FACTIVITY, BELIEF AND DISCOURSE*

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Abstract

A variety of attitude predicates seem to presuppose that their complement is true, including the cognitive factives (*know*, *discover*, *realize*), which presuppose their propositional complement *p*, and emotive factives (*love*, *regret*, *sad*), which presuppose both *p* and the attitude holder's belief in *p*. It will be shown that, in sharp contrast, no predicate in English that reports a communicative act (e.g., *claim*, *say*; *argue*, *explain*) is factive. What underlies this systematic gap? Why do we find attitude predicates that express true beliefs, but not true utterances? We will propose that the answer to this question follows from a systematic grammatical distinction between predicates that report the mental states and those that report discourse moves of conversational agents, coupled with the pragmatic calculation of main point.

1 Introduction

In the Hintikkan framework, attitude predicates describe a host of relations between an attitude holder *x* and a proposition *p* – belief, desire, supposition, statement. A subset of attitude predicates additionally comment on how *p* relates to *w*, the world of evaluation, according to two strategies: *veridical* predicates like *be right* assert *p*'s truth in *w*, while *factive* predicates like *know* and *hate* presuppose it. In principle, veridicality and factivity could be arbitrary lexical properties, intersecting the various classes of attitudes in idiosyncratic (and perhaps language particular) ways. However, in an investigation of 1100 English verbal and adjectival predicates that take declarative complements, Anand et al. (in progress) find that both veridicality and factivity are subject to several systematic gaps; for example, while predicates that discuss *x*'s beliefs about *p* may be factive (i.e., *know*), predicates that discuss *x*'s claims do not. To make the gaps clearest,

Attitude Class	Factivity/Veridicality		
	neither	veridical	factive
Private States			
Doxastic	*believe*, *think*, *guess*	–	**cognitive factives**: *know*, *discover*, *realize* **evidential factives**: *see*, *hear*
Suppositional	*imagine*, *suppose*	–	–
Desiderative	*want*, *hope*, *desire*	–	**emotive factives**: *love*, *regret*, *be sad*
Communicative Acts			
Assertive	*say*, *tell*, *argue*	*be right*, *demonstrate*	–
Mandative	*ask*, *request*, *order*	–	–

Table 1: Distribution of factivity and veridicality across declarative-taking attitude classes

let us assume the following two-level semantic cut of attitude predicates. At the first level, we can distinguish between predicates that discuss "private states" of *x*'s internal cognition (Quirk et al. 1985), such as those targeting belief, desire, and supposition, and those which relate *x* to some public communicative act, such as assertion, commanding, promising, etc. At the second level, we can distinguish the various kinds of mental states and communicative acts along the lines mentioned above. With that rough typology in mind, Anand et al.'s findings can be summarized in Table 1.

As the table illustrates, the distributions of both factive and veridical predicates are surprisingly constrained. The fact that this table is only half-filled cries out for an explanation, arguably one built off of the semantics of these classes of predicates. In some cases, that explanation is reasonably perspicuous. For instance, the lack of veridicality or factivity with mandative predicates is possibly attributable to the fact that these predicates intuitively talk about states of affairs that *x* takes to be unsettled.[1] But other generalizations seem less obviously grounded, such as the curious relation between the last two columns of Table 1: there no veridical doxastics or desideratives, and, conversely, there are no factive assertives. In other words, at the level of predicate classes, veridicality and factivity are mutually exclusive.

Why should this be? And why should factivity align with private states and veridicality with communicative acts? Put more pointedly, why is there no verb with the meaning *express the fact that*? This gap is surprising given that communicative verbs like *tell* or *announce* have been argued to enjoy factive "uses" (i.e., where speakers seem to take the truth of the complement for granted) in particular contexts (cf. e.g., Schlenker 2010, Spector and Egré to appear). Thus, communicative meanings and factivity are not conceptually incompatible, but natural language does not lexicalize

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[1]Note, however, that unsettledness in the mind of the attitude holder is not incompatible with settledness in the world of evaluation.

such concepts.[2]   Correspondingly, while there are factive mental state predicates, there are no merely veridical ones.

The central aims of this paper are twofold: first, to empirically motivate this distributional asymmetry, and second, to sketch a program for explaining it. In the interest of tractability, we confine our empirical scope to attitudes of acceptance (Stalnaker 1984), which include doxastics and assertives. We will briefly turn to other attitudes in section refsec:4, but will leave a detailed examination of these attitudes for future research. We focus on attitudes of acceptance for two related reasons. First, the doxastics and assertives are similar enough to make comparison relatively straightforward. Second, the fact that they behave complementarily with respect to factivity and veridicality is both surprising and important in recent work on presupposition triggering.

The question we ask then is why is it that there are no veridical doxastics, and no factive assertives: why do predicates like know and be right package their entailments and presuppositions the way they do? This question is about know and be right, but it is part of a larger question about lexical uniformity. Certain kinds of lexical items are systematically associated with particular presuppositions, and the questions of why this should be and how this association should come about have been a prime focus of work on presupposition triggering (Stalnaker 1974, Simons 2001, Abusch 2002, Schlenker 2008, Abrusán 2011, a.o.). While these associations may, in principle, be learned idiosyncratically, their relative cross-linguistic stability suggests a more principled division between at-issue and presupposed content. One common and influential line of explanation has been to assume that both presupposed and at-issue content are, semantically speaking, entailments of a linguistic expression, but that presuppositions come about when entailments are backgrounded according to pragmatic principles. In a sense, these approaches aim to do for lexical organization what Heim (1982) inaugurated for presupposition projection: to predict the behavior of an item from how the pragmatics interacts with the semantic primitives. Let us call any entailment about the truth (or falsity) of a propositional complement a *veracity entailment* (we eschew the more common *veridicality entailment* to avoid terminological confusion). Thus, under the pragmatic view of triggering, a predicate is factive because its veracity entailment is backgrounded, and a predicate is veridical if its veracity entailment is foregrounded.

For Simons (2001) and Abrusán (2011), the central principle governing foregrounding involves the "main point" of a linguistic expression: material connected to the main point becomes at-issue and material not connected to it becomes backgrounded. In this framework, the facts in Table 1 suggest that reports of doxastic states and assertive acts lead (by default) to different main points: the belief content for doxastic predicates and the veracity entailment for assertive predicates. Why should this be? Our idea, in essence, is that the pragmatic calculation of main point is determined by the semantics of the attitude; the main point differences are thus a product of the differential semantics of these two attitude classes. At their base, doxastic attitude reports report on the private mental state of an individual. The main point of such reports is on what the content of the attitude holder's mental state is, since the content of that state is "private" (Quirk et al. 1985). In contrast, assertion is a move is discourse, one attempting to update the common ground with a particular proposal. Reports of these moves ultimately tell us the subject's aims with respect to the state of

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[2]Interestingly, Kratzer (2013) notes that the reportative mood in German can appear in the complement of both assertives and doxastics, but that it never appears with factives. This provides another case of the grammar somehow not mixing assertivity and factivity.

that reported common ground. Doxastic reports are thus 'about' the mental state of the attitude holder; assertive reports are 'about' the state of the reported common ground, and whether the question raised by the proposition expressed by the complement clause will be accepted in this reported common ground.

