. In Section 4.2, we highlighted two mechanisms for *de re* interpretation: (i) non-local binding, and (ii) scope taking at logical form. We noted there that for MUST ASSOCIATE theories, the JUDGE-INDEX correlation followed regardless of the mechanism for *de re* interpretation. But we will argue that the context-shifting and logophoric binding approaches crucially require the Scope Theory to capture our correlation. The Scope Theory has received several empirical challenges over the years, and we thus take the dependence of these theories on the Scope Theory as a sign that they cannot, in fact, derive the JUDGE-INDEX correlation. We will begin this argument in reverse, first reviewing the empirical evidence against the Scope Theory and then considering the two theories of SPs. We elaborate on this issue in the Appendix, where we show that MUST DISSOCIATE theories do not get our data in the concept generators framework, a prominent current theory of *de re* interpretation (see Charlow and Sharvit 2014 for discussion).

4.4.1 Problems for the Scope Theory

One central problem of the classical Scope Theory is that it correlates the index of evaluation for the predicates within a nominal with the scopal position of the nominal. What this means is that it predicts a correlation for quantificational nominals between *de re* interpretation and scope-taking with respect to other quantificational operators. There are several counterexamples to this prediction (see Keshet 2008; Schwarz 2012; Keshet and Schwarz 2019 for discussion). One prominent instance is given in (92) below.

(92)   Mary wants to buy a tent just like mine.   (modeled after Fodor 1970)

There is a reading of (92) where Mary forms a desire to buy, let's say, a certain kind of pyramid tent. In this case, there is no specific pyramid tent she wants to buy, just a certain type. Unbeknownst to her, the speaker happens to own that precise kind of pyramid tent. Under the Scope Theory, this kind of reading is unavailable. On the one hand, the description that the tent is like mine cannot be evaluated with respect to the local world introduced by *want*, because that is not part of Mary's desires (nor, indeed, her beliefs). That will mean that *a tent just like mine* will need to scope above *want*, as in (93). But *want* is also a quantificational operator, and hence scoping above it will require that there is a particular tent like the speaker's that all of Mary's desire worlds agree upon, contrary to fact.

(93) $[\ \lambda_0\ i_0\ [\ $ a i_0 tent like mine $i_0\ ]$
$\qquad\quad [\ \lambda_{10}\ \text{Mary}_i$
$\qquad\qquad\quad [\ \text{wants}\ \lambda_1\ i_1\ \ \text{PRO}_i\ \text{to buy}\ t_{10}\ ]\ ]\ ]$

SP-versions of (92) show a similar 'some or another of this type' reading.[37] Thus, (94) has a reading which conveys that the speaker is alleging the tent to be ugly without imputing to Mary such a belief.

(94)   Mary wants to buy an ugly tent.

As for (93), the relevant readings for these sentences are not predicted to be available under the Scope Theory. In response to this difficulty, several kinds of approaches have arisen, including, most prominently, the extensional system with non-local binding that we have been using. In this system, *an ugly tent* can stay within the quantificational scope of *want* but still be evaluated relative to the matrix index, as (95) shows:

(95) $[\ \lambda_0\ i_0\ \text{Mary}_i\ \text{wants}$
$\qquad\qquad\qquad\quad [\ \lambda_1\ i_1\ [\ $ an i_0 ugly tent $i_0\ ]\ \lambda_{10}\ \text{PRO}_i\ \text{to buy}\ t_{10}\ ]$

Another problem for the classic Scope Theory is so-called scope trapping, where a *de re* expression contains material bound by some structurally higher *de dicto* expression—effectively, restricting the LF site of the *de re* term to something relatively low. The setup is illustrated in (96) below, inspired by Bäuerle's (1983) examples.

(96)   *Context: John has recently taken up baking, and decides to impress his friends by baking cakes for their birthdays. Unfortunately for him, he doesn't actually know the birthdays of his friends, and so he ends up baking them cakes on days he believes to be their birthdays.*

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37. Keshet's (2008) version of Fodor's example features *expensive*, which is an SP according to the criteria from Section 2.1.

John thinks that [on each of his friends' birthdays]$_j$, [$_{DP}$ the disgusting cake he baked that day$_j$] was tasty.

By design, since John does not bake his cakes on his friends' actual birthdays, the phrase *on each of his friends birthdays* must be interpreted *de dicto*. But since this expression quantifies over the day that *that day* refers to, it traps that phrase (and hence the DP containing it) below it, and hence below *think* as well. But being in the scope of *think* will mean that the DP will also be interpreted *de dicto* and that *disgusting* will be interpreted relative to the local judge, like *tasty*. We should thus generate a contradiction in this scenario, and the absence of a contradiction is a problem for the Scope Theory (or any other scopal approach to *de re*, e.g. Keshet 2010).

Above we have replicated existing problems for the Scope Theory of *de re* in analogous sentences with SPs. If indices contain judges and we allow non-local index binding, then this is entirely as expected. *De re* interpretation arises via non-local binding, and the non-local index determines both the world of evaluation and the SP judge. Insofar as the literature has already shown that the Scope Theory is problematic for *de re* interpretation, it may seem unimportant to dwell on this fact. However, in the sections below, we will examine two theories which separate judges and worlds of evaluation and which require local judges. We will argue that those two components will force these theories to adopt the Scope Theory of *de re*. We will thus predict that either (i) multi-judge sentences should be wholesale unavailable (if the wide-scoping LFs required by the Scope Theory were, for some reason, systematically blocked), or that (ii) multi-judge sentences should be possible, but not with interpretations that would violate Scope Theory LFs, such as scope-trapping. The fact that we replicate the extant problems for the Scope Theory even with SPs thus furnishes a serious problem for the theories we are about to review.

4.4.2 Indexical contextualism

We begin by examining an indexical contextualist theory (this approach is inspired by McCready 2007 and Bylinina et al. 2014). At first blush, this theory looks like a member of the MUST ASSOCIATE class. In this approach, the judge is treated very much like a shiftable indexical along the lines first proposed in Schlenker 2003. There are two components. First, the context, and not the index, includes the judge coordinate that SPs are relativized to, $c = \langle author, world, judge \rangle$, hence the term contextualism (as elsewhere in the paper, we supress coordinates of the context that are not relevant for us, such as *time* or *location*).

