Anankastic conditionals are just conditionals*

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Abstract Since Sæbø (1985, 2001) drew the attention of formal semanticists to the compositionality problems raised by anankastic conditionals like *If you want to go to Harlem, you have to take the A train*, a number of authors have proposed analyses tailor-made for such conditionals. We demonstrate that the seemingly puzzling properties of anankastic conditionals in fact show up independently from each other within a wider range of conditionals, which we call 'near-anankastic'. While they do not have the means-of implication typically associated with anankastics, near-anankastics give rise to their own special additional implications. As a crucial ingredient for a unified account, we provide a new analysis of the semantics of the desire predicate in the antecedent — an issue that has not been adequately pursued in the previous literature. We claim that *want* has an independently motivated reading on which it predicates the existence of an *action-relevant preference* (Condoravdi & Lauer 2011, 2012, Lauer 2013). We then show that the semantically determined interpretation of anankastic and near-anankastic conditionals arises, predictably and compositionally, from a range of interacting factors that are at play in the interpretation of conditional sentences more generally. The special implications associated with each kind of conditional arise pragmatically. Anankastic and near-anankastic conditionals alike turn out to be just what they seem: regular, hypothetical, indicative conditionals.

Keywords: anankastic conditionals, priority modals, desire predicates, teleological modality, effective preferences

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1 Introduction

Anankastic conditionals are conditionals of the form in (1) that express a necessary-means-of relation between the complement of the attitude predicate in the antecedent and the complement of the modal in the consequent. For example, (1) expresses that taking the A train is necessary to go to Harlem (in an optimal way).[1]

(1) If you want to go to Harlem, you have to / should take the A train.
conveys:
Taking the A train is necessary for going to Harlem (in an optimal way).

For a conditional to have such a reading, the consequent needs to contain a necessity modal that can get a reading relating to an agent's preferences,[2] and the antecedent must contain a 'desire' predicate. Besides *want*, predicates that relate to intentions and planning such as *intend*, *plan* and *goal* produce the same effect (see also Sæbø 2001).

(2) If you intend to go to Harlem, you should / have to take the A train.

(3) If you are planning to go to Harlem, you should / have to take the A train.

(4) If your goal is to go to Harlem, you should / have to take the A train.

Conditionals of this form need not have the anankastic interpretation. For example, (5) does not express that trying not to think about chocolate is necessary in order to eat chocolate in an optimal way, but rather it is used to give advice to the addressee on how to *avoid* eating chocolate.

(5) If you want to eat chocolate, you should try thinking about something else.
does not convey:
Thinking about something else is necessary for eating chocolate (in an optimal way).

As straightforward as the means-of implication of sentences like (1) might intuitively seem, it is far from obvious how it relates to the meaning of the conditional, or even how the conditional is to be interpreted. To paraphrase Sæbø (2001, his 'Problem 4'): How does a conditional of the form *If want(p), must(q)* convey information about a relationship between p and q, that is between a proper part of the antecedent

1 The term 'anankastic' originated with von Wright (1963), who used it to refer to sentences of a somewhat different form that also convey information about a necessary precondition. It came into the linguistic literature via Sæbø (2001), though the first authors to use the term 'anankastic conditional' were von Fintel & Iatridou (2005) (for what von Wright called a 'technical norm').

2 So, for example, *will*-conditionals do not get such a reading.

and the consequent? How do the various constituent expressions combine to give rise to the perceived interpretation?

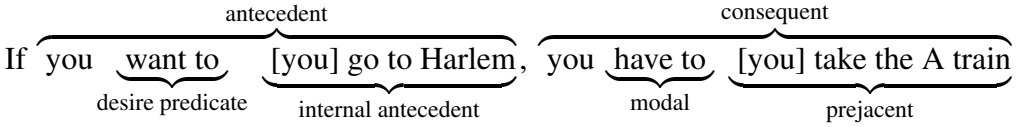
This paper addresses this question. We refer to sentences of the form (1)–(4) as 'anankastic conditionals' if and only if they are understood as conveying that the complement of the modal in the consequent is a necessary precondition for the complement of the desire predicate in the antecedent to be realized (in an optimal way). A central argument of this paper is that the apparently special properties of such conditionals are shared by conditionals that lack this implication, which we dub 'near-anankastic conditionals'. We do not define this term precisely, since ultimately, our claim is that anankastic, near-anankastic, and non-anankastic conditionals should receive a uniform semantic analysis. The question is thus not how to correctly classify conditionals into the three classes, but whether a proposed analysis accounts for the full range of perceived implications.

Although (near-)anankastic conditionals seem to call for a special treatment, our contention in this paper, reflected in our titular slogan, is that any adequate analysis of non-anankastic conditionals will take care of (near-)anankastic conditionals, as well, once the lexical meanings of the constituent expressions are fixed in the right way. Anankastic conditionals are just what they seem: regular, hypothetical, indicative conditional sentences.

2 The compositionality problem

In this section, we lay out the compositionality problem raised by anankastic conditionals. We give the basics of Kratzer's analysis of modals and conditionals and show how the problem manifests itself in this setting. Then we take a more general perspective, showing that the challenges posed by anankastics are general problems for any account of conditionalized necessity statements.

In the following, it will be useful to have some terminology for the various pieces of the conditional. The one we employ is summarized below.[3]



2.1 Kratzer's analysis of modals and conditionals

In Kratzer's (1981) analysis of modality, modals are interpreted relative to two contextually set parameters, whose values are functions from worlds to sets of

3 When there is no danger of confusion, we occasionally use the terms '(internal) antecedent' and 'prejacent' sloppily to refer to the propositions expressed by these clauses.

propositions. These are called the *conversational backgrounds* of the modal. The *modal base* specifies a set of background facts that are held constant in the interpretation of the modal. The *ordering source* consists of propositions corresponding to certain norms based on an ideal, such as lawfulness, goodness, normalcy, an agent's preferences, etc. These two parameters allow for the great variability in the observed interpretations of modal expressions to be reduced to a single rule of semantic interpretation. Of particular interest for this paper are what Portner (2009) calls 'prioritizing' conversational backgrounds, constituted by rules, laws, desires, or goals, as opposed to ideals such as normalcy, likelihood, or overall similarity.

In the following, we use f and g as general symbols for modal bases and ordering sources, respectively, and distinguish between different kinds with appropriate subscripts.[4] At each world w, an ordering source $g(w)$ induces a preorder $\leq_{g(w)}$ on worlds such that world u is (at least) as good as world v iff all the propositions in $g(w)$ that are true at v are also true at u:

(6) $\quad v \leq_{g(w)} u \iff \{p \in g(w) \mid v \in p\} \subseteq \{p \in g(w) \mid u \in p\}$

If we assume that $\leq_{g(w)}$ restricted to a set F is well-founded,[5] then there is a non-empty set of *best* worlds, picked out by *Opt*:

(7) $\quad Opt(w,F,g) = \left\{u \in F \mid \neg\exists v \in F\colon\ u <_{g(w)} v\right\}$

In the interpretation of a modal, the preorder induced by the ordering source is restricted to the set of worlds determined by the modal base. A necessity modal then simply says that its prejacent is true in all the best worlds:

(8) $\quad [\![\text{MUST}_{f,g}(\phi)]\!] = \{w \mid Opt(w, \bigcap f(w), g) \subseteq [\![\phi]\!]\}$

While (8) captures their semantic core, necessity modals are not all interpretationally equivalent. A major contrast is between modals like *must* and *have to*, on the one hand, and modals like *should* and *ought to*, on the other, which has been attributed to a difference in logical strength. We set aside the distinction between the two classes of necessity modals in this paper as it is orthogonal to our main concerns, but see von Fintel & Iatridou 2005, 2008 and Rubinstein 2012.

4 In this paper, we index modals and attitude predicates with their contextual parameters in the logical forms, without intending to take a position on the question of whether the parameters are present at logical form and/or compose with the modals as arguments. We also follow general practice in using the terms *modal base* and *ordering source* both for the functions and their values at particular worlds.

5 This assumption is equivalent to Lewis's (1981) 'Limit Assumption'. See Kaufmann & Kaufmann 2015: p. 334–335 for discussion on why it is necessary to require well-foundedness, rather than just requiring there to be a set of best worlds.

The analysis of conditionals is a generalization of the analysis of modals. A conditional has the structure MODAL[antecedent][consequent]. The function of the *if*-clause is to restrict the modal base: we do not look at *all* worlds determined by the modal base anymore, but rather only at those in which the antecedent is true. MODAL corresponds either to an overt modal in the consequent, or if there is no overt modal, to a covert necessity operator that we designate as NEC. Thus, we can assume the schematic construal rule in (9) and the interpretation rule in (10) for necessity operators, including the covert NEC. (8) can be seen as a special case of (10) where the null antecedent argument is a tautology, imposing a trivial restriction.

