

Attitudes, aboutness, and indirect restriction^{*}

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Abstract A sentence like *If Laura becomes a zombie, she wants you to shoot her* asserts that Laura has a certain *restricted attitude*: her current desires, when considering only possible states of affairs in which she becomes a zombie, are such that you shoot her. This paper seeks to explain the compositional origins of this reading. After arguing against existing theories like Pasternak’s (2018) Kratzerian analysis and Blumberg & Holguín’s (2019) more indirect pragmatic approach, we provide a novel analysis couched in aboutness. In short, we propose that attitude verbs have four arguments: an experiencer (*Who is doing the wanting?*), a proposition (*What is wanted?*), an *evaluation argument* (*Is this an actual or hypothetical desire?*), and an *aboutness argument* (*What state of affairs is this desire about?*). Structurally, a sentence like the one above simply involves an attitude verb in the consequent of a “regular” bare conditional, with two caveats: the evaluation argument is fixed as the actual state of affairs—these are Laura’s actual desires—and the aboutness argument is fixed as the states of affairs quantified over by the conditional (in which Laura becomes a zombie). As a result, the sentence conveys Laura’s actual desires about hypothetical zombie states of affairs. We then show two ways in which this broad treatment can generate the desired truth conditions, in which the attitude’s world-quantification is appropriately restricted.

1 Introduction

Consider (1), based on an example from Pasternak (2018):

- (1) If Laura becomes a zombie, she wants you to shoot her.

On its surface, (1) is a conditional with the attitude verb *want* in its consequent. However, the interpretation that it gives rise to is not a claim about what Laura’s desires *would be* were she to become a zombie. Presumably, zombie-Laura would not want to be shot: she would either want *not* to be shot, or lack the cognitive disposition to care one way or the other. Rather, (1) seems to be a statement about what Laura’s *current* desires are in light of the possibility of her potentially becoming a zombie. That is, (1) claims that Laura has a certain kind of *restricted attitude*: when restricting her attention only to those possible

^{*} **Comments welcome and much appreciated.** Acknowledgments to be added later. The authors are listed alphabetically and share joint lead authorship of this paper. Pasternak’s research was funded by DFG Grant #387623969 (*DP-Border*, PIs: Artemis Alexiadou and Uli Sauerland).

states of affairs in which she becomes a zombie, Laura wants to be shot. Thus, we will sometimes use the term “restricted attitude conditionals” for these cases.¹

This restricted interpretation is unexpected under some simple assumptions: that a conditional antecedent (here: *if Laura becomes a zombie*) takes us to states of affairs where the antecedent proposition is true, and that the conditional consequent (here: *Laura wants you to shoot her*) is evaluated in those states of affairs. We would then expect (1) to be about Laura’s desires *in*, rather than *about*, scenarios where she’s become a zombie. There are in fact sentences that have the expected, “shifted”, reading:

- (2) a. If Laura becomes a zombie, she will want you to shoot her.
- b. If Laura became a zombie, she would want you to shoot her.

The examples in (2), unlike the example in (1), are at least by default read as being about the desires of zombie-Laura, and thus are presumably false.²

Perhaps unsurprisingly, restricted readings are not confined to *want* and can arise with a host of embedding verbs, as exemplified by the conditionals in (3):

- (3) a. If it rains tomorrow, then I **expect/permit/forbid/need** you to bring an umbrella.
- b. If it rained yesterday, then I **hope/think/know/suspect/pray** that you brought an umbrella.

Restricted readings of attitudes are also not confined to conditionals. For instance, [Blumberg & Holguín \(2019\)](#) provide examples in which disjunctions can give rise to similar sorts of readings, as can be seen in their (4):

- (4) [Blumberg & Holguín 2019](#): p. 380:
 Either a lot of people are on the deck outside, or I regret that I didn’t bring more friends.

As [Blumberg & Holguín](#) note, the interpretation of (4) is more or less the same as that of the conditional in (5), suggesting that such disjunctions can also give rise to restricted readings.

- (5) If there aren’t a lot of people on the deck outside, then I regret that I didn’t bring more friends.

We can get restricted readings in disjunctions with desire attitudes as well. Consider the disjunction in (6):

¹ [Blumberg & Holguín 2019](#) introduced the term “attitude conditionals”. Here, we distinguish between two types of readings of attitude conditionals: “restricted” and “shifted”.

² That being said, it seems that these latter examples do not fully prohibit a (by our judgments somewhat marginal) restricted or restricted-like reading describing Laura’s actual, present desires, rather than her hypothetical zombie-desires. This is an interesting fact in and of itself, but for reasons of space we will not address it in this paper.

Context: Laura has taken a test to determine whether the zombie virus is coursing through her veins. The test comes back positive, but just to be sure it's not a false positive Laura has taken a second test and is awaiting the results. Pointing to the first, positive test, Laura says:

- (6) Either this test is a false positive, or I want you to shoot me.

The disjunctive sentence in (6) seems roughly synonymous with the restricted desire reported in (7):

- (7) If this test is a true positive, I want you to shoot me.

So how does one account for these restricted readings? Note that there are at least two salient facts to be explained that make them different from shifted readings: (i) the attitude ascription is evaluated not *in* the scenarios introduced by the conditional antecedent but in the actual here and now (we're talking about Laura's actual current desires), and (ii) the claimed desire is *restricted* to those possible states of affairs introduced by the conditional antecedent.

Anyone familiar with the restrictor theory of conditionals (developed in the work of Lewis (1975), Kratzer (1981, 1991a,b, 2012), and Heim (1982)) may be tempted to see this as just another instance of *if*-clauses serving as restrictors of quantificational operators. In this paper, we will argue that this temptation needs to be resisted. We will consider variants and alternatives to a (simple) restrictor account and in the end, we will conclude that the *if*-clause in (1) and its cousins is in fact a rather mundane conditional antecedent that is not itself restricting the attitude predicate. Instead, the restriction comes about in an indirect way that is rooted in the “aboutness” of attitudes.

Here's an overview of the journey to come. After some preliminary discussion in Section 2 of our basic assumptions about the semantics of attitudes and conditionals, in Section 3 we will outline several *prima facie* plausible accounts and concomitantly provide a variety of evidence suggesting that none of these accounts make the right predictions. In short, we show that restricted readings of attitude conditionals must come from elsewhere. In Section 4, we lay out the basic idea of our proposal: that it is the “aboutness” of attitudes that can give rise to restricted readings. And in Section 5, we develop two ways to implement the basic proposal. We will not decide between the two implementations. The paper concludes in Section 6 with some open questions and a final summary.

2 Basic assumptions about attitudes and conditionals

We will start by putting forward some basic assumptions about the lexical and compositional semantics of attitudes and conditionals. It is worth noting that many of these assumptions are orthogonal to the analyses we will argue against as well as to our own analysis. We will try to be explicit about which assumptions are and are not crucial.

2.1 Conditionals

We begin with conditionals. For the time being, we will adopt the standard view that *if*-clauses serve to restrict quantificational operators, whether they be adverbs of quantification (e.g., *always*, *sometimes*), modals, or perhaps some other operators. Take, for example, the deontic conditional in (8):

- (8) If Laura becomes a zombie, you must shoot her.

Deontic *must* is generally taken to quantify over those worlds that are *circumstantially accessible*. For example, on Kratzerian approaches (Kratzer 1981, 1991a,b, 2012), it universally quantifies over the deontically ideal worlds in this domain: the antecedent-less *you must shoot Laura* is true iff among circumstantially accessible worlds, all of the deontically best ones are worlds in which you shoot Laura. The *if*-clause then restricts the domain of circumstantially accessible worlds to those in which the antecedent is true. Thus, (8) is true iff among those circumstantially accessible worlds *in which Laura becomes a zombie*, all of the best ones are worlds in which you shoot her.

Note that while we are framing this discussion in terms of a Kratzerian “best-worlds” analysis of modals—and will continue to do so for the duration of the paper—this conception of *if*-clauses as restrictors of quantificational operators is not confined to a semantics for deontic *must* along the lines of Kratzer’s. For example, Goble (1996) and Lassiter (2011) argue that deontic modality is best captured by means of the decision-theoretic notion of *expected utility*. But decision-theoretic analyses are equally compatible with the conception of *if*-clauses as restrictors. If *must q* is evaluated by determining the expected utility of *q* relative to the whole domain of possible worlds (or perhaps just those deemed circumstantially accessible), then *if p, must q* can be evaluated by determining the expected utility of *q* relative only to the subdomain of possible worlds in which *p* holds. In other words, while probabilistic or decision-theoretic definitions of modals do not “quantify” in the narrow sense, they still utilize domains that can be restricted by *if*-clauses. Thus, our adoption of a best-worlds semantics is orthogonal to the core issues presented in this paper.

If modals are quantifiers that are restricted by *if*-clauses, the next obvious question is how, compositionally speaking, this domain restriction is effected. One possibility is to take inspiration from quantifiers in the nominal domain, such as *every*. Consider the sentence *Every student left*, in which *student* semantically restricts *every*, with the whole DP taking *left* as its scope.

- (9) $\underbrace{\text{Every}}_Q \underbrace{\text{student}}_R \underbrace{\text{left}}_S$ Q = quantifier, R = restrictor, S = scope

In this sentence, *student* is by all relevant syntactic diagnoses the complement of *every*, and so its restriction can easily be effected via argument saturation. That is, if we define $\llbracket \text{every} \rrbracket$ in the standard manner as in (10), then the first argument (λR) can be saturated

by $\llbracket \text{student} \rrbracket$, and the second argument (λS) by $\llbracket \text{left} \rrbracket$, generating the appropriate truth conditions.

$$(10) \quad \llbracket \text{every} \rrbracket = \lambda R \lambda S. \forall x [R(x) \rightarrow S(x)]$$

It is tempting to say that *if*-clauses restrict modals in the same manner, i.e., by means of argument saturation. Thus, the structure of (8) at LF would be as in (11), with the *if*-clause occupying the complement position of *must*:

$$(11) \quad \underbrace{\text{must}}_Q \underbrace{\text{if Laura becomes a zombie}}_R \underbrace{\text{you shoot her}}_S$$

Now suppose $\llbracket \text{must} \rrbracket$, evaluated at a context c and world w , is as in (12), where $\text{CIR}_{c,w}$ is the set of circumstantially accessible worlds from w as determined in c , and $\text{BEST}_{c,w}(A)$ is the set of deontically best worlds in A as determined by the standards of c in w :

$$(12) \quad \llbracket \text{must} \rrbracket^{c,w} = \lambda p \lambda q. \forall w' \in \text{BEST}_{c,w}(\text{CIR}_{c,w} \cap p) [q(w')]$$

In this case, composing the LF in (11) will lead to the truth conditions in (13), i.e., true iff among those circumstantially accessible worlds in which Laura becomes a zombie, all of the best ones are worlds in which you shoot her:

$$(13) \quad \llbracket (11) \rrbracket^{c,w} = 1 \text{ iff } \forall w' \in \text{BEST}_{c,w}(\text{CIR}_{c,w} \cap \text{ZOMBIE}) [\text{SHOOT}(w')]$$

However, von Fintel (1994) argues based on several grounds that *if*-clauses do *not* restrict their associated modals by means of argument saturation. With this in mind, we will go a slightly different route. Suppose that modals only take one propositional argument, their scope. But each modal carries an index n , and the modal is restricted by whatever proposition the variable assignment g assigns to n . Thus, the denotation for *must* will look as in (14):

$$(14) \quad \llbracket \text{must}_n \rrbracket^{g,c,w} = \lambda q. \forall w' \in \text{BEST}_{c,w}(\text{CIR}_{c,w} \cap g(n)) [q(w')]$$

When an *if*-clause attaches higher in the tree, with *if* coindexed with the modal, the ensuing interpretation is one in which $g(n)$ is replaced with the denotation of the antecedent. We will stipulate this through a semantic rule of composition, though no doubt there are more elegant ways of achieving this:³

$$(15) \quad \llbracket \text{if}_n \Phi, \Psi \rrbracket^g = \llbracket \Psi \rrbracket^{g[n \rightarrow \llbracket \Phi \rrbracket^g]}$$

where $g[n \rightarrow p]$ is the g' identical to g except that $g'(n) = p$

In this case, the LF for (8) will be as in (16):

$$(16) \quad \text{if}_7 \text{ Laura becomes a zombie, you must}_7 \text{ shoot her}$$

³ Note that this is a simplified version of von Fintel's system, as in his analysis an *if*-clause restricts the value of $g(n)$ rather than setting it; this allows for stacking of conditional antecedents. Since this goes beyond the scope of our paper, we adopt the simpler version.

Up to and excluding the *if*-clause, the denotation will be as follows:

$$(17) \quad \llbracket \text{you must}_7 \text{ shoot her} \rrbracket^{g,c,w} = 1 \text{ iff } \forall w' \in \text{BEST}_{c,w}(\text{CIR}_{c,w} \cap g(7)) [\text{SHOOT}(w')]$$

Thanks to the rule in (15), the interpretation of the clause as a whole is as follows:

$$(18) \quad \begin{aligned} & \llbracket \text{if}_7 \text{ Laura becomes a zombie, you must}_7 \text{ shoot her} \rrbracket^{g,c,w} \\ &= \llbracket \text{you must}_7 \text{ shoot her} \rrbracket^{g[7 \rightarrow \text{ZOMBIE}],c,w} \\ &= 1 \text{ iff } \forall w' \in \text{BEST}_{c,w}(\text{CIR}_{c,w} \cap \text{ZOMBIE}) [\text{SHOOT}(w')] \end{aligned}$$

We thus arrive at the exact same interpretation, albeit by different means: *if*-clauses effect their domain restriction through coindexation, rather than argument saturation. While we are skeptical of an argument saturation account for independent reasons, we adopt a coindexation account in this paper not for those reasons, and not because it is required for our own account (it is not). Rather, we adopt it because it allows for considerable syntactic flexibility in the relationship between modal and restrictor, since the restrictor does not need to appear as the complement of the modal at any syntactic level of representation. This in turn gives the theories that we will be arguing against their best chance at success, since our evidence against them will not hinge on arbitrary syntactic constraints relating *if*-clauses to the operators they purportedly restrict.

As a final note before moving on to attitudes, it is well known that conditionals needn't come with overt modal operators, or overt quantificational operators of any kind, as illustrated in (19):

$$(19) \quad \text{If Hans hasn't eaten, then he is hungry.}$$

In such cases, we will follow the commonly adopted view that there is a covert modal MODAL, which is a universally quantifying modal akin to *must* (or in some cases, the future modal *will*), and which is restricted by the *if*-clause as in (20):

$$(20) \quad \text{if}_7 \text{ Hans hasn't eaten, then MODAL}_7 \text{ he is hungry}$$

MODAL is restricted in its choice of modal flavors: it cannot, for example, be deontic in (19). We will posit a denotation of MODAL based on universal quantification over maximally likely worlds, as in (21), where $\text{ML}_w(A)$ is the set of most likely *A*-worlds from *w*:

$$(21) \quad \llbracket \text{MODAL}_n \rrbracket^{g,c,w} = \lambda p. \forall w' \in \text{ML}_w(g(n)) [p(w')]$$

Thus, the LF in (20) will receive the interpretation in (22), true iff among all of the most likely worlds in which Hans hasn't eaten, he is hungry:

$$(22) \quad \llbracket (20) \rrbracket^{g,c,w} = 1 \text{ iff } \forall w' \in \text{ML}_w(\text{NO_EAT}) [\text{HUNGRY}(w')]$$

It is worth noting, in accordance with a running theme of this paper, that adopting the particular denotation for MODAL in (21) is not crucial to any of the theories in this paper, including our own.

2.2 Attitudes

With our assumptions about the compositional semantics of conditionals out of the way, we next move on to our assumptions about the semantics of attitudes. We will mostly focus on *want* in this paper, so we will stick to that in this section, and discuss modifications for other attitude verbs where relevant.

