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Being pragmatic about anankastic conditionals*

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Standard accounts of modals and conditionals fail to derive the correct meaning of anankastic conditionals like *If you want to go to Harlem, you have to take the A train*, which seems non-compositional: the modal in the consequent seems to be restricted by the embedded complement of *want* (you go to Harlem), rather than by the whole antecedent (you *want* to go to Harlem). This has led to proposals for a special semantics for *want* (Condoravdi & Lauer 2016) or a covert purpose clause associated with teleological (goal-oriented) modality (e.g., von Fintel & Iatridou 2005). In this paper, we show that the apparent non-compositionality of anankastic conditionals is more general. It is just one species of what we call *harmonizing readings*, which also occur with other attitude verbs and modal flavors. We offer a pragmatic account that generalizes across modal flavors and attitudes. We argue that harmonizing arises when the meaning of the antecedent together with background assumptions gives rise to a modal inference that matches in flavor with the consequent modal. Our account predicts when harmonizing is possible and when it isn't, without relying on lexical or syntactic idiosyncrasies.

1 Introduction

A speaker can use (1a) to convey that you getting to Harlem requires you taking the A train, just like (1b). On this *anankastic* reading of the conditional (von Wright 1963), it seems irrelevant whether you actually want to go to Harlem or not. The claim would be true even if your actual desires conflict with going to Harlem. This makes it difficult to derive the reading compositionally: we cannot just ignore *want* in the antecedent, and turn (1a) into (1b) literally.

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(1) a. If you want to go to Harlem, you have to take the A train. (Sæbø 2001)
b. If you go to Harlem, you have to take the A train.

Prevailing accounts derive anankastic readings by proposing either a special semantics for *want* (Condoravdi & Lauer 2016), or a special way of interpreting a conditional with a teleological (goal-based) modal (von Fintel & Iatridou 2005, von Stechow et al. 2006). These proposals, however, miss a generalization that we report here, and which, we argue, warrants a pragmatic solution to the problem.

We show that anankastic conditionals are an instance of a general pattern. For any number of attitude verbs, not just desire, and modal flavors *F*, not just teleological,[1] when the antecedent expresses *subject* ATTITUDE *p*, the consequent modal, Mod_F, may be interpreted as restricted to *p*-worlds. For example, (2a) can convey the deontic claim in (2b), and (3a) can convey the epistemic claim in (3b). We will use subscripts *T*, *D*, and *E* for teleological, deontic, and epistemic, respectively:

(2) a. If the Provost requests that grades be posted on Monday, Al must_D finish grading now.
b. If grades are to be posted on Monday, Al must_D finish grading now.

(3) a. If Sherlock Holmes thinks that the crime occurred at 6pm, Al must_E be the culprit.
b. If the crime occurred at 6pm, Al must_E be the culprit.

The generality of the pattern requires a broader explanation. Our account is based on an observation: the anankastic-like interpretation—which we will call *harmonizing*[2]—obtains only when antecedents of the form *Subject* ATTITUDE *p* warrants the defeasible inference that *Subject must/have to*$_F$ *p*, where the modal flavor *F* happens to match the flavor of the consequent modal. For instance, the attitude report *You want to go to Harlem* in (1a) warrants the teleological inference that *you have to*$_T$ *go to Harlem*; the attitude report *The Provost requests that grades be posted on Monday* in (2a) warrants the deontic inference that *grades must*$_D$ *be posted on Monday*; and the attitude report *Sherlock thinks*

[1] Modals in anankastic conditionals are taken to be teleological (von Fintel & Iatridou 2005). One might wonder whether they might be better classified as *bouletic*, thus as based not on goals, but on desires. However, the difference between teleological and bouletic modality is difficult to pin down. As Cariani (forthcoming) puts it, "the distinction between goals and desires is not sufficiently clear to ground anything of theoretical significance." We will thus follow the literature here, and label this type of goal/desire-based modality *teleological*.

[2] We use the term *harmonizing* to evoke the term *harmonic*, coined by Alonso-Ovalle & Menéndez-Benito (2018), to refer to modals that seem to inherit their domain anaphorically from a higher attitude or modal, by being *anchored* to their content (Hacquard 2006, Kratzer 2012). We use the term *harmonizing* rather than *harmonic*, since we don't assume that the domain of the consequent modal is inherited anaphorically from the attitude verb in the antecedent, but merely happens to match in flavor, as we will discuss in §4 and §5.

that the crime occurred at 6pm in (3a) warrants the epistemic inference that *the crime must*$_E$ *have occurred at 6pm*.

Our proposal will be pragmatic, and not semantic nor syntactic, unlike most previous accounts. We will show that this is necessary, given the highly context-sensitive nature of when harmonizing is possible. Indeed, whether a *harmonizing* reading is possible depends on whether the speaker can be assumed to take the attitude subject as a reliable authority in the relevant modality. For instance, if we replace the subject Sherlock Holmes in (3a) with his slow-witted acolyte, Watson, the harmonizing reading seems to disappear.

In a nutshell, we will argue that harmonizing arises from a pragmatic necessity inference derived from the meaning of the attitude report in the antecedent, together with uncontroversial background assumptions, whose modal flavor happens to match the flavor of the modal in the conditional's consequent. Because the modal in the necessity inference and the modal in the consequent happen to quantify over the same set of worlds when the meaning of the conditional is enriched with the modal inference, the consequent modal ends up quantifying over worlds in which the complement of the antecedent's attitude verb *p* holds. To illustrate, the desire report in (1a), *You want to go to Harlem*, invites the inference that *You have to*$_T$ *go to Harlem*. The teleological necessity modal in this inference matches in flavor with the consequent modal: both quantify over the same worlds, namely those compatible with your goals (in those worlds in which the antecedent holds). When the meaning of the conditional is enriched with the modal inference, we obtain that in all worlds compatible with your goals—those in which you want to go to Harlem—you do go to Harlem and you take the A train.

We begin this paper with a review of the problem and the main prior analyses, in §2. In §3 we show how the apparent non-compositionality problem of anankastic conditionals is more general, and can be replicated with attitude verbs beyond *want*, and modal flavors beyond teleological modality, though the availability of such readings is importantly constrained. In §4 we provide a pragmatic proposal based on our empirical generalization for when harmonizing readings are available and when they are not. In §5, we show that harmonizing is a truly pragmatic phenomenon by considering shortcomings with potential lexical, syntactic, or semantic alternatives. We discuss further related cases and potential counterexamples in §6, and conclude in §7.

2 The apparent non-compositionality of anankastic conditionals

Suppose that taking the A train is the only way to get to Harlem. This means-to-an-end relation can be reported using an *anankastic conditional* like (1a). Anankastic conditionals seem to express a relation between the *complement* of the attitude verb

want (e.g., you go to Harlem) and the prejacent of the necessity modal (e.g., you take the A train). Roughly speaking, (1a) conveys that you going to Harlem requires you taking the A train.

Note that not all conditionals of the form *if want p, then have to q* have the same means-to-an-end, anankastic reading, as noted by Hare (1968). The conditional in (4), for instance, intended as advice to a recovering alcoholic, does not mean that *drinking* requires you to think about your family, but rather that the *desire* to drink does, as a way to help you *not* drink.

(4) If you want to drink, you have to think about your family.

Classic accounts of modals and conditionals (e.g., Kratzer 1981, 1991) predict the right truth conditions for ordinary *want*-conditionals like (4). However, they predict that (1a) should be false in scenarios where you don't *actually* want to go to Harlem, or worse, you want to go somewhere that requires taking another train, contrary to intuitions.[3]

To see why, let's briefly consider a classic Kratzerian semantics for modals and for conditionals. In the Kratzerian framework (Kratzer 1981, 1991), modals are interpreted relative to two *conversational backgrounds*: a modal base and an ordering source. Conversational backgrounds are functions from worlds to sets of propositions: modal bases provide propositions that express facts in the world of evaluation *w*; ordering sources provide ideals in *w* (e.g., desires, goals, laws). The modal base first restricts the set of worlds to those compatible with certain facts, and the ordering source is then used to rank these worlds: the modal ends up quantifying over the most ideal worlds of the modal base, given the ordering set by the ordering source. A necessity claim, *must p* or *have to p* is true if and only if the prejacent *p* is true in all of these maximally ideal worlds, given the lexical entry in (5):

(5) $[\![\text{must}]\!]^w = [\![\text{have to}]\!]^w = \lambda f_{\langle s,\langle s,t\rangle\rangle}.\,\lambda g_{\langle s,\langle s,t\rangle\rangle}.\,\lambda p_{\langle s,t\rangle}.\,\forall w' \in \max_{g(w)}\left(\bigcap f(w)\right):\ p(w') = 1$
where $\forall X \subseteq W: \max_{\rho}(X) = \{\, w \in X : \neg\exists w'\,(w' <_{\rho} w)\,\}$

(von Fintel & Heim 2011)

Modals in anankastic conditionals are taken to express *teleological* modality. Teleological modals are interpreted relative to a circumstantial modal base *f*, consisting of relevant facts in the world of evaluation, including those involved in traveling to Harlem for (1a), and a teleological ordering source *g*, which consists of your goals in the world of evaluation.