(97) $[\![$ adorable $]\!]^{\langle \text{AUTHOR}(c), \text{WORLD}(c), \textbf{JUDGE}(c) \rangle, g} = \lambda x \lambda i.1$ iff x is adorable to JUDGE(c) in WORLD(i).

Second, SPs differ from ordinary indexicals in attitude reports. While SPs readily receive an interpretation relative to the attitude holder, English indexicals *I* and *you* typically remain speaker-oriented.[38] In order for the indexical contextualist to capture it, attitude verbs are treated as monstrous operators over contexts (in the sense of Kaplan 1989; Schlenker 2003) and uniformly shift the JUDGE coordinate to the attitude holder, as in (98):

(98) $[\![$ think $]\!]^{\langle \text{AUTHOR}(c), \text{WORLD}(c), \textbf{JUDGE}(c) \rangle, g}$
$= \lambda p_{\kappa, It} \lambda x \lambda i.1$ iff $\forall \langle x, w' \rangle \in DOX_{x,i}$
$[\, p(\langle \text{AUTHOR}(c), \text{WORLD}(c), \textbf{x} \rangle)(\langle x, w' \rangle) = 1 \,]$

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38. Indexicals in other languages, e.g. Amharic, Korean and Zazaki, may in fact refer to the attitude holder in embedded environments, see Deal 2020 for a recent overview of the empirical and theoretical landscape.

As attitude predicates shift the judge coordinate of the context, all judge-dependent items in the scope of an attitude should be interpreted with the attitude holder as the judge. For multi-judge sentences, this correctly derives a contradiction in case the nominal is read *de dicto*.

(99) $[\![\lambda_0\, i_i\ \text{Mary thinks that}\ \lambda_1\, i_1\ \text{an}\ i_1\ \text{adorable fox is ugly}]\!]^{c,g}$ DE DICTO
$= \lambda i.1$ iff $\forall \langle \text{Mary},w'\rangle \in DOX_{\text{Mary},i}$
     $[\,[\,\lambda c'.\lambda i'.1$ iff $\exists y$
       $[\, y$ is a fox in $\text{WORLD}(i')$
         $\wedge\ y$ is adorable for $\text{JUDGE}(c')$ in $\text{WORLD}(i')$
         $\wedge\ y$ is ugly for $\text{JUDGE}(c')$ in $\text{WORLD}(i')\,]\,]$
          $(\langle \text{AUTHOR}(c),\text{TIME}(c),\text{WORLD}(c),\text{M}\rangle)(\langle \text{M},w'\rangle)=1\,]$
$= \lambda i.1$ iff $\forall \langle \text{Mary},w'\rangle \in DOX_{\text{Mary},i}$
     $[\,\exists y\,[\, y$ is a fox in w'
       $\wedge\ y$ is **adorable for Mary** in w'
         $\wedge\ y$ is **ugly for Mary** in $w'\,]\,]$.

Now, let us consider what occurs if the SUBJECT is read *de re*. Since the attitude is what shifts the JUDGE parameter, if the nominal is raised out of the attitude's scope, it will be interpreted relative to the matrix judge. Thus, if we adopt the Scope Theory, *de re* interpretation of the nominal will allow a non-local judge, as we observed for MUST ASSOCIATE relativist theories in Section 4.2. However, if we use non-local index binding to derive *de re* readings, we will not allow a non-local judge. Instead, the judge will be the attitude holder, but the world of evaluation will be the matrix world (99).

(100) $[\![\lambda_0\, i_i\ \text{Mary thinks that}\ \lambda_1\, i_1\ \text{an}\ i_0\ \text{adorable fox is ugly}]\!]^{c,g}$ DE RE
$= \lambda i.1$ iff $\forall \langle \text{Mary},w'\rangle \in DOX_{\text{Mary},i}$
     $[\,[\,\lambda c'.\lambda i'.1$ iff $\exists y\,[$
       y is a fox in $\text{WORLD}(i)$
       $\wedge\ y$ is adorable for $\text{JUDGE}(c')$ in $\text{WORLD}(i)$
         $\wedge\ y$ is ugly for $\text{JUDGE}(c')$ in $\text{WORLD}(i')\,]\,]$
         $(\langle \text{AUTHOR}(c),\text{TIME}(c),\text{WORLD}(c),\text{M}\rangle)(\langle \text{M},w'\rangle)=1\,]$
$= \lambda i.1$ iff $\forall \langle \text{Mary},w'\rangle \in DOX_{\text{Mary},i}$
     $[\,\exists y\,[\, y$ is a fox in w
       $\wedge\ y$ is **adorable for Mary** in w
         $\wedge\ y$ is **ugly for Mary** in $w'\,]\,]$.

The issue in (100) arises because there is no necessary connection between the index and context of evaluation for a particular DP, and so using a non-local index does not require using a non-shifted context.[39] The Scope Theory avoids this issue because the particular landing site of *de re* movement is above the attitude predicate, and hence outside the shifted context. Thus, in indexical contextualism judges are obligatorily local, relative to the attitude predicate's syntactic scope. The sole way around this is to escape that scope. As we will show next, the logophoric binding approach in Pearson (2013a) has a similar signature, and thus also requires the Scope Theory.

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39. We suspect that other contextualist accounts, e.g. Schaffer (2011) and Zakkou (2019b), run into the same problem.

4.4.3 Logophoric binding (Pearson 2013a)

The account in Pearson (2013a) is what Coppock (2018) calls *sophisticated contextualism*. The proposal aims to derive several properties of SPs without substantial appeal to any special technology. For reasons of space, we will only concentrate on some aspects of this system; see Pearson (2013a) for a detailed defense. In (101), we have provided the logical form and interpretation for a sample sentence with an SP.