(9) $$If\,\psi,\chi \;\rightsquigarrow\; \begin{cases} \textsc{Modal}[\psi][\phi] & \text{if } \chi = \textsc{Modal}\,\phi \\ \textsc{nec}[\psi][\chi] & \text{otherwise} \end{cases}$$

(10) $$\left.\begin{array}{l} [\![\textsc{must}_{f,g}[\psi][\phi]]\!] \\ [\![\textsc{nec}_{f,g}[\psi][\phi]]\!] \\ [\![\textsc{should}_{f,g}[\psi][\phi]]\!] \end{array}\right\} = \{w \mid \forall v \in \mathit{Opt}(w, \textstyle\bigcap f^{+}(w), g) \colon\; v \in [\![\phi]\!]\}$$

where for any w, $f^{+}(w) = f(w) \cup \{[\![\psi]\!]\}$

More concretely, a conditional like (11a) has the (schematic) logical form in (11b). In evaluating it, we want to keep the relevant facts of the actual world w_0 constant except for those that are inconsistent with the hypothetical assumption of the antecedent. In the Kratzer framework, this is usually implemented by assuming a modal base which delivers propositions characterizing some set of relevant facts (a so-called 'circumstantial' modal base), whose intersection is effectively presupposed to be compatible with the antecedent, via the usual ban on non-vacuous quantification.

(11) a. If you have any US income this year, you must declare it.
b. MUST [you have US income] [you declare your US income]

According to (10), (11) amounts to saying that in all the best worlds according to the actual law in which you have US income you declare it. That is, the laws that matter for the deontically construed modal in (11) are those of the actual world w_0, regardless of whether the hypothetical assumption is true at w_0 or not.

2.2 The role of the internal antecedent in anankastics

When we move to anankastic conditionals, all that ought to change is the type of ordering source associated with the modal. Since modals like *must*, *should* and *ought* can get priority readings, and the antecedent conditionalizes on the addressee's

desires, a plausible first hypothesis is that the modals in such conditionals are construed with a *bouletic* ordering source, which ranks worlds by how well they satisfy the addressee's desires. Isn't that enough to give the correct result?

Kjell Johan Sæbø was the first to point out, in Sæbø 1985, 2001, that this is not enough: Kratzer's framework, or indeed any variant that analyzes *if*-clauses as restrictors of modals, runs into a formal problem with anankastic conditionals. Take the Harlem sentence in (1) and suppose that we interpret it relative to a circumstantial modal base and a bouletic ordering source. A circumstantial modal base f_{circ} applied to a world w, returns a set of relevant propositions that are true in w (e.g., for the Harlem sentence, this set would include facts about public transportation). A bouletic ordering source for an agent g_{bulA}, applied to a world, yields all of the agent's desires/goals in that world (e.g., for the Harlem sentence, it will include the addressee's goals, such as where he wants to go). According to the analysis encoded in (9) and (10), we can algorithmically describe the interpretation as follows:

(12) We collect all worlds in which the relevant circumstances (about public transportation, etc.) hold. First, we eliminate all those worlds in which the addressee *Ad* has no goal or desire to go to Harlem. Then we rank the remaining worlds according to *Ad*'s *actual* goals. Finally, we check if in all the highest-ranked worlds — which are worlds in which *Ad* achieves his actual goals — *Ad* takes the A train.

But this does not give the right result. The problem is that the ranking is determined on the basis of *Ad*'s actual goals, which may or may not include going to Harlem. If they do, then hypothesizing that *Ad* wants to go to Harlem is inert: the proposition that *Ad* takes the A train will be true in the highest ranked worlds relative to the restricted modal base iff it is true in the highest ranked worlds relative to the original modal base. If they do not, then the proposition that *Ad* takes the A train is not guaranteed to be true in all the highest ranked worlds, potentially rendering (1) false.

Put differently, the question is not, 'Among all the wanting-to-go-to-Harlem worlds, which ones best satisfy the addressee's actual goals?' Rather, we want to know, 'Which worlds (at which the relevant circumstances hold) best satisfy the goals of the addressee plus the hypothetical goal of going to Harlem?' For this, we want an interpretation that can be algorithmically described as follows:

(13) We collect all worlds in which the relevant circumstances (about public transportation, etc.) hold. Then we rank these worlds according to whether the addressee reaches Harlem in them (and according to how well they satisfy the addressee's other goals). Finally, we check whether in all the highest-ranked worlds the addressee takes the A train.

It should be clear that this problem is a fully general one: Whenever the antecedent of a conditionalized modal is about facts that influence the value of the ordering source, any theory that takes *if*-clauses to restrict the modal base of the overt modal will yield the wrong result (cf. also Frank 1997, von Fintel & Iatridou 2005, Huitink 2008).

In order to obtain an interpretation along the lines of (13), Sæbø (2001) amended Kratzer's analysis so as to allow the internal antecedent — the complement of the desire predicate — to be added to the *ordering source* of the modal, rather than adding the full antecedent to its modal base. von Stechow et al. (2006) and von Fintel & Iatridou (2005) criticized his analysis on two counts. First, it is not compositional, since "there is no systematic procedure to obtain [the augmented ordering source] from the sentence 'you want to go to Harlem'" (von Stechow et al. 2006: p. 156), and secondly, simply adding the hypothetical goal to the set of actual goals runs into another problem, the problem of *conflicting goals*.

2.3 Conflicting goals

To illustrate the problem let us consider the following scenario, which is an elaboration of the 'Hoboken scenario' of von Fintel & Iatridou (2005). Suppose you are on a subway platform and notice a stranger who appears lost. You think the stranger might be on his way to Harlem but does not know which train goes there. To be helpful, you approach him and utter (1). As it happens, the stranger actually wants to go to Hoboken, accessible only by the PATH train. Given the facts about transportation and the semantics of indicative conditionals, your utterance of (1) is true regardless of whether the stranger is actually headed to Harlem or to Hoboken.

But on Sæbø's (2001) analysis, (1) comes out as false on this scenario. Here is why. Take g_{bulA} to be a bouletic ordering source representing the desires/goals of the addressee *Ad*, **Harlem** the proposition that *Ad* goes to Harlem, **Hoboken** the proposition that *Ad* goes to Hoboken, **ATrain** the proposition that *Ad* takes the A train, and **PATH** the proposition that *Ad* takes the PATH train. Since the stranger's actual goal is to go to Hoboken, **Hoboken** is one of the propositions in $g_{bulA}(w_0)$. Given the interpretation of conditionals assumed by Sæbø (2001), the augmented ordering source $g^{+}_{bulA}(w_0)$ contains both **Harlem** and **Hoboken**. But then, given that **Hoboken** and **Harlem** are incompatible, the set of the highest ranked worlds (within the modal base) relative to $g^{+}_{bulA}(w_0)$ is partitioned into those that are in **Harlem** and those that are in **Hoboken**. Given the facts about transportation, the **Harlem** worlds are **ATrain** worlds and the **Hoboken** worlds are **PATH** worlds. Hence, the highest ranked worlds are partitioned into the **Harlem** + **ATrain** worlds and the **Hoboken** + **PATH** worlds. But then not all the best worlds are **ATrain** worlds, which makes (1) false.

In general, conflicting goals partition the highest ranked worlds in the modal base, which leads to problematic predictions for both necessity and possibility modals.[6] With necessity modals, conflicting goals lead to falsity of intuitively true conditionals, as discussed above. With possibility modals, they lead to truth of intuitively false conditionals. For instance, (14) is predicted to be true in the Hoboken scenario, contrary to intuition.

(14) If you want to go to Harlem, you can take the PATH train.

The presence of **Hoboken** in $g^{+}_{bulA}(w_0)$ ensures that there is *some* optimal world in which the addressee takes the PATH train, even though we have added the hypothetical goal **Harlem**.

The problem of conflicting goals is not confined to Sæbø's analysis. As discussed by von Fintel & Iatridou (2005), it arises for any analysis that has the effect of merely adding the hypothetical goal to the actual goals of the addressee. Even if we start with a consistent set of propositions, adding the hypothetical goal expressed by the internal antecedent could well lead to inconsistency, in which case the best worlds will be partitioned into equivalence classes, not all of which necessarily verify the prejacent. Moreover, we cannot eliminate the potential inconsistency that the internal antecedent may bring in by restricting attention to those worlds in which the full antecedent is true, since *want p* and *want q* are not incompatible even when *p* and *q* are.