We follow the long tradition of attitude semantics, dating back at least to the work of Hintikka (1969), in which the denotations of attitude verbs share core formal traits with those of modals. Thus, best-worlds analyses of modals are often paired with best-worlds (or similar) theories of attitudes, and decision-theoretic analyses of modals are generally paired with decision-theoretic analyses of attitudes. Much like in the case of modals and conditionals, for our purposes it does not really matter which path we take in terms of the lexical semantics of *want*, and so we will stick to a best-worlds approach. More specifically, we will adopt a somewhat simplified version of von Fintel's (1999) semantics for *want*, which more or less directly imports Kratzer's semantics for modals. This simplified denotation can be seen in (23), where $\text{Dox}_{x,w}$ is the set of worlds compatible with x 's beliefs in w (x 's *belief worlds* in w), and $\text{BEST}_{x,w}(A)$ is the set of best A -worlds by x 's standards in w .

$$(23) \quad \llbracket \text{want} \rrbracket^w = \lambda p \lambda x. \forall w' \in \text{BEST}_{x,w}(\text{Dox}_{x,w})[p(w')]$$

Thus, *Inge wants to leave* is true iff among those worlds compatible with Inge's beliefs, all of the best ones by her standards are worlds in which she leaves.⁴

Notice that by treating the denotations of attitudes as world-quantifiers, we invite the possibility that attitudes can themselves be restricted in the same manner as modals. Given our coindexation account of *if*-clause-imposed restrictions, a denotation for *want* that allows it to be restricted by an *if*-clause will look as in (24):

$$(24) \quad \llbracket \text{want}_n \rrbracket^{g,w} = \lambda p \lambda x. \forall w' \in \text{BEST}_{x,w}(\text{Dox}_{x,w} \cap g(n))[p(w')]$$

In this case, if a coindexed *if*-clause denoting q restricts *want*, then what *want* quantifies over is the set of x 's favored worlds among those belief worlds of hers in which q is true. It is thus conceivable that *if*-clauses could restrict attitudes as well as modals, a possibility that is exploited by multiple of the theories discussed in the next section.

3 Contra existing analyses

In this section, we will discuss three analyses for the compositional semantics of restricted readings that have previously been put forward in the literature. The first of

⁴ For alternative analyses in the narrowly quantificational tradition—that is, non-decision-theoretic denotations—see Heim 1992, Villalta 2008, Phillips-Brown 2018. For decision-theoretic proposals, see Levinson 2003, Lassiter 2011. For overviews comparing and contrasting these approaches, see Crnič 2011, Pasternak 2018. All of these are compatible with all of the analyses in this paper.

these, the **embedded conditional analysis**, posits that supposed restricted readings in conditionals are not restricted readings at all, and instead the interpretation is simply of a plain, non-restricted attitude toward a conditional proposition. That is, (1) is interpreted roughly as in (25):

- (25) Laura wants it to be the case that if she becomes a zombie, you shoot her.

The second analysis, put forward by Pasternak (2018), is what we will call a **direct restriction analysis**: in the relevant conditionals, the *if*-clause restricts the attitude's world-quantification in the same way that it restricts other operators in other kinds of conditionals. Finally, the third analysis is that put forward by Blumberg & Holguín (2019), which we will call an **indirect restriction analysis**: the attitude is not directly restricted by the *if*-clause, but instead the restriction arises pragmatically.

Rather than introducing and arguing against the three analyses together, we will take each in turn, introducing the theory and then immediately introducing the empirical evidence that goes against that theory. In the case of the embedded conditional analysis, this empirical evidence will come in the form of certain strange predicted truth conditions, as previously observed by Drucker (2019) and Blumberg & Holguín (2019). While Pasternak's (2018) direct restriction account avoids this issue, we show that it faces its own problems in the form of inaccurate predictions pertaining to the licensing of donkey anaphora (which the embedded conditional account also fails to capture). And finally, while Blumberg & Holguín's indirect restriction account could plausibly handle the problematic cases of donkey anaphora, we show that their analysis faces difficulties when confronted with certain examples of restrictions arising in disjunctive environments (cf. (6)): namely, cases where the disjunction is obligatorily interpreted exclusively.

These arguments will pave the way for our own analysis, which we introduce in broad strokes in Section 4 and for which we provide two more fully fleshed out versions in Section 5. Our analysis is like Blumberg & Holguín's in that it is an indirect restriction analysis: much like on their account, for us the *if*-clauses in attitude conditionals do not compositionally restrict the attitude, and the attitude's restriction arises from elsewhere. Where our analyses differ is in the precise origin of the attitude's indirect restriction.

3.1 The embedded conditional account

As mentioned above, the **embedded conditional** account treats purported restricted readings as instances of "plain", non-restricted attitudes toward conditional propositions. In other words, the *if*-clause really makes its semantic contribution below the attitude. To our knowledge, this analysis has not been seriously argued for in the literature, though Drucker (2019) and Blumberg & Holguín (2019) argue against versions of it, on the rea-

sonable assumption that it is an intuitively plausible account.⁵ It also bears a *prima facie* resemblance to certain existing theories of non-attitude conditionals: while we assume that *if*-clauses restrict modal operators, there is a long history (for example, Broome (1999)) of instead positing that conditionals like (8) really involve bare conditionals inside the scope of the modal, as informally represented in (26):

(26) must [if Laura becomes a zombie, you shoot her]

A natural way of formulating an embedded conditional analysis is to posit the existence of a MODAL in the embedded clause, with the *if*-clause restricting this modal through co-indexation. Thus, the LF for (1) is predicted to be as in (27):

(27) if₇ Laura becomes a zombie, she wants MODAL₇ you to shoot her.

This will compose straightforwardly, with the *if*-clause restricting MODAL and generating an interpretation more or less identical to that of (25). More specifically, we predict the interpretation in (28), true iff all of Laura's ideal belief worlds w' are such that all of the most likely worlds from w' in which she becomes a zombie are worlds in which you shoot her.

(28) $\llbracket (27) \rrbracket^{g,c,w} = 1$ iff
 $\forall w' \in \text{BEST}_{x,w}(\text{Dox}_{x,w}) [\forall w'' \in \text{ML}_{w'}(\text{ZOMBIE}) [\text{SHOOT}(w'')]]$

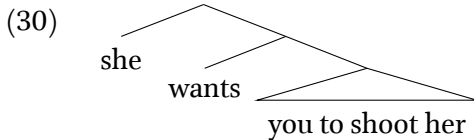
We will call this the **low modal** analysis.

An alternate version of the embedded conditional approach, which is discussed in detail by Drucker (2019) and especially Blumberg & Holguín (2019), involves the *if*-clause making its semantic contribution in the matrix rather than the embedded clause. Operating on our present assumptions, this means that MODAL is in the matrix clause above the attitude, rather than in the embedded clause below it. In this case, the attitude—and presumably the external argument (the subject)—must move covertly in order to outscope MODAL (and thus the conditional). This is represented in (29):

(29) [she wants]₁ if₇ Laura becomes a zombie MODAL₇ t₁ you to shoot her

We will refer to this as the **high attitude** analysis.

By all appearances the low modal analysis is significantly more syntactically plausible than the high attitude analysis. Notice that in the LF in (29), *she wants* moves together to a position that outscores the conditional. However, *she wants* is generally not taken to be a constituent at any level of representation, as illustrated in (30):



⁵ Jerzak (2019) also argues against the embedded conditional account for *want*, but seems to consider it more plausible for cases with *believe*.

Thus, in order for a high attitude analysis to work, it seems that one of two things has to happen. The first possibility is that *she* and *wants* move to separate positions that outscope the conditional, in which case it is unclear how the compositional semantics is meant to generate the correct interpretation.

- (31) she_1 wants₂ if₇ Laura becomes a zombie MODAL₇ t_1 t_2 you to shoot her

The second is that *you to shoot her* moves from its original position, with the matrix verb phrase—including *she*, *wants*, and the embedded clause's trace—then undergoing so-called *remnant movement* to a position that outscopes MODAL:

- (32) [she wants t_2]₁ if₇ Laura becomes a zombie MODAL₇ t_1 [you to shoot her]₂

But once again, it's not entirely clear how the semantics is supposed to take this structure and return the correct interpretation.

As it turns out, regardless of one's preferred version of the embedded conditional analysis, critical evidence goes firmly against this approach as a viable theory of (supposed) restricted readings. While many of Drucker (2019) and Blumberg & Holguín (2019) counterarguments only target very specific versions of a high modal account, they do offer at least one kind of evidence that goes against embedded conditional accounts more generally: simply put, such accounts make strange truth-conditional predictions in a wide variety of cases.

Rather than go through the full argument, for brevity's sake we will simply skip straight to the most extreme case, in which the embedded conditional analysis clearly makes the most absurd prediction. With this in mind, consider (33)

- (33) If I offended you with what I said, then I regret {that / doing so}.

Operating under the reasonable assumption that *that* in (33) is a propositional anaphor referring back to the antecedent of the conditional, any version of an embedded conditional analysis should predict this to mean the same thing as the absurd (34):

- (34) I regret that if I offended you with what I said, then I offended you with what I said.

Of course, (33) is a perfectly reasonable thing to say, and unlike (34) it can be true without any regret about tautologies. But any truth-conditional distinction between the natural (33) and the strange (34) is unexpected on an embedded conditional account, which treats the two as semantically indistinguishable.

While Drucker (2019) and Blumberg & Holguín (2019) offer a litany of other arguments against an embedded conditional analysis, we view this critical shortcoming as more than sufficient to rule out this approach. That being said, we will shortly introduce further evidence from donkey anaphora that similarly go against any kind of embedded conditional account.

3.2 The direct restriction account (Pasternak 2018)

We next turn to **attitude restriction** accounts of our conditionals. Recall from the discussion at the end of Section 2 that because attitudes are world-quantifiers (in the broader sense), they can theoretically be restricted by *if*-clauses in much the same way that modals can. This is in fact the analysis that Pasternak (2018) proposes for restricted readings of attitudes in conditional environments. We will tweak Pasternak’s account to fit with the compositional assumptions detailed in Section 2, though the problems we discuss extend equally well to his formulation.

As a reminder, suppose that $\llbracket \text{want} \rrbracket$ is defined as in (24), repeated below:

$$(24) \quad \llbracket \text{want}_n \rrbracket^{g,w} = \lambda p \lambda x. \forall w' \in \text{BEST}_{x,w}(\text{Dox}_{x,w} \cap g(n)) [p(w')]$$

Suppose in addition that in a conditional like (1), *if* is coindexed not with an embedded MODAL, as in the low modal version of the embedded conditional account, but rather with the attitude itself, as in (35):

$$(35) \quad \text{if}_7 \text{ Laura becomes a zombie, she wants}_7 \text{ you to shoot her}$$

The interpretation generated by the LF in (35) can be seen in (36):

$$(36) \quad \llbracket (35) \rrbracket^{g,w} = 1 \text{ iff } \forall w' \in \text{BEST}_{x,w}(\text{Dox}_{x,w} \cap \text{ZOMBIE}) [\text{SHOOT}(w')]$$

We thus predict (1) to be true iff, among those belief worlds of Laura’s in which she becomes a zombie, all of the ones she (actually) prefers are worlds in which you shoot her. Such a **direct restriction** approach—*direct* in the sense that the attitude’s world-quantification is compositionally restricted by the *if*-clause—thus represents the most straightforward translation of the intuition put forward in the introduction that conditional sentences like (1) make claims about *restricted attitudes*.

The direct restriction analysis avoids the strange readings predicted by embedded conditional analyses. Since we will be eliminating Pasternak’s analysis on independent grounds, we do not think it worthwhile to fully detail *how* his analysis avoids this problem; however, see Blumberg & Holguín 2019 for extensive discussion of why putting the restriction in the attitude (rather than a lower MODAL) avoids the tautologous attitude problem. For our purposes it suffices to note that since the *if*-clause does not make its semantic contribution beneath the attitude verb on this approach, we no longer predict the attitude’s proposition argument in (33) to be the tautologous *if I offended you with what I said, then I offended you with what I said*. Hence, no strange readings involving people regretting tautologies.

So Pasternak’s analysis improves upon an embedded conditional approach largely by proposing that the *if*-clause makes its semantic contribution at a higher point: rather than restricting an embedded MODAL, it restricts the attitude in the matrix clause. But it turns out that this still is not high enough, as evidence from donkey anaphora suggests that the *if*-clause in these conditionals must restrict an operator that *outscores* the attitude.

Donkey sentences feature an indefinite DP that is interpreted in the restrictor of some quantificational operator, as well as a pronoun in the scope of this operator that is anaphoric to that indefinite. (37) is an example where the quantifier is the determiner *every*, with the indefinite DP *a donkey* appearing in *every*'s NP restrictor:

- (37) $\underbrace{\text{Every farmer who owns}}_Q \underbrace{[a \text{ donkey}]_1}_R \underbrace{\text{beats it}_1}_S$.

If an *if*-clause restricts a modal operator whose scope is the consequent, then one should be able to construct similar examples with conditionals: an indefinite takes scope in the antecedent, and a pronoun anaphoric to that indefinite appears in the consequent. This is indeed the case, as illustrated in (38):⁶

- (38) a. If Smith owns $[a \text{ donkey}]_1$, he beats it_1 .
 b. $\underbrace{\text{if}_2 \text{ Smith owns } [a \text{ donkey}]_1}_R \underbrace{\text{MODAL}_2}_Q \underbrace{\text{he beats it}_1}_S$

As most readers will no doubt be familiar, examples like (38) in fact played a crucial role in Heim (1982)'s argument for the restrictor theory of conditionals.

Donkey anaphora is a relatively complex phenomenon, and we will not provide an analysis in this paper. But one particular empirical observation about donkey anaphora in conditional environments will prove useful to us: namely, that if an indefinite DP is interpreted in the restrictor (i.e., antecedent) of some world-quantifying operator, then any donkey pronoun anaphoric to that indefinite must be interpreted “below” that same world-quantifying operator (either later in the restriction or in the scope).⁷ For example, in (38), *it* must be in the scope of MODAL, since *a donkey* is in its restrictor. This observation will in turn allow us to use donkey anaphora as a litmus test for the scope of the world-quantifying operators restricted by *if*-clauses.

We first show that this observation actually holds. To do this we will use examples containing *unfortunately for*, such as (39):

- (39) Leigh₁ is ineligible, unfortunately for her₁.

⁶ Crucially, donkey anaphora is about the indefinite *taking scope* inside the restrictor, not just being pronounced there. Thus, the relevant reading for (38) is the one paraphrasable as “If there is a donkey that Smith owns, he beats it”, and not one in which the indefinite outscopes the conditional altogether, paraphrasable as “There is a donkey such that if Smith owns it, he beats it”. This extends to all other examples of donkey anaphora in this paper.

⁷ We set aside so-called *modal subordination* (Roberts 1987, 1989, Stone 1997), such as (i):

(i) If $[a \text{ zombie}]_1$ enters, you must shoot it_1 . Otherwise, it_1 will eat me.

Clearly, the second *it* is in neither the restrictor nor the scope of *must*, and yet it can be anaphoric to *a zombie*. However, by all appearances the important examples to be discussed shortly are not cases of modal subordination—for example, several lack any additional modal like *will* in (i)—so modal subordination likely will not save an embedded conditional or attitude restriction account.

When there are two clauses, there emerge ambiguities of the sort seen in (40):

- (40) I said that Leigh₁ is ineligible, unfortunately for her₁.

The two potential paraphrases for (40) can be seen in (41):

- (41) a. I said that it is unfortunate for Leigh that she is ineligible.
b. It is unfortunate for Leigh that I said that she is ineligible.

Suppose that, as suggested by the paraphrases, this ambiguity is a matter of scope: the narrow scope reading paraphrased in (41a) features *unfortunate for her* inside the embedded clause, while the wide scope reading paraphrased in (41b) involves higher adjunction in the matrix clause.

Now consider what happens with *unfortunately for* when the embedded clause is a donkey sentence, as in (42):

- (42) I said that if [a candidate]₁ can't solve this puzzle then she₁ is ineligible, unfortunately for her₁.

Here the ambiguity observed in (40) evaporates, and only a narrow scope reading is available: it is unfortunate for the candidate that she is ineligible. This is readily explained if we adopt the previously mentioned constraint on donkey anaphora. The indefinite *a candidate* is interpreted in the antecedent within the embedded clause, meaning that it is inside the restrictor of an embedded MODAL:

- (43) I said that if₇ [a candidate]₁ can't solve this puzzle MODAL₇ she₁ is ineligible
R Q S

As per the constraint on donkey anaphora, this means that any pronoun anaphoric to *a candidate* must be interpreted within the scope of MODAL, so *a fortiori* it must be interpreted within the embedded clause. Since *her* is anaphoric to *a candidate*, and since a wide scope reading of (42) would be the result of *unfortunately for her* adjoining outside of the embedded clause, this reading is unavailable, and the ambiguity disappears. However, once the *unfortunately for* phrase no longer contains a pronoun that is anaphoric to *a candidate*, the ambiguity returns again, indicating that the lack of ambiguity is due specifically to the scope constraint on donkey anaphora:

- (44) I said that if [a candidate]₁ can't solve this puzzle then she₁ is ineligible, unfortunately for the search.