This paper is organized as follows: Section 2 more closely examines the distribution of factivity and veridicality in attitudes of acceptance, with the aim of defusing some potential counterexamples to our generalization. We shall argue for a subtle distinction between factivity and a kind of identification with a reported common ground. In Section 3, we turn to more theoretical concerns. We first argue for a fundamental semantic split between assertives and doxastics. We then use that split to motivate a difference in main point calculation along the lines presented above. Our aims in Section 3 are programmatic. While we will advance a line of argumentation for how main point is determined by the underlying semantics, we leave a more detailed algorithm for another occasion. Section 4, which briefly considers the factivity/veridicality distribution beyond attitudes of acceptance, underscores some of the complexities that such an algorithm will have to take into account. Section 5 concludes with more general discussion of the prospects of our program.

2   Distribution of factivity/veridicality in attitudes of acceptance

Our empirical claim is that factivity only appears within the doxastic class (*know*, *be aware*, *see*). If an assertive predicate entails the truth of its complement, this veracity entailment is foregrounded: the predicate is veridical, but not factive (*be right*, *be correct*). We begin with some basic cases and then turn to potential counterexamples. Doxastic predicates behave in two ways: either they lack a veracity entailment (1), or when they have one, it is presupposed. This yields the classes of cognitive 2 and evidential factives (3). Neither (1) nor (4) entails that Mary is the murderer, but (2) and (3) and their negations in (5) and (6) do (modulo local accommodation):

(1)   John {thinks, believes, is sure/certain} that Mary is the murderer.

(2)   John {knows, realizes, is aware} that Mary is the murderer.

(3)   John {saw, heard} that Mary is the murderer.

(4)   John doesn't {think/believe}/isn't {sure/certain} that Mary is the murderer.

(5)   John doesn't {know, realize}/isn't aware that Mary is the murderer.

(6)   John didn't {see, hear} that Mary is the murderer.

Consider now the case of adjectives of veracity (Martin and White 2005): *be right/wrong*, *correct/incorrect*, and *accurate/inaccurate*. These predicates are veridical ((7) entails that Mary is the murderer), but non factive (8) (note that the negated forms are anti-veridical but not anti-factive):

(7)   John is {right/wrong, correct/incorrect} that Mary is the murderer.

(8)   John isn't {right/wrong, correct/incorrect} that Mary is the murderer.

This minimal contrast between the predicates be aware and be right in (5) and (8) is often presented as a vexing problem for pragmatic accounts of presupposition triggers, because, on first blush, they seem to be exact counterparts of each other: with *be aware*, the veracity

entailment is presupposed and the doxastic entailment asserted, whereas we seem to find the exact opposite pattern with *be right*. If pragmatic principles are to guide which entailments should be foregrounded vs. backgrounded, why should the same entailments yield different results? This problem, of course, only arises if we assume that *be right* and *be aware* share the exact same entailments. But they do not – *be aware* reports on the beliefs of the attitude holder, while *be right* references the commitments of the subject, such as those in conversation. Noticing this subtlety, Schlenker (2010) remarks, "it would remain to explain why such a small difference [belief vs. commitment] should have such a drastic presuppositional effect—by no means a trivial task." Our claim, in essence, is that this difference is not so slight. For one thing, it leads to differences in selectional restrictions – *be aware* requires a sentient subject, while *be right* additionally permits non-sentient entities to serve as subjects as long as they can be construed as *repositories of information* (ROIs), entities like books and articles:

(9)   * The book {knows, is aware} that Mary is the murderer.

(10)   The book is {right/wrong, correct/incorrect} that Mary is the murderer.

As we will see in section 3.1, this sentience requirement is one of the differences which we argued in Anand and Hacquard (2009) set apart doxastics (which report a private mental state) from assertives (which report discourse moves): books and articles can be agents of communicative acts, but they cannot experience beliefs. Hence, *be right* and *be aware* are not mirror images of the others: the former asserts the truth of its complement and presupposes that its subject is committed to the truth of the complement; the latter presupposes the truth of its complement and asserts that its subject believes the truth of the complement.

Our main claim is that factivity requires mention of a private state. This, we argue, explains the factivity gap of assertive attitudes: assertives encode commitments of their subjects, not their beliefs, as evidenced by the fact that they allow ROI subjects, which are incapable of thoughts. Further evidence for the importance of private states comes from the French equivalents of *guess*. Spector and Egré (to appear) contrast the predicates *deviner* 'divine/foretell' and *prédire* 'predict/hazard,' which differ in three crucial aspects: *deviner* is factive, requires a sentient subject, and correspondingly seems to report a private belief reached. *Prédire* is non-factive (like *predict*, it lacks a veracity entailment), allows "any subject whose denotation can be conceptualized as carrying some kind of propositional information" – precisely the ROI subjects congenial with assertive *be right*, and reports a public prediction. In sum, *deviner* is a factive doxastic, *prédire* a non-factive assertive.

In section 3, we will show why we should find differences in backgrounding between reports of commitments and reports of beliefs. Before that, we briefly consider two potential classes of counterexamples to our generalization: predicates that seem to express veridical doxastics in section 2.1, and predicates that seem to express factive assertives in section 2.2.

2.1   Counterexample #1: Veridical doxastic?

There is one class of verbs that first seems to be veridical, namely predicates of demonstration (*demonstrate*, *guarantee*, *imply*, *prove*, *show*). These verbs take subjects that need not be animate, nor ROI, and thus are incapable of holding beliefs:

(11)   The bloody gloves {demonstrate, imply, prove, show} that Mary is the murderer.

(11) seems to entail that Mary is the murderer. And this entailment, again, does not project:

(12)   Do the bloody gloves {demonstrate, imply, prove, show} that Mary is the murderer?

But the predicates in this class all admit an overt experiencer (*to John*, below),[3] in which case the sense that these predicates are veridical vanishes. That is, if something demonstrates to John that *p*, then it has changed John's doxastic state, though not necessarily to align with the truth.

(13)   The bloody gloves {demonstrate, imply, prove, show} to John that Mary is the murderer.

What these overt experiencer cases mean for the formal analysis of bare forms in (11) is unclear in a way that mirrors the discussion over predicates of taste (see section 4). On the one hand, in line with Jackendoff's (2007) approach, these predicates may lack an experiencer in their semantic argument structure and gain it for cases like (13) via a lexical rule. On the other, they may uniformly involve a covert experiencer or judge, which, as in Stephenson's (2007) analysis, may be replaced with overt pronominal counterparts.

For our present purposes, both analyses come to the same conclusion with respect to our distributional generalization. If these predicates lack an experiencer slot in their argument structure when bare, then we have an additional case of veridicality without a private (doxastic) state. If instead we assume that they have a covert experiencer, then we would have a private state without a veracity entailment. That is, regardless which explanation is ultimately correct, we lack a private state and veridicality simultaneously.

2.2   Counterexample #2: factive assertives?

We now turn to cases of predicates that are assertives, and yet seem factive. These counterexamples come from one central class of attitudes: response-stance discourse moves (Catell 1978), predicates that describe a conversational response. Out of the very many predicates that express linguistic or argumentative attitudes in the 1100 we surveyed in English, the following verbs are the only ones that appear to be factive: *acknowledge*, *admit*, and *confirm*. Given that these verbs allow ROI subjects, we assume that they do not encode the beliefs but the commitments of their subject. And yet, they all seem to trigger the presupposition that the complement is true in questions like (14).

(14)   Does the book {acknowledge, admit, confirm} that Mary is the murderer?