[3] Condoravdi & Lauer (2016) show that the problems with anankastic conditionals arise on any restrictor analysis of conditionals. Here we use the classic Kratzerian framework to illustrate the issues.

(6) a. $f(w)$ = {*p: p* is a relevant fact in *w*}
b. $g(w)$ = {*p: p* is one of your goals in *w*}

A teleological modal ends up quantifying over worlds compatible with the relevant facts that best obey some relevant goals (*your* goals in (1a)) in the world of evaluation (the actual world in (1a)). In this system, the propositions of the ordering source are not ranked relative to one another. Suppose Al has two incompatible goals: she wants to go to Harlem and she also wants to go to Hoboken, but cannot do both. Because the two goals cannot be ranked, the worlds that best fit them are not all of one sort: in some, she goes to Harlem, in others, she goes to Hoboken. Since the best worlds are not all Harlem worlds, the theory predicts that it is false to say *Al has to go to Harlem* using *have to* teleologically—evidently a correct prediction: it is not true that *Al has to*$_T$ *go to Harlem*, if she also wants to go to Hoboken, and cannot do both. As we will see, what allows the theory to make the right predictions in this scenario will turn out to be its downfall in anankastic conditionals.

Turning to the semantics of conditionals, under a classic restrictor analysis (Kratzer 1986), *if*-clauses restrict the modal base of the modal in the consequent. (In the absence of an overt modal, the *if*-clause is taken to restrict a covert epistemic necessity modal, NEC.) In (1a), the antecedent restricts the worlds quantified over by the consequent modal *have to* to those where you want to go to Harlem. Thus, (1a) is predicted to be true just in case:

(7) In all *w'* compatible with the relevant facts in *w* that best fit your goals in *w*, and where ***you want to*** go to Harlem in *w'*, you take the A train

To see the problem with anankastic conditionals, suppose that, in the actual world, taking the A train is the only way to get to Harlem, but you do not want to go to Harlem or anywhere that requires the A train. In this scenario, (1a) is still intuitively true, since taking the A train is necessary for going to Harlem, regardless of whether you want to go there or not. The truth conditions in (7), however, predict that it should be false, because (7) requires that you take the A train in all of the worlds most ideal given your *actual* goals. In this scenario, the most ideal worlds are not worlds where you take the A train, since your actual goals do not include going to Harlem or anywhere requiring taking the A train.

The classic analysis of modals and conditionals faces two problems with anankastic conditionals: a *non-compositionality problem*, and a *conflicting goals problem* (von Fintel & Iatridou 2005). Concerning the first problem, Sæbø (2001) first showed that this semantics doesn't allow the hypothetical desire in an anankastic conditional to have any bearing on the ordering source of the modal in the consequent: *have to*'s ordering source

orders worlds of the modal base relative to your *actual* desires. However, intuitively, the modal does in fact seem to be restricted to worlds that best obey this desire. Sæbø fixes the problem by forcing the complement of *want* (in (1a), *you go to Harlem*) to be directly added to the ordering source. But this solution is non-compositional: it just uses a subpart of the antecedent, namely the complement of *want*, to restrict the interpretation of the consequent. A compositional solution should use the entire antecedent. In response, subsequent accounts assume a *double modal* analysis, building on Frank (1997), according to which conditionals are always implicitly modalized by an epistemic necessity modal, even in the presence of an overt modal in the consequent (Huitink 2005, von Fintel & Iatridou 2005, von Stechow et al. 2006, Condoravdi & Lauer 2016).[4]

A double modal analysis was first argued for for deontic conditionals like (8), where the antecedent expresses a hypothetical law (here, that jaywalking is a crime), and the consequent modal is interpreted deontically:

(8) If jaywalking is illegal, Al must$_D$ get a fine. (adapted from von Fintel & Iatridou 2005)

A *single* modal restrictor analysis for (8) has the antecedent restrict the consequent modal's modal base to worlds where jaywalking is illegal. However, the *ordering source* of the consequent modal still consists of *actual* laws. If jaywalking is legal in the actual world, then (8) is predicted to be false, contrary to intuitions, as it is not true that in all the best deontic worlds given actual laws, Al gets a fine. A double modal analysis fixes the problem by having the antecedent restrict a higher epistemic necessity modal, NEC. The consequent modal is then relative to those epistemic worlds in which jaywalking is illegal, thereby allowing its ordering source to contain a law prohibiting jaywalking.

With a double modal analysis, a conditional like (1a) has two layers of modality: the overt modal in the consequent, *have to*, and the higher, unpronounced, epistemic necessity modal, NEC, which the antecedent restricts. (1a) has the structure in (9a), and truth conditions in (9b):

(9) a. NEC [you want to go to Harlem] [***have to*** [you take the A train]]
b. In all *w'* compatible with what is known in *w* and where you want to go to Harlem, all *w"* given the facts in *w'* that best fit your goals in *w'* are such that you take the A train

The antecedent restricts the epistemic modal. The lower modal *have to* is then evaluated relative to those worlds *w'* in which you want to go to Harlem. It can then pick out the

[4] For an account of anankastic conditionals that does not assume a double modal structure, see Cariani (forthcoming).

best circumstantial worlds given your goals in *w'*. Given that you want to go to Harlem in *w'*, going to Harlem can now be one of the goals that make up *have to*'s ordering source. The double modal analysis thus fixes the *non-compositionality problem*, by providing a way for the desire expressed in the antecedent (going to Harlem) to be part of the ordering source of the modal in the consequent.

However, the *conflicting goals problem* remains. While a double modal analysis allows for the desire expressed in the antecedent to be added to the consequent modal's ordering source, it doesn't force this desire to trump other desires that conflict with it. Consequently, the analysis makes the wrong predictions in scenarios where, as far as the speaker of (1a) knows, you have a desire that *conflicts* with the one expressed in the antecedent. Suppose, as before, that going to Harlem requires taking the A train, and going to Hoboken requires taking the PATH train. Suppose further that the speaker allows that you may also want to go to Hoboken. In this case, there will be worlds *w"* where you have both desires, but since you cannot go to both places at once, the most ideal worlds given your goals will be divided into worlds where you go to Harlem (and take the A train) and worlds where you go to Hoboken (and take the PATH train): (1a) is predicted to be false, contrary to intuitions.

Anankastic conditionals thus seem to require that the hypothetical goal (*you going to Harlem*) trump any other potentially conflicting goals (e.g., *you going to Hoboken*). Effectively, what seems to be needed to get the right truth conditions for a conditional like (1a) is for the consequent modal to quantify only over worlds verifying the complement of *want* (*you go to Harlem*), thereby eliminating worlds where you go to Hoboken. This has been achieved in two main ways in the previous literature. One solution is to induce a ranking that automatically breaks the tie in conflicting desires towards the one mentioned in the antecedent. This is done by appealing to a special semantics for *want*, according to which *want* can either express a pure desire, or an *effective preference*, i.e., a desire that trumps all other conflicting ones (Condoravdi & Lauer 2016). The dialogue in (10) illustrates the two readings of *want*:

(10) a. A: Do you want to go to the party?
b. B_1: Yes/I want to, but I have to babysit my sister.
c. B_2: No/I don't want to, I have to babysit my sister.

With B_1, B expresses the pure desire to go to the party (irrespective of B's other desires or obligations), while with B_2, B claims to not effectively *want* to go to the party, because of their need to babysit. According to Condoravdi & Lauer (2016), this action-guiding *want* is what is involved in anankastic conditionals, guaranteeing that the desire expressed (e.g., going to Harlem) outranks other conflicting ones (e.g., going to Hoboken).

The other solution appeals to a syntactic stipulation, according to which the complement of *want* restricts the consequent via a covert purpose clause associated with teleological modality, as in (11a). This analysis is motivated by the fact that purpose clauses can independently be used to state goals explicitly, as in (11b) (von Fintel & Iatridou 2005, von Stechow et al. 2006):

(11) a. If you want to *p*, then [to *p*] you must *q*
b. To go to Harlem, you have to take the A train.

Each type of approach has its own merits and challenges (see e.g., Condoravdi & Lauer 2016 for arguments against the syntactic approach, and Phillips-Brown 2019 for arguments against the lexical approach). In this paper, we mostly put aside these issues (but see §4.4 and §6.1), and point out that, while the literature has zoomed in on *want* and teleological modality, the apparent non-compositionality problem of anankastic conditionals can in fact be replicated with attitude verbs beyond *want*, and modals beyond teleological ones. Thus, the problem is much more general, and so, we argue, must its solution be. We propose such a solution, according to which there is nothing semantically nor syntactically special about anankastic conditionals. Like Condoravdi and Lauer, we take anankastic conditionals to be regular conditionals. However, unlike Condoravdi and Lauer, we propose a general account that goes beyond *want*, and isn't tied to lexical idiosyncrasies.

In the next section, we show that attitude verbs and modals of *any* flavor can, in principle, give rise to *harmonizing* readings, in which the complement of an attitude verb in the antecedent of a conditional seems to restrict the consequent modal. In §4 and §5, we argue that the phenomenon is pragmatic in nature, and that harmonizing arises from a necessity inference derived from the meaning of the attitude report in the antecedent, together with uncontroversial background assumptions, whose modal flavor happens to match that of the consequent modal. But while harmonizing readings can be found with various attitude verbs and modal flavors, we will show that they crucially do not arise automatically: they are blocked, for instance, when the attitude holder is taken not to be an authority in the relevant modality. For instance, the variant of (1a) in (12) does not as easily get an anankastic reading according to which going to Harlem requires taking the A train, unless it is common ground that Mary's desires dictate your own:

(12) If Mary wants you to go to Harlem, you have to take the A train.