Thus it appears that our constraint on donkey anaphora is correct: if an indefinite takes scope inside an *if*-clause, then any donkey pronoun anaphoric to that indefinite must take scope below whatever operator that *if*-clause restricts. But what does this have to do with our particular conditionals? As it turns out, when an indefinite appears in the antecedent of a *want* conditional, a pronoun that is not in the scope of the attitude can be anaphoric to that indefinite. Here is the crucial example:

Laura is the clear leader of the group: what she says, goes. She is also selfish and believes that a cure for zombie-ism will be developed soon, so no matter what, she wants to be kept alive at all costs.

- (45) If Laura becomes a zombie and attacks [a civilian]₁, then unfortunately for him₁ she wants you to let her eat him₁.

For (45) to be true it needn't be the case that Laura *wants* things to be unfortunate for her potential victim. In fact, she needn't even *think* it will be unfortunate for him: she might be some sort of zealot who genuinely believes it is in her victim's best interests to let her eat him. Rather, *unfortunately for him* indicates the *speaker's* belief that Laura's desire to be saved at all costs is unfortunate for her hypothetical victim. In other words, *unfortunately for him* does not somehow take scope below the attitude, but as with the other cases takes scope in the matrix clause, above *want*.

For another version of the argument, consider (46):

- (46) If one zombie attacks Laura and another attacks [a civilian]₁, then he₁ is the person that she wants you to save.

The anaphoric pronoun *he* in (46) cannot possibly be interpreted in the scope of *want*: no upward movement or reconstruction could place the pronoun inside of the other DP (*the person...*), into an embedded clause in a relative clause that has no open arguments for *he* to saturate. But once again, the pronoun can be anaphoric to an indefinite in the antecedent of the conditional.

Based on our observation about donkey anaphora in conditionals, the fact that donkey pronouns can outscope the attitude in the relevant cases indicates that the *if*-clause must restrict some world-quantifying operator that scopes above the attitude. This runs directly counter to Pasternak's (2018) direct restriction account, which posits that the operator restricted by the *if*-clause is the attitude itself. Furthermore, these observations hammer one more nail into the coffin of the embedded conditional analysis, where the alleged restricted operator is even lower.

3.3 Blumberg & Holguín's (2019) indirect restriction account

The last existing account we will discuss is Blumberg & Holguín's (2019) account, which is to our knowledge the most sophisticated extant analysis of restricted readings of attitudes. If Pasternak's (2018) analysis constitutes *direct* restriction—the *if*-clause compositionally restricts the attitude—then Blumberg & Holguín's (2019) analysis can be thought of as **indirect restriction**, since they posit that the restriction of the attitude is purely pragmatic, albeit with some syntactically determined constraints on the choice of pragmatically adopted attitude restriction.

Consider again the conditional in (1), repeated below:

- (1) If Laura becomes a zombie, she wants you to shoot her.

As we have previously noted, on its surface (1) simply looks like a conditional with an attitude verb in its consequent. On Blumberg & Holguín's analysis we can take that surface-level appearance seriously. While they do not explicitly adopt the view that *if*-clauses compositionally restrict modal operators, we can easily translate the core of their analysis into this framework. In short, in this retelling of Blumberg & Holguín (2019), in a conditional like (1) there is a MODAL that outscopes the attitude and is compositionally restricted by the *if*-clause. Hence, the attitude really is in the consequent of the conditional, in the sense that it scopes below the restricted operator. Meanwhile, attitude verbs like *want* permit pragmatic restriction that in this case generates the appropriate restricted reading.

More specifically, suppose that for any proposition q , $\llbracket \text{want}_q \rrbracket$ is defined as follows:⁸

$$(47) \quad \llbracket \text{want}_q \rrbracket^w = \lambda p \lambda x. \forall w' \in \text{BEST}_{x,w}(\text{Dox}_{x,w} \cap q) [p(w')]$$

The LF for (1) will then be as in (48):

$$(48) \quad \text{if}_7 \text{ Laura becomes a zombie, } \text{MODAL}_7 \text{ she wants}_{\text{ZOMBIE}} \text{ you to shoot her.}$$

So while MODAL is the only operator *directly* restricted by the *if*-clause, *want* is still *pragmatically* restricted by the proposition denoted by the antecedent clause, *Laura becomes a zombie*. Meanwhile, in contexts where attitudes are apparently not restricted, they are actually vacuously restricted by the necessarily true proposition \top .

Notice that the observations about donkey anaphora that were problematic for both the embedded conditional and direct restriction accounts of restricted attitude readings could potentially be resolved under an indirect restriction account. After all, what the evidence from donkey anaphora showed was that the *if*-clause must be restricting some operator that outscopes the attitude. This is precisely what Blumberg & Holguín's indirect restriction analysis predicts, as it is a higher MODAL and not the attitude itself that is restricted by the *if*-clause. In other words, there is no reason why a donkey pronoun could not outscope the attitude, since the attitude no longer marks the scopal upper bound for donkey anaphora in the relevant conditionals.

The next step in Blumberg & Holguín's analysis is determining how structure constrains the choice of attitude restriction. Clearly when an attitude appears in the consequent of a conditional, the antecedent to that conditional ought to be available as a possible restriction of the attitude. Likewise, examples like (6), repeated below, suggest that in a disjunction of the form Φ or Ψ , an attitude inside clause Ψ can take the negation of $\llbracket \Phi \rrbracket$ as its restriction. Hence, the preferred reading of (6) is that when restricting her attention to possible states of affairs in which the test is *not* a false positive, Laura's

⁸ Blumberg & Holguín (2019) use Heim's (1992) more complex semantics for *want*, rather than von Fintel's (1999). This difference is immaterial for our purposes, and the same pros and cons apply.

desires are such that you shoot her. This is represented in (49), where FALSE_POS is the proposition true iff the test is a false positive (i.e., the denotation of the first disjunct).⁹

Context: Laura has taken a test to determine whether the zombie virus is coursing through her veins. The test comes back positive, but just to be sure it's not a false positive Laura has taken a second test and is awaiting the results. Pointing to the first, positive test, Laura says:

- (6) Either this test is a false positive, or I want you to shoot me.
- (49) Either this test is a false positive, or I want_{¬FALSE_POS} you to shoot me.

But as Blumberg & Holguín note, order seems to matter here: (50), which is identical to (49) but with the order of disjuncts reversed, is quite odd, and does not seem to permit the restricted reading seen in (49):

- (50) ?? Either I want you to shoot me, or this test is a false positive.

Blumberg & Holguín implement a dynamic analysis to account for these observations; we will not go through the details here, and will instead take for granted that in their analysis, the antecedent of a conditional is available as a pragmatic restriction for an attitude in the consequent, and the negation of the first disjunct is available as a restriction for an attitude in the second disjunct, but not vice versa.

Our arguments against Blumberg & Holguín's indirect restriction account will look somewhat different from those we offered against the embedded conditional and direct restriction accounts, in that we will not offer evidence against an indirect restriction account *per se*. In fact, our own analysis put forward in the rest of this paper will itself be a form of indirect restriction that shares certain core ideas with Blumberg & Holguín's analysis. That being said, we will argue against the particular implementation of indirect restriction offered by Blumberg & Holguín.

Our first counterargument is less about an empirical inaccuracy in their analysis and more about a gap therein: Blumberg & Holguín (2019) never actually provide a compositional semantics for any of the relevant sentences in their paper, instead focusing only on which restrictions are available for which attitudes in which syntactic environments. Given the general dearth of prior theoretical work on restricted readings of attitudes this lacuna is understandable, but at the same time it leaves open some quite basic and substantial questions that must be addressed. For example, on Blumberg & Holguín's analysis the attitude in attitude conditionals is interpreted in the consequent of the conditional. In light of this, the follow-up question that might immediately come to mind is: How is it that in these constructions, the attitudes under consideration are real, rather than hypothetical attitudes? To use (1) as an example, how is it that *want* is interpreted

⁹ Here and throughout, we use $\neg p$ to indicate p 's intensional negation (i.e., the complement of p in the domain of possible worlds/situations), reserving \neg for boolean negation.

in the scope of *MODAL*, and yet the truth conditions pertain to the *actual* (restricted) desires of *actual*-Laura, and not the *zombie*-desires of *zombie*-Laura? And if the *if*-clause does not compositionally restrict the attitude, and if the existence of *MODAL* does not change the real-world interpretation of the attitude, then what role do the *if*-clause and *MODAL* actually play in the compositional semantics, if any? These questions do not arise for the embedded conditional and direct restriction analyses, where things are more cut-and-dry: the desires at play are real-world desires because *want* does not scope under any intensional operators, and the *if*-clause's semantic contribution is obvious and consistent. But in Blumberg & Holguín's account things are not so clear.

The gap in Blumberg & Holguín's analysis of conditionals is not an inherently insurmountable obstacle to their analysis. In fact, our own, compositionally explicit indirect restriction analysis will seek to address these very questions, and at least some of our proposals could plausibly be translated to Blumberg & Holguín's analysis. However, restricted attitudes in disjunctive environments present a more dire picture for their proposal, and here quick fixes do not seem to be forthcoming. To illustrate the general problem, consider again the disjunction in (6). As per Blumberg & Holguín's analysis, the predicted restriction for *want* is to those possible states of affairs in which the test is not a false positive, i.e., in which Laura is on the cusp of becoming a zombie. But much like what we saw with conditionals, there's more to the sentence than just the restricted attitude: there's a whole other disjunct there. And once again, while Blumberg & Holguín make explicit their predictions about the available restrictions for attitudes, they do not go beyond that to discuss the compositional semantics as a whole, and so we are left guessing as to what they predict the final semantic interpretation and derivation to look like in cases like (6).

With this in mind, there seem to be two *prima facie* viable analyses for how the disjunction in (6) gives rise to the observed interpretation. The first is that by some means or other, the disjunction is interpreted as truth-conditionally identical to the second disjunct: in some sense, the disjunction is not interpreted disjunctively at all. As a result, the interpretation of the sentence as a whole will simply be the ascription of a restricted desire to Laura, as represented in (51):

$$(51) \quad \llbracket (6) \rrbracket^w \stackrel{?}{=} \forall w' \in \text{BEST}_{\text{laura}, w} (\text{DOX}_{\text{laura}, w} \cap \neg \text{FALSE_POS}) [\text{SHOOT}(w')]$$

That is, among Laura's belief worlds in which the test is not a false positive, all of her favored ones are such that you shoot her.

This seems to be the right truth-conditional prediction, but it has been derived by what are at best questionable means. Given two sentences Φ and Ψ whose truth conditions are independent, how can one possibly utter Φ or Ψ and mean only Ψ ? One might object that we know of disjunctive sentences where the interpretation does not seem to be disjunctive in the classical, truth-tabular sense. Perhaps the most striking cases of this are ones like the following example from Klinedinst & Rothschild (2012):

(52) I am away at a conference, or I would meet you.

Importantly, someone who utters (52) is at least committed to the truth of the first disjunct, and on the reasonable assumption that *would* in the second disjunct is restricted (\approx *If I wasn't away at a conference, I would meet you*) the same holds of the second disjunct as well. And of course, if one utters Φ or Ψ and is thereby committed to the truth of at least Φ and probably Ψ as well, then *or* does not seem to be behaving like a typical disjunction. So perhaps something similar is going on with (6).

However, there are two major reasons to think this is not the case. Firstly, the semantic result of the “non-truth-tabular” disjunction in (52) looks completely different from the interpretation of (6). (52) commits the speaker to the truth of the first disjunct, and probably the second as well. (6) purportedly commits the speaker to the truth of the second disjunct (the restricted attitude), but not the first: in uttering (6), Laura is of course not committed to the test in fact being a false positive. Thus, even if one accepts our strange, non-disjunctive disjunction, it is of an altogether distinct interpretive species to that observed by Klinedinst & Rothschild. And secondly, the two are distinct syntactically as well. As Klinedinst & Rothschild observe, their non-truth-tabular disjunction is incompatible with *either*, as illustrated by the unacceptable (53):

(53) # Either I am away at a conference, or I would meet you.

This can of course be contrasted with (6), where the presence of *either* is not only permissible but preferred. Thus, in order for this approach to succeed, we must motivate an entirely novel form of non-truth-tabular disjunction that is both syntactically and semantically distinct from that observed by Klinedinst & Rothschild, and that seems to surface only in this very specific case. This does not seem to be a reasonable approach to the compositional semantics of sentences like (6).

With this first path closed off to us, it seems that the only other option is to posit that the disjunction is interpreted exactly as we would expect a disjunction to be interpreted. In this case, we would predict the interpretation of (6) to be as in (54):

$$(54) \quad \llbracket (6) \rrbracket^w \stackrel{?}{=} \text{FALSE_POS}(w) \vee \\ \forall w' \in \text{BEST}_{\text{laura}, w} (\text{DOX}_{\text{laura}, w} \cap \neg \text{FALSE_POS}) [\text{SHOOT}(w')]$$

This may at first blush seem odd. After all, (6) appears to be making a claim that is confined “inside Laura’s head”, so to speak: whether or not (6) is true depends only on whether Laura has a certain kind of restricted attitude. But the truth conditions in (54) also depend on the material conditions outside of Laura’s head: the denotation in (54) leads to a prediction that (6) is true if the test happens to be a false positive, regardless of what Laura does or does not want, since in this case the first disjunct would be true. That being said, this intuitive strangeness does not necessarily rule out Blumberg & Holguín’s analysis, as judgments aren’t actually clear here: at least as far as we can tell, it is

not entirely obvious whether (6) is true if the test is a false positive and Laura does not have the relevant restricted desire.

Fortunately, judgments become clearer—and importantly, go against Blumberg & Holguín’s analysis—when we modify these sentences so that the disjunction is interpreted as unambiguously exclusive, rather than inclusive. For example, consider the admittedly clunky but nonetheless fully interpretable (55) (where all-caps indicates focus):

- (55) Exactly one of these is true: EITHER that test is a false positive, OR I want you to shoot me.

The interpretation of (55) seems to be biconditional in nature: we derive truth conditions more or less equivalent to the conjunction of the two sentences in (56):

- (56) a. If that test is a false positive, then it is not the case that I want you to shoot me.
b. If that test is not a false positive, then I want you to shoot me.

To show that a successful Blumberg & Holguín-style analysis of (55) is unlikely, we will operate under the simplifying assumption of a templatic exclusive disjunction semantics for sentences like (55), as illustrated in (57) (where \vee is exclusive disjunction):

- (57) $\llbracket \text{Exactly one of these is true: EITHER } \Phi, \text{ OR } \Psi \rrbracket = \lambda w. \llbracket \Phi \rrbracket(w) \vee \llbracket \Psi \rrbracket(w)$

We will then briefly discuss why a more nuanced, implicature-based view of the derivation of exclusive disjunction readings is unlikely to rescue Blumberg & Holguín’s account without substantial stipulation. By way of contrast, our own analyses will predict the correct biconditional reading for exclusive attitude disjunctions, regardless of how the exclusivity inference is derived.

If as per Blumberg & Holguín’s analysis *want* in (55) is restricted to worlds in which the test is not a false positive ($\neg \text{FALSE_POS}$), then the predicted truth conditions on the simplistic view of exclusive disjunction are as in (58):

- (58) $\llbracket (55) \rrbracket_{\text{B\&H}} = \lambda w. \text{FALSE_POS}(w) \vee \text{Laura wants}_{\neg \text{FALSE_POS}} \text{SHOOT in } w$

There are two important reasons why these predicted truth conditions are incorrect. To see the first one, suppose that Laura does indeed have the restricted desire ascribed in the second disjunct: her desires, restricted to possible states of affairs in which the test is not a false positive, are such that you shoot her. Therefore, the second disjunct is true. But because the disjunction is exclusive, this means that in order for the sentence as a whole to be true the first disjunct must be false. In other words, if we know Laura has the relevant restricted desire then the prediction is that (55) should be true *if and only if the test is not actually a false positive*. This is of course not the case, and the truth conditions of (55) are not so dependent upon whether the test itself happens to be a false positive. Put simply, if we know that Laura’s desire state meets certain conditions, then we can definitively know that (55) is true regardless of the actual state of the test.