We believe that these verbs appear to be factive because of the kind of discourse moves these predicates report. Discourse moves are attempts to shape a particular common ground, and discourse move reports are thus reports of these attempts in some other reported common ground (i.e., not the common ground of the actual speaker and her interlocutors). Some of these reports, moreover, comment on *uptake*, on whether the move succeeded in the reported common ground, and these are predicates like *acknowledge*, *admit*, and *confirm*. All of these report discourse moves which lead to the acceptance of the complement *p* into the common ground of the reported discourse. This acceptance of *p* can easily bleed into the actual common ground, under the

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[3]Note that the overt DP must be a sentient experiencer, diagnosed by the inadmissibility of ROI elements:

(i)   # The bloody gloves demonstrate to the book that Mary is the murderer.

assumption that no subsequent move removed *p* from the common ground: an illusion of factivity arises whenever a reported context is taken to faithfully represent the conversational community in the world of evaluation. That is, in (14), the reason *Mary is the murderer* seems to project is that we conventionally take the book to be making its acknowledgement in a conversational context that includes the participants of the actual context. This assumption coupled with *acknowledge p*'s requirement that *p* is common ground in the reported context yields the sense that *p* is true in the actual context as well. With sufficient epistemological distance between the two conversational contexts, we see that factivity disappears, as in the example below, where we are reporting the beliefs of a people long separated from ourselves:

(15)   In Ancient Greece it was widely accepted that the Earth was flat. Eratosthenes however thought that it was round. After his peers demonstrated to him that he couldn't be right, he finally {acknowledged/admitted} that the Earth was flat.

Thus, we assume that a verb like *acknowledge* merely reports a discourse move: it does not encode the beliefs of its subject, nor does it presuppose that its complement is true. But because it is a response-stance predicate, it encodes a conversational context, in which the complement does hold as a result of the discourse move. When the speaker takes the reported discourse move to be part of a larger conversation, with a shared community, it leads to illusions of factivity.

We suspect that something very similar is behind the confusing behavior of predicates like *inform*. Assuming that *inform* is factive, Schlenker (2008) demonstrates its propositional content does not project in situations where the proposition is true if and only if the attitude holder says so. For instance, in situations where there is a dinner party, a question of the form (16) below seems to be usable in contexts where the interlocutor is unsure about the truth of the complement.

(16)   Has the butler informed the guests that dinner is ready?

Of course, this entire puzzle is predicated on *inform* being reliably factive outside of such recondite contexts. One putative contrast Schlenker advances concerns the behavior of *inform* versus *announce*. Schlenker claims that the factivity of announcements varies depending on the perceived reliability of the announcer. Consider the announcement report below against scenarios that differ on the reliability of the subject with respect to the embedded proposition:

(17)   Mary has announced [$_p$ that she is pregnant].
   a.   Scenario: Mary is 30 years old and is expected to be reliable about *p*.
   b.   Scenario: Mary is 7 years old and is not expected to be reliable about *p*.

Schlenker argues that these differing contexts lead to distinct presupposition profiles: in scenario (17a), where Mary's reliability stems from a variety of first-personal authority, a speaker uttering (17) comes across as presupposing Mary's pregnancy. In scenario (17b), where that reliability is significantly lower, not only does the presuppositionality vanish, but so does the veridicality.

In contrast, *inform* is claimed not to be so wayward; even if we assume Mary is highly unreliable, 18 is taken to always commit the speaker to *p*:

(18)   Mary has informed them [$_p$ that she is pregnant].

We are not sure that *inform* sounds appreciably different than *announce* here. Note that, strictly speaking, this is merely testing veridicality, and it is possible for us that *inform* is veridical but not factive, given that it reports a discourse move. However, there are reasons to doubt even its veridicality. For example, the collocation *falsely inform* is non-contradictory and widely attested, which would be surprising if the predicate lexically encoded the truth of its complement:[4]

(19)   Family falsely informed that soldier son was killed in Afghanistan. http://www.kare11.com/news/news_article.aspx?storyid=824393

(20)   From March 2012, Peart's and King's co-conspirators are alleged to have contacted victims in the U.S. and falsely informed them that they had won more than a million dollars in a lottery. http://www.justice.gov/opa/pr/2013/November/13-civ-1171.html

What is going on here? We believe that much can be learned from the cases in (19) and (20) above. Even in these cases of false informing, the intended goal of the informing agent is met: the addressees of the communicative act (the family and the victims, respectively) come to commit to *p*. Thus, it appears that for a discourse move to count as informing, *p* must come to hold in reported common ground. And then, to the extent that we identify ourselves with that context, we will get an illusion of projection, just as for *acknowledge*.

To flesh this out a bit more, let us close with the case of *confirm*. *Confirm* is typically taken to be veridical, if not factive. But, again, *falsely confirm* is well-attested and non-contradictory. We suggest that *confirm* likewise simply causes *p* to be added to the reported common ground, and that this may lead to factivity illusions in the same manner as above. We believe, however, that *acknowledge* is more likely to yield this inference than *confirm*, and this comes from the reliability of the attitude holders encoded by the lexical predicates. Gunlogson (2008) notes that in discourse we keep track of who vouches for a proposition based on independent grounds. She terms those that do so *sources* and those who merely accept a proposition already committed to by someone *dependents*. The details of her proposal are not important here, but the vocabulary gives us way of differentiating the various roles across the predicates we have discussed. In both acknowledgement and admission, the role of the subject is to serve as a dependent for some proposition that has been introduced into the discourse long before. One might think that confirmation is similar, but note that, in general, prior to confirmation there is no real sense that *p* is common ground, while afterwards it is. That is, in confirmation, the subject is vouching for *p*, as a source. It is thus not surprising that confirmation reports are more rarely seen as factive, since the question under discussion is whether the subject actually assented to *p*; given her sourcehood, we cannot be certain of *p* ourselves if an authority for *p* has not yet weighed in on it.

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[4]Similarly, while the verb *point out* may appear at first blush to be factive, it easily appears with *incorrectly*, showing that it is in fact not veridical:

(i)   I incorrectly pointed out Dominic Moore's assist tonight was his first point with the Sharks. https://twitter.com/SharksStats/status/176159825502285824

(ii)   Leo incorrectly pointed out that the new Mac Pro has FireWire. It does not. https://twitter.com/mahall85/statuses/344539199967461377

3   A Programmatic Proposal

Our proposal derives the factivity/veridicality complementarity from two strands of research. First, we will argue in Section 3.1 for a fundamental semantic distinction in the semantics of attitude predicates that report private mental states, like doxastics, and those that report public communicative acts, like assertives, which make reference to a reported common ground. Second, we will adopt the pragmatic view of presupposition triggering, according to which presuppositions are lexical entailments that are backgrounded based on pragmatic principles. We will notably build on Abrusán's (2011) proposal that entailments get fore- or backgrounded through a default "main point" calculus. Section 3.2 discusses the pragmatic view of presupposition triggers and main point calculation and section 3.3 combines these two proposals to derive the distribution of factivity and veridicality amongst attitudes of acceptance.

3.1   Attitudes of acceptance: *doxastics* vs. *assertives*

In Anand and Hacquard (2009), we examined several semantic and pragmatic distinctions of attitude predicates, focusing in particular on attitudes of acceptance (Stalnaker 1984). Attitudes of acceptance are attitudes said to be correct if their complement is true. If John believes that the Earth is flat is true, his belief is correct if the earth is flat (in contrast with desire reports like John wants the earth to be flat, where we can't talk about John's desire being correct). Attitudes of acceptance seem to form a uniform class, both in terms of their meaning, and in terms of selection. All acceptance predicates express a judgment of truth, in contrast to attitudes of desire or command (e.g., *want*, *demand*), which express preferences. In terms of distribution, they typically select for finite complements in English, for the indicative in Romance languages (Farkas 1985, Giannakidou 1997, Villalta 2000, 2008, a.o.); they allow parenthetical uses and parenthetical syntax (Bolinger 1968, Hooper 1975); they license epistemic modals (Anand and Hacquard 2009, 2013). These properties can be explained by giving all attitudes of acceptance a representational semantics, in which the complement clause holds in all of the worlds compatible with the attitudinal state. In this, they may differ from other attitudes (like desideratives and commands), which instead combine with their complements via a logic of preference (cf. von Wright 1963, Bolinger 1968, Stalnaker 1984, Farkas 1985, Heim 1992, Villalta 2000, 2008).