Finally, the problem is not just with the particular conversational background for the ordering source we have chosen for the exposition, namely a (pure) bouletic background. Whatever the conversational background g is taken to be, it should be such that it allows for the truth of the conditional no matter what the hypothesized goal in the antecedent is (provided the facts are right). For example, in the scenario described above it should simultaneously verify both the Harlem sentence and the Hoboken sentence (15).

(15) If you want to go to Hoboken, you have to / should take the PATH train.

This means that g should be such that adding *any* goal proposition to $g(w_0)$ via the antecedent results in a $g^{+}(w_0)$ that can non-spuriously verify the consequent of the conditional. One way this is achieved is if $g^{+}(w_0)$ is consistent. The question is how this is to be ensured for arbitrary goal propositions.

6 Thanks to Rick Nouwen (p.c.) for raising the question whether the problem of conflicting goals arises only for necessity modals. Nissenbaum (2005), Werner (2006) discuss possibility anankastics, but the issues they raise have to do with interfering compatible goals, rather than conflicting goals. See n. 51 in Section 7.1.1.

The compositionality problem posed by anankastic conditionals thus manifests itself in a Kratzerian setting in two ways. The hypothesis made with the antecedent should matter, as it usually does in conditionals, but it seemingly does not. And the actual goals/desires should not all matter, but they do. More technically, the propositions in the ordering source of the overt modal are not simply those determined by the world of evaluation but are affected by the antecedent in some way. But whatever the antecedent contributes cannot simply be added to the ordering source at the world of evaluation.

2.4 Conditioning on preferences beyond the Kratzer framework

Independently of any particular semantic analysis, anankastics are conditionals that hypothesize on a preference in a special way. Their antecedent plays a double role: it contributes the hypothesis that the agent has the stated preference and at the same time the hypothetical preference is a norm that influences the ordering underlying the semantics of the modal. An outstanding issue is how this is achieved. We call this the *problem of conditioning on norms*. Another issue is which preferences, in addition to the hypothesized one, play a role in the ordering. We call this the *interacting preferences problem*.

Within the Kratzer framework, Sæbø (2001) identified the problem of conditioning on norms, while von Fintel & Iatridou (2005) and von Stechow et al. (2006) identified an aspect of the interacting preferences problem. But these two problems are not confined to this framework, and in fact are, to a considerable extent, independent from issues of semantic composition. To bring this out, we briefly consider anankastics from the perspective of Dyadic Standard Deontic Logic (DSDL).

In DSDL, conditional obligations $O(C \mid A)$ are represented in terms of a dyadic operator O, which specifies that, given an extrinsically given system of norms, C is an obligation ('what ought to be the case') provided the facts are as specified by A. The English conditional in (11a) would be represented as in (16). For this sentence, the norms can be thought of as given by US tax law. For the Harlem sentence, they are given by the preferences of the agent.

(16) O(you declare your US income | you have US income)

On the usual construal of $O(\cdot \mid \cdot)$, the Harlem sentence cannot be represented as a standard conditional obligation, as in (17), because the standard construal simply applies the extrinsically given norms to antecedent situations. What is needed is a provision for the antecedent to *influence* the norms.[7]

7 In the Hansson-Lewis semantics for $O(\cdot \mid \cdot)$, which of course served as inspiration for Kratzer's analysis, the norms are captured through an extrinsically given ordering on worlds (Hansson 1969,

(17) $O(\text{you take the A train} \mid \text{want}(\text{you go to Harlem}))$

Setting the issue of compositionality aside, if we are looking for a way to represent the Harlem sentence by means of a formula of deontic logic, two obvious strategies for dealing with *conditioning on norms* are: (i) revise the semantics of $O(\cdot|\cdot)$ so that it can represent conditionals like (11a) *and* conditionals like the Harlem sentence;[8] (ii) retain the classical treatment for (16), but represent the Harlem sentence with a different operator, say $O(\cdot \mid_n \cdot)$, that allows us to represent the Harlem sentence as in (18), and allows the condition to influence the ordering (this is essentially the move made by Sæbø (2001) within the Kratzer framework).

(18) $O(\text{you take the A train} \mid_n \text{you go to Harlem})$

In either case, the interpretation of one of these two operators must treat the relevant system of norms not as fixed *ex ante*, but allow it to be changed so as to include the condition.

As a consequence, either choice will also have to deal with the interacting preferences problem, since conflicts created by hypothesizing on a preferential norm must be treated differently from conflicts between extrinsically given preferences. The latter will render either one or both unconditional necessity statements in (19) false, while the corresponding conditionals in (20) can be true in the same context.[9]

(19) [Context: John and Bill are playing chess. John is by far the superior player, but Bill is good enough to draw out the game for a considerable amount of time, and competitive enough to not accept a draw. John hates to resign a game to an inferior player, but it is 3am, and he needs to go to bed. The only way to get out of the game quickly is to resign. The only way to win, of course, is to keep playing. He cannot make up his mind.]

a. (In view of what he wants,) John should resign the game.

b. (In view of what he wants,) John should not resign the game.

Lewis 1973). $O(C \mid A)$ is true just in case the best A-worlds according to the ordering are all C-worlds. Consequently, anankastics are just as problematic for DSDL as they are for Kratzer's analysis: (17) says that, relative to the extrinsic ordering in terms of the agent's preferences, the best wanting-to-go-to-Harlem worlds are A train worlds. Neither the problem of conditioning on norms, nor the interacting preferences problem is due to the way Kratzer derives the ordering on worlds from the ordering source.

8 Variants of DSDL, that allow for nested O-operators, such as those of Åqvist (2002), could presumably represent the Harlem sentence by means of a formula like $O(C \mid O(A))$. Thanks to Leon van der Torre for discussion on this point.

9 (19) is parallel to Kratzer's (1981) mayor example. Huitink (2008: p. 29) points out that sentences like the conditional necessities in (20) can be true even if the corresponding unconditional necessities are false due to a conflict.

(20) [Context: As in (19)]

a. If John wants to go to bed, he should resign.

b. If John wants to win the game, he should not resign.

Based on examples like these, one may be tempted to address the interacting preferences problem by *disregarding* the extrinsically given norms entirely, and only take into account the hypothetical preference of the antecedent.[10] This ensures that any conflicts are avoided in the conditional case. But this strategy will run into trouble, as well, because at least *some* compatible preferences need to be taken into account even when conditionalizing on norms, as we will see in Section 4.

In sum, the problem of conditioning on norms and the problem of interacting preferences are problems for any logic of conditional necessity just as much as they are problems for the compositional interpretation of natural language sentences. In the context of anankastic conditionals, it may be tempting to solve both problems by the same mechanism. As we will see in the next section, this is what von Fintel & Iatridou (2005) and von Stechow et al. (2006) aimed at. In Section 4, we will cast doubt on this strategy, showing that the two problems show up independently from each other in near-anankastics.

3 Previous approaches: A special status for the antecedent goal

von Fintel & Iatridou (2005), von Stechow et al. (2006), Huitink (2005, 2008) have proposed accounts of anankastic conditionals within the Kratzer framework. They all share two features (cf. von Fintel & Iatridou's (2006) characterization of 'the consensus' at the time). First, the *if*-clause is not taken to restrict the overt modal in the consequent. Secondly, they all aim, in one way or another, at implementing the following idea: The goal specified by the internal antecedent (e.g., **Harlem**) is given special status, so as to make sure that it wins out against any competing goals (e.g., **Hoboken**). There is something clearly correct about this idea. Any successful analysis will have to ensure that the goal mentioned in the antecedent wins out against other goals that are not mentioned, if they are in conflict. In this section, we summarize how these previous approaches aim to achieve the special status of the antecedent goal, and therewith solve the conflicting goals problem. We defer discussion of the role of the *if*-clause until Section 6.

10 As we will see in Section 3, this is essentially the move of von Fintel & Iatridou (2005) and Huitink (2008).

3.1 A 'strong' interpretation for the antecedent

Huitink (2008) suggests (following up on a remark in Nissenbaum 2005) that the *if*-clause of anankastics is interpreted in a 'strong' way, viz., as hypothesizing that the agent *only* has the stated goal, and no others. Thus, the Harlem sentence is interpreted, in effect, as (21). Together with an independent solution to the problem of conditioning on norms,[11] this move side-steps the problem of conflicting goals, as it is equivalent to the strategy, mentioned in Section 2.4, of disregarding all actual preferences of the agent in the interpretation of a conditional necessity.[12]

(21) If the only thing you want is to go to Harlem, you have to / should take the A train.