The second reason that (58) is not the correct interpretation is that it does not derive the biconditional inference, and in particular the inference in (56a) that if the test *is* a false positive, then Laura does *not* want you to shoot her. After all, the truth conditions of the second disjunct of (58) only pertain to Laura's desires when restricted to \neg FALSE_POS worlds, and do not impose any requirements about what Laura's desires are like when restricted to FALSE_POS worlds. Thus, if Laura wants you to shoot her regardless of whether or not the test is a false positive, then the second disjunct of (58) is true. Of course the first problem from above still remains, and the truth conditions of the sentence as a whole will depend on whether the test is in fact a false positive. But if it is not a false positive, and if Laura wants you to shoot her no matter what, then (58) predicts that (55) should be true, contrary to fact.

We have thus seen two problems with a Blumberg & Holguín-style account of attitude disjunctions when the disjunction is interpreted exclusively, at least on a somewhat simplistic view of exclusive disjunction. The first is that the predicted truth conditions rely too heavily on the state of things outside of the head of the attitude holder: on such an account the presence of a certain mental state does not suffice for a sentence like (55) to be true, contrary to fact. The second is that we do not derive the biconditional inference, i.e., the inference that if the test is a false positive then Laura does not want to be shot.

That being said, proponents of a Blumberg & Holguín-style analysis might understandably complain that the problems we observe are not problems with their analysis, but rather with our simplistic representation of exclusive readings in (57). After all, standard approaches to disjunction treat *or* as having a lexically inclusive denotation, with exclusive interpretations being derived through implicature (Grice 1967 and much work since). While implicatures are often optional, one approach to modified numerals like *exactly three* is to treat them as instances of obligatory implicature generation: while without implicature *three students left* means that at least three students left, the *exactly* in *exactly three students left* triggers an obligatory implicature that no more than three students left (see, e.g., Landman 1998). The exclusive interpretation in (55) could be of precisely the same kind: we start with an inclusive denotation for *or*, and then the prefatory *exactly one of these is true*—perhaps paired with the focus on *either/or*—triggers obligatory implicatures, and thus a mandatory exclusive interpretation. This indirect approach to generating an exclusive reading could perhaps be used to salvage Blumberg & Holguín's account, as something along the implicature-generating path from inclusive to exclusive disjunction might at the same time head off the two problems noted above.

However, it is in our opinion unlikely that this approach would generate the desired result without considerable stipulation, for a fairly simple reason: the problems we observe, especially the truth-conditional over-reliance on the actual test results, owe to the presence of an exclusive disjunctive interpretation *in and of itself*, regardless of how it is derived. That is, once we end up with an exclusive disjunction reading, it immedi-

ately falls out that whether or not the test is in fact a false positive will play a crucial and undesired role in determining the truth of the sentence as a whole. Even if the second disjunct were somehow revised in order to generate the appropriate biconditional reading, so that the interpretation of the sentence as a whole were as in (59), the other problem would remain.

$$(59) \quad \lambda w. \text{FALSE_POS}(w) \vee \\ (\text{Laura wants}_{\text{FALSE_POS}} \text{SHOOT in } w \wedge \neg(\text{Laura wants}_{\text{FALSE_POS}} \text{SHOOT in } w))$$

It thus appears that in order to preserve Blumberg & Holguín’s analysis it does not suffice to simply generate the exclusive disjunction in a different way; instead one must say that in certain very specific instances sentences of the form *Exactly one of these is true: EITHER Φ OR Ψ* do not generate exclusive disjunction interpretations at all. This seems to us to be far-fetched, and while it may perhaps be feasible on a technical level, we believe that all else being equal a theory that simply derives the appropriate interpretation with exclusive disjunction—regardless of how that exclusive disjunction is derived—is to be preferred over such an analysis. As will be seen in the next section, our own analyses accomplish precisely this.¹⁰

3.4 Summary

In this section we have taken a tour through previously discussed analyses of restricted readings of attitudes, showing that each has critical faults. The embedded conditional analysis, in which attitude conditionals are interpreted as attitudes toward conditional propositions, assigns strange readings of tautologous attitudes in certain cases where the actual interpretation is perfectly natural and devoid of tautologies. The observation that donkey pronouns in attitude conditionals can outscope the attitude verb contradicts both the embedded conditional analysis and Pasternak’s (2018) direct restriction analysis, in which the *if*-clause restricts the world-quantification of the attitude itself. Finally, Blumberg & Holguín’s (2019) indirect restriction analysis, in which all attitude restriction is pragmatic but structurally constrained, avoids these problems but faces its own troubles with respect to restricted readings in disjunctive environments, especially when that disjunction is interpreted exclusively. Furthermore, they do not address the looming question of how restricted attitudes compose with the rest of the clause in order to derive the actual readings we are familiar with, e.g., how attitude conditionals end up pertaining to actual (rather than hypothetical) attitudes, as well as how the “regular” semantics of disjunction contributes to the interpretation of sentences like (6).

¹⁰ We end this argument by pointing out that similar considerations are developed by Dorr & Hawthorne (2013: especially around p. 884) for possibly related cases with a restricted reading of a modal in the second disjunct.

Starting in the next section we will offer our own analysis, which is like Blumberg & Holguín's in that attitude restriction is indirect and not effected through composition with the *if*-clause. However, we will show that by tweaking the mechanism by which this attitude restriction occurs, we can retain the benefits of Blumberg & Holguín's proposal while avoiding those problems it encounters, all within a fully compositional semantics in which operators like (exclusive) disjunction have precisely the semantic interpretations we intuitively assign to them.

4 Indirect restriction: The broad strokes

The two analyses to be proposed in the positive part of this paper are best considered as two distinct flavors of the same broad approach. With this in mind, in this section we will discuss only the shared core architecture of the proposal, abstracting away from those features that differentiate between the two more specific candidate analyses. In the next section we will explore our two alternatives for fleshing out this skeletal architecture.

Our analysis is like Blumberg & Holguín's and unlike Pasternak's in that the restriction of the attitude is always *indirect*: the attitude is not directly restricted by syntactic operators like *if*-clauses. For Blumberg & Holguín, this indirect restriction was pragmatic, with the set of possible attitude restrictions being determined by the structural environment in which the attitude verb resides. We propose instead that the attitude is restricted by means of *aboutness*: attitudes are about worlds or situations (where situations are partial worlds), and the lexical semantics of *want* uses its aboutness argument to restrict the attitude.¹¹ Since one of the ways in which the two candidate analyses diverge in the next section is in the use of possible worlds versus more fine-grained situations, in this section we will use the term *state of affairs* (SoA) as a more general term covering both worlds and situations.

(60) through (62) below illustrate in very broad terms how aboutness is integrated into our compositional semantics for restricted and shifted attitude conditionals and (exclusive) restricted attitude disjunctions; in each example, the (b) sentence loosely paraphrases our proposed truth conditions for the (a) sentence.

(60) **Restricted Attitude Conditional:**

- a. If Laura becomes a zombie, she wants you to shoot her.
- b. SoAs in which Laura becomes a zombie are SoAs about which Laura's actual desires are such that you shoot her.

(61) **Shifted Attitude Conditional:**

- a. If Laura becomes a zombie, she will want you to shoot her.

¹¹ Saying that attitude predicates have an element of aboutness is of course far from unprecedented. We refer here just to Barwise & Perry 1983, Kratzer 2002, 2021, and Yablo 2014.

- b. SoAs in which Laura becomes a zombie are SoAs in which and about which Laura's desires are such that you shoot her.

(62) **(Exclusive) Restricted Attitude Disjunction:**

- a. Exactly one of these is true: EITHER that test is a false positive, OR I want you to shoot me.
- b. Exactly one of these is true: either the SoA in question is one in which the test is a false positive, or it is one about which my desires are such that you shoot me.

Note that on our analysis the primary distinction between restricted and shifted attitude conditionals concerns what might be called “where the wanting takes place” (the *evaluation SoA*): the restricted attitude conditional makes a claim about Laura's actual desires about hypothetical zombie-SoAs, while the shifted attitude conditional makes a claim about a hypothetical zombie-Laura's desires about zombie-SoAs. Furthermore, (62) illustrates that we treat exclusive attitude disjunctions as involving true exclusive disjunction (regardless of how exclusivity is derived), which we showed to be problematic for Blumberg & Holguín's analysis. Motivating how this is all compositionally derived, as well as how the result of this composition leads to the desired truth conditions, will be the task of this section and the next section.

The rest of this section proceeds as follows. In Section 4.1 we discuss the broad strokes of how an aboutness argument is to be integrated into the lexical semantics of *want* and other attitude verbs. In Section 4.2 we move up to the clausal level, putting forward our analysis of the compositional semantics of sentences with attitude verbs. In Section 4.3 we turn our attention to restricted and shifted attitude conditionals, discussing how their differing interpretations arise compositionally. Finally, in Section 4.4 we discuss (exclusive) attitude disjunctions, showing—again, in relatively informal terms—how the desired truth conditions are derived and the problems faced by Blumberg & Holguín's account are avoided. In the next section we will show two different ways in which the gaps left in this section can be filled in.

4.1 Aboutness in the lexical semantics of *want* (and other attitudes)

Our first step is to define a semantics for *want* that permits an aboutness argument to effect restriction of that attitude's quantification. By way of illustration, we build on (a simplified version of) von Stechow (1999)'s lexical semantics for *want*, seen below. We use ω as a variable that can range over either worlds or situations, depending on the analysis; we will continue to use the term *state of affairs* (SoA) as a neutral term for worlds/situations.

$$(63) \quad \llbracket \text{want} \rrbracket_{\text{VF}} = \lambda p \lambda x \lambda \omega_e. \forall w \in \text{BEST}_{x, \omega_e} (\text{Dox}_{x, \omega_e}) [p(w)]$$

This definition of $\llbracket \text{want} \rrbracket$ has three arguments: a propositional argument p , an experiencer argument x , and an evaluation SoA ω_e (roughly, where the wanting takes place).

The definition then returns true iff among x 's belief worlds in ω_e , all of their ideal ones (by their standards in ω_e) are p -worlds. It is worth re-emphasizing at this point that our use of von Fintel (1999)'s lexical semantics for *want* is by no means essential, and the basic ideas put forward in the rest of this paper are compatible with a wide variety of possible analyses for the lexical semantics of *want* and other attitudes and operators. Furthermore, note that while our evaluation argument is ambiguous between situations and worlds (depending on the analysis), we treat the domain of quantification of the attitude itself as simply being worlds; this is not out of necessity, but because the distinction between worlds and situations is not relevant for this aspect of the semantics, and so it is easier to simply stick with worlds.

von Fintel's analysis does not include an aboutness argument, so we need to add one. Furthermore, this aboutness argument must restrict the world-quantification of the attitude. With this in mind, a templatic representation of our semantics for *want* can be seen in (64):

$$(64) \quad \llbracket \text{want} \rrbracket \approx \lambda p \lambda \omega_a \lambda x \lambda \omega_e. \forall w \in \text{BEST}_{x, \omega_e} (\text{Dox}_{x, \omega_e} \cap \mathcal{R}(\omega_a)) [p(w)]$$

Notice that here there are two SoA arguments: ω_e , the evaluation argument (*where is the wanting?*), and ω_a , the aboutness argument (*what is the wanting about?*). Meanwhile, \mathcal{R} is some yet-to-be-specified means of taking an aboutness argument and returning (the characteristic function of) a set of worlds. This proposition is then intersected with the belief worlds Dox_{x, ω_e} , and thus restricts the attitude as a whole. That is, we predict truth iff among those worlds that are compatible with x 's beliefs *and stand in the relevant relation to the about-SoA*, all of the best ones are p -worlds. The main difference between the two analyses in the next section, then, is in defining precisely what \mathcal{R} is, as well as what the mechanisms are that allow it to take an SoA and return a proposition that serves to restrict the attitude.

Note that this general template allows aboutness-based restriction for a whole host of attitudes, and there is nothing in the broad proposal that is inherently confined to desiderative attitudes like *want*. For example, $\llbracket \text{believe} \rrbracket$ can be defined similarly:

$$(65) \quad \llbracket \text{believe} \rrbracket \approx \lambda p \lambda \omega_a \lambda x \lambda \omega_e. \forall w \in \text{Dox}_{x, \omega_e} \cap \mathcal{R}(\omega_a) [p(w)]$$

This is important because, as was discussed briefly in the introduction and in greater detail by Blumberg & Holguín 2019, the sorts of restricted readings seen in attitude conditionals and attitude disjunctions are available for a wide variety of attitudes. That being said, we will confine our discussion to *want* for the sake of concreteness and brevity.

Before moving to the compositional semantics, a final note is in order pertaining to unrestricted readings of attitudes, including in syntactic environments in which restricted readings could hypothetically occur. This is illustrated with a disjunction below:

Context: Will has an interview today for an exciting job. He has also recently quit smoking. All day he has caught himself being fidgety and easily agitated, and he is not completely sure why. Reporting this to a friend, he says:

- (66) Either I'm really anxious about this interview, or I desperately want to smoke a cigarette.

Intuitively, this does not convey that Will's desires, restricted to worlds in which he is not anxious about the interview, are such that he smoke a cigarette. Rather, it conveys that he does not know what his desires are, and he is entertaining the possibility that his *unrestricted* desires are such that he smoke a cigarette. There are at least two ways that unrestricted desires can be tackled in the approach outlined in this paper. The first is through vacuous restriction: intersection of the belief-worlds with $\mathcal{R}(\omega)$ (where ω is the about-SoA) always occurs, but sometimes the latter is a superset of the former, and so this restriction is vacuous (see Blumberg & Holguín 2019 for a similar approach). The second is to treat restriction as well and truly optional: the syntactic head that introduces aboutness (and thus restriction), which we will discuss in more detail shortly, is not a syntactic and semantic argument of the attitude, but instead is syntactically an adjunct and semantically a modifier. Out of a desire for simplicity we have gone with the former approach; hence, the about-SoA ω_a is a semantic argument of the verb in (64). A truly optional approach to aboutness would require some revisions to our lexical semantics for *want* (and *believe*, etc.), but would be no less compatible with the core ideas espoused in this paper.

4.2 Composition at the clausal level

Next we move on to the syntax and compositional semantics. As seen in (64), we take attitudes like *want* to have four semantic arguments: a proposition, an about-SoA, an experiencer, and an evaluation SoA. Clearly the propositional argument is saturated by the embedded clause, and the experiencer argument is saturated by the subject. This just leaves the two SoA arguments. We take the about-SoA argument to be saturated by a pronoun, which we refer to as ABT, and which is bound by a higher lambda abstractor along the lines discussed by Percus (2000).¹² As for the evaluation SoA, we take that to be saturated in some form by the cluster of tense, aspect, and mood (TAM) heads along the clausal spine. Our reason for adopting this is because it draws the straightest line between the morphosyntactic and semantic distinctions between restricted and shifted attitude conditionals: morphosyntactically they are distinguished by the absence or presence of conditional morphosyntax (*want* vs. *will/would want*), and semantically they are distinguished in terms of the evaluation SoA (Laura's actual desires vs. the desires of a

¹² To our knowledge there is nothing that inherently rules out a deictic rather than bound interpretation for ABT. We leave exploration of this interesting possibility for future work.

hypothetical zombie-Laura). Thus, it seems reasonable to suppose that whatever cluster of TAM heads is responsible for the presence or absence of conditional morphosyntax is equally responsible for determining whether we end up with an actual or non-actual evaluation SoA.¹³ Furthermore, since we are setting aside other parts of the semantic contribution of TAM heads, we will assume for simplicity that their only semantic contribution is in the form of an evaluation SoA.

To illustrate, consider the simple, unembedded desire ascription in (67):

(67) Laura wants you to shoot her.

On our analysis, (67) has the (simplified) syntactic structure seen in Fig. 1. Notice that for simplicity we are treating the whole cluster of tense, aspect, and mood heads as a single head TAM. Since we do not have any conditional morphosyntax, TAM is co-indexed with the actual-SoA lambda-abstractor $\lambda\omega_1$; in this example this is trivial since there is only one lambda-abstractor, but when attitude conditionals enter into the picture we will see that this becomes a non-trivial distinction.