(101)   a.   Montmorency is adorable.

       b.   LF:
$\lambda_1 \, \lambda_2 \, w_2$ Montmorency λ_{10} [GEN $\lambda_3 \, w_3$ [t_{10} is adorable $I(y_1, x_4, w_2)$]]

       c. $[\![$ 101b $]\!]^{c,g}$
$= \lambda y_1 \lambda w_2.GEN_{x_4,w_3}$ [y_1 identifies with x_4 in $w_2 \rightarrow$
          Montmorency is adorable to x_4 in w_3]

In a nutshell, the approach has three components. First, SPs are argued to be individual-level predicates (see discussion in Section 3.2), and individual-level predicates are analyzed as inherently generic (Chierchia 1995, though see Czypionka and Lauer 2016). This is responsible for the GEN operator in (101). Second, Pearson assumes that SPs are dyadic predicates with a judge argument, although the judge is bound by the generic, as with x_4 in (101c). Finally, SPs impose a restriction on the domain of GEN: they restrict GEN to a set of individuals that the speaker (or attitude holder) empathizes or identifies with.[40] To this end, Pearson proposes that SPs involve first-person genericity (cf. Moltmann 2010a, 2012), via the relation I of identification, designed to encode those individuals whose perspectives are under consideration:[41]

(102)   *Identify with* relation I:
       $I(x,y,w)$ iff y identifies with x in w

The crucial component for present purposes is the identifier argument y_1. In Pearson's system, it is bound by the λ_1 operator at the left periphery of the clause. As a shorthand, we will call this kind of individual binder a *logophoric binder*. Embedded clauses also introduce a logophoric binder, and the system provides interpretive rules so that root logophoric binders map to the speaker (to result in speaker-autocentric readings) and embedded logophoric binders map to attitude holders (to handle reported autocentric readings). Thus, there is a unified LF in both cases, with embedded and root clauses both interpreted as properties of individuals (cf. Chierchia 1989), and interpretive differences arise from how those properties are further combined.[42]

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40. This component is used in the theory in part to derive the fact that SPs are typically autocentric.

41. Following Pearson (2013a), the LF in (101) is taken to indicate that generics unselectively bind Heimian/predicative indefinites. The proper theory of how generics bind free variables is not a principal concern of ours. One may simply assume the alternative LF below, which has a more transparent compositional interpretation:

(i) $\lambda_1 \lambda_2 \, w_2$ Montmorency λ_{10} [[GEN $\lambda_4 \, I(y_1, x_4, w_2)$] $\lambda_4 \lambda_3 \, w_3$ [t_{10} is adorable x_4]]]

42. Pearson further proposes that this logical form is responsible for all *de se* interpretations, following Chierchia (1989); Percus and Sauerland (2003). The fact that autocentric embedded SPs are *de se* (as shown by Stephenson 2007a) follows from this LF.

(103) a. **Root position**:
$[\ \lambda_1\lambda_2\ w_2\ ...\ \text{GEN}\ [\ ...\ \text{adorable}\ [\ I(\boldsymbol{y_1},x_4,w_2)\ ]\ ]\ ]$

b. **Embedded position**:
$[\ \lambda_1\lambda_2\ w_2\ \text{Mary thinks}$
$\qquad[\ \boldsymbol{\lambda_{21}}\lambda_{22}\ w_{22}\ ...\ \text{GEN}\ [\ ...\ \text{adorable}\ [\ I(\boldsymbol{y_{21}},x_4,w_{22})\ ]\ ]\ ]\ ]$

Alongside the licit LFs above, there is another potential LF given in (104), where the identifier argument of an embedded SP is bound by the matrix binder, yielding a speaker-oriented SP in embedded clauses:

(104) **Mismatch interpretation in the embedded position:**
$[\ \lambda_1\lambda_2\ w_2\ \text{Mary thinks}$
$\qquad[\ \boldsymbol{\lambda_{21}}\lambda_{22}\ w_{22}\ ...\ \text{GEN}\ [\ ...\ \text{adorable}\ [\ I(\boldsymbol{y_1},x_4,w_{22})\ ]\ ]\ ]\ ]$

In order to block the logical form in (104), Pearson assumes that the identifier argument must be bound by the closest possible binder (cf. similar constraints in Anand 2006; Hacquard 2006; Percus 2000):

(105) CLOSEST IDENTIFIER BINDER (CIB):
The identifier argument of an SP must be bound by the closest logophoric binder.

With this brief summary, we can now return to our test cases, repeated again in (106) below:

(106) Mary thinks that an adorable dog is ugly.

a. #Sue: Mary thinks that an adorable$_{\text{MARY}}$ dog is ugly$_{\text{MARY}}$.　　　　　DE DICTO

b. ✓Sue: Mary thinks that an adorable$_{\text{SUE}}$ dog is ugly$_{\text{MARY}}$.　　　　　DE RE

c. #Sue: Mary thinks that an adorable$_{\text{MARY}}$ dog is ugly$_{\text{MARY}}$.　　MIXED (*de re* noun)

d. #Sue: Mary thinks that an adorable$_{\text{SUE}}$ dog is ugly$_{\text{MARY}}$.　　MIXED (*de dicto* noun)

How does Pearson's account fare with respect to those cases? Our interest in answering this question is ultimately about the identifier argument to the I predicate. We will thus dispense with the generic quantifier in what follows. To make this concrete, we will reformulate the LFs as ones where the SP take the identifier directly, and where the identifier is subject to the CIB.

For *de dicto* subjects (106a), we would obtain the following LF, where *dog*, *adorable*, and *ugly* are all evaluated with respect to w_{22}, the world introduced by the intensional operator:

(107)　$[\ \lambda_1\lambda_2\ w_2\ \text{Mary thinks}$　　　　　　　　　　　　　　　(LF for (106a))
$\qquad[\ \lambda_{21}\lambda_{22}\ w_{22}\ [\ \text{a}\ w_{22}\ [\ \text{adorable}\ y_{21}\ ]\ \text{dog}\ ]\ [\ \text{is}\ [\ \text{ugly}\ y_{21}\ ]\ ]\ ]\ ]$

Due to the CIB, *adorable* and *ugly* will have the same binder for their identifier, λ_{21}, which will make them both relative to the same judge, Mary. This will yields a contradiction. So the account in Pearson (2013a) does not overgenerate and correctly rules the unattested (106a) out. By the same token, it also rules out the the unattested (106d): the noun will be interpreted *de dicto*, as in (107), and the framework does not allow non-local judges without *de re*.