Our pragmatic account will straightforwardly capture this context-sensitivity, and can best accommodate the full range of data associated not only with anankastic conditionals, but harmonizing conditionals in general.

3 Harmonizing beyond anankastics

In this section we present data showing that the same apparent non-compositionality of anankastic conditionals, where a clause embedded inside the antecedent seems to restrict the consequent modal, can be found beyond *want* and teleological modality.

First, and as already noted by Sæbø (2001) and Condoravdi & Lauer (2016), desire and goal-oriented predicates other than *want* can also give rise to anankastic readings, as illustrated in (13). As with (1a), (13) can be true even in situations where your actual plans or desires conflict with going to Harlem:

(13) If you {*intend/plan/hope/would like*} *to go to Harlem, you have to take the train.*

Moreover, the apparent non-compositionality of anankastic conditionals is not confined to desire predicates and teleological modality. It can be replicated with other modal flavors and embedding verbs. We first turn to deontic cases, with the example in (2a), repeated in (14a):

(14) a. If the Provost requests that grades be posted on Monday, Al must$_D$ finish grading.
b. In all *w'* compatible with the facts in *w* that best obey the rules in *w* and where the Provost requests that grades be posted Monday, Al finishes grading

Classic Kratzerian accounts for modals and conditionals yield the truth conditions in (14b), which come out as false, contrary to intuitions, in case the rules in the actual world require that grades be posted on days other than Monday. Yet (14a) seems to have a harmonizing reading where the *complement* of *request* restricts the deontic modal *must* in the consequent (*If grades are to be posted on Monday, Al must$_D$ finish grading*).

A double modal analysis can help fix the non-compositionality problem here. After all, this analysis was designed specifically to let the consequent modal of deontic conditionals inherit laws stated in the antecedent *qua* laws, as we saw with (8). With a double modal structure, (14a) has the LF in (15a) and truth conditions in (15b). The consequent modal quantifies over worlds compatible with the rules in worlds *w'* in which the Provost requests that grades be posted on Monday. *If* we take the Provost's words as law, we can add the proposition that grades are posted on Monday (i.e., the attitude verb's complement) to the modal's ordering source:

(15) a. NEC [the Provost requests grades be posted Monday] [must$_D$ [Al finish grading]]
b. In all *w'* compatible with what we know in *w*, and where the Provost requests that grades be posted Monday, all *w"* compatible with the facts in *w'* that best obey the rules in *w'* are such that Al finishes grading

As for the *conflicting goals* problem, it seems this may not have a counterpart in the legal domain, where the requirements are underwritten by laws and not goals.[5] Legal rulings governing a community may relate to each other differently than do personal desires. The Provost may overrule whatever came before, but your own desire to go to Harlem may not eclipse your interest in Hoboken. Consequently, without this second problem to solve, a double modal analysis may be sufficient to handle the deontic cases. Here it only needs to handle the compositionality problem. And to do that it needs one crucial provision: that the *complement* of attitude verbs like *request* counts as law for purposes of the consequent modal. We will come below to what would underwrite this provision.

Turning next to epistemic modality, we can also find harmonizing readings with conditionals, as illustrated in the example in (3a), repeated as (16a) below, which classic Kratzerian accounts predict to have the truth conditions in (16b):

(16) a. If Sherlock Holmes thinks that the crime occurred at 6pm, Al must$_{E}$ be the culprit.
b. In all *w'* compatible with what is known in *w*, and where Sherlock believes in *w'* that the crime occurred at 6pm, Al is the culprit in *w'*

Contra intuitions, the truth conditions in (16b) come out as false in a scenario where the evidence in the actual world leaves open whether the crime was committed at 6pm or 7pm, and where Al has an irrefutable alibi from 7pm onward, but not before. This is so because in such a scenario, some of the worlds compatible with the evidence have Al be the culprit (the worlds where the crime was committed at 6pm), but not all of them (those where the crime was committed at 7pm). The content of the complement of the attitude verb in the antecedent should have no bearing on the consequent modal. However, if we trust Sherlock's epistemic authority, it seems that (16a) can have a harmonizing reading, expressing that Al must$_{E}$ be the culprit, if the crime was committed at 6pm. Here again, it seems as if we need to be able to have the complement of the attitude verb in the antecedent restrict the modal in the consequent.

To sum up, the apparent non-compositionality problem of anankastic conditionals, where the *embedded* complement of an attitude verb in the antecedent seems to restrict

[5] Kratzer (1991) classic example to motivate the double relativity of modals does include conflicting laws, inherited from judgments made by different judges. However, it is difficult to recreate naturalistic examples where one ruling wouldn't override others. If we do allow for the possibility of conflicting laws, our account will be able to neutralize the offending ones, by making the content of the rule expressed in the antecedent hold in all worlds quantified over by the consequent modal, just as with conflicting desires.

the consequent modal, is not confined to the attitude verb *want*, nor to teleological modality: it arises with other embedding verbs in the antecedent, and can be replicated with epistemic and deontic modality. Hence, solutions tailored to teleological modality or to *want* (or desire verbs more generally) are insufficient to account for the full range of data discussed in this section. We could, of course, provide separate treatments for each of these cases. Instead, we will offer a pragmatic account that generalizes across modal flavors and attitudes, and derives harmonizing readings without postulating anything special about teleological modality or desire predicates, solving both the non-compositionality problem common to all modal flavors, and the conflicting goals problem specific to anankastic conditionals in the process.

As we will now see, one of the main motivations for a pragmatic account is that harmonizing seems to be context-sensitive. Indeed, while harmonizing readings can occur with various attitude verbs and modal flavors, the availability of these readings seems to be restricted. Consider, for instance, a variant of (16), shown in (17a):

(17) a. If silly Watson thinks the crime occurred at 6pm, Al must$_{\text{E}}$ be the culprit.↛
b. If the crime occurred at 6pm, Al must$_{\text{E}}$ be the culprit.

The harmonizing reading in (16a), which conveys (17b), arises when the subject of the belief report in the antecedent is Sherlock Holmes, a highly regarded detective, whose epistemic authority the speaker trusts. This reading, however, seems to disappear in (17a), when the subject is replaced by silly Watson, whose epistemic authority the speaker does not trust.

Similarly, (14a) can convey (18b), when the subject of *request* is *the Provost*, whom we take to be an authority on university regulations. This harmonizing reading, however, seems to disappear when the subject is replaced by eager undergrad *Chad*, who has no legal authority on university regulations.

(18) a. If Chad requests that grades be posted on Monday, Al must$_{\text{D}}$ finish grading now.↛
b. If grades are to be posted on Monday, Al must$_{\text{D}}$ finish grading now.

Returning finally to teleological modality, the anankastic reading seems to disappear when the wanter is a random individual, Mary (as we saw in (12)), whose desires are irrelevant to yours, or worse, when the wanter is someone whose desires you definitely do not want to endorse, for instance, Satan. Indeed, one would not readily interpret (19a) as expressing that *going to Harlem* requires taking the PATH train, like (19b). (19a) simply expresses that *Satan's desire for you to go to Harlem* requires that you take the

PATH train, perhaps to avoid succumbing to any kind of temptation. This conditional could be true, for instance, in a situation where Harlem is unreachable by the PATH train, and you happen to want to do the *opposite* of what Satan wants you to do. (19a) only gets a harmonizing (anankastic) interpretation, if Satan's desires dictate your own, i.e., if *Satan wants p* implies that *p* is necessary given *your* goals.

(19) a. If Satan wants you to go to Harlem, you have to$_T$ take the PATH train.
b. If you go to Harlem, you have to$_T$ take the PATH train.

What we see is that attitude verbs and modals of *any* flavor can, in principle, give rise to harmonizing readings, but that the availability of these readings is context-sensitive. It depends on whether the speaker can be assumed to take the subject of the attitude report to be an authority in the relevant modality: Sherlock, but not Watson, for epistemic modality, the Provost, but not Chad, for deontic modality, you, but not Satan, for teleological modality keyed to your desires.

In the following section, we propose an empirical generalization that captures when harmonizing is available, and when it is not. This generalization will lead to our pragmatic proposal for anankastic conditionals, and harmonizing more generally, according to which harmonizing results from a modal inference that naturally arises from the meaning of the proposition expressed by the complement, together with additional background assumptions, and where the flavor of modality of the inference matches that of the consequent modal. This account will derive all of the cases where harmonizing happens, without over-extending to cases where it doesn't, and it will solve in particular the case of anankastic conditionals, without postulating a peculiar semantics for *want*, or a special syntax for conditionals with teleological modals.