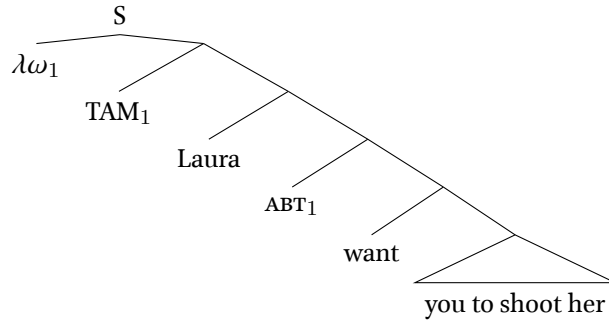


Figure 1 Syntactic analysis of *Laura wants you to shoot her*.

In this case, the result of semantic composition is the following:

$$(68) \quad \lambda\omega. \forall w \in \text{BEST}_{\text{laura}, \omega} (\text{Dox}_{\text{laura}, \omega} \cap \mathcal{R}(\omega)) [\text{SHOOT}(w)]$$

¹³ The true empirical picture seems to be more complicated than this, as evidenced by attitude conditionals in embedded finite clauses:

- (i) Harlan (mistakenly) believes that if Laura becomes a zombie, she wants you to shoot her.

While the evaluation SoA for *want* is not a zombie-Laura SoA, in line with our observations above, it is also not the/an actual SoA: the sentence details Laura's desires *in those SoAs compatible with Harlan's beliefs*. While the connection between morphosyntax and semantics in terms of the choice of evaluation SoA is an interesting and seemingly complex issue that warrants further study, for our purposes we will stick to the simplistic mantra that a lack of conditional morphosyntax entails an actual evaluation SoA.

That is, we predict truth in an SoA ω iff among those worlds compatible with Laura's beliefs in ω that stand in the relevant aboutness-relation to ω ($\mathcal{R}(\omega)$), all of the best ones by Laura's standards are such that you shoot her.

This may seem puzzling, on the grounds that we predict a potential restriction of the attitude in entirely unembedded environments: depending on what \mathcal{R} is, even the simple *Laura wants you to shoot her* can feature attitude restriction. Note that this is similar but not identical to the question addressed at the end of the previous subsection. There, the question was how to derive unrestricted readings in either embedded or unembedded environments. The question we currently face, on the other hand, is what to do about the possibility of restricted readings in entirely unembedded environments: nothing in our analysis prevents unembedded restriction, regardless of how one chooses to answer the question of what to do with unrestricted attitudes. In the next section we will argue that our analysis's ability to generate attitude restrictions in unembedded environments is a good thing, as it points the way toward an analysis of so-called *revisionist attitude reports*. But for now let us put this issue to the side and look at the compositional semantics of attitude conditionals and (exclusive) attitude disjunctions.

4.3 Restricted and shifted attitude conditionals

In turning to the more complex constructions that are the central focus of this paper, we start with the compositional semantics of restricted attitude conditionals. As discussed above, on our analysis such conditionals make assertions about actual-SoA attitudes about hypothetical SoAs. So how is this accomplished? We have noted previously that on a basic surface level, both restricted and shifted attitude conditionals look like plain conditionals with attitude verbs in their consequents. We propose that this observation be taken seriously. Thus, in line with the assumptions about conditionals detailed previously we propose that in restricted attitude conditionals there is a covert modal MODAL, and the *if*-clause is co-indexed with—and thus directly restricts—this modal. In the consequent clause, meanwhile, the SoA arguments for *want* are determined by TAM and ABT, as previously discussed: ABT is co-indexed with the lower lambda-abtractor ($\lambda\omega_2$, the one quantified over by MODAL), and since there is no conditional morphosyntax TAM is co-indexed with the higher, actual-SoA lambda-abtractor ($\lambda\omega_1$). This is illustrated in Fig. 2.

It is worth noting that this core claim—that restricted attitude conditionals are structurally just conditionals with attitudes in their consequents—is also adopted by Blumberg & Holguín. But as we noted when discussing their analysis, they do not offer an explanation for how the desires under consideration can be those of actual, non-zombie Laura, rather than hypothetical zombie-Laura. After all, the attitude verb is in the consequent of the conditional, so why is it not evaluated in zombie SoAs? Connecting the attitude's evaluation-SoA to TAM in the manner we propose suggests a path toward a

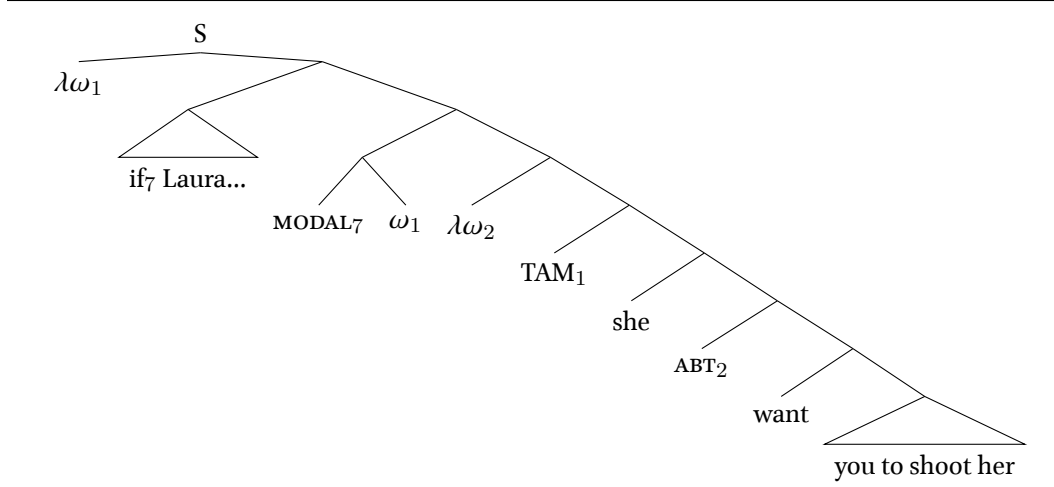


Figure 2 Syntactic analysis of *If Laura becomes a zombie, she wants you to shoot her.*

solution, though of course more work needs to be done so that this connection can be derived in a satisfying manner, rather than simply being stipulated. But in the meantime our simplistic stipulation will do just fine for deriving the desired truth conditions for attitude conditionals.

Note also that under our analysis, the donkey anaphora data that were problematic for both embedded conditional accounts and Pasternak (2018)’s direct restriction account are unsurprising. An illustrative example can be seen in (69):

- (69) If Laura becomes a zombie and attacks a civilian, then unfortunately for him she wants you to let her eat him.

The problem noted above is that there is an indefinite in the antecedent, and a pronoun anaphoric to that indefinite that clearly outscopes the attitude verb. If the *if*-clause directly restricted the attitude or some operator in its scope, this should not be possible. But on our analysis the *if*-clause restricts MODAL, which outscopes the attitude. Thus, so long as the pronoun sits in the scope of MODAL one should expect the donkey anaphora in (69) to be licit, regardless of where the pronoun-containing constituent scopes relative to *want*.

As for how the structure in Fig. 2 semantically composes, the denotation up to and including the lower lambda-abtractor ($\lambda\omega_2$) will be as follows for a given variable assignment g :

$$(70) \quad \lambda\omega. \forall w \in \text{BEST}_{\text{laura},g(1)}(\text{DOX}_{\text{laura},g(1)} \cap \mathcal{R}(\omega))[\text{SHOOT}(w)]$$

Put informally, this proposition is true of an SoA ω iff Laura's desires in $g(1)$ about ω are such that you shoot her. The SoA of evaluation is $g(1)$ because TAM is co-indexed with the higher lambda-abstractor $\lambda\omega_1$, and at this point the variable $g(1)$ is still free.

Next up is the modal MODAL. While the core semantics of MODAL will be for the large part the same in the two analyses under consideration in this section, there will be slight differences due to the increased ontological fine-grainedness of situations in contrast to worlds. For now we can abstract away from these issues as follows. First, notice that as before we are assuming that when *if*-clauses effect direct restriction, as happens here between the *if*-clause and MODAL, this restriction is effected through co-indexation: when MODAL has an index n it is restricted by the proposition $g(n)$, and an *if*-clause with index n revises the variable assignment so that $g(n)$ points to the antecedent proposition. With this in mind, for convenience we can define $\llbracket \text{MODAL}_n \rrbracket^g$ abstractly as follows:

$$(71) \quad \llbracket \text{MODAL}_n \rrbracket^g = \lambda\omega\lambda p. \mathcal{M}_\omega(g(n), p)$$

Thus, $\llbracket \text{MODAL}_n \rrbracket^g$ takes two arguments: an SoA of evaluation ω , and a proposition p denoted by its complement. The abstraction comes in the form of assuming some formal operator \mathcal{M} , parameterized to the SoA of evaluation, which takes a restrictor $g(n)$ (eventually, the antecedent) and its scope p (the consequent) and returns a truth value.

After combining with ω_1 and the consequent clause, the resulting interpretation is as follows, given a variable assignment g :

$$(72) \quad \mathcal{M}_{g(1)}(g(7), \lambda\omega. \forall w \in \text{BEST}_{\text{laura}, g(1)} (\text{Dox}_{\text{laura}, g(1)} \cap \mathcal{R}(\omega)) [\text{SHOOT}(w)])$$

Next, the *if*-clause sets $g(7)$ to ZOMBIE, the proposition true of those SoAs in which Laura becomes a zombie:

$$(73) \quad \mathcal{M}_{g(1)}(\text{ZOMBIE}, \lambda\omega. \forall w \in \text{BEST}_{\text{laura}, g(1)} (\text{Dox}_{\text{laura}, g(1)} \cap \mathcal{R}(\omega)) [\text{SHOOT}(w)])$$

And finally we lambda-abtract over $g(1)$ with $\lambda\omega_1$:

$$(74) \quad \lambda\omega. \mathcal{M}_\omega(\text{ZOMBIE}, \lambda\omega'. \forall w \in \text{BEST}_{\text{laura}, \omega} (\text{Dox}_{\text{laura}, \omega} \cap \mathcal{R}(\omega')) [\text{SHOOT}(w)])$$

This is all well and good, but what does it mean? It means that as discussed above in more informal terms, a restricted attitude conditional makes truth-conditional predictions about actual desires about hypothetical scenarios: the SoA of evaluation in the consequent is ω , the actual SoA, while the about-SoA is ω' , the SoA quantified over by MODAL. In other words, the consequent of the conditional is the proposition true of an SoA ω' iff Laura's actual desires (in ω) about ω' are such that you shoot her. Thus, the predicted truth conditions will be true roughly if hypothetical states of affairs in which Laura becomes a zombie are also states of affairs about which Laura's actual desires are such that you shoot her.

To illustrate how this will derive the desired interpretation, let us suppose a simplistic definition for \mathcal{R} , as follows:

$$(75) \quad \mathcal{R} \approx \lambda\omega. \begin{cases} \text{ZOMBIE if ZOMBIE}(\omega) \\ -\text{ZOMBIE if } \neg\text{ZOMBIE}(\omega) \end{cases}$$

Thus, the restriction of the attitude will be ZOMBIE if the about-SoA is a ZOMBIE-SoA, and otherwise it will be \neg ZOMBIE. But in our attitude conditional, MODAL's quantification is restricted to ZOMBIE-SoAs, meaning all of the SoAs in which the consequent is evaluated will be ZOMBIE-SoAs. (75) therefore ends up equivalent to (76):

$$(76) \quad \lambda\omega. \mathcal{M}_\omega(\text{ZOMBIE}, \lambda\omega'. \forall w \in \text{BEST}_{\text{laura}, \omega}(\text{Dox}_{\text{laura}, \omega} \cap \text{ZOMBIE})[\text{SHOOT}(w)])$$

As a result, the SoA-quantification introduced by MODAL is now vacuous, as the lambda-abtractor in MODAL's scope ($\lambda\omega'$) does not bind anything. Therefore we can again simplify:

$$(77) \quad \lambda\omega. \forall w \in \text{BEST}(\lesssim_{\text{laura}, \omega}, \text{Dox}(\text{laura}, \omega) \cap \text{ZOMBIE})[\text{SHOOT}(w)]$$

These are in fact the desired truth-conditions: Laura's (actual) desires, restricted to possible states of affairs in which Laura becomes a zombie, are such that you shoot her.

While the two candidate analyses discussed in the next section differ at various points in this process, this is more or less how both derive the truth conditions for attitude conditionals. The result is an analysis that derives the same truth conditions as Pasternak's (2018) direct restriction account in simple cases, but that at the same time predicts the acceptability of wide-scope donkey anaphora, since it is the higher MODAL that is restricted by the *if*-clause, rather than the attitude itself.

Next we turn to shifted attitude conditionals. On our account, the only semantic distinction between restricted attitude and shifted attitude conditionals is in the evaluation SoA: actual in the case of restricted attitude conditionals, and non-actual in the case of shifted attitude conditionals. This is determined by TAM, so that in a shifted attitude conditional TAM is co-indexed with $\lambda\omega_2$, the lower lambda-abtractor, rather than the higher $\lambda\omega_1$. Thus, the truth conditions for (78) are predicted to be as in (79):

$$(78) \quad \text{If Laura becomes a zombie, she will want you to shoot her.}$$

$$(79) \quad \lambda\omega. \mathcal{M}_\omega(\text{ZOMBIE}, \lambda\omega'. \forall w \in \text{BEST}_{\text{laura}, \omega'}(\text{Dox}_{\text{laura}, \omega'} \cap \mathcal{R}(\omega'))[\text{SHOOT}(w)])$$

Notice that all instances of ω in the consequent have been replaced with ω' , the variable quantified over by MODAL. That is, we predict (78) to be true iff states of affairs in which Laura becomes a zombie are states of affairs *in which and about which* she wants you to shoot her. Since in our scenario we can safely assume that this is not the case, regardless of what \mathcal{R} is—hypothetical zombie-Laura simply does not want to be shot—we rightly predict (78) to be false.

4.4 Attitude disjunctions

Finally, there are attitude disjunctions like (6), repeated below:

Context: Laura has taken a test to determine whether the zombie virus is coursing through her veins. The test comes back positive, but just to be sure it's not a false positive Laura has taken a second test and is awaiting the results. Pointing to the first, positive test, Laura says:

- (6) Either that test is a false positive, or I want you to shoot me.

As was discussed above, in the basic case it is not obvious whether the disjunction itself is interpreted inclusively or exclusively. However, one can easily construct instances of attitude disjunctions in which the disjunction is obligatorily interpreted exclusively, as in (55), repeated below:

- (55) Exactly one of these is true: EITHER that test is a false positive, OR I want you to shoot me.

(55) has what we have called an *biconditional* interpretation, roughly equivalent to the conjunction of the interpretations of the two attitude conditionals in (56), repeated below:

- (56) a. If that test is a false positive, then it is not the case that I want you to shoot me.
b. If that test is not a false positive, then I want you to shoot me.

We have also shown that Blumberg & Holguín's account of attitude disjunctions fails to accurately capture the truth conditions of exclusive attitude disjunctions for two reasons. First, it fails to derive a biconditional interpretation, and in particular the inference in (56a). And second, the truth conditions are predicted to depend too heavily on affairs outside of Laura's head: even if both of the claims in (56) are true, because of the exclusive nature of the disjunction (55) is predicted to be false if the test happens to also be a false positive.

Our analysis avoids these problems with exclusive attitude disjunctions. To illustrate, we will again operate under the simplifying assumption of a templatic semantics for sentences like (55), as shown in (80):

- (80) $\llbracket \text{Exactly one of these is true: EITHER } \Phi, \text{ OR } \Psi \rrbracket = \lambda\omega. \llbracket \Phi \rrbracket(\omega) \vee \llbracket \Psi \rrbracket(\omega)$

While this is of course an oversimplification, it does raise an important point. On our analysis it does not matter *how* an exclusive disjunctive interpretation arises in sentences like (55), whether it be through obligatory implicature calculation or something else. Once an exclusive disjunctive interpretation is derived, so is the appropriate interpretation for the sentence as a whole.