However, this theory cannot derive the fact that *de re* interpretation results in a non-local judge, and this is the result of the CIB. Note first that the Scope Theory will yield non-local judges. Scoping the DP outside the embedded clause will mean that it is subject not to the λ_{21} logophoric binder but to the non-local λ_1 binder, parallel to the one we observed for the approach in Lasersohn (2005) in Section 4.2 and for indexical contextualism in Section 4.4.2:[43]

(108) $[\ \lambda_1\lambda_2\ [\ a\ \ w_{2,*22}\ [\ \text{adorable}\ y_{1,*21}\ ]\ \text{dog}\ ]$ (LF for (106b))
                $\lambda_4\ w_2\ \text{Mary thinks}$
                         $[\ \lambda_{21}\lambda_{22}\ w_{22}\ t_4\ [\ \text{is}\ [\ \text{ugly}\ y_2\ ]\ ]\ ]\ ]\ ]$

However, just as with indexical contextualism, it is the Scope Theory that is doing the job of linking the world and judge of the SP. Even though the world and the identifier are bound by separate binders, the particular landing site of *de re* movement is above both of them, and hence the world and identifier correlate. If we consider long-distance binding for *de re* interpretation instead, then we yield the wrong interpretation, precisely as with indexical contextualism. While the world argument of the DP is bound long-distance, the CIB forces a local judge, yielding a contradictory interpretation (109).

(109) $[\ \lambda_1\lambda_2\ w_2\ \text{Mary thinks}$ (LF for (106c))
                $[\ \lambda_{21}\lambda_{22}\ w_{22}\ [\ a\ \ w_2\ [\ \text{adorable}\ y_{21/*1}\ ]\ \text{dog}\ ]\ [\ \text{is}\ [\ \text{ugly}\ y_{21}\ ]\ ]\ ]\ ]\ ]$

To recapitulate, the accounts in Pearson (2013a) and Bylinina et al. (2014) can generate felicitous interpretations of multi-judge sentences only if *de re* attitude ascription proceeds via movement of the subject DP outside of the attitude. But we have discussed that we can create scope paradoxical sentences like (96) with multi-judge sentences, meaning that such movements are not necessary for *de re* subjects in such sentences (Charlow and Sharvit (2014) discuss further problems for the Scope Theory). We thus have strong evidence against splitting judges from worlds of evaluation. We follow up on this discussion in the Appendix, where we show that when Pearson's (2013a) account is coupled with concept generators, it still fails to predict the only reading available for attributive SPs in multi-judge scenarios under attitudes.[44]

4.5   Deriving the correlation via identification

We have argued that Pearson's logophoric binding approach does not account for multi-judge sentences because the CIB prevents long-distance logophoric binders. However, the CIB was originally advanced for main predicate SPs. It therefore may be possible that it applies only to that position, much like Percus (2000) argues for world-binding. In that case, we could suppose that attributive SPs allow any c-commanding binder, subject to whatever constraints SPs impose (cf. Sæbø's (2009) compositional differences between main predicate vs. attributive SPs). As with the CAN DISSOCIATE approaches, it may become difficult to rule out contradictory mixed LFs. In Section 4.3, we argued against the possibility of using the acquaintance inference to restrict the potential judges for a given world. However, the

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43. In fact, Pearson explicitly assumes the Scope Theory of *de re* when mentioning the possibility of a non-local judge for an embedded SP in the attributive position (Pearson 2013a:118, fn.15).

44. One reason to scrutinize this possibility is that it could be argued that concept generators somehow introduce another logophoric binder that can bind into a DP read *de re*. However, Charlow and Sharvit (2014) argue on the basis of quantificational DPs read *de re* that the concept generator applies to the trace of the moved DP, leaving the DP itself interpreted via long-distance index binding as we have been assuming. See the Appendix for details.

logophoric binding system additionally has an identification relation, I, that restricts the generic. It may be possible to use that relation to appropriately constrain interpretations.

Let us now re-consider the kind of mixed-judge LF that the CIB was designed to block:[45]

(110)   **Sue**: **Mary** thinks that an **adorable**$_{\text{SUE}}$ **dog** is **ugly**$_{\text{MARY}}$.   (=106d)
    $[\,\lambda_1\lambda_2\,w_2\,$ Mary thinks   MIXED (*de dicto* noun)
        $[\,\boldsymbol{\lambda_{21}\lambda_{22}}\,w_{22}$
            $[\,$a $\boldsymbol{w_{22}}$ GEN $[\,$adorable $[\,I(\boldsymbol{y_1},x_4,\boldsymbol{w_{22}})\,]\,]\,]$ dog $]$
                $[\,\lambda_{60}$ GEN $[\,t_{60}$ is $[\,$ugly $[I(\boldsymbol{y_{21}},x_5,\boldsymbol{w_{22}})\,]\,]\,]\,]\,]$
        $]\,].$

We argued that without the CIB, nothing would block this unattested mixed reading with only the nominal read *de dicto*. One alternative mechanism to consider is the I relation. If identification is a matter of empathic perspective-taking, then it might seem reasonable to suggest that the identifier and identifee must stand in a certain relation in w_{22}, and hence must both be residents of w_{22}.[46] Minimally, then, we could assume the following presupposition:

(111)   For all y, x, and w, $I(y,x,w)$ is defined only if y exists in w and x exists in w.

If y_1 is not present in w_{22}, then we can rule out the undesired LF in (110) on the basis of restrictions arising from the I relation. This is a potentially elegant way to capture the JUDGE-INDEX correlation within a system like Pearson's. In what follows, we will argue that despite this elegance, there are problems with assuming that (111) is a restriction on felicitous use of SPs and that y_1 is not in w_{22}.

When we contemplated the restrictive powers of the acquaintance inference in Section 4.3, we presented counterfactuals whose premises denied the existence of the speaker in the counterfactual worlds (91). In that vein, consider what George Bailey from *It's a Wonderful Life* might say after being shown the alternate timeline without him:

(112)   If I were never born, this town would be awful and Uncle Billy's life would be depressing.

Such examples are comprehensible and felicitous, contrary to what we would expect if the presupposition in (111) were always active. Conversely, in the case of our multi-judge scenarios, we are also skeptical of the claim that y_1 doesn't exist in w_{22}, though here the discussion becomes a bit more involved.