4 Proposal

We argue that the harmonizing readings of anankastic conditionals and their kin are pragmatic in nature. They arise from an optional modal inference, derived from the meaning of the proposition expressed by the conditional's antecedent, together with uncontroversial background assumptions. When this modal inference matches in flavor with the modal of the consequent, it gives the illusion that the complement of the attitude verb in the antecedent restricts the consequent modal. But, we argue, it does so indirectly, by having the modal inference quantify over the same set of worlds as the consequent modal. We now spell out this proposal and its two main ingredients, *Necessitation by Attitude* (NBA)—the modal inference derived from the attitude report

in the antecedent, and *Flavor Matching*. We show how to derive harmonizing readings based on these two ingredients, and how to prevent them.

4.1 Necessitation by Attitude (NBA)

Looking at the instances when harmonizing readings arise, we first note an empirical generalization. In examples (1a), (2a), and (3a), a modal inference seems to arise naturally from the meaning of the attitude report in the antecedent of the conditional, which happens to match in flavor with the modal in the consequent. In (1a), we can infer from the attitude report in the antecedent *You want to go to Harlem* the teleological necessity that *you have to*$_T$ *go to Harlem*. In (2a), we can infer from the attitude report *The Provost requests that grades be posted on Monday* the deontic necessity that *grades must*$_D$ *be posted on Monday*. And in (3a), we can infer from *Sherlock thinks that the crime occurred at 6pm* the epistemic necessity that *the crime must*$_E$ *have occurred at 6pm*. Schematically, the generalization can be stated as follows:

(20) **Necessitation by Attitude** (NBA): *subject* ATTITUDE $p \Rightarrow \Box_F\, p$
where F *is some modal flavor*

Before we detail our account, two notes are in order about the modal $\Box_F$ in (20).[6] First, necessities are expressed in English either by *must* or *have to* (*should* and *ought to* express *weak necessity*). In the theoretical literature, these modals are assumed to express a variety of different flavors. But in fact, at least in colloquial North American English, *must* is almost always used epistemically (Tagliamonte & D'Arcy 2007); deontic uses can sound formal, and bouletic and teleological uses are almost impossible. Meanwhile the semi-modal *have to* is natural for teleological and bouletic necessities, and for many cases of epistemic modality (see Williams et al. 2025). We use $\Box_F$ in (20), to state our generalization, which is intended to stand for either *must* or *have to*, depending on flavor. Second, one might wonder if the NBA that a verb like *want* tends to trigger might not better be labeled as *bouletic* (desire-based), rather than *teleological* (goal-based). As mentioned in footnote 1, distinguishing bouletic and teleological modality is difficult, and some may question whether genuine cases of the former truly exist.[7] Whether there is a genuine distinction between bouletic and teleological modality in fact doesn't matter to us. What matters is that utterances of the form *you want to p* seem to routinely trigger an inference that *p* is necessary given what you want, expressible

[6] We are grateful to Clemens Mayr and to two anonymous reviewers for helpful discussion on these points.

[7] Examples of bouletic modality from the literature include *Given how you love chocolate, you should try this cake* (Portner 2009), or *You have to go to your room [Stern father]* (von Fintel 2006). It is not clear, however, how these are truly distinct from an interpretation where the necessity is in terms of goals, rather than desires.

with a necessity modal in English like *have to*, which we might call either bouletic or teleological.

In all cases where harmonizing goes through, the subject of the attitude report can be viewed as an authority in the relevant modality. With teleological modality, as in (1a), we routinely take people to be authorities on their own goals and desires: obtaining what one wants should fulfill one's goals. Thus *you* are an authority for teleological necessities relative to *your* desires: you are naturally compelled to have your own desires fulfilled. However, you may be less compelled to fulfill someone *else*'s desires. Thus, when we change the subject from *you* to *Satan* in (19a), the NBA inference fails to go through without further assumptions. This is because we are unlikely to infer from *Satan wants p* that *p* is teleologically necessary for *you*, unless we know that Satan's desires dictate your own. If we enrich the context with the assumption that you are a Satanist, a harmonizing reading becomes possible. We will return to the meaning of *want* and teleological necessity, and the fairly automatic nature of the inference from the former to the latter in §4.4.

With deontic modality, as in (14a), we take the Provost to be a legal authority on university policies. Thus, we can infer from *The Provost requests that p* that it is deontically necessary that *p*: the NBA inference goes through. However, this inference disappears in (18a), when the subject *the Provost* is replaced with *Chad*, a student with no authority on university policies.

Lastly, with epistemic modality, as in (16a), we readily take the revered detective Sherlock Holmes to be an epistemic authority, and when we do, we infer from *Sherlock Holmes thinks p*, that it is epistemically necessary that *p*: the NBA inference goes through. However, in (17a), this inference disappears when the subject is replaced by Sherlock's dense acolyte *Watson*, whose epistemic authority we do not trust.

To sum up, Necessitation by Attitude is an inference that arises naturally from the meaning of an attitude report in the antecedent of a conditional, when the attitude holder is assumed to be an authority in the relevant modality. When the flavor of the modal inference matches the modal in the consequent, we derive a harmonizing reading, as discussed in the next section.

Note that we take NBA inferences to be run-off-the-mill, defeasible inferences, based on world knowledge. They are similar to the kind of inference one draws from *Al is a basketball player* to the assumption that Al is tall. Just like with NBA, such inferences can pragmatically enrich a conditional: when one hears *If Al is a basketball player, he needs an extra long bed*, one naturally restricts the interpretation of the consequent to worlds where Al is tall, something one might not do if we were to replace *basketball*

player with *skateboarder*. Finally, we take the NBA inference to be a *general* inference. Thus, it should hold not just in our world, but in all worlds that we take to be like ours. We will thus assume that the NBA holds in all worlds that are epistemically accessible. This importantly will allow the NBA inference to hold in conditionals, which we assume are implicitly quantified by an epistemic modal NEC, following the literature discussed in §2.[8]

4.2 Flavor Matching

When a modal inference is triggered by Necessitation by Attitude (NBA), a harmonizing reading for a conditional becomes possible if the flavor of the modal in the consequent of the conditional matches the flavor of the modal in the NBA. We refer to this condition as Flavor Matching:

(21) **Flavor Matching**: the consequent modal F matches the NBA-derived $\Box_F$

In (1a), the flavor of the NBA modal is teleological, which is the flavor of the modal in the consequent (both modals are anchored to the addressee's goals). In (2a), both modals are deontic, and in (3a), both modals are epistemic.

Importantly, we do not take the domain of the consequent modal to be inherited anaphorically from the attitude verb in the antecedent, or by any semantic mechanism. Rather, we assume that the domain of the consequent modal is restricted by the prejacent of the NBA-derived modal inference indirectly, from the fact that the two modals happen to quantify over the exact same sets of worlds. We justify this pragmatic proposal over semantic or syntactic alternatives in §5.

We propose that harmonizing arises pragmatically when the modal inference derived from the meaning of an attitude report in the antecedent (NBA) matches in flavor with the modal in the consequent (Flavor Matching), as schematized below. Take a conditional of the form *If subject* ATTITUDE *p*, $must_F$ *q* in (22a). Via NBA, we derive the necessity inference $must_F$ *p in all epistemically accessible worlds in which subject* ATTITUDE *p*, as sketched in (22b). Flavor Matching occurs when the NBA modal and the consequent modal match in flavor, as shown in (22c). (22d) shows the meaning of (22a) enriched with the inference in (22b), in boldface. Given that both the NBA modal and the consequent modal quantify over the same set of F worlds, it looks as if the consequent modal is directly restricted by the complement of the attitude verb, *viz.* the prejacent *p* of the NBA modal (in boldface). (22d) can be simplified as in (22e),[9] giving

[8] We are grateful to Clemens Mayr for making us realize that we needed to make this assumption explicit.

[9] An anonymous reviewer points out that this assumes Consistent Agglomeration, according to which *MOD* ϕ and *MOD* ψ entail *MOD* ϕ & ψ, which Kratzerian modal accounts guarantee. However, this assumption may be contentious. For

the illusion that the complement of the attitude in the antecedent directly restricts the consequent modal:

(22) a. If subject ATTITUDE p, must$_F$ q
b. **NBA**: *subject* ATTITUDE $p \Rightarrow \Box_F p$ *(in all epistemically accessible worlds)*
c. **Flavor Matching**: F in $\Box_F p$ matches F *of consequent modal*
d. $\Rightarrow$ If subject ATTITUDE p, $\Box_F p$ and $\Box_F q$
e. $\Rightarrow$ If subject ATTITUDE p, $\Box_F \boldsymbol{p}$ and q

The following illustrates harmonizing with the textbook Harlem conditional, repeated in (23a). First, we assume that *you* are an authority on your own desires. Thus, through NBA, we obtain the modal inference in (23b). Since the teleological flavor of the modal of the NBA inference matches the teleological flavor of the consequent modal, Flavor Matching occurs, as in (23c). This leads to the harmonizing reading in (23d), where the meaning of (23a) used in this context is enriched with the NBA inference (indicated in boldface). As both the NBA and the consequent modals quantify over the same set of worlds, (23d) can be simplified as in (23e), giving the illusion that the complement of *want* (*you go to Harlem*), which is the prejacent of the NBA modal, directly restricts the consequent modal:

(23) a. If you want to go to Harlem, you have to$_{T_{you}}$ take the A train.
b. **NBA**: You want to go to Harlem $\Rightarrow$ You *have to*$_{T_{you}}$ go to Harlem (*in all epistemic worlds*)
c. **Flavor Matching**: T_{you} in (22b) matches T_{you} in (22a)
d. If you want to go to Harlem, **you have to$_{T_{you}}$ go to Harlem** and you have to$_{T_{you}}$ take the A train
e. If you want to go to Harlem, you have to$_{T_{you}}$ **go to Harlem** and take the A train

Harmonizing readings are prevented when either step, NBA or Flavor Matching, fails to hold. As we saw in the previous section, NBA can fail when the attitude holder is not taken to be an authority on the relevant modality. For instance, Satan may not be an authority on your desires, and thus it may not follow that *you have to*$_{Tyou}$ *go to Harlem* from the fact that Satan wants you to go. Harmonizing can also be prevented when Flavor Matching does not hold, for instance, if the consequent modal in (23a) is interpreted deontically, rather than teleologically. In the next section, we show how to derive harmonizing readings in more formal detail.

discussion, see Boylan (2023), who argues that Agglomeration holds for deontic, but not epistemic *ought*, though it is not clear to us that the arguments carry over to epistemic *must* or *have to*, which are the modals we take to be at play in the NBA inferences.