This proposal raises two kinds of issues, one theoretical, one empirical. The theoretical issue was well-appreciated by Huitink (2008) herself, who wrote (p. 146, emphasis in original): "But *why* would the *if*-clause ever be interpreted in such a strong way?" Huitink briefly considers the possibility that this interpretation arises because, in the presence of conflicting desires, an agent often has to decide which one is to have priority, but quickly dismisses this as a general solution, as such considerations would not narrow down the set of goals to one. She resigns herself to simply stipulating that the *if*-clause gets this interpretation, noting that the alternative accounts that we will discuss in the remainder of this section are no less stipulative. The empirical issue is that the 'strong' interpretation of the *if*-clause is too strong. We will see in Section 4 that it is often crucial that other goals be taken into account besides the one mentioned in the antecedent, especially with near-anankastics.

Nevertheless, we think Huitink zeroed in on the right idea, viz., that the conflicting goals problem is to be solved by an appropriate interpretation for the antecedent, rather than special properties of the modal in the consequent, as on the two analyses we discuss next.

3.2 Anankastics as elliptical purpose constructions

The analyses proposed by von Stechow et al. (2006) and von Fintel & Iatridou (2005) aim to ensure the special status of the antecedent goal in a different way. They start

11 Huitink considers two options, one of which is a 'nested modal' structure for the conditional (Frank 1997). In Section 6, we provide additional arguments for such a structure, which we adopt as part of our own analysis.

12 Huitink's analysis is also designed to solve another problem concerning certain non-conflicting goals. This problem only affects strong modals like *must*, but not weak modals like *should*, and hence it will ultimately have to be solved by the correct account of the difference between the two classes of modals. As we have set the issue of modal strength aside in the present paper, we will be discussing only issues pertaining to all necessity modals.

from the idea that anankastics contain a covert purpose clause: the modal in the consequent is assumed to require an additional argument, the purpose clause, and the internal antecedent provides it non-compositionally, by means of an anaphora-like relationship. *If want p, then must q* is actually interpreted like *If want p, then to p must q*. This conditional, in turn, is taken to communicate, in terms of its informational content, just what the naked purpose construction *To p must q* would communicate. Schematically:[13]

(22) a. If want p, then must q.
IS ELLIPTICAL FOR:
b. If want p, then to p must q.
IS INFORMATIONALLY EQUIVALENT TO:
c. To p must q.

The communicative equivalence of (22a) and (22c) seems appropriate for typical examples of anankastics, such as (1), which is indeed intuitively equivalent to *To go to Harlem, you have to take the A train*. As we shall see in Section 4, however, there are conditionals of the same form which pose the same kind of problems as anankastic conditionals but for which this equivalence does not hold. For now, however, we focus on how (22c) (and therewith (22a)) is interpreted according to these authors.

Since, in the purpose clause variant, the internal antecedent functions as a separate argument of the modal, it can be given a special status, overriding all conflicting goals or desires. von Stechow et al. and von Fintel & Iatridou differ in how this special status is achieved.

3.2.1 The purpose construction according to von Stechow et al. (2006)

von Stechow et al. (2006) analyze *to p must q* as equivalent to the counterfactual *If it were the case that p, then it would be the case that q* (in its truth-conditions, but without the presumption that the antecedent is false). We can assume the construal rule in (23), where $\Box\!\!\rightarrow$ is used to designate a counterfactual modal (reminiscent of Lewis' counterfactual conditional operator).

(23) *to p must q* $\rightsquigarrow \Box\!\!\rightarrow[p][q]$

13 von Stechow et al. and von Fintel & Iatridou differ in how (21b) comes to be interpreted as essentially equivalent to (21c). von Stechow et al. (2006) propose to view the whole conditional as a biscuit conditional, treating the *if*-clause essentially as a relevance hedge. von Fintel & Iatridou (2005) suggest another option, the double-modal analysis, which we will discuss in Section 6.

Following Kratzer's analysis of counterfactuals, von Stechow et al. assume that the counterfactual modal $\Box\!\!\rightarrow$ is always evaluated relative to a trivial modal base $f_\emptyset$ (for any w: $\bigcap f_\emptyset(w) = W$) and a totally realistic ordering source (i.e., an ordering source that maps any world to a set of propositions that uniquely characterizes that world).

On this account, (24a) and (24b) both get mapped to the same logical form and receive the same truth-conditional interpretation.

(24) a. To go to Harlem, you have to take the A train.
b. If you were to go to Harlem, you would take the A train.

The internal antecedent of an anankastic conditional supplies the elliptical purpose clause argument of the modal in the consequent, whose logical form is then derived according to (23). Given (23), the internal antecedent ends up as the restriction of $\Box\!\!\rightarrow$, so the precajent is guaranteed to be evaluated only relative to **Harlem** worlds, namely the maximally similar worlds to w_0 in which **Harlem** is true. The problem of conflicting goals is thereby avoided.

Thus, on this analysis, in anankastic conditionals the modals *must, have to, should, need, ought to*, despite appearances, are counterfactual, i.e., similarity-based, modals, not priority modals. This leads to problematic predictions, as we discuss in Section 4.

3.2.2 The purpose construction according to von Fintel & Iatridou (2005)

von Fintel & Iatridou (2005) assume that the modal of *to p must/should q* is a teleological modal and that teleological modals are special with respect to their contextual parameters: they are interpreted relative to a modal base, a primary ordering source, and possibly a secondary ordering source. The primary ordering source g_{desG} consists of a "designated goal", which is provided by the purpose clause. Like an indexical, g_{desG} has a constant value across worlds. The secondary ordering source g_{bul} consists of other relevant goals or desires and resolves ties left by the primary ordering source. The distinction between primary and secondary ordering sources rests on the proposal by von Fintel & Iatridou (2008) that the difference in strength between necessity modals depends on whether a secondary ordering is made use of in the interpretation of the modal.[14]Essentially, strong modals do not make reference to a secondary ordering source, only weak modals do.[15]

von Fintel & Iatridou's analysis can thus be characterized by the construal rules in (25) and the special interpretation rules for teleological modals in (26) and (27).

14 We use the notation $g_1 \circ g_2$ for the combination of a primary and a secondary ordering source.

15 For a critical discussion of distinguishing between primary and secondary conversational backgrounds see Rubinstein 2012.

(25) a. *to p must/have to q* $\rightsquigarrow$ TEL-MUST$^p(q)$
b. *to p should/ought to q* $\rightsquigarrow$ TEL-OUGHT$^p(q)$

(26) $[\![\text{TEL-MUST}^p_{f_{circ},g_{bul}}(q)]\!] = \{w \mid \forall v \in Opt(w, \bigcap f_{circ}(w), g_{desG}) : v \in [\![q]\!]\}$,
where $g_{desG}(w) = \{[\![p]\!]\}$ for any w
'All the worlds in the modal base in which the designated goal p is realized are q worlds.'

(27) $[\![\text{TEL-OUGHT}^p_{f_{circ},g_{bul}}(q)]\!] = \{w \mid \forall v \in Opt(w, \bigcap f_{circ}(w), g_{desG} \circ g_{bul}) : v \in [\![q]\!]\}$,
where $g_{desG}(w) = \{[\![p]\!]\}$ for any w
'All the highest ranked worlds in the modal base in which the designated goal p is realized are q worlds.'

It is worth noting that since the primary ordering source contains a single proposition, the effect is the same as adding this proposition to the modal base (as long as the two are compatible). Thus, von Fintel & Iatridou's analysis is essentially equivalent to an analysis of anankastics according to which the *internal* antecedent is added to the modal base. As such, the analysis is equivalent to an early unpublished proposal by von Stechow (referenced in von Stechow et al. 2006), according to which the verb *want* in anankastics is semantically vacuous (see also von Stechow et al. 2006: p. 159 and Huitink 2008: p. 136).

3.3 Upshot

On the views of von Stechow et al. and of von Fintel & Iatridou, what makes a conditional anankastic is the implicit purpose clause, while for Huitink (2008), it is a special 'strong' interpretation of the antecedent. Huitink (2008) criticizes the covert purpose clause analyses as stipulative, and acknowledges that the same is true for her proposal. Ideally, we would like the interpretation of anankastic conditionals to simply arise from the interaction of semantic properties that the expressions involved have generally, within and outside of anankastics.