At first, it seems clear that in some scenarios y_1 is in w_{22}. In particular, in the scenario in which Sue utters the sentence corresponding to (110), she exists in some form in Mary's doxastic alternatives, since Mary and Sue are having a conversation about the animals in the catalog (and hence, should be present in each other's doxastic alternatives). And, again, the overt judge SUBJECT DP *a dog adorable to me* in (113) allows the multi-judge *de dicto* reading, showing that the speaker can exist in the intensional indices.

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45. (110) assumes the following. First, the SUBJECT DP scopes above the MAINPRED generic to derive a reading where there is one object under consideration, which, in turn, requires a generic operator within the subject DP (both *dog* and *adorable* are presumed to be inherently generic). Second, the world binders of the generic operators are suppressed for presentational clarity.
46. We are grateful to an anonymous reviewer for suggesting this possibility and for pressing us on the limits of Pearson's system.

(113)   **Mary** thinks that a dog **adorable for me** is ugly.

This much is true for the simplified version of Pearson's system we have been considering so far. It thus appears that there is evidence from counterfactuals against requiring the intuitive identifier from being in the local world of evaluation as well as evidence from overt judges that in our case y_1 is in w_{22}.

However, the interested reader may wonder how Pearson's more complete system involving self-ascription of *de se* properties affects the reasoning above. In what follows, we briefly consider some possible responses, referring readers to Pearson (2013a) for justification for the details we will now assume.

In Pearson's complete system, the logophoric binders create a property that is applied not to the speaker or attitude holder, but to their *de se* alternatives. In (110), the doxastic alternatives quantify over individual-world pairs, with worlds corresponding to worlds meeting Mary's beliefs and individuals corresponding to who she self-identifies with in each belief world (as per Lewis 1979), and y_{21} picks out Mary's self-ascribed alternative in each w_{22}, not necessarily Mary herself. Similarly, y_1 is not the speaker, Sue, in the actual world, but each of Sue's *de se* doxastic alternatives relative to the possible w_2 alternatives to the actual world. In light of this nuanced understanding, the question is whether Sue's *de se* alternative y_1 is present in Mary's belief worlds.

Reasoning from the data alone, the overt judge form in (113) would suggest that y_1 is present. In Pearson's system, the overt judge *me* is bound by λ_1 precisely as the identifier of a covert identification relation, since the first person indexical is interpreted *de se* and all *de se* expressions involve logophoric binding (see detailed discussion in Pearson 2013b). If the overt judge is in w_{22}, then so should be the covert identifier. We then should be able to generate the same multi-judge *de dicto* reading.

We can think of one possible, admittedly complex, response to this. Lewis (1986) proposes a metaphysical framework in which individuals are strictly world-bound (i.e., the mapping from individuals to worlds is one-to-one). Under such a view, Sue's *de se* counterparts could never be in w_{22}, since they are in w_1 worlds. To handle the grammaticality of (113), we would need to assign the referent of *me* a *de re* interpretation with respect to Mary's doxastic state, producing a cross-world counterpart that actually exists in w_{22}. We thus would have an expression with a *de se-de re* profile: it is *de re* with respect to the lower attitude (Mary's thoughts) and *de se* with respect to the higher one (Sue's self-ascribed statement). Then such an approach would have to stipulate that the covert identifier for an SP cannot be similarly interpreted *de se-de re*. Note that we cannot appeal to the fact that the covert identifier is an obligatory *de se* anaphor, since such anaphors are routinely interpreted *de se-de re* when further embedded under other attitudes (see Anand 2006 for discussion).

Stepping back a bit, any view that makes individuals inhabitants of exactly one world renders individuals strictly more informative than worlds alone. Such an approach would not need SPs to depend on individuals and worlds, nor have property abstraction over individuals and worlds. In both cases, individuals would make a suitable proxy for an individual-world index in our discussion, hence invalidating the idea of breaking apart centered worlds to begin with.

To sum up this discussion, ruling out the multi-judge *de dicto* reading within Pearson's system involves three requirements: (i) that the identifier is in the world of evaluation, (ii) that individuals are world-bound, and (iii) that overt elements read *de se* allow *de se-de re* interpretations, but covert ones do not. In turn, we have shown that none of these requirements are innocent. The first seems to be empirically false in general, the second undermines the idea of separating worlds and judges, and the third is, at present, a stipulation.

5 Conclusion

Much of the research on SPs is based on their behavior in main predicate position. In this paper, we scrutinize their attributive uses in attitudinal environments. Those uses are of interest since they allow an interpretation not readily available for main-predicate SPs, one where the SP is reflecting the speaker's, and not the attitude holder's, judgment. With the exception of Sæbø (2009) and Pearson (2013a), this fact is rarely discussed in the literature. By bringing these uses to the fore, we show that a proper account of them has consequences for how one theorizes about subjective meaning in general and thus demonstrate the relevance of linguistic arguments in philosophy of language disputes (cf. Moss 2012).

On the empirical side, we establish that an attributive SP can be interpreted from a non-local perspective if and only if the entire DP containing it is read *de re* (114b). A mixed reading in (114d) such that the SUBJECT DP is read *de re* and an SP inside it is relativized to the attitude holder is not attested (the reverse mixed reading, 114c, isn't attested either, with the subject DP being read *de dicto* and an SP inside it being relativized to the speaker). Such behavior may seem unremarkable. After all, it is precisely what is expected of intersective modifiers across the board (Keshet 2008).

(114)   Pascal: Mordecai believes [that the uplifting documentary is depressing].   (=5)

    a.   # …that the uplifting$_M$ documentary is depressing$_M$.   DE DICTO

    b.   ✓…that the uplifting$_P$ documentary is depressing$_M$.   DE RE

    c.   # …that the uplifting$_M$ documentary is depressing$_M$.   MIXED (*de re* noun)

    d.   #…that the uplifting$_P$ documentary is depressing$_M$ MIXED (*de dicto* noun)

However, a lot of recent work in linguistics and philosophy of language revolves around the idea that SPs are *not* ordinary predicates. Most theories assume that the judge of SPs is semantically represented as a special entity, and it is a matter of an ongoing debate how judges are fixed compositionally, if at all. The debate focuses primarily on various features that distinguish SPs from ordinary predicates and on which theory of SP exceptionalism can better account for those features. One could, in principle, expect that the behavior of SPs in attitudes would be also exceptional and somehow different from that of ordinary predicates. This is not the case. We argue that aspects of SPs that make them unexceptional should be taken into account in theories of SP exceptionalism.