4.3 Deriving harmonizing conditionals

As in previous accounts, we assume the independently motivated double modal structure for conditionals (Frank 1997, Huitink 2005, von Fintel & Iatridou 2005, Condoravdi & Lauer 2016), according to which conditionals with an overt modal in the consequent involve an additional covert epistemic necessity modal (NEC), which the antecedent restricts. We assume that this double modal structure is always possible, not just with overt *root* modals (e.g., deontic, teleological) in the consequent, but with overt epistemic modals as well. We however remain agnostic as to whether the covert modal is always present, or only optionally, so long as it is present when harmonizing arises.

Assuming a double modal structure, the Harlem conditional has the LF in (24a), where the antecedent restricts NEC. We get the truth conditions in (24b), assuming the lexical entry for *want* in (24c):[10]

(24) a. NEC [You want to go to Harlem] [**have to**$_{T_{you}}$ [you take the A train]]
b. In all *w'* compatible with what is known in *w* and such that in all *w"* compatible with your desires in *w'* you go to Harlem, all *w'''* compatible with the facts in *w'* that best fit your goals in *w'* are such that you take the A train in *w'''*
c. $[\![\text{want}]\!]^w = \lambda p.\ \lambda x.$ in all worlds *w'* compatible with *x*'s desires in *w*, $p(w')=1$

Through Necessitation by Attitude (NBA), we derive the teleological necessity inference in (25). Since the NBA holds across all epistemically accessible worlds, it will hold in the worlds *w'* quantified over by NEC:

(25) a. $[\![\text{You want to go to Harlem}]\!]^{w'} \Rightarrow [\![\text{You have to}_{T_{you}} \text{ go to Harlem}]\!]^{w'}$
b. In all *w"* compatible with your goals in *w'* you go to Harlem ⇒ In all *w"* compatible with the facts in *w'* that best fit your goals in *w'*, you go to Harlem

Given that the NBA derives a teleological necessity, Flavor Matching holds: both the NBA modal and the teleological modal in the consequent quantify over worlds compatible with your goals in the same world of evaluation *w'*, namely, the worlds quantified over by the epistemic modal NEC in which the antecedent holds. Thus, we obtain that in all relevant teleological worlds, you go to Harlem (from NBA), and in all of these worlds, you take the A train (from the consequent). (26b) shows the truth conditions in (24b) enriched with the NBA inference in (25) (in boldface), and simplified in (26c):

[10] This lexical entry is a simplification, and meant as a place holder for whatever the right semantics for *want* turns out to be, a topic of much debate, as we briefly discuss in §4.4.

(26) a. ⟦If you want to go to Harlem, you have to$_T$ take the A train⟧^{w}
b. In all *w'* compatible with what is known in *w* and such that in all *w"* compatible with your desires in *w'* you go to Harlem, **all** *w'''* **compatible with the facts in *w'* that best fit your goals in *w'* are such that you go to Harlem** and all *w'''* compatible with the facts in *w'* that best fit your goals in *w'* are such that you take the A train
c. In all *w'* compatible with what is known in *w* and such that in all *w"* compatible with your desires in *w'* you go to Harlem, all *w'''* compatible with the facts in *w'* that best fit your goals in *w'* are such that **you go to Harlem** and you take the A train

These enriched truth conditions give the illusion that the complement of the attitude verb directly restricts the consequent modal. However it does so indirectly, via the additional modal inference, derived pragmatically from the meaning of the attitude report in the antecedent, together with uncontroversial background assumptions (e.g., going to Harlem is achievable, etc.). Thus harmonizing solves the non-compositionality problem of anankastic conditionals pragmatically. It also solves the conflicting goals problem in the process, by having all of the worlds quantified over by the consequent modal be worlds in which you go to Harlem, thereby preventing any Hoboken worlds.

Note that we can derive the same harmonizing reading with other desire attitudes, as in (13), using the same mechanism. Harmonizing should occur whenever the NBA inference *You have to$_T$ go to Harlem* can be inferred from *You {intend/hope/would like/wish} go to Harlem*.

The harmonizing reading of the deontic conditional repeated in (27a) works the same way. Again, we assume a double modal structure, such that the antecedent restricts NEC, as shown in (27b), with the standard truth conditions in (27c), using the denotation for *request* in (27d):[11]

(27) a. If the Provost requests that grades be posted Monday, Al must$_D$ finish grading.
b. NEC [the Provost requests grades posted Monday] [**must**$_D$ [Al finish grading]]
c. In all *w'* compatible with what is known in *w* and such that in all *w"* compatible with what the Provost requests in *w'* grades are posted Monday, all *w'''* compatible with the facts in *w'* that best fit the rules in *w'* are such that Al finishes grading
d. ⟦request⟧^{w} = $\lambda p.\ \lambda x.$ in all *w'* compatible with what *x* requests in *w*, $p(w')$=1

[11] This lexical entry and the one for *think* in (30d) are again a simplification. We are not committed to any particular semantics for attitude verbs, and simply want to show how to capture the NBA inference.

Through NBA, we derive the deontic necessity inference in (28) (again we assume that the NBA inference holds across all epistemically accessible worlds):

(28) a. $[\![$The Provost requests that grades be posted Monday$]\!]^{w'} \Rightarrow [\![$Grades must$_D$ be posted Monday$]\!]^{w'}$
b. In all *w"* compatible with what the Provost requests in *w'* grades are posted Monday ⇒ In all *w"* compatible with the facts in *w'* that best fit the rules in *w'* grades are posted Monday

The flavor of both the NBA modal and the consequent modal is deontic: the modals quantify over the same sets of worlds, and Flavor Matching obtains. (29a) shows the truth conditions in (27c) enriched with the (boldfaced) NBA inference in (28b), and simplified in (29b). Here again, the complement of the attitude report in the antecedent seems to restrict the consequent modal, but it does so via the addition of the defeasible NBA inference.

(29) a. In all *w'* compatible with what is known in *w* and such that in all *w"* compatible with what the Provost requests in *w'* grades are posted Monday, **in all *w‴* compatible with the facts in *w'* that best fit the rules in *w'* grades are posted Monday**, and in all *w‴* compatible with the facts in *w'* that best fit the rules in *w'* Al finishes grading
b. In all *w'* compatible with what is known in *w* and such that in all *w"* compatible with what the Provost requests in *w'* grades are posted Monday, in all *w‴* compatible with the facts in *w'* that best fit the rules in *w'* **grades are posted Monday** and Al finishes grading

We predict that similar harmonizing readings can arise with other attitudes used to report rules, e.g., if we replace *request* with verbs *say*, *mandate*, or *declare*, via the same mechanism. We should get a harmonizing reading whenever the NBA inference *Grades must$_D$ be posted on Monday* can be inferred from attitude or speech reports like *If the Provost {mandates/says/declares} that grades are posted Monday….*

We finally turn to harmonizing readings with epistemic conditionals, as in (3a), repeated in (30a) below. Here again, we assume a double modal structure for conditionals, so that (30a) has the LF in (30b). This assumption is crucial for us, so that the NBA inference can be relative to the same worlds as the consequent modal.[12] For concreteness, we assume that epistemic modals like *must* take an epistemic modal

[12] For independent evidence for a double modal structure with epistemic modals, see Geurts (2004).

base and an optional stereotypical ordering source Kratzer (1981), and that *think* has the lexical entry in (30d). Given all this, the truth conditions for (30a) are given in (30c):

(30) a. If Sherlock thinks the crime was committed at 6pm, Al must be the culprit.
b. NEC [Sherlock thinks the crime was at 6pm] [**must**$_E$ [Al is the culprit]]
c. In all *w'* compatible with what is known in *w* and such that in all *w"* compatible with Sherlock's beliefs in *w'* the crime was at 6pm, all *w'''* compatible with what is known in w' most stereotypical from the perspective of w' are such that Al is the culprit
d. $[\![\text{think}]\!]^w = \lambda p.\ \lambda x.$ in all *w'* compatible with *x*'s beliefs in *w*, $p(w')=1$

Here again, the NBA inference goes through (in all epistemically accessible worlds), assuming that we take Sherlock to be an epistemic authority:

(31) a. $[\![\text{Sherlock thinks crime was at 6}]\!]^{w'} \Rightarrow [\![\text{the crime must}_E \text{ have been at 6}]\!]^{w'}$
b. In all *w"* compatible with Sherlock's beliefs in *w'*, the crime was at 6 ⇒ In all *w"* compatible with what is known in w' most stereotypical from the perspective of *w'*, the crime was at 6

And here again, we can enrich the truth conditions in (30c) with the NBA inference in (31), as shown in (32a). Given Flavor Matching, as the NBA modal and the consequent modal quantify over the same worlds (i.e., epistemic worlds anchored to the worlds quantified over by NEC), (32a) can be simplified as in (32b), once again giving the illusion that the complement of the antecedent's attitude verb directly restricts the consequent modal.