Given the templatic treatment of exclusive disjunction in (80), on our analysis a sentence like (55), uttered by Laura, will have the following interpretation:

- (81) $\lambda\omega. \text{FALSE_POS}(\omega) \vee \forall w \in \text{BEST}_{\text{laura}, \omega} (\text{Dox}_{\text{laura}, \omega} \cap \mathcal{R}(\omega)) [\text{SHOOT}(w)]$

That is, we predict (55) to be true of SoA ω iff exactly one of the following is true: either ω is an SoA in which the first test was a false positive, or it is one in which Laura's desires, restricted to $\mathcal{R}(\omega)$ -worlds, are such that you shoot her.

So how does this resolve the problem with Blumberg & Holguín's analysis? The trick is that for both of the analyses discussed in this section, the restriction of the attitude in the second disjunct will end up depending on the truth value of the first disjunct. That is, \mathcal{R} will come out looking roughly as follows:

$$(82) \quad \mathcal{R} \approx \lambda\omega. \begin{cases} \text{FALSE_POS if FALSE_POS}(\omega) \\ \neg\text{FALSE_POS if } \neg\text{FALSE_POS}(\omega) \end{cases}$$

Now let us imagine an SoA ω_α in which Laura wants to be shot if and only if the test is not a false positive. That is, the biconditional expressed by the sentences in (56) is true of ω_α . As desired, the analysis at hand predicts (55) to also be true in ω_α , regardless of whether the test itself is in fact a false positive in ω_α .

First, suppose that $\text{FALSE_POS}(\omega_\alpha)$ happens to be true, i.e., ω_α happens to be an SoA in which the test is a false positive. In this case, because of how \mathcal{R} is defined in (75), the predicted truth value is as below. Note that as per (82), the attitude restriction is resolved to FALSE_POS because $\text{FALSE_POS}(\omega_\alpha)$:

$$(83) \quad \text{Predicted truth value if } \text{FALSE_POS}(\omega_\alpha) \text{ is true:} \\ \text{FALSE_POS}(\omega_\alpha) \vee \forall w \in \text{BEST}_{\text{laura}, \omega_\alpha} (\text{Dox}_{\text{laura}, \omega_\alpha} \cap \text{FALSE_POS}) [\text{SHOOT}(w)]$$

The first disjunct is true, meaning that in order for the sentence as a whole to be true the second disjunct must come out as false. Luckily, this is the case. The second disjunct is true iff Laura's desires, restricted to SoAs in which the test is a false positive, are such that you shoot her. But this is not the case: it is only if the test is *not* a false positive that Laura wants you to shoot her. Thus, we rightly predict the sentence to be true in this scenario.

Now let us suppose instead that $\text{FALSE_POS}(\omega_\alpha)$ happens to be false: the test is not a false positive. In this case, the predicted truth value will be as shown below. Note again that since in this case $\text{FALSE_POS}(\omega_\alpha)$ is false, the attitude restriction is resolved to $\neg\text{FALSE_POS}$ due to the definition of \mathcal{R} in (82):

$$(84) \quad \text{Predicted truth value if } \text{FALSE_POS}(\omega_\alpha) \text{ is false:} \\ \text{FALSE_POS}(\omega_\alpha) \vee \forall w \in \text{BEST}_{\text{laura}, \omega_\alpha} (\text{Dox}_{\text{laura}, \omega_\alpha} \cap \neg\text{FALSE_POS}) [\text{SHOOT}(w)]$$

Since the first disjunct is false, the truth value as a whole will be true iff the second disjunct is true. And it is: Laura's desires, when restricted to SoAs in which the test is not a false positive, are indeed such that you shoot her. We thus rightly predict that if Laura's desires are such that the two claims in (56) are true, then the exclusive attitude disjunction in (55) is true, *regardless of whether the test is in fact a false positive*. We thus avoid the problem of mind-externalness faced by Blumberg & Holguín's account: whether or not the test happens to actually be a false positive will not get in the way of (55) being true if Laura is of the right bouletic disposition.

The last step, then, is to show how we come to actually *infer* the biconditional from (55). After all, up to this point all we have shown is that we predict (55) to be true if the biconditional is true; we have not shown that such a state of affairs is required on the relevant interpretation. Luckily, this is relatively straightforward given some basic pragmatic assumptions. First, utterances of disjunctions—exclusive or otherwise—typically come with an *ignorance implicature*. That is, an utterance by x of Φ or Ψ comes with an implicature that x does not know which of Φ or Ψ is true. So for our attitude disjunction, Laura’s utterance of (55) generates an implicature that Laura does not know whether the test is a false positive. If this is the case, then in order for her to be able to assert (55) with an appropriate degree of confidence, she must know that the sentence as a whole will be true regardless of whether the individual disjunct FALSE_POS is true. But in order for that to be the case, the second disjunct in (83) must be false, and the second disjunct in (84) must be true.¹⁴ That is, in order for Laura to be able to confidently assert (55) without knowing if the test is a false positive, it must be that (I) her desires when restricted to FALSE_POS SoAs do *not* entail that she be shot, and (II) her desires when restricted to \neg FALSE_POS SoAs *do* entail that she be shot. This is precisely the biconditional interpretation, and so we rightly predict that an utterance of (55) gives rise to a biconditional interpretation.

Before turning to the two specific instantiations of the account offered in this section, one more note is required. The biconditional interpretation that is actually generated by (55) seems to be slightly stronger than what we have derived. More specifically, our analysis predicts an inference that Laura’s desires, when restricted to SoAs in which the test is a false positive, *do not entail* that she be shot. This is the negation of the second disjunct in (84), shown in (85a). This is fully compatible with Laura’s simply being indifferent about whether she is shot. Meanwhile, the actual interpretation seems to require that if the test is a false positive, then Laura actively wants you *not* to shoot her, as shown in (85b).

- (85) a. $\neg \forall w \in \text{BEST}_{\text{laura}, \omega_\alpha} (\text{Dox}_{\text{laura}, \omega_\alpha} \cap \neg \text{FALSE_POS}) [\text{SHOOT}(w)]$
b. $\forall w \in \text{BEST}_{\text{laura}, \omega_\alpha} (\text{Dox}_{\text{laura}, \omega_\alpha} \cap \neg \text{FALSE_POS}) [\neg \text{SHOOT}(w)]$

This seems to be a clear case of so-called *neg-raising*, the same phenomenon that leads to near-identical interpretations for (86a) and (86b):

- (86) a. I don’t want you to shoot me.
b. I want you not to shoot me.

We will not provide an analysis for neg-raising in this paper. We merely bring up the issue to point out a small gap between the truth-conditional predictions of our analysis

¹⁴ Technically, all that’s required is that the second disjunct of (83) be false *if* FALSE_POS is true, and the second disjunct of (84) be true *if* FALSE_POS is false. But if we make the reasonable assumption that Laura’s internal bouletic state does not depend on the state of the actual test, then we derive the stronger requirement seen in the main text.

and the actual empirical picture, as well as what appears to be a clear path forward in determining what accounts for that gap. We also leave open the potentially interesting issue of what exclusive attitude disjunctions might uniquely illustrate about how neg-raising works.

We have now fully gone over the basic premises shared between the two candidate analyses discussed in the next section, abstracting away from two important details that these alternatives must flesh out: namely, definitions for \mathcal{R} (the mechanism for attitude restriction) and \mathcal{M} (the modal operator in conditionals). We have also illustrated in loose terms how these analyses derive the desired truth conditions for attitude conditionals and attitude disjunctions, while avoiding the faults of prior analyses like those of Pasternak 2018 and Blumberg & Holguín 2019. Our next task is to illustrate our two proposals for how to put some flesh onto this skeletal analysis.

5 Two ways to implement the indirect restriction account

In this section we propose two ways of completing the partial analysis provided in the previous section, which left undecided the status of \mathcal{M} (the interpretation of MODAL) and \mathcal{R} (determining the attitude’s restriction in light of its about-SoA). The two analyses that we will put forward are (I) a **question-based account**, which builds on Blumberg & Lederman (2021)’s work on so-called *revisionist attitude reports*; and (II) a **situation-based account**. After introducing each analysis, we will show how it derives the desired truth conditions in the manner discussed in the previous section, as well as discussing any additional benefits or downsides to the approach at hand.

5.1 Analysis I: Question-based restriction

We start with the question-based approach to attitude restriction. For this analysis, we will not need the full ontological power of situations, and so we will simply treat all of our SoAs as worlds. Of course, this account is compatible with a situation-based ontology, but since it is not necessary it will be easier for us to just stick to worlds.

According to the question-based analysis, indirect attitude restriction occurs as follows: take some contextually salient question Q^c (where c is the context parameter), find the answer to Q^c in the about-world ($\text{ANS}(Q^c, w_a)$), and use this proposition to restrict the attitude. While there are many ways to instantiate this approach, we will go with a relatively simple one: a question is a partition over (some subdomain of) the domain of possible worlds, and for question Q and world w , $\text{ANS}(Q, w)$ is the $p \in Q$ such that $p(w)$ (cf. Hamblin 1973). This is far from the only way to skin this particular cat—all that’s really needed is some notion of a question and an algorithm for finding the answer to that question in a given world—but it is perhaps the simplest, and will thus make expounding the analysis easiest. We note that the question-based analysis es-

entially provides attitudes with an additional conversational background that serves to restrict the worlds that the attitude quantifies over to those that agree with the about-world as to the answer to a particular question. In other words, there is an admixture of circumstantial modality to the usual analysis of desire attitudes.^{15,16}

With this in mind, our definition for $\llbracket \text{want} \rrbracket$ on this approach, with an appropriate replacement for \mathcal{R} , is as follows:

(87) **Question-sensitive denotation for *want*:**

$$\llbracket \text{want} \rrbracket^{g,c} = \lambda p \lambda w_a \lambda x \lambda w_e. \forall w \in \text{BEST}_{x,w_e} (\text{Dox}_{x,w_e} \cap \text{ANS}(Q^c, w_a)) [p(w)]$$

Our next step is to define \mathcal{M} , i.e., $\llbracket \text{MODAL} \rrbracket$. Here our account is once again fairly agnostic, and so we will make our choice based on simplicity: we will assume that $\llbracket \text{MODAL} \rrbracket$ universally quantifies over maximally likely worlds. Thus, if $\text{ML}_w(p)$ is the set of maximally likely worlds from w in which p holds, our definition for $\llbracket \text{MODAL} \rrbracket$ will be as follows:

$$(88) \quad \llbracket \text{MODAL}_n \rrbracket^{g,c} = \lambda w \lambda p. \forall w' \in \text{ML}_w(g(n)) [p(w')]$$

Thus, a bare conditional like *if Φ , Ψ* is predicted to be true in w iff all of the maximally likely $\llbracket \Phi \rrbracket$ -worlds from w are $\llbracket \Psi \rrbracket$ -worlds.

Now let us see what happens when we replace \mathcal{R} and \mathcal{M} with these new definitions in our denotation for the attitude conditional *If Laura becomes a zombie, she wants you to shoot her*:

$$(89) \quad \llbracket \text{If Laura becomes a zombie, she wants you to shoot her} \rrbracket^{g,c} = \lambda w_e. \forall w \in \text{ML}_{w_e}(\text{ZOMBIE}) [\forall w' \in \text{BEST}_{\text{laura},w_e} (\text{Dox}_{\text{laura},w_e} \cap \text{ANS}(Q^c, w)) [\text{SHOOT}(w')]]$$

To simplify this denotation, we must determine what the contextual question Q^c is. There are many possibilities that will derive the correct interpretation, but perhaps the simplest would be something like the denotation of *Does Laura become a zombie?*. For any proposition p , let $p^?$ be $\{p, -p\}$, which roughly corresponds to the yes-no question *Is p true?*. Now suppose Q^c is *ZOMBIE?*. We are universally quantifying over worlds in $\text{ML}_{w_e}(\text{ZOMBIE})$, so for all worlds w in that domain, $\text{ANS}(\text{ZOMBIE?}, w) = \text{ZOMBIE}$. In other words, we are quantifying over worlds in which the answer to the question *Does Laura become a zombie?* is yes. This means we can simplify the denotation in (89) to (90):

$$(90) \quad \llbracket \text{If Laura becomes a zombie, she wants you to shoot her} \rrbracket^{g,c} = \lambda w_e. \forall w \in \text{ML}_{w_e}(\text{ZOMBIE}) [\forall w' \in \text{BEST}_{\text{laura},w_e} (\text{Dox}_{\text{laura},w_e} \cap \text{ZOMBIE}) [\text{SHOOT}(w')]]$$

¹⁵ It may be instructive to compare the move adopted here to the cases of mixed modal flavors investigated by Knobe & Szabó 2013.

¹⁶ We also note that Dorr & Hawthorne 2013 propose a similar modification of the semantics of epistemic modals that makes them sensitive to circumstances at the index of evaluation.

And as discussed in the previous section, after this simplification the quantification over worlds effected by MODAL is now vacuous, so this simplifies to (91), which is precisely the restricted reading we were hoping for:

$$(91) \quad \llbracket \text{If Laura becomes a zombie, she wants you to shoot her} \rrbracket^{g,c} = \\ \lambda w_e. \forall w \in \text{BEST}_{\text{laura}, w_e} (\text{DOX}_{\text{laura}, w_e} \cap \text{ZOMBIE}) [\text{SHOOT}(w)]$$

As discussed in the previous section, the predicted interpretation for the shifted attitude conditional *If Laura becomes a zombie, she will want you to shoot her* is as in (92): the only difference from (89) is that the evaluation world for the attitude will be the quantified-over hypothetical worlds, rather than the actual world.

$$(92) \quad \llbracket \text{If Laura becomes a zombie, she will want you to shoot her} \rrbracket^{g,c} = \\ \lambda w_e. \forall w \in \text{ML}_{w_e} (\text{ZOMBIE}) [\forall w' \in \text{BEST}_{\text{laura}, w} (\text{DOX}_{\text{laura}, w} \cap \text{ANS}(Q^c, w)) \\ [\text{SHOOT}(w')]]$$

And on our usual assumptions about zombies, no matter what the question Q^c is we expect the interpretation to be false: there is no way of restricting zombie-Laura's doxastic worlds—assuming zombie-Laura has beliefs in the first place—such that she wants you to shoot her.

This just leaves our exclusive attitude disjunction, which we predict to have the interpretation in (93):

$$(93) \quad \llbracket \text{Exactly one of these is true: EITHER that test is a false positive, OR I want you to shoot me} \rrbracket^{g,c} = \\ \lambda w_e. \text{FALSE_POS}(w_e) \vee \\ \forall w \in \text{BEST}_{\text{laura}, w_e} (\text{DOX}_{\text{laura}, w_e} \cap \text{ANS}(Q^c, w_e)) [\text{SHOOT}(w)]$$

Now suppose that $Q^c = \text{FALSE_POS?}$. In this case, we have exactly the scenario described in the previous section for exclusive attitude disjunction. If the first disjunct is true in the evaluation world w_e , then $\text{ANS}(\text{FALSE_POS?}, w_e) = \text{FALSE_POS}$, and so the second disjunct is false since Laura's desires when restrict to FALSE_POS -worlds are not such that she be shot. And if the first disjunct is false, then $\text{ANS}(\text{FALSE_POS?}, w_e) = \neg \text{FALSE_POS}$, and we predict the second disjunct to be true: Laura's desires, restricted to $\neg \text{FALSE_POS}$ -worlds, are indeed such that you shoot her. We thus derive precisely the truth conditions anticipated in the previous section, and therefore predict the appropriate biconditional interpretation.

We thus see that a question-based account of indirect attitude restriction derives the desired truth conditions for restricted attitude conditionals, shifted attitude conditionals, and attitude disjunctions. There is an additional benefit to this analysis: namely, it is an extension of [Blumberg & Lederman 2021](#)'s account of *revisionist attitude reports* like their (94), inspired by [Pryor 2004](#):

Context: A music professor says to a dark, crowded auditorium: 'I want all the doctors here tonight to clap on the third beat...' My sister Dorothy, who is a doctor, and

her husband were listening to their iPods. The husband unplugs his earphones and asks, 'What's going on?' I say:

- (94) He wants Dorothy to clap on the third beat.