Leaving conceptual differences between various approaches to SPs aside, we focus on their formal properties. We argue the following. If SPs are judge-dependent in some way, then SP judges should be formally connected to the worlds of evaluation in order to predict non-local perspective for SPs in the attributive position in attitudes. We show that the behavior of SPs in attitudes follows from the interaction of intensional quantification and general rules of semantic composition, and no dedicated machinery is needed to shift (or not shift) judges in attitudes. To this end, theories that account for our data treat the judge as part of the index of evaluation, the MUST ASSOCIATE theories (Lasersohn 2005, 2017; MacFarlane 2005, 2014; Egan 2010; Bylinina 2017). We thus provide a novel argument for relativism about subjective meaning, as only relativist accounts belong to the MUST ASSOCIATE class. Theories that formally separate judges and worlds are (i) either too flexible and derive unattested readings, as the implicit variables theories comprising the CAN DISSOCIATE class (Stephenson 2007a,b; Stojanovic 2007; Sæbø 2009), or (ii) too rigid and only derive our data under a scopal view on *de re*, requiring undesirable constraints otherwise, as contextualist approaches in the MUST DISSOCIATE class (McCready 2007; Schaffer 2011; Bylinina et al. 2014; Pearson 2013a; Zakkou 2019b).

Finally, in this paper we have assumed that SPs do have a judge argument, but nothing in our data keeps us from abandoning judges wholesale, at least in semantics. There are genuinely judge-free frameworks such that the beholder has no formal representation and is determined pragmatically (Anand 2009; Kennedy and Willer 2016; Coppock 2018). Those theories predict that SPs in attitudes would behave like ordinary predicates from the point of view of semantic composition, namely, that the SUBJECT DP containing a predicate contrary to that in MAINPRED position would be interpreted *de re*. Such theories also get our data.

In that vein, SPs are not the only expressions that have been argued to be judge-dependent. Multiple recent approaches to epistemic modality argue that the knower whose knowledge is relevant for expressions such as *must* and *might* behaves similarly to the judge of SPs (a.o. Egan et al. 2005; Stephenson 2007a,b; Schaffer 2011; Pearson 2013b; MacFarlane 2014). In attitudes, only the local knower is allowed for modal auxiliaries *might* and *must* in main-predicate position (Hacquard 2006, 2010; Stephenson 2007a; though see Yanovich 2013). However, as shown in Korotkova 2015, epistemic adjectives such as *likely* also allow non-local perspective in attitudes when used attributively. We might wonder whether, just like for SPs, such reading is only possible when the DP containing an epistemic expression is interpreted *de re*. Consider the following example:

(115) **Sue**: **Mary** thinks that a stuffed animal **which must be a fox** is **a dog**.

The felicity of (115) depends on the SUBJECT being interpreted *de re*, which is confirmed by the infelicity of such examples in existentials (116a) and FID (116b), both being *de re* blocking environments.

(116)   a.   #**Mary** thinks there's a stuffed fox **which must be full price on sale**.   [THERE]

        b.   #One stuffed animal **which must be a fox** is **a dog**, **she** thinks.   [FID]

If epistemics behave similarly to SPs and reference the knower in their semantics, it is important to correlate knowers and worlds (cf. Stephenson 2007a; MacFarlane 2014). However, the theoretical landscape for epistemic modals is different than that for SPs (see overviews in von Fintel and Gillies 2008; Weatherson and Egan 2011; Khoo and Phillips 2018) and we leave it for future research to determine how these particular proposals might account for the epistemic version of the JUDGE-INDEX correlation along with a more detailed examination of other putatively subjective expressions, such as epithets (Patel-Grosz 2015) or expressives (Potts 2005, 2012).

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Appendix: Concept Generators

In the main text of the paper, we considered two approaches to handling *de re*, the Scope Theory and non-local binding of index variables. We showed that several accounts can derive the JUDGE-INDEX correlation only with the Scope Theory, which is empirically problematic. However, the so-called Double Vision puzzles about *de re* interpretation cannot be solved by changing the binder for an index variable. In this appendix, we discuss these puzzles and review a recent approach to handle them known as the concept generator account (Percus and Sauerland 2003). We show that even with this more sophisticated treatment of *de re*, our main conclusion stands. Only MUST ASSOCIATE theories derive the desirable *de re* readings and exclude the undesirable *de dicto* readings, while MUST DISSOCIATE accounts do not. Finally, the choice of theory of *de re* is irrelevant for our discussion of CAN DISSOCIATE accounts because they overgenerate.

Under the Scope Theory, *de re* interpretation arises due to flexibility in the LF position of the item read *de re* as well as the replacement of the original position with a bound variable. The data in Section 4.4.1 raise questions for the possibility that *de re* items have a position outside the intensional domain. A different strand of research has also questioned whether it is viable to view the original position as a simple, unmediated bound variable.

The starting point for this is in the work of Quine (1956), who brings up the so-called Double Vision scenarios, where one individual sees another in two different environments and fails to realize that they are looking at the same person. The problem for any theory of *de re* is to account for this possibility without attributing contradictory beliefs to anyone. We illustrate Double-Vision cases below with an example from the American TV series *Breaking Bad*, where a character named Hank Schrader fails to recognize the druglord Heisenberg and Skylar's husband as one person, Walter White. Both of the sentences in (117) are judged true of Hank in Season 4 of *Breaking Bad* without imputing to him contradictory beliefs.

(117)   *Context: Walter White is a high school chemistry teacher who begins to manufacture metham-phetamine to supplement his income, unbeknowst to his family, including his wife Skylar and his brother-in-law, Hank, who serves in the Drug Enforcement Administration. Meanwhile, Hank is investigating Heisenberg, a potentially apocryphal new drugmaker, and comes into possession of a sketch of Heisenberg.*

    a.   Hank believes that Walter is a drug manufacturer.   DE RE

    b.   Hank believes that Walter is not a drug manufacturer.   DE DICTO

For any scopal view on *de re* (including the classic Scope Theory and Keshet's (2010) Split Intensionality), it is difficult to explain the fact that both sentences in (117) can be true at the same time. Moving the DP *Walter* outside of the scope of *believe* will leave a bound variable trace that will necessarily denote the same individual (=the actual world Walter), leading to a claim of contradictory beliefs.