(32) a. In all *w'* compatible with what is known in *w* and such that in all *w"* compatible with Sherlock's beliefs in *w'* the crime was at 6, **in all *w"* compatible with what is known in *w'* most stereotypical from the perspective of *w'* the crime was at 6**, and in all *w'''* compatible with what is known in w' most stereotypical from the perspective of w' Al is the culprit
b. In all *w'* compatible with what is known in *w* and such that in all *w"* compatible with Sherlock's beliefs in *w'* the crime was at 6, in all *w"* compatible with what is known in w' most stereotypical from the perspective of *w'* **the crime was at 6** and Al is the culprit

We predict that similar harmonizing readings can arise with other attitude reports (e.g., when we replace *think* in (30) with verbs like *say*, *believe*, or *assume*), using the same mechanism. We should get a harmonizing reading whenever the NBA inference *The*

crime must$_E$ have occurred at 6pm can be inferred from attitude or speech reports like *Sherlock {said/believes/assumes} that the crime occurred at 6pm.…*

In sum, we propose that anankastic conditionals, and harmonizing conditionals more generally, are the result of a modal inference derived from reasoning about the meaning of an attitude verb in the antecedent, a modal inference whose flavor matches the modal in the consequent. Our pragmatic account derives these readings without postulating any lexical idiosyncrasies for particular attitude verbs, or types of modality. It captures the context-sensitive nature of the availability of the readings, which, as we saw, seems to depend on how easily the attitude holder can be viewed as an authority in the relevant modality. In the next subsection, we show how to avoid harmonizing for regular *want* conditionals, and then justify further a pragmatic view of harmonizing over a semantic, syntactic or lexical alternative in §5.

Before we move on, we would like to note a parallel between the NBA inference at the heart of our pragmatic proposal, and parenthetical readings that arise with attitude reports. As first noted by Urmson (1952), attitude reports can sometimes give rise to so-called parenthetical readings, where the speaker seems to endorse the attitude, and somehow proffer its content (Hooper 1975, Simons 2007). (33a), for instance, can be used to indirectly assert (33b). This indirect assertion arises when the speaker takes the attitude holder, *Mom*, to be an authority on when bedtime is, and endorses her assertion, thus indirectly proffering that it is time for bed. As with the NBA, the endorsement is pragmatic, and the proffering indirect.

(33) a. Mom {said / thinks} it's time for bed.
b. ⇒ It's time for bed.

As with the NBA, the availability of such parenthetical readings is sensitive to the context, and notably to the reliability of the subject of the attitude holder. Replacing *Mom* with an individual who the speaker does not take to be a trusted authority, such as *Bozo the Clown*, seems to prevent the indirect assertion:

(34) a. Bozo the Clown {said / thinks} it's time for bed.
b. ?⇒ It's time for bed.

4.4 want *vs. teleological* have to *and non-anankastic readings of* want *conditionals*

The pragmatic nature of our proposal for anankastic conditionals was initially motivated by the fact that harmonizing goes beyond *want* and teleological modality. However, focusing on the original cases with *want*, one might wonder why the anankastic reading is so robust that it seemed to warrant syntactic or lexical treatments

in the previous literature. How systematic are NBA inferences from *you want p* to *have to*$_{T_{you}}$ *p*? And if they are systematic, how do we obtain regular, non-anankastic readings of *want* conditionals, like the one in (4), repeated in (35) below? Recall that when (35) is uttered as advice to a recovering alcoholic, the intended meaning is not that *drinking* requires that you think about your family, but rather that *the desire to drink* does: in fact, the advice seems to be that you should think about your family in order *not* to drink. In this section, we briefly review meaning differences between *want* and teleological *have to*, and show how to derive non-anankastic readings for conditionals like (35).

(35) If you want to drink, you have to think about your family.

We believe that the robustness of harmonizing readings in textbook anankastic conditionals is due to the quasi-automaticity of the NBA inference. Indeed, teleological *have to* and *want* seem almost synonymous: both express a strong preference for a state of affairs. However, their meanings differ in at least one important way: *want* is parasitic on belief, teleological *have to* is not. While the precise semantics for *want* is subject to great debate in the literature (see e.g., Heim 1992, von Fintel 1999, Villalta 2008, Condoravdi & Lauer 2016), most would agree that it expresses a preference of the subject for a state of affairs, which has to be compatible with the subject's (sometimes fallible) *beliefs*. Thus, we can say that *Al* ***wants*** *to sell her cello*, even if she doesn't own a cello, but is under the misimpression that she does. Neither teleological nor bouletic *have to* (if distinct), however, rest on beliefs. In the Kratzerian tradition, all root modals are relative to a circumstantial modal base, which picks out worlds compatible with relevant facts in the world of evaluation, and quantifies over the worlds among those that best fit a salient set of priorities (like laws, goals, or desires—often the subject's). Teleological *have to* thus lacks *want*'s subjectivity: we cannot say that *Al has to sell her cello*, if she doesn't own one, regardless of what Al believes.

According to Phillips-Brown (2019), the doxastic nature of *want* turns out to be fatal for Condoravdi and Lauer's account, according to which *want* can be used to express two readings: pure desire, and *effective preference*, a special kind of preference that guides actions. The latter is what they assume is involved in anankastic conditionals, to guarantee that the expressed desire outranks other conflicting ones. Condoravdi and Lauer propose that an agent's preferences (e.g., desires) are arranged in a *preference structure*, where they are ranked by how important they are to the agent. These preferences can be inconsistent, thus accommodating the intuition that we sometimes want incompatible things. However, to *act* on a desire or preference, one has to consolidate all of one's desires into an action-guiding set of preferences that is free

of contradictions, which they refer to as an *effective preference structure*. A *consistency condition* requires that one's effective preferences cannot be inconsistent with respect to one's beliefs. For example, one cannot effectively want to go to Harlem and effectively want to go to Hoboken, while believing that one can't do both. Anankastic readings, they say, arise with effective preference *want*, which guarantees that the stated desire (e.g., going to Harlem) outranks all others that conflict with it (e.g., going to Hoboken). Phillips-Brown (2019) shows that this account makes the wrong predictions in a scenario where it is compatible with your beliefs that one can both go to Hoboken and to Harlem, but not in reality. In such a scenario, it is still judged true that *If you want to go to Harlem, you have to take the A train*, but Condoravdi and Lauer predict that it should be false, as going to Hoboken should not be ruled out. Our analysis does not run into this problem, as it does not rely on the wanter's beliefs. A harmonizing reading arises through the inference that *you have to*$_{T_{you}}$ *go to Harlem*, where *have to*'s modal base is relative to relevant facts in the world of evaluation, not the wanter's beliefs. The harmonizing reading thus comes out as true, regardless of what your beliefs are.

While *want* and teleological *have to* differ in subjectivity, the inference from the former to the latter always seems possible. If so, how do we prevent a harmonizing reading for (35)? Ultimately, we believe that the lack of harmonizing in (35) stems from a lack of *Flavor Matching*, and not necessarily from a lack of *NBA*. Indeed, a teleological necessity inference seems possible in (35) from *You want to drink* to *You have to*$_{T_{you}}$ *drink*: given your desires for immediate pleasure, it is teleologically necessary that you drink. However, the consequent modal seems to express a teleological necessity relative to a different set of your (longer term) goals or desires: desires to be healthy, to have a good relationship with your family, etc. It seems that both teleological *have to* and *want* can be relative to a host of different desires, even within a single individual, and that such desires can even be expressed within the same utterance. In a context in which I am conflicted between these two kinds of desires (immediate vs. long term), I can say: *I want to drink and I want to not drink*, or *I have to*$_{T_{me}}$ *drink and I have to*$_{T_{me}}$ *not drink*. Given the fine-graininess of the desires that both *want* and teleological *have to* can express, we take it that the lack of harmonizing in (35) is due to a lack of Flavor Matching. The NBA modal and the consequent modal are relative to different desires of yours: the former, relative to your desires for immediate pleasure, the latter, to your longer term desires. The modals then quantify over different worlds, and we do not get a harmonizing, anankastic reading.[13]

[13] We are grateful to an anonymous reviewer for helping us think through how to derive non-anankastic readings.