We argued that while attitudes of acceptance share a representational semantics, they form two distinct classes: assertives[5] (i.e., attitudes of putting forward a claim) vs. doxastics (i.e., attitudes of personal belief).

(21)   Assertive attitudes: *argue*, *say*, *claim*, *imply*, …

(22)   Doxastic attitudes: *believe*, *think*, *know*, …

We proposed that as assertives are reports of discourse moves, their lexical semantics refers to a projected common ground (the reported common ground CG_R): the proposition expressed by their complement clause has to hold not in the attitude holder's belief worlds, as with doxastics, but in the worlds of the context set that match the goals of the discourse move event. This contrast is illustrated for *claim* and *believe* below.

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[5]We referred to this class as "profferings" to highlight the proposal-making character of these attitudes as opposed to *assert*, which may be more intentionally-bleached.

(23) $[[claim]]^{c,w,g} = \lambda p \lambda e.claim'(e,w) \wedge \forall w'$ compat. with $Goal(e)[\forall w'' \in CG_R(w')[p(w'')]]$

(24) $[[believe]]^{c,w,g} = \lambda p \lambda e.belief'(e,w) \wedge \forall w'$ compat. with $belief'(e,w)[p(w')]$

The idea that the uptake intent of conversational acts should be formalized in terms of future states of the common ground is also exploited in Farkas and Bruce (2009), which focuses on the semantico-pragmatics of assertions and questions. Farkas & Bruce propose that proper modeling of the usage of response particles such as yes and no requires a model of conversational state with four central components: the state of the common ground (cg); per conversational participant x, her set of discourse commitments (DC_x); the stack (T) of current questions under discussion; and the projected set (ps) of canonical ways of removing the top of the stack from the focus of conversational attention. In this model, discourse moves are modeled as transitions between conversational states. For example, the ASSERT operator below has the following conversational context change potential on input context c: An assertion of p commits its speaker x to the content of p (by adding p to DC_x); it raises the issue of p by putting it on the table and pushing it to the top of the stack, and it "directs the conversation towards a unique resolution of that issue, namely confirmation of the assertion", by adding p to all future common grounds in ps (removing those that are incompatible with p).

(25) $ASSERT(x,p,c) = \langle cg', DC', T', ps' \rangle$, where
    a. $cg' = cg$,
    b. $DC'_x = DC_x + p$, and $DC'_y = DC_y$, for all other y,
    c. $T' = push(p,T)$, and
    d. $ps' = \{cg_i + pcg_i \in ps \wedge cg_i$ compatible with $p\}$

If Farkas & Bruce are correct that linguistic items like response particles make reference to this articulated structure for discourse moves, it is reasonable to assume that the semantics of discourse move reports themselves make reference to some version of this structure, and we thus expect to find grammatical distinctions between this class and the doxastics. Indeed we do.

In Anand and Hacquard (2009), we examined subject restrictions within attitudes of acceptance. We showed that only assertives allow inanimate subjects, so long as they are Repository of Information (ROI) subjects, that is, NPs that refer to entities such as books or articles, which are not sentient, but which nonetheless encode a body of information. Doxastics, on the other hand, do not allow any inanimate subjects:

(26) The book {argues, claims, implies} that Mary was the murderer.

(27) # The book {thinks, believes, knows} that Mary was the murderer.

We argued that this selectional restriction followed from the discourse-move nature of assertives. Because discourse moves are attempts to update the common ground, they are agentive. This act can be done either by a sentient individual or by an ROI which contains some argumentative perspective (i.e., the view of its author). In contrast, doxastics merely report the doxastic state of an individual, and doxastic states require sentience. Thus, following this logic, if a predicate disallows ROI arguments, we assume that it requires experiencers and not discourse agents.

There is also suggestive evidence that assertive and doxastic predicates differ as well in their complement-taking behavior. Pesetsky (1992) shows that the ability of a predicate to take ECM

complements correlates negatively with agentivity and positively with sentience—believe admits ECM but, for example, say does not. As we would expect, no assertive admits ECM:[6]

(28) a. John {assumed, believed, considered, imagined, judged, supposed} Mary to be the murderer.

   b. * John {admitted, affirmed, announced, asserted, claimed, observed, said, wagered} Mary to be the murderer.

Pesetsky, in fact, identifies a class of predicates that do not permit ECM or control, which he terms the *wager* class. This class is identical with the assertives:[7]

(29) Pesetsky's *wager* class
   admit, affirm, announce, mumble, mutter, scream, wager, whisper, shout, sight, yell; *assert, avow, claim, conjecture, declare, decree, disclose, grant, guarantee, intimate, maintain, note, observe, posit, recollect, say, state, stipulate, verify*

Moulton (2008) observes that Pesetsky's wager class differs from doxastics in prohibiting content nominal such as *claim, idea, rumor,* or *story,* which he takes to denote the individual correlates of some propositional content (see as well (Moltmann 2003)):

(30) a. John {believed, considered, judged, imagined} the rumor.

   b. * John {admitted, affirmed, declared, said} the rumor.

Building on Kratzer (2006), Moulton proposes that the facts in (30) point to a fundamental argument structural difference between doxastic and *wager* predicates. The former involve triadic predication of an attitude holder a, an event of the attitude e, and a propositional individual correlate x at world w, while *wager* terms denote binary predicates between x and an event e at w:

(31) a. $[[believe]]^{c,w,g} = \lambda x \lambda e \lambda a.belief'(e,w) \wedge Experiencer(e,a) \wedge Content(e,x)$
   b. $[[wager]]^{c,w,g} = \lambda e \lambda a.wager'(e,w) \wedge Agent(e,a)$

These two classes combine with propositional elements via distinct complementizers: for the doxastics, it is a complementizer that relates propositions to individual correlates, and for wager class predicates, it relates propositions to events:

(32) a. $[[C_{bel}]]^{c,w,g} = \lambda p \lambda x. \forall w'$ compatible with x in w $[p(w')]$
   b. $[[C_{wag}]]^{c,w,g} = \lambda p \lambda e. \forall w'$ compatible with e in w $[p(w')]$

Moulton doesn't precisely explicate what differentiates compatibility with individual correlates and events. However, in light of our discussion about assertives, we may be able to interpret compatibility with an event as the content of the desired discourse future (i.e., $Goal(e)$ or the

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[6]Moulton (2008) argues the correlation is actually a matter of aktionsart: eventive predicates forbid ECM and stative ones allow it. If this is correct, the lack of ECM with assertives is evidence of their eventive nature, not necessarily that their attitude holders are agents. We leave adjudicating this dispute to another occasion.