The problem posed by such examples, as well as by their more sophisticated versions discussed in Charlow and Sharvit (2014), is that we need some formal way to mediate between the binder and the variable. Kaplan (1968) proposes that what is interpreted in the intensional environment is not the *de re* expression itself. Instead, it should be a kind of description that goes proxy for that expression, a relation through which the attitude holder is acquainted with the *res*, i.e. the object interpreted *de re*. For example, for Hank and Walter in (117), this description could be *the man whose alias is Heisenberg*. For Kaplan, then, (117a) is felicitous due to two facts: (i) *the man whose alias is Heisenberg* is Walter evaluated relative to the actual world, and (ii) *the man whose alias is Heisenberg is a drug dealer* is true when evaluated relative to Hank's doxastic alternatives.

One persistent problem with a Kaplanian view on *de re* has been determining a compositional method by which descriptive content and *res* connect, namely, how a term like *Walter* could somehow be interpreted as *the man whose alias is Heisenberg* (see Aloni 2001 and Ninan 2012 for a thorough discussion). The Concept Generator framework (Charlow and Sharvit 2014; Percus and Sauerland 2003), which we introduce below, is designed to do that.

The crucial innovation of Percus and Sauerland (2003) is the introduction of *acquaintance-based concept generators* (*concept generators* for short, ignoring a general definition in the original paper), which provide the link between descriptive content and the *res*, and are defined in (118):[47]

(118) G is a *concept generator* for individual x in i iff

   a. $G \in D_{e,Ie}$

   b. $Dom(G) \subseteq \{z \in D_e \,|\, x \text{ is acquainted with } z \text{ in } i\}$

   c. $Dom(G) \subseteq \{z \in D_e \,|\, G(z)(i) = z\}$

A concept generator thus encodes a bijective correspondence between (i) each individual an attitude holder is acquainted with, and (ii) descriptions met uniquely by that individual.[48] This bijection is what enables a compositional account of *de re*. For (117a), we are not attributing to Hank the claim that Walter is a drug manufacturer, but rather that the description $G(Walter)$, evaluated in each doxastic alternative, is. By the definition of concept generators, we are assured that this description is one that holds of Walter.

To ensure that $G(\text{Walter})$ means what it should, Percus and Sauerland propose that attitude verbs also introduce binders over concept generators in the logical form. Consider the LF for (117a) in (119).

(119) $\lambda_0\, i_0$ Hank believes
$\qquad [\, \lambda_8\, \lambda_1\, i_1\, [\, [\,_\alpha\, G_8\, [\,_\beta\, \text{Walter}\,]\,]\, i_1\,]$ is a drug manufacturer $]$

The resulting semantics for *believe* is as follows:

(120) $[\![\, \text{believe}\,]\!]^{c,g}$
$\qquad = \lambda P_{eIe,It} \lambda x_e \lambda i_I.1$ iff $\exists G$ for x in i such that $\forall i' \in DOX_{x,i}\, [\, P(G)(i') = 1\,]$

With these preliminaries out of the way, consider the α constituent. First, the β constituent inside it denotes the *res*, while the α constituent denotes the description under which Hank is acquainted with

the *res*. This is combined with the local index of evaluation i_1 to generate an individual that meets that description in the intensional index. Because it is the output of a concept generator, this description must as well yield the *res* when evaluated at i_0. Let us assume that this description is as follows:

(121) λi_I. the unique z such that z's alias is Heisenberg in i

The description in (121) uniquely picks out Walter in i_0, and the subject DP's denotation is as follows:

(122)   a. $[\![\, \beta \,]\!]^{c,g} =$ Walter

        b. $[\![\, \alpha \,]\!]^{c,g'} = [\![\, G_8 \; \beta \,]\!]^{c,g'}$
           $= g'(8)(\text{Walter})$
           $= \lambda i_I.$the unique z such that z's alias is Heisenberg in i

        c. $[\![\, \alpha \; i_1 \,]\!]^{c,i,g} = g'(8)(\text{Walter})(g'(1))$
           $= [\, \lambda i_I.$ the unique x such that x's alias is Heisenberg in $i\,](g'(1))$
           $=$ the unique z such that z's alias is Heisenberg in $g'(1)$

The remainder of the complement composes as follows:

(123) $[\![\lambda_8 \; \lambda_1 \; ... \,]\!]^{c,g}$
      $= \lambda G_{eIe,It}\lambda i_I.[\![\, ... \,]\!]^{c,g[8/G,1/i]}$
      $= \lambda G_{eIe,It}\lambda i_I.1$ iff $G(\text{Walter})(i)$ is a drug manufacturer in i

This is a function from concept generators to propositions, and it is the attitude verb's role to introduce a concept generator via existential quantification:

(124) $[\![$ believes $[\, \lambda_8 \; \lambda_1 \; i_1 \; [\, [\,_\alpha \; G_8 \; [\,_\beta \; \text{Walter} \,] \,] \; i_1 \,]$ is a drug manufacturer $]\;]\!]^{c,g}$
      $= \lambda x \lambda i. 1$ iff $\exists G$ for x in i such that
            $\forall i' \in DOX_{x,i}[G(\text{Walter})(i')$ is a drug manufacturer in $i'\,]$.

(125) $[\![\; \lambda i_0 \; i_0 \; \text{Hank believes} \; [\, \lambda G_8 \; \lambda i_1 \; i_1 \; [\, [\,_\alpha \; G_8 \; [\,_\beta \; \text{Walter} \,] \,] \; i_1 \,]$ is a drug manufacturer $]\;]\!]^{c,g}$
      $= \lambda i. 1$ iff $\exists G$ for Hank in i such that $\forall i' \in DOX_{\text{Hank},i}$
         $[\, G(\text{Walter})(i')$ is a drug manufacturer in $i'\,]$

Because there is a description under which Hank is acquainted with Walter and who is a drug manufacturer, there is a concept generator which makes the above condition true. And thus the sentence is true.