5 Harmonizing is pragmatic

As we have seen, anankastic conditionals, and harmonizing conditionals more generally, give rise to a puzzle where a clause embedded inside the antecedent (under an attitude verb), looks as if it restricts a modal in the consequent, in a seemingly non-compositional fashion. Here we have offered a pragmatic account of anankastic conditionals that generalizes across modal flavors and attitude verbs. In this section, we justify this pragmatic solution, by comparing it to three potential alternative implementations, inspired by current accounts of anankastic conditionals: a lexical one, a syntactic one, and a semantic one. We discuss potential problems with each of these alternatives, and show that there is flexibility in harmonizing, which can't be accounted for if harmonizing is hard-coded lexically, semantically, or syntactically. Hence, we propose that harmonizing is truly a pragmatic phenomenon, and that there is nothing syntactically, lexically, nor semantically special about anankastic conditionals.

5.1 A lexical alternative?

First, let's consider a lexical approach, which would essentially generalize Condoravdi & Lauer (2016)'s account of *want* to other attitude predicates: various attitude verbs could have an *effective* reading, where the attitude complement would somehow be taken to hold in the relevant modality. *Request* or *ask* could, for instance, have readings that express requirements that trump others, verbs like *think* might have a true belief reading, etc. It is unclear to us whether such an account could be made for all attitudes. But even if it could, we believe that a lexical implementation would still both over- and undergeneralize. First, a lexical approach would have to be supplemented by some pragmatic principles, to explain why *effective* readings depend on the reliability of the subject of the attitude verb in the relevant modality. This could well end up recapitulating the NBA, making the purported systematic ambiguity redundant. More decisively, a lexical approach would undergenerate, in that it would have to assume a fairly strict mapping between attitude meaning and modal flavor of the harmonizing modal. However, this mapping seems to be fairly flexible, and largely determined by context. For instance, the use of *want* with a subject considered a legal authority can trigger a harmonizing *deontic* reading, as illustrated in (36a). This reading is derived straightforwardly in our pragmatic account, given that in such a context, the NBA inference in (36b) seems warranted:

(36) a. If the Provost wants grades to be posted on Monday, Al must$_D$ finish grading.
b. The Provost wants grades to be posted on Monday ⇒ Grades must$_D$ be posted on Monday.

5.2 A syntactic alternative?

Harmonizing could also be implemented syntactically, by having a syntactic counterpart of the attitude verb's complement restrict the consequent modal, for instance, via a covert *given* clause. Such an account could be viewed as an extension of von Fintel & Iatridou (2005)'s treatment of anankastic conditionals beyond teleological modality.

Von Fintel and Iatridou observe that anankastic conditionals like the Harlem sentence can be paraphrased using a purpose clause as in (37a), and propose that an elliptical purpose clause is also present in anankastic conditionals, as an argument of a teleological modal, whose content is supplied by the *if*-clause, as in (37b). They propose that teleological modals take two ordering sources, a primary ordering source (the designated goal), supplied by the elliptical purpose clause, which takes precedence over any other goals, and a secondary ordinary ordering source. The designated goal guarantees that the worlds quantified over by the modal are worlds in which you go to Harlem:

(37) a. To go to Harlem, you have to take the A train.
b. If you want to go to Harlem, then [to go to Harlem] you have to take the A train.

While this purpose clause analysis is tied to teleological modality, one might propose an extension of this idea, by syntacticizing the NBA inference in a covert *given*-clause, as sketched in (38). The content of the modal inference would have to be inherited from the antecedent through ellipsis, requiring a linguistic antecedent (underlined in (38)):

(38) If you want *p*, then [given that you **have to** *p*] you **have to** *q*

It seems, however, that harmonizing readings can arise even in cases where the prejacent of the NBA modal (the modal in the *given*-clause in this syntactic implementation) lacks a true syntactic antecedent. Consider a scenario where both speaker and addressee know that Fletcher is a pathological liar, who only says the opposite of what is true. Fletcher claims that Al stole your money. In this scenario, the conditional in (39) seems to have a harmonizing reading, where the *negation* of the proposition expressed by the attitude verb's complement seems to restrict the consequent modal, though there is no linguistic constituent *Al didn't steal your money* that could serve as antecedent for the covert clause.[14]

[14] We thank Yunhui Bai for discussion that led to this example, and Aron Hirsch for pointing out its relevance for a syntactic account.

(39) a. If Fletcher said that Al stole your money, then Al must$_E$ be innocent.
b. If Fletcher said that Al stole your money, then it must$_E$ be that **Al didn't steal your money** and that Al is innocent.

This reading is, however, predicted by our pragmatic account, given that we can derive the NBA inference in (40) from the meaning of the antecedent together with the contextual assumptions given:

(40) Fletcher said that Al stole your money. ⇒ Al must$_E$ not have stolen your money.

Note that in this case again, we find a parallel in behavior with parenthetical uses of attitude reports, suggesting that parenthetical uses and NBA inferences are made of the same pragmatic cloth. Indeed, if it is common ground that Fletcher is a pathological liar, a speaker could use an utterance of *Fletcher said that it's raining* to proffer that it is *not* raining. We take these kinds of examples to support the view that harmonizing readings are pragmatic in nature, and cannot be straightforwardly derived syntactically.

5.3 A semantic alternative?

A final potential implementation for harmonizing conditionals is a semantic one, where harmonizing readings would arise via modal subordination (e.g., Roberts 1989, 2020, Brasoveanu 2010), where the domain of the consequent modal would be determined anaphorically from the content of the attitude in the antecedent.

Stone (1999) and Sudo (2014) argue that attitude verbs like *want* can introduce a set of worlds that a subsequent modal can then be anaphoric to. This anaphoric relation could hold between the attitude in the antecedent and the modal in the consequent, assuming some kind of donkey-anaphoric treatment: roughly, (1a) would express that you take the A train in all of *those* worlds compatible with your desires in which you go to Harlem.

Assuming that anankastic conditionals result from modal subordination would easily extend to the other harmonizing cases that we have seen. However, it would also generate harmonizing readings where they do not seem to be attested. Indeed, we would expect that a modal could be anaphoric to *any* attitude report, including in cases where the speaker doesn't take the subject to be an authority in the relevant modality, as it isn't clear why speaker endorsement should matter for anaphoricity. Tricky cases of undergeneration discussed for the syntactic approach, such as (39a), would also be problematic for a semantic approach.

To sum up, we have seen that harmonizing readings can be found in all modal flavors and with a wide range of attitude verbs in the antecedent. We have also seen

that their distribution is highly context-sensitive, in a way that semantic, lexical, or syntactic accounts can not derive straightforwardly. We conclude that there is nothing semantically nor syntactically special about anankastic conditionals and their kin: harmonizing is a pragmatic phenomenon.

6 Further issues

In this section, we discuss how our account can handle further cases, such as what Condoravdi & Lauer (2016) call near-anankastic conditionals, as well as potential counterexamples to our pragmatic account, which seem to involve apparent mismatches in flavor between the NBA and consequent modals. We close with a brief examination of embedding of the NBA inference.

6.1 Near-anankastic conditionals

As discussed in Condoravdi & Lauer (2016), the problems with anankastic conditionals are present in cases beyond *want* conditionals expressing a means-to-an-end relation. Consider for instance the example in (41):

(41) If you want to go to Disneyland, you have to spend at least five days there. (Condoravdi & Lauer 2016)

A consequent-focused conditional like (41) doesn't express that spending five days is necessary for going to Disneyland; instead, it is about what you have to do in worlds where you do go to Disneyland. Such examples are problematic for von Fintel & Iatridou (2005), as a purpose clause paraphrase (*To go to Disneyland, you have to spend at least five days there*) doesn't seem to capture the meaning of (41).

Our proposal accounts for these conditionals straightforwardly: (41) gets the LF in (42a), and the standard truth conditions in (42b). We assume that the NBA inference in (42c) goes through.

(42) a. NEC [you want to go to Disneyland] [**have to**$_{T_{you}}$ [you spend five days there]]
b. In all *w'* compatible with what is known in *w* such that in all *w"* compatible with your desires in *w'* you go to Disneyland, in all *w'''* compatible with the facts in *w'* that best fit your goals in *w'* you spend 5 days there
c. $[\![$You want to go to Disneyland$]\!]^{w'} \Rightarrow [\![$You have to$_{B_{you}}$ go to Disneyland$]\!]^{w'}$

Given the NBA inference, (42b) gets the enriched truth conditions in (43a) (with the NBA enrichment in boldface), and given Flavor Matching between the NBA modal and the consequent modal, (43a) gets simplified as in (43b):

(43) a. In all *w'* compatible with what is known in *w* such that in all *w"* compatible with your desires in *w'* you go to Disneyland, in **all** *w'''* **compatible with the facts in *w'* that best fit your goals in *w'* you go to Disneyland**, and in all *w'''* compatible with the facts in *w'* that best fit your goals in *w'* you spend 5 days there

b. In all *w'* compatible with what is known in *w* such that in all *w"* compatible with your goals in *w'* you go to Disneyland, in all *w'''* compatible with the facts in *w'* that best fit your goals in *w'* **you go to Disneyland** and you spend 5 days there

6.2 Partial harmony

In this section, we turn to a couple of potential counterexamples to our account, where there seems to be a mismatch between the flavor of the NBA modal and that of the consequent modal, which should prevent harmonizing, but where a harmonizing reading does, in fact, seem to be possible.