Quite independently of that, in the next section, we show that there are also empirical problems for the three accounts. While it is right that the goal expressed by the internal antecedent must be given priority over conflicting goals, the special status assigned to this goal by the analyses discussed in this section is *too* special. As a result, the analyses cannot generalize to near-anankastic conditionals, which pose the same kinds of problems for a compositional analysis as anankastics do.

4 Generalizing the compositionality problem

The discussion of anankastic conditionals in the literature has focussed on examples in which the conditional conveys that the internal antecedent and the prejacent are related by a 'necessary means of' relation or a 'best way of achieving' relation.[16] In this section, we show that the problems raised by anankastic conditionals are not confined to conditionals of this kind. The same kind of issues are raised by conditionals that do not convey information about the means to an end.

First, let us note that some anankastics communicate something more general than a 'means-of' implication. (28) does not communicate that having a table that seats at least 20 people is a means of inviting everyone to dinner — instead, it is merely a precondition (for seating all the people invited) that has to be satisfied.

(28) If you want to invite everyone to the dinner, your table has to seat at least 20 people.

In light of such examples, we want to say that what anankastic conditionals express, at best, is the more general necessary-precondition relation, with necessary-means-of being simply a special kind of a necessary precondition. In Sæbø 2001 and much subsequent work, anankastics are generally characterized as involving necessary preconditions rather than the more specific 'means-of' relation, though discussion has invariably focussed on cases involving means. This has led some researchers to construe the problems raised by anankastics as being inherently about understanding the 'means-of' relation (Fernando 2005, Werner 2006). It should be clear, however, that (28) raises exactly the same problems for semantic analysis as (1), and so do the cases we discuss below.

4.1 Strengthened goals

In the core anankastic cases, the internal antecedent can plausibly be seen as the only source for the elided material of the purpose clause. But in general there may be an overt purpose construction in the consequent, as in (29a), or an implicit one which cannot be simply supplied by the internal antecedent. For instance, (29b) need not convey that getting a vaccine is a necessary precondition for traveling to that place no matter what. In both cases, the internal antecedent has to join the other goal, be it explicitly mentioned by a purpose clause or understood.

16 It should be pointed out, however, that this implication does not fall out directly from the semantic analyses we have discussed above. von Stechow et al. (2006) and von Fintel & Iatridou (2005) consider adding an extra clause to the semantics to capture it as an entailment.

(29) a. If you want to travel to that place, you should/must get a vaccine to be safe.
b. If you want to travel to that place, you should/must get a vaccine.

(30) To travel there and be safe you should/must get a vaccine.

In order for (29) to be interpreted like (30), as it has to be on the analyses of von Fintel & Iatridou (2005) and von Stechow et al. (2006), multiple goal propositions have to be involved, which reintroduces the potential for inconsistency that the analyses tried to circumvent. The propositions have to be consistent so that their intersection is non-empty. As far as we can see, the only way to ensure this is to stipulate it.

Similarly, on Huitink's proposal, according to which the antecedent in (29) is interpreted as equivalent to *if the only thing you want is to travel to that place*, at least (29b) is predicted to be false if getting a vaccine is not a necessary precondition for going (but only a necessary precondition for being safe when going). The goal of being safe cannot enter into the evaluation of (29b) — unless we assume, rather implausibly, that *if you want to travel to that place* is interpreted as *if the only thing you want is to travel to that place and be safe*.

4.2 Near-anankastics about teleological consequences

The problems raised by anankastics are even more general, as examples like (31) show.

(31) If you want to go to Disneyworld, you must / should spend at least five days there.

(31) is not about *pre*conditions at all. Instead, it is about a *consequence* of achieving the goal of going to Disneyworld. But still, (31) raises exactly the same kind of compositionality problem as the canonical examples of anankastic conditionals: the conditional ends up conveying information about a relationship between the internal antecedent (*you go to Disneyworld*) and the prejacent (*you spend at least five days there*).

(33) (a non-counterfactual variant of the naturally occurring (32)) is ambiguous between a 'precondition' and a 'consequence' reading, which can be made explicit with adverbs that temporally constrain the prejacent, as in (34a) and (34b). On both readings, however, it asserts a relationship between privatizing and bulldozing (i.e., the internal antecedent and the prejacent), rather than a relationship between a *desire* to privatize and bulldozing (i.e., the full antecedent and the prejacent).

(32) If the government wanted to privatize here, they would have to bulldoze everything. And that's never going to happen. *NYT*, Nov. 18, 2012

(33) If the government ever wants to privatize here, they will have to bulldoze everything.

(34) a. If the government ever wants to privatize here, they will have to bulldoze everything first.
b. If the government ever wants to privatize here, they will have to bulldoze everything afterwards.

(31) and both temporal interpretations of (33) raise the same compositionality problem as the Harlem sentence (1). This casts doubt on the strategy of von Stechow et al. (2006) and von Fintel & Iatridou (2005) to solve the problem by reducing anankastic conditionals to purpose constructions. Unlike with (1) and mere-precondition variants like (28), the analogous purpose construction in (35) is not intuitively equivalent to (31), either in the non-conditional version (35a) or in the conditional version (35b). Nor is (34b) intuitively equivalent to (36a) or (36b).

(35) a. #To go to Disneyworld, you have to spend at least five days there.
b. #If you want to go to Disneyworld, to go to Disneyworld, you have to spend at least five days there.

(36) a. #To privatize here, the government will have to bulldoze everything afterwards.
b. #If the government ever wants to privatize here, to privatize here, they will have to bulldoze everything afterwards.

This case also reveals a problem for von Stechow et al.'s (2006) analysis of the modal in anankastics as a similarity modal. Their analysis gives (31) and (37) the same truth conditions.

(37) If you went to Disneyworld, you would spend at least five days there.

But (31) and (37) are not truth conditionally equivalent. Suppose you can only take three days off work (and that this is mutually known to speaker and addressee). (31) can be true in this case — and can be used to dissuade the addressee from spending his three days off work in Disneyworld — while (37) would be false. The same problem arises for regular anankastics but it is obscured by the fact that the counterfactual is a plausible implication of the anankastic under certain contextual conditions.

4.3 Near-anankastics about deontic consequences

(31), like the canonical examples of anankastics, arguably contains a teleological or bouletic modal in the consequent: it is a necessity to spend at least five days in Disneyworld *in view of the agent's desires or goals* (e.g., a desire to make the most of one's vacation). Strikingly, the same kind of compositionality problem arises with conditionals involving *deontic* consequences, such as (38).

(38) If you want to use the exemption now, you must / will have to pay more taxes next year.

It is, of course, perfectly legal to *desire* to take the exemption this year, and not pay more taxes next year. What (38) conveys, intuitively, is that it is illegal to actually take the exemption now and not pay more taxes next year. That is, (38) conveys information about a (deontic) relationship between the internal antecedent (*you take the exemption now*) and the consequent (*you have to pay more taxes next year*).

4.4 'What kind of' near-anankastics

Another case of near-anankastics which can neither be paraphrased by a purpose construction nor have a means-of implication are those where the prejacent entails the internal antecedent, as in (39) and (40).

(39) a. If you want to go to the disaster area, you should go there quickly.
b. #To go to the disaster area, you should go there quickly.

(40) a. If you want to buy a fancy dress, you should buy a well-made one.
b. #To buy a fancy dress, you should buy a well-made one.

In (39a) and (40a) the prejacent is neither a precondition for, nor a consequence of, the goal stated in the antecedent, but a specialization of it. By specifying the particular way in which the goal can be optimally realized, (40a), for example, can be used to give advice about *what kind* of fancy dress to buy.

Once again, the infelicity of the corresponding purpose construction will be troublesome for any analysis that assumes that anankastic conditionals contain covert purpose clauses. And Huitink's analysis will predict the sentences in (39a) and (40a) to be equivalent to the ones in (41a) and (41b), respectively. But, intuitively, these sentences do not have the same truth-conditions — e.g., (41b) could be true because, if you want to buy nothing else, you should use all your disposable income on the dress, in which case (40a) is not necessarily true.

(41) a. If the only thing you want is to go to the disaster area, you should go there quickly.

b. If the only thing you want is to buy a fancy dress, you should buy a well-made one.

Finally, such cases highlight the difference between the priority-based modal in (40a) and the similarity-based modal in (42). (40a) can be true when (42) is not, e.g., if the addressee lacks the necessary funds to buy a well-made dress.

(42) If you bought a fancy dress, you would buy a well-made one.

4.5 The 'vacuity' of *want*

While (38) and (40a) are not intuitively equivalent to the analogous purpose construction, they are intuitively equivalent to the same conditional without *want*.

(43) If you take the exemption now, you must / will have to pay more taxes next year.