[7]—ECM predicates that admit control, the *demand* class, include discourse moves where correctness and truth do not coincide, like demands and promises. As we are confining our attention to attitudes of acceptance here, we will not discuss them.

desired update potential to the projected set). This would connect these syntactic restrictions with the semantic mechanisms inherent in discourse move reports. That is, it would provide conceptual motivation for Moulton's argument structural difference in (31) and explain why the complementizer in (32a) is not selected by assertive attitudes, whose notion of content is directly tied to the intended update triggered by an event. We leave a precise integration of Moulton's interesting proposal to a later date, and will remain agnostic about the details of composition between a predicate and its complement, and whether it is mediated by different complementizers (see also Kratzer 2013). In addition to these syntactic differences, the semantic difference between doxastic and assertive attitudes additionally correlates with the pragmatics of subjective terms in the complement clause. In Anand and Hacquard (2009), we proposed that this distinction was evidenced further by the interpretation of subjective predicates, such as predicates of personal taste, in the complements of doxastics vs. assertives:

(33)   a. John believed that this wine tastes oakey.
        b. John claimed that this wine tastes oakey.

(33a) seems to discuss a personal, subjective, opinion of John. In contrast, (33b) discusses an opinion he has about what the wine tastes like "objectively": (33a) discusses a belief about a preference, (33b) a belief about a general consensus. Given that assertives make explicit mention of a projected set in which the propositional content is common ground, the intended objectivity of such reports follows for the same reason that assertion of subjective statements tends to trigger an intended commitment to community-wide subjective agreement Stephenson (2007). In contrast, statements of belief do not reference a larger community, and hence report simply someone's mental state independent of the larger community. It is this distinction that led us to call such mental state reports "solipsist" – at their base, they are simply about the content of someone's internal beliefs.

In sum, we find that several distributional grammatical differences – subject sentience, allowance of ECM and content nominals, and community-wide objectivity – stem from the same underlying semantic source: a reference to mental states alone with doxastic predicates, and to a projected common ground for assertive attitudes. Our aim in the remainder of the paper is to argue that this distinction is similarly the culprit for the lack of factive assertive attitudes.

3.2   Foregrounding and main points

Broadly speaking, there are two approaches to predicting what presuppositions an item will trigger. In *alternative-based* accounts (Abusch 2010, Romoli to appear), which typically focus on soft triggers, presuppositions arise as inferences from what was said and a restricted set of alternatives that could have been said, as with Gricean quantity implicatures. For Abusch, these alternatives are contrasting items that all share certain entailments, and those shared entailments end up being triggered as presuppositions. For example, *win* triggers a presupposition of participation because *win* contrasts with *lose*, which shares the participation entailment. For Romoli, triggering is, in fact, a form of Gricean reasoning (see also Chemla 2010): *win* forms a scale with *participate*, and the *reason* win triggers a "presupposition" of participation under negation, for example, is formally identical to why *not every* leads to an implicature of *at least one*. These approaches have several virtues, not the least being a simplification of mechanisms for deriving inferred content, but they inherit the stubborn question that arises for Horn scales as well: Where do the alternatives

come from? More to the point, Abusch makes *know* an alternative of *be unaware* to derive the backgrounding of veracity, but why that alternative and not *believe*? If our generalization is correct, there should be a principled mechanism for deriving alternative-mates.[8]

A complementary tradition has arisen that derives presuppositions not from alternatives for the trigger but from the entailments of the trigger itself. In the *pragmatic triggering* approach, presuppositions are lexical entailments that are backgrounded according to pragmatic principles. Which entailments get backgrounded seems to be highly dependent on the context, and so one influential line that has been advanced is that backgrounding is guided by the conversational Question under Discussion (QUD) (cf. Simons 2007, Simons et al. 2010, a.o.). According to this view, propositional content that is intended to answer the QUD is termed the "main point," and everything else is backgrounded. In the case of vanilla factives, like *know* in the example below, the embedded clause (here, about eating vegetables) is often not directly relevant to the QUD (here, about surprising events involving the first graders), and hence is not main point, meaning it will be backgrounded, as desired:

(34)   A: What most surprised you about the first graders?   (Simons et al. 2010)
       B: They didn't know you can eat raw vegetables.

Occasionally, though, it is, and in such cases the content of the embedded clause becomes main point, and hence non-presupposed. In (35), A's question becomes a QUD against which B makes her assertion. Since the complement clause answers this question, it becomes the main point of B's assertion (and the main clause gets demoted to parenthetical status).

(35)   A: Why isn't Louise coming to our meetings these days?   (Simons 2007)
       B: Henry discovered/realized/figured out/learned that she's left town.

Even the complement of *know* can become the main point in certain contexts, as in (36) below. In this case, the embedded clause is not presupposed. The addressee will accommodate the inference that if Harry was dating Sally, Bill would know that he is; B's uncertainty about the truth of the complement ensues.

(36)   A: Is Harry dating Sally?   (Simons et al. 2010)
       B: Bill doesn't know that he is.

While it is true that contexts in which the QUD is answered by a complement can affect presuppositionality, Abrusán (2011) notes that the picture is too porous, since it predicts that a version of (34) where the embedded clause (here, about the first graders) relates to the QUD will lose presuppositionality, contrary to fact:

(37)   A: What most surprised you about the first graders?   (Abrusán 2011)
       B: They didn't know they failed the exam.

Instead, Abrusán argues that there seem to be some default "bottom up" preference for backgrounding: the veracity component for verbs like *know* or *realize* are backgrounded by default, while their doxastic component seems to be the default main point. Abrusán argues extensively that

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[8]Note that our conception of how main point depends on the semantics discussed in section 3.2 could, in principle, supply such a theory of how alternatives are constructed.

these default principles may be overridden by context, which can supply additional main points, thus shifting material backgrounded by default into the foreground. When the question under discussion is the status of the truth of the complement clause, this secondary main point results in that becoming at-issue as well, as happens in (35). Abrusán proposes that the main point of the sentence is, by default, calculable from the (run time of the) matrix event of the predicate (the use of run times is designed to avoid mereological questions about events). Any entailment about the matrix event run time is part of the main point, and hence foregrounded; entailments not part of the main point become backgrounded (or, presupposed). Following Demolombe and Fariñas del Cerro (2000, 2010), Abrusán defines what it means for a formula ϕ to be about term t in terms of whether model-theoretic satisfaction of ϕ depends on what atomic formulas are true of t.[9] Given that the central issue at hand is aboutness with respect to the matrix event run time, we may shorthand this to checking whether a given entailment's truth is dependent on what is true of that time interval.

Let us run through the system with *know*. The two relevant entailments are provided below, annotated with the temporal trace information.

(38)   John knows that Mary was the murderer.
    a. Mary was the murderer at t_1.
    b. John believes at t_2 that Mary was the murderer.

According to the formulation for aboutness sketched above, (38a) is about t_1 and (38b) is about t_2. Assuming that the matrix event of this sentence is the belief event, then there is only one entailment about that event's run time (t_2). Hence (38b) becomes the main point of the sentence and (38a) is backgrounded, as desired. This logic extends directly to all other cognitive factives and to emotive factives as well, assuming that the matrix event references the emotive state.

Generally speaking, Abrusán's system will always background a veracity entailment as long as the veracity is not itself part of the matrix event. For some predicates, like the logical predicates like *be true* and *entail*, there is arguably no entailment beyond veracity; these should thus be veridical, and indeed they are. However, the predicates of veracity (*be right*, *be correct*) do pose a problem for the theory, and, indeed, for the family of triggering theories that seek general principles of backgrounding.

Stalnaker (1974) was the first to offer a version of these principles for know. Arguing that the conjunction of belief in *p* and *p* was too complicated a bundle to be lexicalized, Stalnaker proposed that *p* is backgrounded in such cases as a way of streamlining the at-issue content. Abusch (2002, 2010) noticed that this story cannot be complete, given the existence of *be right*, which seems roughly identical to *know* (or *be aware*) in terms of entailments. It would seem quite hard to formulate general principles that distinguish the presuppositions of these terms on the basis of their meanings alone, as Stalnaker and his heirs (e.g., Schlenker 2008, 2010) would do.