First, Condoravdi & Lauer (2016) present an example where an anankastic reading of a *want* conditional seems to be available, but where the consequent modal is taken to be deontic:

(44) If you want to use the exemption now, you will have to$_{D}$ pay more taxes next year.

Under our account, we should only derive a harmonizing reading if an NBA inference goes through, and the flavor of the NBA modal matches that of the consequent modal. However, the only possible NBA inference for (44) seems to be teleological, not deontic. The attitude report *You want to use the exemption now* seems to trigger the inference that it is *teleologically* necessary for you to use the exemption, not that you are *legally* obligated to do so.

Importantly, we take NBA inferences to be just one kind of possible pragmatic enrichments, not the only one. In this particular example, we can easily assume that anyone would want to take advantage of any tax exemption that they qualify for. Given that the context presupposes that there is an exemption that can be used (given the use of the definite), it is fairly natural for the speaker to assume that if you want to and can use an exemption, then you will use it. We can thus interpret (44) with the enrichment in boldface in (45), and get an anankastic interpretation:

(45) If you want to use the exemption now, **you will use the exemption now**, and you will have to$_{T_{you}}$ pay more taxes next year, (**having used the exemption now**).

Another tricky example comes from a footnote in Condoravdi & Lauer (2016; 8:38), where it is used to show that on a restrictor analysis, the problems with anankastic conditionals are present even when the antecedent is about the facts that influence the contents of the modal base, and not the preferences in the ordering source. This problem is left as an open issue in Condoravdi & Lauer (2016). An adaptation of this example is given in (46), assuming a context where Al has been bragging about how much money she made this year:

(46) If we believe Al made lots of money, she will have to$_{\mathrm{D}}$ pay a lot of taxes.

In this example, we seem to get a harmonizing reading, where the complement of the attitude verb seems to restrict the modal base of the consequent modal: Al will have to pay a lot of taxes if she made a lot of money. Our account, however, only derives harmonizing readings when the flavor of the NBA modal matches the flavor of the consequent modal. The consequent modal in (46) is deontic, but while we can plausibly derive the epistemic NBA inference in (47b) from (47a), we cannot get the deontic one in (47c):

(47) a. We believe Al made a lot of money.
b. $\Rightarrow$ Al $\textsc{must}_{\mathrm{E}}$ have made a lot of money.
c. $\not\Rightarrow$ Al $\textsc{must}_{\mathrm{D}}$ have made a lot of money.

Intuitively, it seems that what is going on in (46) is that we take as fact that Al made a lot of money, and we take this fact for granted for the interpretation of the consequent modal. We tentatively propose that harmonizing can occur here, if we assume the following NBA inference from a belief report to a *circumstantial* (*C*) necessity:[15]

(48) We believe Al made a lot of money $\Rightarrow \Box_{\mathrm{C}}$ Al made a lot of money

Since deontic modals take a circumstantial modal base, the modal inference would deliver that in all worlds quantified over by the modal's modal base, Al made a lot of money, and in the legally best of these worlds, she pays a lot of taxes, as desired.

[15] In the Kratzerian tradition, both circumstantial and epistemic modal bases pick out worlds compatible with some *facts* in the world of evaluation. They differ in that (only) the latter can ignore some of these facts. Kratzer (1991) famously shows this with a scenario in which we come to a new land, and see that the soil and climate are ideal for hydrangeas, but we know that hydrangeas never made it to this part of the world. In this scenario, the circumstantial claim *Hydrangeas can grow here* seems true, but the epistemic claim *Hydrangeas might be growing here* seems false. This, Kratzer argues, shows that the epistemic modal base must include the fact that hydrangeas have not yet made it to this part of the world, but the circumstantial base doesn't. This might argue that circumstantial modal bases are simply subsets of epistemic ones, though see Condoravdi (2022) for discussion.

Assuming the LF in (49a), and the NBA inference in (48), we obtain the enriched truth conditions in (49b), with the enrichment in boldface. Under the hypothesis that the NBA modal and the consequent modal quantify over the same circumstantial worlds (further ordered by a deontic ordering source, in the case of the latter), we can simplify (49b) as (49c):

(49) a. NEC [we believe Al made a lot of money] [$\mathbf{must_D}$ [Al pays a lot of taxes]]
b. In all *w'* compatible with what is known in *w* and such that in all *w"* compatible with our beliefs in *w'* Al made a lot of money, in **all *w"* compatible with the facts in *w'* Al made a lot of money**, and in all *w"* compatible with the facts in *w'* that best fit the laws in *w'* Al pays a lot of taxes
c. In all *w'* compatible with what is known in *w* and such that in all *w"* compatible with our beliefs in *w'* Al made a lot of money, in all *w"* compatible with the facts in *w'* that best fit the laws in *w'* **Al made a lot of money** and pays a lot of taxes

6.3 Embedding

We conclude this paper by briefly turning to matters of embedding. What happens when the attitude report that triggers the NBA inference, *Subject* ATTITUDE *p*, is itself embedded within the antecedent? Can we still get a harmonizing reading then? On our view, the prediction is that we can, provided that the antecedent triggers an NBA inference, from *Subject* ATTITUDE *p* to $\Box_F$ *p* in the relevant worlds, and that *F* matches the flavor of the consequent modal. Since this inference is pragmatic, the question of whether it arises will depend on various background assumptions, pertinent not only to the embedded ascription, but also to the predicates that embed it. In this section, we briefly discuss some examples, and conclude that the facts seem to be as we predict them to be.

First, it appears that harmonizing readings are possible when a neg-raising attitude verb in the antecedent appears under negation. For instance, a natural interpretation of (50a) below, is the harmonizing reading that *not drinking* requires that you think of your family. This, we believe, is due to the NBA inference in (50b), where the negation is interpreted in the scope of the necessity modal:

(50) a. If you *don't* want to drink, you have to think of your family.
b. **NBA**: You don't want to drink ⇒ You *have to*$_{T_{you}}$ *not* drink (*in all epistemically accessible worlds*)

Similarly, we can get a harmonizing reading for (51a) as in (51b), thanks to the NBA inference in (51c), where the negation is again interpreted in the scope of the modal:

(51) a. If Sherlock *doesn't* think that the crime occurred at 6pm, Al must be the culprit.
b. If the crime *didn't* occur at 6pm, Al must be the culprit.
c. **NBA**: Sherlock doesn't think the crime occurred at 6pm ⇒ The crime *must*$_E$ have *not* occurred at 6pm (*in all epistemically accessible worlds*)

We can also get a harmonizing reading when an attitude report is embedded under another, through a chain of NBA inferences. Thus, from (52a), we may infer (52b), if we take Sherlock to be an epistemic authority, and Watson a truthful speaker, via the NBA in (52c), assuming the NBA holds in the relevant worlds:

(52) a. If Watson said that Sherlock thinks the crime occurred at 6pm, Al must be the culprit.
b. If the crime occurred at 6pm, Al must be the culprit.
c. **NBA**: Watson said that Sherlock thinks that the crime was at 6pm ⇒ Sherlock *must*$_E$ think that the crime was at 6pm (*in all epistemically accessible worlds*) ⇒ The crime *must*$_E$ have been at 6pm (*in all epistemically accessible worlds*)

But while harmonizing is possible in some cases where the attitude report is deeply embedded inside the antecedent, we predict that harmonizing will fail whenever the relevant NBA fails to arise. (53), for instance, doesn't get the reading in (52b), because the NBA inference in (52c) is not triggered.

(53) If Watson falsely claimed that Sherlock thinks the crime occurred at 6pm, Al must$_E$ be the culprit.

We leave other more complex cases of embedding to future discussion.

7 Conclusion

Anankastic conditionals have been vexing for classic accounts of modals and conditionals. They give rise to an apparent non-compositionality problem, where the embedded complement of an attitude verb in a conditional's antecedent seems to restrict the modal in its consequent. Previous literature derives anankastic readings by postulating lexical or syntactic idiosyncrasies for *want* or for teleological modality in conditionals. We believe, however, that the focus on *want* conditionals has been myopic. It has led to over-specialized analyses that miss the bigger picture. In this paper we have shown that the apparent non-compositionality problem of anankastic conditionals can be replicated with attitude verbs beyond *want*, and modals beyond the teleological. All can give rise to what we called harmonizing readings, where the complement of

an attitude verb in the antecedent of a conditional seems to restrict the modal in the conditional's consequent.

We have offered a pragmatic account of harmonizing conditionals that generalizes across modal flavors and attitude meanings. Specifically, we have argued that harmonizing arises when the meaning of the antecedent together with background assumptions gives rise to a necessity inference that matches in flavor with the consequent modal. The complement of the attitude verb—which corresponds to the prejacent of the inferred necessity modal—looks as if it directly restricts the consequent modal. However, under our proposal, it only does so indirectly, through the fact that the inferred necessity modal—though it's not part of the truth conditions of the conditional—and the consequent modal happen to quantify over the exact same worlds.

This general pragmatic solution to anankastic conditionals and their kin can predict when harmonizing readings are possible, when they are not, and the highly context-sensitive nature of the process. And it does so without relying on any flavor-specific idiosyncrasies. Hence, there really does not seem to be anything syntactically, or semantically special about anankastic conditionals. Harmonizing is wholly a pragmatic phenomenon.

Competing interests

The authors have no competing interests to declare.

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