With this background, we can now see how the approaches to SPs we have considered square with the concept generator framework. We will first show that MUST ASSOCIATE theories like Lasersohn (2005) continue to derive the correlation. We will then turn to the account in Pearson (2013a) and demonstrate that our data continue to be problematic for that theory, even with concept generators.

First, let us consider Lasersohn's account. Because the chief job of concept generators is to pick out proxy descriptions, everything about judges should be determined by the *de re* index i_0 in the *res* itself. For concreteness, (126b) is the concept generator LF for (126a), one of our original multi-judge sentences.

(126) *Context: **Sue** and **Mary** are debating several stuffed animals in a Steiff catalog. They happen on an item that Sue believes is an **adorable dog** and Mary an **ugly fox**.*

    a. **Sue**: **Mary** thinks that an **adorable**$_{\text{SUE}}$ **dog** is **ugly**$_{\text{MARY}}$.   (=39a)

    b. $\lambda_0 \, i_0$ Mary thinks that
$$[\, \lambda_8 \, \lambda_1 \, i_1 \, [_\beta \text{ an } i_0 \text{ adorable dog }]$$
$$\lambda_3 \, [\, [\, [_\alpha \, G_8 \, t_3 \,] \, i_1 \,] \text{ is ugly }]$$

Let us unpack what is going on here. In (126b) everything below λ_3 is as in (119) above, including how the concept generator interacts with its argument. The novelty comes instead from the interpretation of the quantified subject DP. As the subject *an adorable dog* in (126b) is not individual-denoting, we cannot apply the concept generator to it directly. We will assume that subject quantified DPs can undergo quantifier raising to a position with sentential scope. Following Charlow and Sharvit (2014), we will assume that the concept generator applies to the trace of the quantified DP, which is of the right type:

(127) $\lambda_8 \, ... \, \lambda_3 \, [\, [\, [_\alpha \, G_8 \, t_3 \,] \, i_1 \,] \text{ is ugly }]$

Coming back to the interaction of worlds and judges, the β *res* constituent, which contains the SP, is not affected by the concept generator, which applies to the bound variable trace. Rather, it is the i_0 index variable in the quantified subject that fixes the judge. As a result, an extensional theory where judges are inside indices alongside worlds will predict that we are considering objects that are dogs in the i_0 world relative to the i_0 judge (i.e., the speaker). Here is how the derivation proceeds:

(128) a. $[\![\, \lambda_8 \, \lambda_1 \, i_1 \, [_\beta \text{ an } i_0 \text{ adorable dog }] \, \lambda_3 \, [\, [\, [_\alpha \, G_8 \, t_3 \,] \, i_1 \,] \text{ is ugly }] \,]\!]^{c,g'}$
$= \lambda G \lambda i. \, 1 \text{ iff } \exists x \, [\, x \text{ is a dog in WORLD}(g'(0))$
$\wedge \, x \text{ is adorable to JUDGE}(g'(0)) \text{ in WORLD}(g'(0))$
$\wedge \, G(x)(i) \text{ is ugly to JUDGE}(i) \text{ in WORLD}(i) \,].$

    b. $[\![\, \lambda_0 \, i_0 \text{ Mary thinks}$
$[\, \lambda_8 \, \lambda_1 \, i_1 \, [_\beta \text{ an } i_0 \text{ adorable dog }] \, \lambda_3 \, [\, [_\alpha \, G_8 \, t_3 \,] \, i_1 \,] \text{ is ugly }] \,]\!]^{c,g}$
$= \lambda i. \, 1 \text{ iff } \exists G \text{ for Mary in } i \text{ such that } \forall i' \in DOX_{\text{Mary},i}$
$[\, \exists x \, [\, x \text{ is a } \textbf{\underline{dog in}} \, \textbf{\underline{WORLD}}(i)$
$\wedge \, x \text{ is } \textbf{\underline{adorable}} \, \textbf{\underline{to}} \, \textbf{\underline{JUDGE}}(i) \, \textbf{\underline{in}} \, \textbf{\underline{WORLD}}(i)$
$\wedge \, G(x)(i') \text{ is } \textbf{ugly to JUDGE}(i') \textbf{ in WORLD}(i') \,] \,].$

Because there is a description under which Mary is acquainted with an adorable dog and that she thinks is ugly, there is a concept generator which makes the above condition true, so the sentence is true.

We now turn to Pearson's (2013a) approach, which restricts logophoric binders via the CIB. The LF in (129b) below combines our simplified version of Pearson's account of SPs with concept generators.

(129) a. **Sue**: **Mary** thinks that an **adorable**$_{\text{SUE}}$ **dog** is **ugly**$_{\text{MARY}}$.

    b. $[\, \boldsymbol{\lambda_1} \lambda_2 \, w_2 \text{ Mary thinks}$
$[\, \lambda_8 \boldsymbol{\lambda_{21}} \lambda_{22} \, w_{22} \, [_\beta \text{ an } w_2 \, [\text{ adorable } y_{*1,\mathbf{21}} \,] \text{ dog }]$
$\lambda_4 \, [\, [_\alpha \, G_8 \, t_4 \,] \, w_{22} \,] \, [\text{ is } [\text{ ugly } y_2 \,] \,] \,] \,] \,]$

Of interest here is the denotation of the subject NP, given in (130):

(130) $[\![$ adorable dog $]\!]^{c,g}$
$= \lambda x \lambda w.$ 1 iff $[\,x$ is a dog in $w\,] \wedge [\,x$ is adorable to y_{21} in $w\,]$

Per the CIB, the identifier argument of *adorable* must be y_{21}, namely, Mary (or her *de se* counterparts). This is the unavailable *de dicto* reading for multi-judge sentences in (106c). The problem arises for the same reasons as before: the identifier argument of the SP and the world argument of the DP are logically disconnected, and hence one cannot correlate them.

In sum, we see that adding concept generators to our calculations does not change the conclusions we have drawn in the main part of the paper: MUST ASSOCIATE accounts continue to admit *de re* subject DPs and disallow *de dicto* subject DPs in multi-judge sentences, while MUST DISSOCIATE theories that relied on the Scope Theory to derive the JUDGE-INDEX correlation only derive the undesirable *de dicto* reading.