(44) If you buy a fancy dress, you should buy a well-made one.

This is the case for many anankastics and near-anankastics. (45a) is intuitively equivalent to (31), (1) is equivalent to (45b).

(45) a. If you go to Disneyworld, you must / should spend at least five days there.
b. If you are going / ever go to Harlem, you (will) have to take the A train.

At first blush, these cases suggest that *want* is 'vacuous' (denotes the identity function), as in the preliminary proposal by von Stechow mentioned in Section 3.2.2. This would circumvent the compositionality problem: The conditional is able to express a relationship between the internal antecedent and the consequent because the whole antecedent is semantically identical to the internal antecedent. However, assuming that the desire predicate *want* has a vacuous homonym would make the interpretation of anankastic conditionals the result of a quite curious lexical accident. It would also be a mystery why anankastic conditionals have the same kind of interpretation across languages, and why anankastic interpretations arise with semantically similar predicates such as *intend* and *plan*.

Moreover, the following example, due to Doris Penka (p.c.), shows that *want* interacts with embedding operators in the usual way.

(46) If you don't want to get a letter grade for the course, you don't have to take the exam.

The negation in the antecedent must semantically apply to *you want to get a letter grade*, rather than the complement of *want*, since (46) conditionalizes on indifference, i.e., the absence of a preference.[17] Like near-anankastics, (46) does not have a purpose clause paraphrase, even though it conveys information about a relationship between the internal antecedent and the prejacent.

The apparent vacuity of *want* should hence be viewed as a concise way of describing the problematic interpretation of anankastic and near-anankastic conditionals, rather than a semantic hypothesis.

4.6 Summary

Near-anankastics, anankastics that rely on implicit goals, and those that conditionalize on indifference pose the same challenges for semantic analysis as run-of-the-mill anankastics do. Specifically, (i) the conditional conveys information about a relationship between the internal antecedent and the prejacent of the modal; and (ii) actual goals of the agent that are incompatible with the goal mentioned in the antecedent are ignored. At the same time, none of the near-anankastics are equivalent to the analogous purpose construction, and neither a similarity-based analysis of the modal nor a 'strong' interpretation of the antecedent will give the correct truth conditions. Consequently, the analyses we have discussed, which are tailor-made for anankastic conditionals, cannot account for the full range of the data.

5 The semantics of *want*

We argue that correctly analyzing the contribution of the desire predicate and its interaction with the rest of the construction is key to a satisfactory analysis of anankastic and near-anankastic conditionals. Our analysis derives the differential behavior of conflicting and non-conflicting goals and the interpretation of the antecedent arises compositionally in a systematic way. Thus, while we agree with Huitink (2008) that what is crucial is the right interpretation of the antecedent, our semantics is different from, and avoids the problems of, her 'strong' construal.

In taking into account the semantic contribution of the desire predicate, our approach contrasts with the analyses of Sæbø (2001), von Fintel & Iatridou (2005), and von Stechow et al. (2006), which do not assign any crucial role to the interpretation of *want* but take it to signal that something special is afoot — a special interpretation rule for conditionals, which augments the ordering source with the internal antecedent, or an elliptical modal purpose construction in the consequent.

17 Since *want* is a NEG-raiser, *not want p* tends to get the strengthened reading *want not p*, but crucially not in (46).

5.1 Two readings of *want*

Hare (1968) clearly articulated the intuition that in anankastics *want* has an interpretation that differs from the semantic contribution it makes in superficially similar sentences. Comparing the anankastic (47) and the non-anankastic (48), he wrote:[18]

> "Let us consider the meaning of 'If you want' in the two cases. In the 'diabetes' case, a first approximation would be to say that it means the same as 'If you, as a matter of psychological fact, have a desire'. *I am very much inclined to deny that it means anything like this in the 'waiter' case.*"
>
> (Hare 1968: p. 46, emphasis ours)

(47) If you want to have sugar in your soup, you should ask the waiter.

(48) If you want to have sugar in your soup, you should get tested for diabetes.

This intuition can be corroborated by evidence for the two readings outside of anankastics. Levinson (2003), developing an argument sketched by Davis (1984), observes that the two replies in (49) are not contradictory:

(49) Do you want to play tennis?

a. I want to, but I have to teach.

b. No [= I don't want to], I have to teach.

We can easily imagine that the same agent gives the answers in (49a) and (49b) within a short time without having changed his mind. One way to make sense of this is to assume that *want to play tennis* in (49a) means 'having, as a matter of psychological fact, a desire to play tennis', while it means something else in (49b).

What is this second reading, on which *want* does not predicate a (mere) desire one has, as a matter of psychological fact? We think Levinson (2003) is on the right track when he characterizes the attitude involved as "the kind of desire accompanying intentional action."[19] More concretely, we propose that, on the relevant reading, *a wants p* reports on a preference that the agent assigns a special status to: an *action-relevant* preference.

For an agent who has to decide between alternative courses of action, the decision is driven by two factors. On the one hand, he has certain beliefs, including beliefs about which actions are available, and what their consequences are. On the

18 Hare goes on to propose an analysis of *want* in anankastic conditionals which, unlike the one we will propose, is linguistically quite implausible.

19 Levinson cast his analysis within a probabilistic utility-theoretic framework. Using the same kind of formal tools, Lassiter (2011) offers a similar analysis, which applies to modals as well.

other hand, he has certain preferences for how the world turns out to be, relative to outcomes over which he might have some influence. But not all desires or preferences that the agent has as a matter of psychological fact need to count among the preferences that guide action choice. He might simply fail to take some of his desires into account, or a more important preference might defeat a less important one. We call the preferences that the agent takes into account when choosing actions his *effective preferences*.

Effective preferences are closely related to *intentions*, though we do not identify the two notions. While the correct analysis of intention is a complex and controversial topic, we do not think that the existence of effective preferences is similarly controversial: Something like the concept is part and parcel of every theory of *choice*. It is reflected, for instance, in the assumption of a unique utility assignment per agent in the various models of action choice in game and decision theory. How the two notions relate to each other depends largely on what the correct analysis of intention is. One way to fit intentions into our set-up is to assume that they are a particular kind of effective preference with special properties. Specifically, intentions could be those effective preferences that the agent has decided, for the time being, to maintain indefinitely into the future, until they are either realized or consciously reconsidered. This would be close to the conception of intention that Bratman (1987) articulates.

In any case, we will proceed on the assumption that, at least under certain conditions, if an agent intends p, then that agent effectively prefers p, but we allow for an agent to effectively prefer p without intending it.

Our proposal will be that in anankastic and near-anankastic conditionals, *want* has an effective preference reading. This idea gets some initial support from the observation made in the introduction and by Sæbø (2001) that anankastics can employ intention-related predicates such as *intend*, *plan* or *goal* instead of *want*. The same is true for the various kinds of near-anankastics, as (50) illustrates.[20]

(50) a. If you intend to take the exemption now, you must / will have to pay more taxes next year.
b. If you plan to go to Disneyworld, you should spend at least five days there.
c. If you plan to buy a new dress, you should buy a well-made one.

5.2 Inferential properties of underspecified *want*

To account for the fact that *want* can predicate both the existence of a mere desire (that the agent has as a matter of psychological fact) and of an effective preference,

20 *Intend*, *plan* and *goal* have additional entailments that *want* does not have, even on its effective preference reading. We set aside the question of what these additional entailments are.

we propose that *want* is underspecified in much the same way as modals are on a Kratzerian analysis: *want* has a contextual parameter that specifies which kind of preferential attitude is targeted.

If *want* is context-dependent, it is possible that its inferential properties vary depending on how this underspecification is resolved. We will argue that this is indeed the case. When checking inferential properties, it is of course crucial to interpret all occurrences of the predicate with the same contextual parameters. In the following we will try and tease apart the inferential properties that *want* has on the effective preference reading and on the 'mere desire' reading, respectively, by employing examples with *intend* (for the effective preference reading) and *would like to* (for the 'mere desire' reading), on the assumption that, in the contexts under discussion, the former entails effectively preferring, while the latter does not.[21]

Conjunction introduction Levinson (2003) criticizes previous semantic analyses of *want* because they validate conjunction introduction:

(51) a. a wants ϕ
b. a wants ψ

---

c. a wants $\phi \wedge \psi$

Levinson argues that empirically this need not hold. He raises two issues. First, he points out that ϕ and ψ may be inconsistent, in which case the conclusion of the argument in (51) would mean that a desires the contradiction. Secondly, he claims that $\phi \wedge \psi$, unlike ϕ or ψ individually, "may have consequences that will make it unwanted." (p. 230)

One way to react to the first point is to question whether the two premises (51a) and (51b) can be jointly true. If they cannot, then it would not be surprising that assuming that they are has counter-intuitive consequences. However, it is possible, in general, to assert that an agent wants two incompatible things (which, in addition, the agent knows to be incompatible). (52) and (53) are cases in point.