For Abrusán, however, if the matrix event of be right were the event of the proposition being true, then the theory will produce exactly the opposite backgrounding as *know/be aware*, as desired.[10] But this very solution underscores the fact in Abrusán's proposal, it is not clear how the theory derives what the matrix event is in a non-stipulative fashion. While it derives that all veridical doxastics are factive, it does so only because all such predicates select (by fiat) the

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[9]That is, we know that ϕ is about t iff there are two models, M and M' differing on the satisfaction of ϕ which are precisely the same except on what facts are true of the interpretation of t (i.e., for all predicates P, $I_M(P)$ and $I_M'(P)$ can differ only on tuples containing $I_M(t) = I_M'(t)$).

doxastic event as their matrix event; there is nothing in the theory stopping another predicate from selecting the embedded event as the matrix event. Thus, the theory lacks the explanatory character we are aiming for here.[11]

All of this points to a need for a predictive theory of what constitutes possible main point content. In what follows, we take from Abrusán the notion that the main point is determined according to certain default principles, but argue that these principles are determined by the semantics of the entailments themselves, not via interaction with an additional parameter (like the matrix event). We argue that what drives the difference in main points of veridical doxastics and predicates of veracity is what they report: doxastics are about solipsist mental states, while predicates of veracity are about public expressions of commitment in discourse.

3.3 Main points and attitude meanings

As we argued in section 2 be right and be aware are not actually true counterparts, since the former does not involve the beliefs of the attitude holder, but merely its commitments. This is shown by the fact that these adjectives can take ROI subjects:

(39)   The book is {right, #aware} that Mary is the murderer.

Why is it that with *be aware*, the belief component gets foregrounded and veracity backgrounded, but with *be right*, commitment is backgrounded, and veracity foregrounded? We have seen that there is a systematic correlation between reporting discourse moves and thematic role, sentential complementation, admission of ROI subjects and content nominals, and objectivity. What the *be right/be aware* flip shows us is that a sixth property, lexical main point, also correlates. Veridical commitment predicates like *be right* are rare, but to the extent that they exist, they uniformly presuppose the commitment state and assert veracity. The exact reverse is uniformly true for doxastic predicates. The backgrounding contrast itself is evidence for how main points are differentially determined: the main point of a doxastic attitude report with a veracity entailment is the attitude itself and the main point of a commitment report with a veracity entailment is the veracity entailment. We propose that the default main point of an attitude report is determined via an ordering of importance among the lexical entailments. Given the presuppositional profile of these attitudes, it appears that doxasticity is more important than veracity and veracity than expression of commitment. The nature of this ordering may be a language faculty-internal

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[11]The proposal may be circular as well. In general, operators operate on at-issue content, something we as theorists use to diagnose what is backgrounded content. Hence, while we may use how temporal operators interact with event run times to determine what is at-issue, the responsibility of a projection theory should be to derive these facts, not take them as lexical axioms.

[11] Abrusán claims that her proposal predicts that *be right* should background both the veracity entailment and the commitment entailment. She suggests, however, that this default is overridden by contextual pressures: if these predicates are typically used in situations where the truth of the complement proposition is under discussion, that contextual fact will serve to foreground the veracity entailment. While this account is broadly consistent with the architecture of her presuppositional calculus, it is not clear that the theory actually predicts that *be right* backgrounds the commitment entailment. Abrusán uses matrix tense as an index of the matrix event responsible for default main point content. But matrix tense seems to control the time of the claim (e.g., For *John will probably guess I was born in Paris. While that's not true, he will be right that I was born in France*, the future targets John's speech time, not the time of birth.), meaning that *be right* should pattern precisely like *know*, backgrounding the veracity entailment and foregrounding the commitment event. But we know of no use of *be right* that behaves this way, despite its default status.

principle, but in the sketch that follows we will try to ground it in the typical pragmatic functions of doxastic and assertive attitude reports.

At their base, doxastic attitude reports report on the private mental state of an individual. The main point of such reports is on what the content of the attitude holder's mental state is, since the content of that state is "private" (Quirk et al. 1985), i.e., not independently observable or verifiable. In contrast, discourse moves are public attempts to alter the commitments expressed in some discourse common ground. Reports of these moves are less about some static "content" than the subject's intent with respect to the state of the discourse. With response-stance predicates like *confirm* and *deny*, it is partly to resolve a question under discussion, while claim and argue aim to update the common ground with the proffered content. But discourses are special creatures: they are collaborative acts where the (canonical) central aim is to narrow the context set to the actual world. In reporting a discourse move, one cannot help raise the issue of whether the intended common ground of the report is realistic, because the ultimate aim of that reported conversation is precisely the same as the conversation in which it is being reported. Both Farkas and Bruce (2009) and Ginzburg (2012) assume that asserting p typically raises the issue of *whether p*. We are suggesting that asserting *say p* does the same.

The special status of assertive attitudes vs. doxastics vis a vis p's status goes a long way to explaining their differential propensity to "parenthetical" or "evidential" uses. As we discussed in section 3.2, although attitude predicates formally relate a proposition to an attitude holder, attitude reports can be used in conversation to pragmatically assert p itself.

(40)   A: Why hasn't Louise coming to our meetings recently? (Simons 2007) B: Henry said that she's left town.

The example above makes clear that such uses are possible even in the absence of a veracity entailment for the predicate (like for say above). Hooper (1975) argues that attitude predicates fall into two classes, 'weak' and 'strong' assertives, in terms of how easily this kind of secondary assertion can occur.[12] And when one looks at these two classes, they show a striking familiarity to one we've already seen – doxatics are weak assertives, and assertives are strong assertives. Thus, speakers may assert p using non-veridical predicates like *claim* and *say* in a way they will not for doxastic ones.

It is this contrast that affects what becomes the main point if there is a competition between p and either a doxastic report or an assertive report. In the former, since the central concern is about reporting the private state, adding some additional information about the correctness of the private state doesn't change the fact that, as a private state report, ultimately, the central issue is the content of the mental state. For an assertive report, we have argued that the central issue is, ultimately, the state of the reported common ground: will p be part of that common ground? If the reporting predicate has no veracity entailment, then the main point is the common ground update attempt itself. But if it has a veracity entailment, things change, precisely because the question of

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[12]Hooper calls these verbs "assertives" because they optionally "assert" the complement clause. Hooper takes weak assertives to be assertive with a first person subject and present tense in the matrix. In such cases, "the complement of a weak assertive is only 'weakly' asserted. That is, the main predicate serves to weaken the claim to truth made by the complement. The strong assertive predicates, on the other hand, represent a rather strong commitment to the truth of the complement." While it is possible to have verbs like *think* with third person subjects in Simons-style dialogues as in (40), they are less easily available than with verbs like *say*.

the common ground's accuracy is front and center. Hence, in such cases the veracity entailment itself becomes the main point.

4 Factivity and veridicality beyond attitudes of acceptance

In our discussion so far we have limited our attention to attitudes of acceptance. For these, we have argued that only the doxastics have a chance to be factive, since these are the only ones where veracity is not the pragmatic main point. But, as we mentioned at the outset of the paper, there are factive attitudes outside of the acceptance class. Our goal in this section is to tentatively discuss these.