The point here is that the professor does not know that Dorothy is both present and a doctor, so without any restriction on the attitude (94) should be false. But nonetheless there is a reading of (94) that is true and completely acceptable in the context provided. To account for such revisionist attitude reports, Blumberg & Lederman propose precisely the same mechanism we are using in this account of indirect attitude restriction: the attitude is restricted by the true answer to a contextually supplied question.¹⁷ That is, if DOR_DOC_PRES is the proposition true iff Dorothy is a present doctor, then for (94) we derive the interpretation in (95):

- (95) $\lambda w_e. \forall w \in \text{BEST}_{\text{prof}, w_e} (\text{DOX}_{\text{prof}, w_e} \cap \text{ANS}(\text{DOR_DOC_PRES?}, w_e)) [\text{DOR_CLAP}(w)]$

Since $\text{ANS}(\text{DOR_DOC_PRES?}, w_e)$ is true—Dorothy is a present doctor in w_e —the predicted truth conditions are true iff among the professor's belief worlds in which Dorothy is a present doctor, all of his favored ones are such that she clap on the third beat.

In fact, one can even devise examples in which an attitude in an attitude conditional is further restricted through revisionist reporting. Consider the following example:

Context: The department chair wishes to pursue a more aggressive anti-cheating policy, so she has asked the faculty to report any student misconduct. Prof. Johnston has scheduled his exam, and (unbeknownst to the chair) has decided that the students are not allowed to collaborate on it. He tells his TA:

- (96) If any students work together on the exam, the chair wants us to file a report.

There is a reading of (96) that is true in the context provided. But notice that if the chair's belief-worlds are only restricted by the antecedent of the conditional, we do not predict truth: since the chair does not know if students are allowed to work together, it is not the case that all of her ideal belief worlds in which students collaborate are such that a report is filed. Instead, her belief-worlds need to be further restricted to those in which collaboration has been disallowed. Once this is done we predict the desired result: among the chair's belief worlds in which students work together on the exam *and collaboration has been disallowed*, all of her favorite ones are such that a report is filed.

There are many ways of accomplishing this in the analysis provided, but here is one we find particularly compelling. Let COLLAB be the proposition true iff students collaborate, and let BANNED be the proposition true iff collaboration has been disallowed. Thus,

¹⁷ Blumberg & Lederman's motivations for using the answer to a contextually-determined question, rather than simply a contextually-determined proposition, involve more complex embedded examples that are beyond the scope of this paper. But it is worth noting that their argumentation is in many respects the same as our argument from exclusive disjunction: the restriction of the attitude must be able to change depending on what holds in the about-world.

COLLAB? and BANNED? are two distinct partitions over the domain of possible worlds, But we can easily define a way to combine these into a single 2×2 partition:

- (97) If Q_1 and Q_2 are partitions of the same domain D of worlds, let
 $Q_1 \mid Q_2 := \{p \cap q \mid p \in Q_1 \wedge q \in Q_2\}$

Given this definition, $\text{BANNED?} \mid \text{COLLAB?}$ will divide the domain of possible worlds into four regions. One region will contain worlds in which collaboration is banned but occurs ($\text{BANNED} \cap \text{COLLAB}$). Another will contain worlds in which collaboration is banned and does not occur ($\text{BANNED} \cap (\neg \text{COLLAB})$). Yet another will contain worlds in which collaboration is allowed, and occurs ($(\neg \text{BANNED}) \cap \text{COLLAB}$). And the last one will contain worlds in which collaboration is allowed, but does not occur ($(\neg \text{BANNED}) \cap (\neg \text{COLLAB})$).

With this in mind, consider the proposed denotation for (96) seen in (98):

- (98) $\lambda w_e. \forall w \in \text{ML}_{w_e}(\text{COLLAB})[$
 $\forall w' \in \text{BEST}_{\text{chair}, w_e}(\text{DOX}_{\text{chair}, w_e} \cap \text{ANS}(Q^c, w))[\text{REPORT}(w')]]$

Now suppose that Q^c is in fact $\text{BANNED?} \mid \text{COLLAB?}$. In all of the maximally likely worlds in which collaboration occurs, COLLAB is of course true. Moreover, since in the context it is established that collaboration has been disallowed, all of the maximally likely COLLAB -worlds are such that BANNED is also true. Thus, in all of the worlds w quantified over by MODAL , $\text{ANS}(Q^c, w) = \text{BANNED} \cap \text{COLLAB}$, and so this will be the attitude's restriction. After simplification, including removing the now-vacuous world-quantification, we end up with (99), which is appropriately true: among those belief worlds of the chair's in which collaboration has been disallowed and has occurred, her favored ones are all such that a report is filed.

- (99) $\forall w \in \text{BEST}_{\text{chair}, w_e}(\text{DOX}_{\text{chair}, w_e} \cap \text{BANNED} \cap \text{COLLAB})[\text{REPORT}(w)]$

We thus see that a question-based analysis of indirect restriction allows for a potentially unified account of attitude conditionals, attitude disjunctions, and revisionist attitude reports. Of course, it is entirely within the realm of reason that there should be two distinct mechanisms for attitude restriction, and that examples like (96) simply illustrate cases where both mechanisms are simultaneously at work. But we take it for granted that all else being equal, a unified account is to be preferred over one that posits two separate attitude restriction mechanisms that happen to work in deeply similar ways.

Another advantage of a question-based account is that completely unrestricted readings are quite easy to derive by means of vacuous restriction. If \top is the proposition true in all worlds, then for all worlds w , $\text{ANS}(\top?, w) = \top$, meaning that if Q^c is ever $\top?$ then the attitude restriction will be vacuous. Thus, examples like (66) can easily be accounted for without any changes needed to the account at hand: simply put, in some cases the question used for determining the attitude restriction is $\top?$ or something similarly vacuous, and in other cases it is a question whose answer is more contentful.

However, a potential disadvantage to this approach is that it is fairly loose: we have not put any constraints on what kinds of questions can be used to generate attitude restrictions. Blumberg & Lederman 2021 note that this has the potential to raise problems when it comes to revisionist attitude reports. For example, they note that there is a contrast between examples like (100a) and (100b) below (based on the *Tennis* example made famous by Fauconnier 1985):

Context: Grandmaster Caruana believes that anyone can become a chess grandmaster if they start studying before the age of seven. Lisa is a six-year-old child who recently started taking chess lessons. Caruana has never met or heard of Lisa.

- (100) a. Caruana thinks that Lisa can become a grandmaster.
b. # Caruana thinks that Lisa is six years old.

In both (100a) and (100b), it seems like the attitude restriction involved would be to worlds in which Lisa exists and is six years old. And yet while (100a) is fine, (100b) is false or odd. To account for examples like (100b), Blumberg & Lederman propose some pragmatic constraints on the types of questions that can be used to restrict the attitude's world-quantification. Presumably similar constraints would need to be extended to our account, perhaps in addition to new constraints in light of the new uses to which we put their machinery. We leave for future work the task of defining these restrictions, as well as determining whether they can be well-motivated enough to retain a question-based analysis, or whether they are stipulative in a way that suggests an alternative account, such as the situation-based account to which we now turn.

5.2 Analysis 2: Situation-based restriction

An alternative to deriving the attitude restriction by means of question-answering in the about-world involves using a more fine-grained ontology of *situations*, which we take to simply be partial worlds. A situation-based account of attitude restriction would go roughly as follows: if the about-situation is some situation s_a , then the world-quantification of the attitude is restricted to worlds containing situations that are indistinguishable from s_a . Note that this really defines a space of hypotheses rather than a singular hypothesis, as there are at least two dimensions along which such theories might vary. The first is in the degree of similarity required: how similar does a situation have to be to count as indistinguishable from s_a ? The second is in the standards of similarity: what features of a pair of situations matter in determining how similar they are? And how objective is this determination: do we care about how objectively similar two situations are, or do we only care if they are indistinguishable as far as the attitude experiencer is concerned? Moreover, it is entirely conceivable that either or both of these factors can vary depending on context, or even depending on the particular choice of attitude verb, further complicating matters.

Since we need to make a choice in order to illustrate the proposal at hand, we will go with what we take to be the simplest option: given an about-situation s_a , an attitude's world-quantification will be restricted to worlds containing situations that are *objectively, spatiotemporally identical* to s_a . This is illustrated in the definition for $\llbracket \text{want} \rrbracket$ seen below; notice that we have switched to situations for both the evaluation argument s_e and the aboutness argument s_a .

(101) **Situation-sensitive denotation for *want*:**

$$\llbracket \text{want} \rrbracket = \lambda p \lambda s_a \lambda x \lambda s_e. \forall w \in \text{BEST}_{x, s_e} (\text{Dox}_{x, s_e} \cap \langle s_a \rangle) [p(w)],$$

where $\langle s_a \rangle$ is the set of worlds containing situations that are identical to s_a

We thus have our \mathcal{R} for our situation-based account; all we need now is our definition of $\llbracket \text{MODAL} \rrbracket$, i.e., \mathcal{M} . Here we will follow much of the situation-semantic literature and make use of *minimal situations*. Given a proposition p and situation s , s is a *minimal p -situation* roughly if s is a p -situation that does not have any p -situations as proper parts. In reality, determining minimal p -situations is significantly more complex—see Kratzer 1989, 2021 for substantial discussion—but our simplistic approach will do for our purposes.¹⁸ With this in mind, we take $\llbracket \text{MODAL} \rrbracket$ to be defined as follows: given antecedent p and consequent q , every maximally likely minimal p -situation expands into (i.e., is contained in) a q -situation. This is fleshed out in more detail below:

$$(102) \quad \llbracket \text{MODAL}_n \rrbracket^{g, c} = \lambda s \lambda p. \forall s' \in \text{MLMS}_s(g(n)) [\exists s'' [s' \sqsubseteq s'' \wedge q(s'')]],$$

where $\text{MLMS}_s(p)$ is the set of maximally likely (from the vantage point of s) minimal p -situations, and $s_1 \sqsubseteq s_2$ iff s_1 is a (possibly improper) part of s_2 .

Therefore, on a situation-based analysis an attitude conditional like *If Laura becomes a zombie, she wants you to shoot her* is predicted to have the following interpretation:

$$(103) \quad \llbracket \text{If Laura becomes a zombie, she wants you to shoot her} \rrbracket^{g, c} = \\ \lambda s_e. \forall s \in \text{MLMS}_{s_e}(\text{ZOMBIE}) [\exists s' [s \sqsubseteq s' \wedge \\ \forall w \in \text{BEST}_{\text{laura}, s_e} (\text{Dox}_{\text{laura}, s_e} \cap \langle s' \rangle) [\text{SHOOT}(w)]]]$$

That is, we predict truth iff every maximally likely minimal ZOMBIE-situation s expands into a situation s' , such that among Laura's belief worlds containing situations identical to s' , all of her ideal ones are such that you shoot her. Now consider some arbitrary minimal ZOMBIE-situation s . Naturally, every world containing a situation that is spatiotemporally identical to s is a world in which ZOMBIE is true. That is, $\langle s \rangle \subseteq \text{ZOMBIE}$. Thus, when restricting Laura's beliefs to $\langle s \rangle$ -worlds, one is restricting her beliefs at least

¹⁸ Notice that it is entirely plausible for there to be multiple minimal p -situations in a given world: if Sarah buys a car multiple times in a given world, then there are simply multiple minimal Sarah-car-buying situations in that world.

to ZOMBIE-worlds.¹⁹ So it is indeed the case that Laura's desires, when restricted to $\langle s \rangle$ -worlds, are such that you shoot her. And since every situation (improperly) contains itself, we know that there is a situation that contains s and is such that Laura's desires about that situation are that you shoot her: namely, s itself. And since we showed this for arbitrary minimal ZOMBIE-situation s , we know that this is the case for all maximally likely minimal ZOMBIE-situations, and thus, we rightly predict (103) to be true.

Meanwhile, we predict the corresponding shifted attitude conditional *If Laura becomes a zombie, she will want you to shoot her* to have the following interpretation:

$$(104) \quad \llbracket \text{If Laura becomes a zombie, she will want you to shoot her} \rrbracket^{g,c} = \\ \lambda s_e. \forall s \in \text{MLMS}_{s_e}(\text{ZOMBIE}) [\exists s' [s \sqsubseteq s' \wedge \\ \forall w \in \text{BEST}_{\text{laura}, s'} (\text{Dox}_{\text{laura}, s'} \cap \langle s' \rangle) [\text{SHOOT}(w)]]]$$

Once again, the only difference between this and the restricted attitude conditional is in the situation of evaluation for *want*: now it is the hypothetical expanded ZOMBIE-situation s' , rather than the actual topic situation s_e . Thus, we once again rightly determine (104) to be false.

Finally, there is the attitude disjunction. We derive the following interpretation for our exclusive attitude disjunction:

$$(105) \quad \llbracket \text{Exactly one of these is true: EITHER that test is a false positive, OR I want you to shoot me} \rrbracket^{g,c} = \\ \lambda s_e. \text{FALSE_POS}(s_e) \vee \\ \forall w \in \text{BEST}_{\text{laura}, s_e} (\text{Dox}_{\text{laura}, s_e} \cap \langle s_e \rangle) [\text{SHOOT}(w)]$$

Now consider a situation s_e that contains at least Laura, her initial (positive) test, and her current bodily state. Thus, this situation contains enough information that if the test is a false positive, then it is a false positive in all worlds containing situations spatiotemporally identical to s_e , and if it is not a false positive, then it is also not a false positive in all worlds containing situations spatiotemporally identical to s_e . In other words, s_e can be said to *fully determine* whether the test is a false positive in its world.

First, suppose that the test is in fact a false positive in s_e . In this case, the first disjunct is true. Meanwhile, all of the worlds in $\langle s_e \rangle$ are such that the test is a false positive, and so Laura's desires in the second disjunct will be restricted to worlds in which the test is a false positive; thus the second disjunct is false and the exclusive disjunction as a whole

¹⁹ One might wonder how much *additional* restricting on top of ZOMBIE is accomplished by restricting to $\langle s \rangle$. Or put differently, how much information is contained in a minimal ZOMBIE-situation beyond Laura simply becoming a zombie? For example, is the color of Laura's socks a part of a minimal situation of her becoming a zombie? What about the color of her toes, or the state of each neuron in her brain? While one's answer to these questions depends on one's ontology of situations, we think it fair to claim that whatever one takes to be a minimal ZOMBIE-situation, it would not contain any information that would fundamentally alter the predicted truth conditions for the attitude conditionals at hand.

is true. And if the test is not a false positive in s_e , then the first disjunct is false. But the attitude in the second disjunct will be restricted to worlds in which the test is not a false positive, since every world containing a situation spatiotemporally identical to s_e will be one in which the test is not a false positive. Thus, the second disjunct is true—Laura’s desires, restricted to worlds in which the test is not a false positive, are indeed such that you shoot her—and we again predict the sentence as a whole to be true. We therefore once again correctly derive the biconditional reading, just like in the templatic analysis in the previous section and the question-based analysis from earlier in this section.

We thus see that a situation-based approach can also derive the right results for restricted attitude conditionals, shifted attitude conditionals, and attitude disjunctions. A natural follow-up question, given the comparison with the question-based approach discussed earlier in this section, is whether this situation-based approach can also handle revisionist attitude reports. By all appearances, it can. We will illustrate with (96) from before, which as we saw above was a combination of an attitude conditional with a revisionist attitude report. On the situation-based approach, (96) will have the interpretation seen in (106):

$$(106) \quad \lambda s_e. \forall s \in \text{MLMS}_{s_e}(\text{COLLAB}) [\exists s' [s \sqsubseteq s' \wedge \\ \forall w \in \text{BEST}_{\text{chair}, s_e}(\text{DOX}_{\text{chair}, s_e} \cap \langle s' \rangle) [\text{REPORT}(w)]]]$$

Now consider a given maximally likely minimal COLLAB-situation s . The context establishes that collaboration has been disallowed (i.e., BANNED is true). Thus, any maximally likely minimal COLLAB-situation s will be contained within a larger situation s' in which collaboration has occurred *and been disallowed*; s' might, for example, include the course syllabus with the anti-collaboration clause, or the slice of spacetime in which the professor informs his students that collaboration is forbidden, etc. Therefore, every world in $\langle s' \rangle$ is a $\text{COLLAB} \cap \text{BANNED}$ world, so the chair’s desires, when restricted to $\langle s' \rangle$ -worlds, are in fact such that a report is filed. We thus rightly predict truth, since every maximally likely minimal COLLAB-situation is contained in a situation about which the chair wants a report to be filed. It therefore seems that a situation-based approach has the potential to do just as well as a question-based approach when it comes to unifying accounts of restricted attitude conditionals, shifted attitude conditionals, attitude disjunctions, and revisionist attitude reports.