(52) I want it to rain tomorrow so the picnic gets canceled, but I (also) want it to be sunny tomorrow so I can go hiking.

(53) John wants to move in with his girlfriend, but he also wants to keep living alone. He can't make up his mind.

21 As we discuss in section 7.2.3, *a would like to p* does not entail that *p* is not an effective preference. It entails that *p* is a desire of the agent, leaving it open whether this desire is an effective preference or not.

The consistency of (52) and (53) is, however, dependent on a contextual resolution for *want* where the targeted preference is 'mere desire'. This can be seen by comparing (54) and (55). While (54) is coherent (and simply attributes indecision to John), (55) sounds contradictory (or attributes a certain amount of irrationality to John).

(54) John would like to move in with his girlfriend, but he would also like to keep living alone. He can't make up his mind.

(55) John intends to move in with his girlfriend, but he also intends to keep living alone.

We conclude, therefore, that Levinson's first argument against conjunction introduction at best goes through for the 'mere desire' construal of *want*. It can be deflected for the effective preference construal, because in that case inconsistent ϕ and ψ can lead to inconsistent premises in the schema in (51). We propose that effective preferences are subject to a rationality constraint that mere desires do not need to obey. An agent *a*, even a rational one, may well desire two things that he takes to be incompatible, but if he is to act, he has to decide which of the two is more important to him. Two preferences that an agent believes to be incompatible cannot both be effective preferences at the same time. This means that the premises of (51) cannot be jointly true on the effective preference reading (at least as long as we assume that *a* is rational), but they can be jointly true on the 'mere desire' reading of *want*.

As part of his second argument, Levinson asks us to consider the following sentences.

(56) a. John would like to visit Paris this summer.
b. John would like to visit Rome this summer.

Levinson claims that (56a) and (56b) can be true without (57) being true, if, for example, "[John] does not have enough time or money to visit both cities." (p. 229).[22]

(57) John would like to visit both Paris and Rome this summer.

22 It is worth noting that Levinson uses *would like to* rather than *want* in constructing this argument.

The relevant reading of (57) is one on which *both* scopes under *would like to*.[23] It can be brought out by adjusting the example slightly:

(58) John would like to go to both Paris and Rome this summer.

We agree that (56a) and (56b) could both be true in a context, without (58) being true. We distinguish between two variants of Levinson's scenario. On the first, John simply does not have enough money to go to both places, and this is common knowledge among the interlocutors and John. In this case, the example is an instance of preferences that are known to be incompatible, and hence the considerations above apply: On the assumption that effective preferences (but not mere desires) are required to obey a consistency constraint, (56a) and (56b) cannot be jointly true on the effective preference reading if John is aware that his funds do not suffice to go to both places.

More interesting is the case in which John in principle has the money and time to go to both places, but, while he considers going to Paris and going to Rome worthwhile individually, he disprefers going to both places because of the expense and time spent. This indeed would be a context in which (56a) and (56b) appear to be true without (58) being true. However, crucially, in this case, there is a *third* preference in play, namely the preference to not spend the amount of money (or time) required to go to both places. And, at least on the effective preference reading, these three preferences cannot be jointly held by John. This means that if (56a) and (56b) are true on the effective preference reading, then there cannot be a third effective preference that is incompatible with the preference in (58).[24]

In sum, we agree with Levinson that *want* does not always validate conjunction introduction, but we maintain that it validates the principle on the effective preference reading. The comparison with *intend* is, again, highly suggestive.

(59) a. John intends to visit Paris this summer.

23 As Magda Kaufmann (p.c.) points out, Levinson's (57) has an irrelevant reading on which *both* scopes over *would like to*, asserting essentially the same as *John would like to go to Paris and he would like to go to Rome*. For the German near-equivalent in (i), this 'high *both*' reading is actually more prominent than the 'low *both*' reading intended by Levinson.

(i) Hans möchte diesen Sommer sowohl Paris als auch Rom besuchen.
Hans would like this summer both Paris and Rome visit.
'Hans would like to visit both Paris and London.'

24 Levinson assumes a utility assignment which assigns a very low value to the option of going to both places. He motivates this assignment in terms of a preference against spending too much money. Proponents of utility-based accounts often appeal to individual, ranked preferences in order to justify the proposed utility assignments. One way to unify the two perspectives is to view utility assignments as probabilistic representations that are determined by a background preference structure.

b. John intends to visit London this summer.

---

c. John intends to visit London and Paris this summer.

In contrast to (51), it is hard to see how someone could assent to both (59a) and (59b), but withhold assent from (59c).

Upward entailment Levinson also considers Upward Entailment (UE):

(60) a. a wants ϕ
b. ϕ implies ψ

---

c. a wants ψ

Levinson claims that upward entailment should not be valid, since "if Upward Entailment does hold, every proposition which is physically or logically necessary, or just believed to be true,[25] is also wanted." (p. 225) Heim (1992) and von Fintel (1999) assume that *a wants* ϕ presupposes that a believes neither that ϕ nor that $\neg\phi$. Levinson considers this an *ad hoc* stipulation. Examples which suggest that the proposed constraint does not hold in general are easy to construct:[26]

(61) John really wants to get the job, but he knows they won't hire him.

But (61) calls for a mere desire reading of *want*. The constraint proposed by Heim and von Fintel is not at all *ad hoc* for the effective preference reading, but instead follows naturally from the fact that effective preferences are those preferences that are used to decide between actions. A preference for something that is believed to be unavoidable, or fulfilled already, or unattainable is not a preference that should influence action choices.

Levinson further questions the validity of UE based on examples involving non-specific indefinite arguments within the desire report, such as Asher's (1987) example (62).

(62) a. Nicholas wants to take a free trip on the Concorde.
b. Nicholas wants to take a trip on the Concorde.

25 This is not strictly speaking true for UE in the classical sense, but it is true for any analysis that takes *want* to quantify over 'ideal worlds' in the agent's belief state, which is the kind of analysis that Levinson discusses at this point.

26 Note that in (61) *want* is modified by *really*, but gets a mere-desire reading. This shows that the strength of the preference indicated by *really* is, in principle, orthogonal to the mere-desire/effective preference distinction.

Asher and Levinson ask us to consider these sentences in a context in which paying for a trip on the Concorde would mean financial ruin for Nicholas, but in which he would very much like to be given a free trip on the Concorde. Because of the latter, (62a) is true, and since riding on the Concorde for free entails riding on the Concorde, if UE is valid, (62b) must be true, as well. And yet, in the imagined scenario, Levinson claims, (62a) is true, but (62b) is false.

While the judgement of falsity accords with intuition at first blush, a closer examination reveals it to be problematic. (62b) would be false in this scenario if we assume that the sentence entails that Nicholas has a desire that is satisfied by *any* way of taking a trip on the Concorde. But this is not what (62b) says. Observe that (63) seems like an impeccable bit of reasoning, while (64) does not, on any construal of *want*. It is perfectly fine to say that John wants to get a dog, even if he abhors poodles and would never want to have one, invalidating (62).[27]

(63) John wants to get a poodle, so he wants to get a dog.

(64) John wants to get a dog. So he would be happy to get a poodle.

These considerations suggest that *want* supports UE of the type in (62) and it seems to do so on both the desire and the effective preference construal.

5.3 Representing preferences

An agent is generally subject to a large number of constraints and attitudes that influence his actions: desires, inclinations, personal moral codes, and obligations, to name but a few. All of these come in varying degrees of importance. We use *preference structures*, as defined in (65), to model ranked preferences and assume that, at any given world,[28] any agent has a set of such structures representing the various sources of his preferences (Condoravdi & Lauer 2011, 2012). We model

27 von Fintel (1999: p. 120) makes a similar point. Elaborating on an example from class notes by Heim, he notes that the following two sentences "seem hopelessly contradictory":

(i) [Context: John disprefers buying the couch at full price, but prefers buying the couch at a 25% discount.]

a. John doesn't want to buy this couch but he wants to buy this couch at a 25% discount.
b. John wants to buy this couch at a 25% discount but he doesn't want to buy this couch.

von Fintel, moreover, stresses that whether or not *John wants to buy this couch* is judged true or false can depend on John's beliefs. If John is not aware that a 25% discount is a possibility, we may well judge the sentence false, while if he is aware that a discount is a possibility, we may judge it true (without thereby accepting that he would pay full price).