The bulk of these attitudes are concerned with evaluation one way or another. The most famous of these are the emotive factives, which entail that their complement is true, that their subject has an emotional attitude towards the truth of the complement, and that she believes that it is true:[13]

(41) Susan {is sad, hates, regrets} that Mary is the murderer.
  ⊨ Mary is the murderer
  ⊨ Susan believes that Mary is the murderer

As emotive factives also make entailments about private state, we should expect the main point to be about the content of that private state, and thus veracity should be backgrounded. And indeed it is – these predicates are factive. Beyond emotive factives, there are two additional classes that entail some evaluative state. The first are **evaluative predicates** (*coincidental*, *deplorable*, *emblematic*, *uncanny*; *bad*, *(un)lucky*), which do not refer to the doxastic state of one of the syntactic arguments, but are nevertheless factive. All of these predicates participate in an intransitive frame, where the propositional argument p is the subject or is extraposed; most additionally allow the source of the evaluative stance to be syntactically specified by an experiencer adjunct, as in (42). In addition, the **predicates of benefit** (*bad*, *good*, *(in)convenient*, *(un)fortunate*, *(un)important*, *(un)lucky*) allow an additional sentient beneficiary to be specified by a *for* PP, as in (42b).

(42) a. It is {coincidental, deplorable, uncanny} (to {Bill, #the book}) that Mary is the murderer.
  b. It is {good, fortunate, lucky} (for {John, #the book}) that Mary is the murderer.

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[13]This is the classical analysis of emotive factives. A parellel tradition (Klein 1975, Schlenker 2003, Egré 2008) argues that certain emotives lack a veracity entailment, and merely require doxastic acceptance on the part of the attitude holder, based on examples such as the following:

(i) John wrongly believes that Mary got married, and regrets that she is no longer single. (Egré 2008)

The central question is whether environments like that above simply bring out the lack of entailment or serve to cancel presuppositions as well. It is significant that removing the factivity requires an explicit mention of the attitude holder's belief state in a way that strongly indicates its inaccuracy, and Gazdar (1979) posits that such cases serve to license a kind of free indirect discourse, which he shows allows cognitive factives' veracity presupposition to vanish as well (see Abrusán (2011) for related discussion). Notably, other cases involving potential pragmatic deviance, like out and out contradictions with the actual world's facts, as that below, do not seem to eliminate factivity.

(ii) # John is {happy, sad} that I am dead.

Of the roughly 30 predicates of benefit we have found, only two, *(un)fortunate* and *(un)lucky*, participate in an alternation with a subject beneficiary and propositional complement:

(43)   John is {fortunate, lucky} that Mary is the murderer, but he will never know that she is.

Crucially, these predicates do not entail anything about the doxastic state of one of the syntactic arguments. Indeed, (43) shows that even when it is the subject, the beneficiary need not have any awareness of p's truth, despite the requirement that the beneficiary is sentient. However, insofar as these are evaluative, they require some evaluative source. If we take that source to be a judge (Lasersohn 2005, Stephenson 2007), which, given (42a) must be sentient, then these do report on a private state (of the judge), and hence we would correctly predict that all evaluative predicates background their veracity entailment.

However, we do not currently derive the fact that the judge's belief in p is also backgrounded, simply because we do not have any principles for deriving what the main point of evaluative predication is. A similar question arises with emotive factives, which systematically forefront the emotive component. Again, to stake out the empirical territory, what we need to derive is clear: in a competition between evaluativity/emotivity and doxasticity, evaluativity/emotivity wins. This is a third combinatoric gap: while there are plenty of evaluative and doxastics that presuppose doxasticity, the reverse simply doesn't occur. The pragmatic grounding for this preference is not presently clear to us. One explanation might be that mental states of evaluation are themselves necessarily parasitic on belief, and that foregrounding must be consistent with this parasitism. That is to say, the feeling of happiness and having the evaluation of uncanniness are not possible on purely hypothetical grounds. If this were true, foregrounding a question of whether the judge believed p while backgrounding an evaluation of p would be incoherent.

There is reason to think that the issue is larger than evaluatives. In Anand and Hacquard (2013), we discuss the case of what we term **emotive doxastics** (*hope*, *fear*), attitudes that simultaneously discuss the attitude holder's beliefs and preferences: if x hopes that p, then x both prefers p to some other (contextual) alternative and is uncertain about p. What is important in this case is that, by default at least, the doxastic component seems more likely to project. In both instances in (44), there is a sense the speaker is committing to John's uncertainty about the outcome of the trial (whether this is a speaker presupposition is a more delicate judgment).

(44)   a.   Does John hope that Mary was found innocent?
       b.   If John hopes that Mary was found innocent, then he will be disappointed.

The behavior for *hope* is an instance of a more general gap. Just as there are no emotive factives that invert the doxastic and emotive component, nor are there any non-veridical preference-oriented attitudes that reverse their doxastic and preference-oriented components. For example, we have proposed that *wish* supplies an anti-doxastic presupposition (see Heim 1992, Anand and Hacquard 2013); there is no corresponding inversion of wish that presupposes preferences and asserts doxastic exclusion. Understanding the main points of these more complex attitudinal reports will require much closer scrutiny than we can provide here, though we suspect it will require examining preference and evaluative attitudes on their own terms, as we have attempted to do for assertives.

5 Conclusion

We began this paper with the challenge of understanding the distribution of factivity and veridicality across attitude classes, and in particular, attitudes of acceptance. We argued that this distribution is ultimately a reflection of a relatively sharp demarcation in attitudes of acceptance between those which describe mental states and those which describe moves in conversation. While this distinction is semantic, we argued that it is the *pragmatics* of reporting these two kinds of events that is responsible for how they handle veracity entailments. Reporting discourse moves always have the capacity to raise the reported question under discussion to the reporting context, and it is this fact which leads to a default preference to make the veracity entailment the main point of assertives.

This line of explanation furnishes us with a skeletal explanation for the rarity of predicates of veracity. Distributionally speaking, doxastics with a veracity entailment are far more common than assertives with a veracity entailment (given the broad family of cognitive factives vs. the narrow synonymy group of veracity predicates for assertives). Why should this be? Now, lexicalization is influenced by many extra-grammatical factors, but one pressure is surely functional: Why lexicalize what is communicated for free? Even though assertive reports often do not lexically include a veracity entailment, we have seen several cases where the speaker nevertheless seems to be committing herself to *p*, such as the behavior of the putative factives (*acknowledge*, *admit*, and *confirm*). What we argued in that case is that insofar as the utterance author identifies herself with the reported common ground in such cases, the successful update by such a proposal "leaks" quite readily into the matrix common ground. We take this to be a natural pragmatic property of reporting discourse moves, and so it suggests that there is no real need to lexicalize veridicality for assertive reports. This is not to say that it is a conceptual or lexical impossibility, merely that it is pragmatically otiose, and hence unlikely to arise. In English, it appears to be a relatively special property, reserved for the predicates that are maximally underspecified about the form of the discourse move, but our proposal predicts that these cases should be quite rare indeed, both cross-linguistically and within a language.

Assessing this claim will require much closer scrutiny of how veridicality is distributed among attitudes more generally. Egré (2008), for instance, has discussed the idea that attitudes which take propositional complements are veridical if and only if they allow whether complements. Thus, for example, *know* allows both complements and *knowing whether p* requires the attitude holder's doxastic state to be correct. As Egré notes, this generalization is leaky in both directions: *regret* and *resent* are veridicals that cannot embed questions, while *guess* and *tell* are not clearly veridical with *that* complements, despite requiring accuracy on the part of the subject for embedded questions. But note that these predicates are assertive attitudes, and it thus suggests that the generalization should be considered only for veridical doxastics, i.e., the factives. (The problems for *regret* and *resent* would have to be dealt with separately.)