An apparent advantage of a situation-based approach is that it does not seem to throw as much into the pragmatic wastebasket as does the question-based analysis: we derive the right truth conditions for restricted attitude conditionals (including those with revisionist attitudes), shifted attitude conditionals, and attitude disjunctions without requiring stipulations like determining what question to evaluate in the about-world. However, it is worth noting that a situation-semantic account is not free from its own necessary stipulations. Consider (100) again. On a situation-based account, presumably we capture the truth of (100a) by making the about-situation include Lisa’s age and chess

experience; this will then restrict Caruana’s belief-worlds to worlds containing identical situations, i.e., worlds in which Lisa is six and has started taking chess lessons. But why can this not be done for (100b)? In other words, the same questions arise about licit versus illicit restrictions for a situation-based approach to attitude restriction as for a question-based approach to attitude restriction. Moreover, as was already discussed above there are many points of potential variation in this analysis with respect to determining which pairs of situations are “indistinguishable”, and it is possible that the same results do not apply across all contexts or across all attitude verbs. We thus believe that it is far too early to call the match in favor of a situation-semantic approach, though it does look to be an interesting and promising alternative to a question-based analysis.

5.3 Summary

In this section, we have seen two possibilities for how to fill in the gaps for the skeletal analysis introduced in the previous section. On one approach, building on [Blumberg & Lederman 2021](#)’s analysis of revisionist attitude reports, we find the answer to a contextually salient question in the about-world, and this proposition is used to restrict the attitude’s world quantification. On the other approach, the about-argument is a situation, and the attitude is restricted to possible worlds containing situations that are in some sense indistinguishable from the about-situation. We have also explored some of the advantages and drawbacks to both of these approaches: both seem to be promising ways of accounting for revisionist attitude reports, but each also requires certain undesirable stipulations as things currently stand. We find both of these analyses promising, and are hopeful that future work will help determine whether one of these approaches is more empirically or explanatorily adequate than the other, or whether some third alternative might be able to beat them both.

6 Outlook and conclusion

6.1 Are other conditionals indirect restrictions too?

Before wrapping up, it is worth briefly discussing what our analysis of attitude conditionals might tell us about non-attitude conditionals like (8):

- (8) If Laura becomes a zombie, you must shoot her.

Up to this point we have followed [Kratzer \(1981, 1991a,b, 2012\)](#) in supposing that for deontic conditionals like (8), the *if*-clause really does directly restrict the world-quantification of the modal *must*, in contrast to the indirect restriction of shifted attitude conditionals. However, our analysis of attitude conditionals invites another possibility: namely, that conditionals with modals (and other operators that can be restricted by *if*-clauses) also involve indirect restrictions. That is, if modals can be thought of as having the same kind

of aboutness as attitudes, (8) may have an LF more along the lines of Fig. 3, generating a reading of (8) pertaining to actual obligations about hypothetical SoAs.

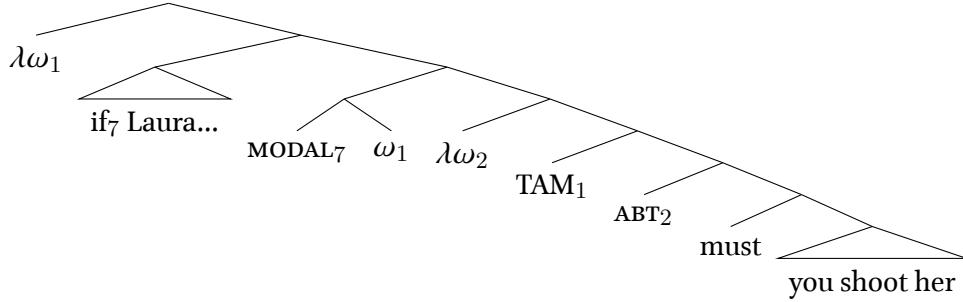


Figure 3 Potential indirect restriction LF structure for (8).

In fact, if other conditionals involve indirect restriction and the only operator that *if* directly restricts is the covert modal MODAL , then there is no longer any need to posit the existence of MODAL in the first place, and its semantic role can be shifted to *if*. That is, if we adopt the situation approach then *if* can be assigned the interpretation in (107):

$$(107) \quad \llbracket \text{if} \rrbracket = \lambda s \lambda p \lambda q. \forall w \in \text{ML}_s(p) [\exists s' [\text{MINSIT}(p, w) \sqsubseteq s' \wedge q(s')]]$$

This definition loads the work of MODAL onto *if*, thereby allowing a simplification of the LF in Fig. 3 to that in Fig. 4, with an identical interpretation. The same reallocation of semantic work could be done for all of the conditionals discussed in this paper.

One benefit of such an approach is that it would allow for a unified treatment of attitude conditionals and other conditionals: much like how Pasternak's (2018) analysis reduces both modal and attitude conditionals to direct quantificational restriction by *if*-clauses, this new approach would reduce both to indirect restriction through non-actual

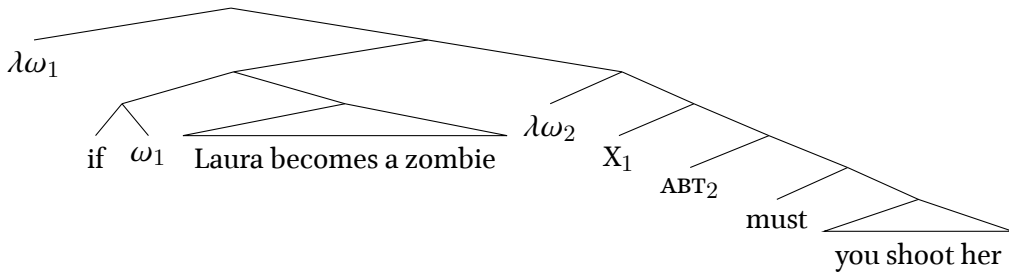


Figure 4 Alternate indirect restriction LF structure for (8), with *if* providing world-quantification.

about-SoAs. Moreover, modal conditionals are known to exhibit a semantic contrast that bears a striking resemblance to the distinction between restricted and shifted attitude conditionals, exemplified in (108) (see Frank 1996, Geurts 2004 among others):

(108) Geurts 2004: p. 1:

- a. If Beryl is smoking marijuana, we have to report her to the police.
- b. If smoking marijuana is illegal in this country, we have to report Beryl to the police.

(108a) looks like a regular deontic conditional: on a Kratzerian account, it is true iff in all of the deontically best worlds in which Beryl is smoking marijuana, we report her to the police. But (108b) is slightly different, since the antecedent does not pertain to the circumstances of whether Beryl is smoking marijuana, but rather to what the laws actually are for this country. In other words, in (108a) the laws that inform the truth of the deontic claim are taken for granted, while in (108b) it is precisely the nature of these deontic rules that is called into question in the first place. This latter reading is also the most salient reading of the counterfactual (109):

(109) Frank 1996: p. 31:

If Luther hadn't brought about the Reformation, we would still have to pay indulgences.

(109) is clearly a claim about what our obligations would be not only if circumstances were different, but if the laws informing deontic modality were themselves different.

This distinction in interpretations could be captured on our account by framing the contrast between restricted and shifted modal conditionals in a manner similar to the contrast between restricted and shifted attitude conditionals. Restricted deontic conditionals like (8) and (108a) would be interpreted analogously to restricted attitude conditionals: they are claims pertaining to actual obligations about hypothetical SoAs. Meanwhile, shifted deontic conditionals—that is, deontic conditionals pertaining to obligations if the laws were potentially different from how they actually are, such as (108b) and (109)—would be analogous to shifted attitude conditionals: they pertain to non-actual obligations about non-actual SoAs. That being said, while we think that an indirect restriction account of non-attitude conditionals is an interesting and promising route to pursue, we must set aside for future work the task of determining whether it has any meaningful empirical advantages (or disadvantages) when compared with a traditional account in which *if*-clauses directly restrict modal and other operators.

6.2 Conclusion

In this paper, we have argued against three types of analysis of restricted readings of attitudes that have been put forward in the literature: the embedded conditional analysis,

the direct restriction analysis (Pasternak 2018), and Blumberg & Holguín's (2019) indirect restriction analysis. Our evidence included strange truth-conditional predictions for embedded conditional accounts, data pertaining to donkey anaphora and scope that were problematic for both embedded conditional and direct restriction accounts, and examples with exclusive disjunctions that were troublesome for Blumberg & Holguín's (2019) analysis. We have sought to resolve the problems faced by these theories by introducing a novel account in terms of aboutness: shifted readings of attitudes in conditional environments involve the ascription of actual attitudes about non-actual states of affairs. We then showed two ways in which this broad analysis might be given a more concrete formulation, either via questions (cf. Blumberg & Lederman 2021) or situations. Our proposal also poses wide-ranging questions about the compositional semantics of conditionals as a broader class, and more specifically, whether all cases of *if*-clause restriction are in fact instances of indirect restriction.

Along the way, we have tried to point toward issues that ought to be addressed in future work. For example, we have posited that heads in the domain of tense, aspect, and mood are responsible for fixing the evaluation SoA of an attitude, based on morphosyntactic evidence. However, we have more or less stipulated the actual compositional means by which this was accomplished. We thus believe that future work ought to find a more satisfactory way of deriving this connection between conditional morphosyntax and actual or hypothetical evaluation SoAs. In addition, both of the concrete formulations in the previous section raised their own issues: for example, how does one devise coherent and insightful principles that prevent the misuse of contextually-determined questions or about-situations to generate non-existent restricted readings? These seem to us to be important issues whose exploration promises to furnish deep insights into the nature of attitude semantics, and semantic composition more generally.

References

- Barwise, Jon & John Perry. 1983. *Situations and attitudes*. Cambridge, MA: MIT Press.
- Blumberg, Kyle & Ben Holguín. 2019. Embedded attitudes. *Journal of Semantics* 36(3). 377–406.
- Blumberg, Kyle & Harvey Lederman. 2021. Revisionist reporting. *Philosophical Studies* 178(3). 755–783. <https://doi.org/10.1007/s11098-020-01457-4>.
- Broome, John. 1999. Normative requirements. *Ratio* 12(4). 398–419. <https://doi.org/10.1111/1467-9329.00101>.
- Crnič, Luka. 2011. *Getting even*. Cambridge, MA: MIT dissertation.
- Dorr, Cian & John Hawthorne. 2013. Embedding epistemic modals. *Mind* 122(488). 867–913. <https://doi.org/10.1093/mind/fzt091>.
- Drucker, Daniel. 2019. Policy externalism. *Philosophy and Phenomenological Research* 98(2). 261–285.

- Fauconnier, Gilles. 1985. *Mental spaces: Aspects of meaning construction in natural language*. Cambridge University Press.
- von Fintel, Kai. 1994. *Restrictions on quantifier domains*. Amherst, MA: University of Massachusetts Amherst dissertation.
- von Fintel, Kai. 1999. NPI licensing, Strawson entailment, and context dependency. *Journal of Semantics* 16(2). 97–148.
- Frank, Anette. 1996. *Context dependence in modal constructions*. Stuttgart: Universität Stuttgart dissertation.
- Geurts, Bart. 2004. *On an ambiguity in quantified conditionals*. University of Nijmegen, Ms.
- Goble, Lou. 1996. Utilitarian deontic logic. *Philosophical Studies* 82(3). 317–357.
- Grice, Paul. 1967. Logic and conversation. Lecture Notes for William James lectures at Harvard University, published in slightly revised form in Grice 1989, pp. 1–143.
- Grice, Paul. 1989. *Studies in the way of words*. Cambridge, MA: Harvard University Press.
- Hamblin, C. L. 1973. Questions in Montague English. *Foundations of Language* 10(1). 41–53.
- Heim, Irene. 1982. *The semantics of definite and indefinite noun phrases*. Amherst, MA: University of Massachusetts Amherst dissertation.
- Heim, Irene. 1992. Presupposition projection and the semantics of attitude verbs. *Journal of Semantics* 9(3). 183–221.
- Hintikka, Jaakko. 1969. Semantics for propositional attitudes. In *Models for modalities*, 87–111. Dordrecht: Reidel.
- Jerzak, Ethan. 2019. Two ways to want? *Journal of Philosophy* 116(2). 65–98. <https://doi.org/10.5840/jphil201911624>.
- Klinedinst, Nathan & Daniel Rothschild. 2012. Connectives without truth tables. *Natural Language Semantics* 20(2). 137–175.
- Knobe, Joshua & Zoltán Gendler Szabó. 2013. Modals with a taste of the deontic. *Semantics and Pragmatics* 6(1). <https://doi.org/10.3765/sp.6.1>.
- Kratzer, Angelika. 1981. The notional category of modality. In H.J. Eikmeyer & H. Rieser (eds.), *Words, worlds, and contexts: New approaches in word semantics*, 38–74. Berlin: de Gruyter.
- Kratzer, Angelika. 1989. An investigation of the lumps of thought. *Linguistics and Philosophy* 12(5). 607–653.
- Kratzer, Angelika. 1991a. Conditionals. In Arnim von Stechow & Dieter Wunderlich (eds.), *Semantik/Semantics: An international handbook of contemporary research*, 651–656. Berlin: de Gruyter.
- Kratzer, Angelika. 1991b. Modality. In Arnim von Stechow & Dieter Wunderlich (eds.), *Semantik/Semantics: An international handbook of contemporary research*, 639–650. Berlin: de Gruyter.

- Kratzer, Angelika. 2002. Facts: Particulars or information units? *Linguistics and Philosophy* 25(5/6). 655–670.
- Kratzer, Angelika. 2012. *Modals and conditionals: New and revised perspectives*. Oxford: Oxford University Press.
- Kratzer, Angelika. 2021. Situations in natural language semantics. In Edward N. Zalta (ed.), *The stanford encyclopedia of philosophy*, Winter 2021. Metaphysics Research Lab, Stanford University.
- Landman, Fred. 1998. Plurals and maximalization. In Susan Rothstein (ed.), *Events and grammar*, vol. 70 (Studies in Linguistics and Philosophy), 237–271. Dordrecht: Springer Netherlands. https://doi.org/10.1007/978-94-011-3969-4_10.
- Lassiter, Daniel. 2011. *Measurement and modality: The scalar basis of modal semantics*. New York, NY: New York University dissertation.
- Levinson, Dmitry. 2003. Probabilistic model-theoretic semantics for *want*. In *Semantics and linguistic theory (SALT)*, vol. 13, 222–239. Ithaca, NY: Cornell University.
- Lewis, David. 1975. Adverbs of quantification. In Edward L. Keenan (ed.), *Formal semantics of natural language*, 3–15. Cambridge: Cambridge University Press.
- Pasternak, Robert. 2018. *The mereology of attitudes*. Stony Brook, NY: Stony Brook University dissertation.
- Percus, Orin. 2000. Constraints on some other variables in syntax. *Natural Language Semantics* 8(3). 173–239.
- Phillips-Brown, Milo. 2018. I want to, but... In Robert Truswell, Chris Cummins, Caroline Heycock, Brian Rabern & Hannah Rohde (eds.), *Proceedings of Sinn und Bedeutung 21*, 951–968.
- Pryor, James. 2004. An epistemic theory of acquaintance. Handout from a talk given at the UCSB Conference on Content and Concepts. <http://www.jimpryor.net/research/papers/Acquaintance.pdf>.
- Roberts, Craige. 1987. *Modal subordination, anaphora, and distributivity*. Amherst, MA: University of Massachusetts Amherst dissertation.
- Roberts, Craige. 1989. Modal subordination and pronominal anaphora in discourse. *Linguistics and Philosophy* 12(6). 683–721.
- Stone, Matthew. 1997. *The anaphoric parallel between modality and tense*. University of Pennsylvania Department of Computer and Information Science Technical Report No. MS-CIS-97-09.
- Villalta, Elisabeth. 2008. Mood and gradability: An investigation of the subjunctive mood in Spanish. *Linguistics and Philosophy* 31(4). 467–522.
- Yablo, Stephen. 2014. *Aboutness*. Princeton University Press. <https://doi.org/10.1515/9781400845989>.

Attitudes, aboutness, and indirect restriction

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