There are other imperfect generalizations deserving of closer scrutiny. While we dub *hope* and *fear* emotive doxastics because they encode both emotivity and doxastic uncertainty, English seems to lack predicates that express both emotivity and doxastic certainty, minus veridicality. As noted in footnote 13, some have argued that, in fact, all emotive factives are really simply doxastic, with the veridical inference assumed on the side. If this is correct, why might this be, and how does it connect with our understanding of predicates like *acknowledge*?

Our belief is that all of these puzzles are not simply of a type, but are nonetheless evidence for unacknowledged systematicity in attitudinal predication. Given the sheer welter of ways in which we relate to propositions, the Hintikkan tradition provides us a vast sea of combinatoric variations. We hope to have shown that extant attitudes distribute in highly constrained ways in this space, and thus that even in this corner of the lexicon, language is more regular than one might think on first blush.

References

Abrusán, M. 2011. Predicting the presuppositions of soft triggers. *Linguistics and Philosophy* 34:491–535.

Abusch, D. 2002. Lexical alternatives as a source of pragmatic presuppositions. *Proceedings of SALT 12* .

Abusch, D. 2010. Presupposition triggering from alternatives. *Journal of Semantics* 27:37–80.

Anand, P., J. Grimshaw, and V. Hacquard. in progress. The subjects of predicates with clausal complements. M.s.

Anand, P., and V. Hacquard. 2013. Epistemics and attitudes. *Semantics and Pragmatics* 6:1–59.

Anand, Pranav, and Valentine Hacquard. 2009. Epistemics with attitudes. In *Proceedings of SALT XVIII*, ed. T. Friedman and S. Ito. Ithaca, NY: Cornell University.

Bolinger, Dwight. 1968. Post-posed main phrases: An english rule for the romance subjunctive. *Canadian Journal of Linguistics* 3–30.

Catell, R. 1978. On the source of interrogative adverbs. *Language* 54:61–77.

Chemla, E. 2010. Similarity: towards a unified account of scalar implicatures, free choice permission and presupposition projection. M.s.

Demolombe, R., and L. Fariñas del Cerro. 2000. Towards a logical characterization of sentences of the kind 'sentence p is about object c'. In *Intellectics and computational logic: Papers in honor of wolfgang bibel*, ed. S. Holdobler. Dordrecht: Kluwer.

Demolombe, R., and L. Fariñas del Cerro. 2010. Information about a given entity: From semantics towards automated deduction. *Journal of Logic and Computation* 20:1231–1250.

Egré, P. 2008. Question-embedding and factivity. In *Grazer Philosophische Studien*, ed. F. Lihoreau, Vol. 77, 85–125. Rodopi.

Farkas, D., and K. Bruce. 2009. On reacting to assertions and polar questions. *Journal of Semantics* 27:81–118.

Farkas, Donka. 1985. *Intensional descriptions and the romance subjunctive mood*. New York: Garland.

Gazdar, G. 1979. *Pragmatics: Implicature, presupposition and logical form*. New York: Academic Press.

Giannakidou, Anastasia. 1997. The landscape of polarity items. Doctoral Dissertation, University of Groeningen, The Netherlands.

Ginzburg, J. 2012. *The interactive stance*. Oxford: Oxford University Press.

Gunlogson, C. 2008. A question of commitment. *Belgian Journal of Linguistics* 22:101–136.

Heim, I. 1982. The semantics of definite and indefinite noun phrases. Doctoral Dissertation, UMass.

Heim, Irene. 1992. Presupposition projection and the semantics of attitude verbs. *Journal of Semantics* 9:183–221.

Hooper, Joan. 1975. On assertive predicates. In *Syntax and semantics, volume 4*, ed. J. Kimbell, 91–124. New York: Academy Press.

Jackendoff, R. 2007. *Language, consciousness, culture: Essays on mental structure*. Cambridge: MIT Press.

Klein, E. 1975. Two sorts of factive predicate. *Pragmatics Microfiche it 1.1* frames B5–C14.

Kratzer, A. 2013. Modality and the semantics of embedding. Slides for a talk at Amsterdam Colloquium.

Kratzer, Angelika. 2006. Decomposing attitude verbs. URL http://semanticsarchive.net/Archive/ DcwY2JkM/attitude-verbs2006.pdf, talk given at The Hebrew University of Jerusalem, July 2006.

Lasersohn, P. 2005. Context dependence, disagreement, and predicates of personal taste. *Linguistics and Philosophy* 28:643–686.

Martin, J. R., and P. R. R. White. 2005. *The language of evaluation: Appraisal in english*. Houndsmills: Palgrave Macmillan.

Moltmann, Friederike. 2003. Propositional attitudes without propositions. *Synthese* .

Moulton, Keir. 2008. Clausal complementation and the *wager*-class. In *Proceedings of the North East Linguistic Society*, ed. A. Schardl and M Walkow, 38. NELS, Amherst, MA: GLSA Publications.

Pesetsky, David. 1992. Zero syntax II: Infinitival Complementation. Available at: http://web.mit.edu/linguistics/www/pesetsky/infins.pdf.

Quirk, R., S. Greenbaum, G. Leech, and J. Svartvik. 1985. *A comprehensive grammar of the english language*. London: Longman.

Romoli, J. to appear. The presuppositions of soft triggers are obligatory scalar implicatures. *Journal of Semantics* .

Schlenker, P. 2003. The lazy frenchman's approach to the subjunctive. In *Proceedings of Romance languages and linguistic theory*, 269–309.

Schlenker, P. 2008. Be articulate: A pragmatic theory of presupposition projection. *Theoretical Linguistics* 34:157–212.

Schlenker, P. 2010. Local contexts and local meanings. *Philosophical Studies* 151:115–142.

Simons, M. 2001. On the conversational basis of some presuppositions. In *Proceedings of Semantics and Linguistic Theory*, ed. R. Hastings, B Jackson, and S. Zvolenszky, Vol. 11. Ithaca, NY: CLC Publications.

Simons, M., J. Tonhauser, D. Beaver, and C. Roberts. 2010. What projects and why. In *Proceedings of Semantics and Linguistic Theory*, ed. N. Li and D. Lutz, Vol. 20, 309–327. Ithaca, NY: CLC Publications.

Simons, Mandy. 2007. Observations on embedding verbs, evidentiality and presupposition. *Lingua* 117:1037–1056.

Spector, B., and P. Egré. to appear. A uniform semantics for embedded interrogatives: An answer, not necessarily the answer. *Synthese* .

Stalnaker, R. 1974. Pragmatic presuppositions. In *Semantics and philosophy*, 197–214. New York: New York University.

Stalnaker, Robert. 1984. *Inquiry*. Cambridge, Mass.: MIT Press.

Stephenson, T. 2007. Judge dependence, epistemic modals, and predicates of personal taste. *Linguistics and Philosophy* 30:487–525.

Villalta, Elisabeth. 2000. Spanish subjunctive clauses require ordered alternatives. In *Proceedings of SALT X*, ed. Brendan Jackson and Tanya Matthews, 239–256. Cornell University, Ithaca, NY: CLC Publications.

Villalta, Elisabeth. 2008. Mood and gradability: an investigation of the subjunctive mood in Spanish. *Linguistics and Philosophy* 31:467–522.

von Wright, G. H. 1963. *The logic of preference*. Edinburgh: Edinburgh University Press.