28 Really: at any given world and time. We drop the temporal parameter here.

this by assuming our models contain a function $\mathbb{P}$ from pairs of agents and worlds to such sets.

(65) Given a set of worlds W, a *preference structure* is a pair $\langle \mathbf{P}, \prec \rangle$, where $\mathbf{P} \subseteq \wp(W)$ and $\prec$ is a strict partial order on $\mathbf{P}$.

A preference structure can be thought of as an ordering source plus an 'importance' ranking and it may well contain inconsistent preferences, such as the simultaneous desires reported in (52) and (53). However, if the agent is to decide on a course of action, he needs to integrate his various preferences into an over-arching set of preferences that can guide action. We thus assume that a rational agent a in w will have a distinguished preference structure that he uses to guide action choice, which we call *a's effective preference structure* at w.

We require that the effective preference structure of an agent (but not necessarily his other ones) are *consistent* with respect to his beliefs, in the following sense.[29]

(66) **Consistency**
A preference structure $\langle \mathbf{P}, \prec \rangle$ is *consistent* with respect to an information state B iff for any $X \subseteq \mathbf{P}$, if $B \cap \bigcap X = \emptyset$, there are $p, q \in X$ such that $p \prec q$.

Given that effective preference structures must be consistent, while the non-effective preference structures from which they are derived do not have to be consistent (internally or with each other), an agent will have to resolve conflicts (by strictly ranking preferences known to be incompatible) in the process of deriving his effective preference structure.

A full characterization of effective preference structures is beyond the scope of this paper. Besides consistency, which is the central requirement for our current purposes, we only require that effective preference structures are *realistic*, in the following sense:[30]

(67) **Realism**
A preference structure $\langle \mathbf{P}, \prec \rangle$ is *realistic*, relative to an information state B, iff for all $p \in \mathbf{P}$: $p \cap B \neq \emptyset$.

29 This version of consistency is equivalent to those in Condoravdi & Lauer 2012 and Lauer 2013. Unlike the weaker version in Condoravdi & Lauer 2011, it also rules out preference structures in which three or more unranked preferences are pairwise consistent, but jointly inconsistent.

30 (67) is entailed by (66) but it is independently plausible; cf. the 'goal-postulate' of Zimmermann (2006: p. 745). We can also see one part of the Heim-von Fintel presupposition of *want* discussed above (namely, that the agent does not believe that $\neg\phi$) as arising from the realism condition on effective preference structures.

5.4 An underspecified semantics for *want*

We propose that the interpretation of *want* is relative to a preference structure, which its meaning leaves unspecified. We take context to *select* one of the preference structures that are given as part of the model. For concreteness, we implement this in a traditional Kratzerian way and assume that context provides a function P that maps pairs of agents and worlds to preference structures such that $P(a,w) \in \mathbb{P}(a,w)$. We call such functions 'preferential backgrounds'. For obvious reasons, we introduce a name for one special such background:

(68) EP is the function such that, for any a and any w, $EP(a,w)$ is a's effective preference structure at w.

The semantics of *want* relates its propositional argument to the set of highest-ranked preferences in the preference structure supplied by a contextually-fixed preferential background:

(69) $want_P(a,\phi)$ is true in w iff $[\![\phi]\!] \in \max[P(a,w)]$

(70) $\max[\langle \mathbf{P}, \prec \rangle] := \{p \in \mathbf{P} \mid \neg\exists q \in \mathbf{P}\colon\ p \prec q\}$

Since preference structures are *partially* ordered sets, they can have any number of maximal elements, and therefore $\max[P(a,w)]$ will generally not be a singleton set.[31]

Given that the preferential background P is fixed by context, the interpretation of *want*, as well as its inferential properties, can vary from context to context. If $P(a,w)$ is a preference structure that is not required to be consistent, then $want_P(a,\phi)$ and $want_P(a,\psi)$ can be jointly true at w even if ϕ and ψ are incompatible (and known to be incompatible). This is why (52) and (53) are consistent: Their content is about about non-effective preferences, which need not be consistent.

On the other hand, when *want* targets a preference structure $P(a,w)$ that must be consistent — in particular, when it targets effective preferences — then $want_P(a,\phi)$ and $want_P(a,\psi)$ are incompatible if ϕ and ψ are believed to be incompatible by agent a at w. This property will play a crucial role in our analysis of (near-)anankastic conditionals.

5.5 Preference structures and monotonicity: Three options for *want*

According to (69), the complement of *want* has to denote a proposition that is itself a member of the relevant preference structure. But there are at least two salient

31 If it were, our analysis would be deriving the 'strong' construal of Huitink (2008), and inheriting its empirical problems.

alternative options for an analysis of *want* based on preference structures, on the assumption that the complement of *want* denotes a proposition. Which of the three options is chosen will influence the inferential properties we predict.

The three alternatives are given in (71), together with paraphrases approximating the claim that a *want*-sentence makes according to the analysis.

(71) a. *Success-oriented*
$want_P(a,\phi)$ is true in w if there is $p \in \max[P(a,w)]$ and $[\![\phi]\!] \subseteq p$
'Agent a has a preference that is satisfied if $[\![\phi]\!]$ is true.'

b. *Quine-Hintikka*
$want_P(a,\phi)$ is true in w if there is $p \in \max[P(a,w)]$ and $[\![\phi]\!] \supseteq p$
'Agent a has a preference that is satisfied only if $[\![\phi]\!]$ is true.'

c. *Exact-match* [= (69)]
$want_P(a,\phi)$ is true in w if there is $p \in \max[P(a,w)]$ and $[\![\phi]\!] = p$
'Agent a has a preference that is satisfied if and only if $[\![\phi]\!]$ is true.'

Our proposal in (69) corresponds to (71c). On the face of it, (71c) may seem far too strong — it requires that the proposition corresponding to the complement of *want* is *identical* to one of the members of the preference structure. But as we discuss below, (71c) is defensible. We should note, at any rate, that for our analysis of anankastics and near-anankastics either (71c) or (71b) would do.

(71a), which corresponds to what Zimmermann (2006) calls the 'success-oriented' analysis of *try*, presumably is what Asher (1987) and Levinson (2003) (among others) have in mind when they claim that (62b) is false if there are certain kinds of Concorde trips that Nicholas disprefers (e.g., expensive ones). As we pointed out above, this claim is problematic. Further, Zimmermann notes that on this analysis *want* would be *downward-entailing*. Consequently, conjunction introduction would be valid for any choice of preferential background. But downward-entailment for *want* is contrary to intuition,[32] and as we have seen, conjunction introduction should not be valid on the 'mere desire' reading.

According to (71b), which corresponds to what Zimmermann calls the 'Quine-Hintikka' analysis, $want_P(a,\phi)$ is true if the agent has a preference that can only be satisfied if ϕ is true.[33] This analysis ensures that *want* is upward-entailing in its propositional argument.

32 Moreover, as Zimmermann points out, downward-entailment rather immediately rules out upward-entailment for *want*. If *want* were both upward- and downward-entailing at the same time, its truth conditions would be independent from its propositional argument.

33 It deserves the name '(Quine-)Hintikka' because a Hintikka analysis of $want(a,\phi)$ essentially says that all optimal worlds are ϕ-worlds. In the preference structure setting, 'optimal' is restricted to a particular individual preference p. In analogy with (71a), we could also call this the 'Failure-oriented' analysis. According to (71b), $want_P(a,\phi)$ specifies the conditions under which one of the preferences

By contrast, on the 'exact-match' analysis in (71c), *want* is neither upward-entailing nor downward-entailing in its propositional argument. Consider (72a), on its non-specific reading. The null assumption for this reading is that *a dog* quantifies over individuals and takes narrow scope with respect to *want*, i.e., the sentence has a logical form like (72b). On the 'exact-match' analysis, this logical form predicates the existence of a preference that is satisfied if and only if John gets a dog — any dog will satisfy it, and only dogs will.

(72) a. John wants to get a dog.
b. $want_P(j, \exists x\colon\ dog(x) \wedge get(j,x))$

How can we square this with the intuition that (63), repeated below, seems to be a valid piece of reasoning?

(63) John wants to get a poodle, so he wants to get a dog.

Taking this example at face value, we conclude that (71) should be entailed by (73).

(73) John wants to get a poodle.

If we maintain the assumption that the logical form of (73) is something along the lines of (72b), it is hard to avoid the conclusion that *want* is upward entailing, and hence that we should prefer the analysis in (71b) over the 'exact-match' analysis in (71c).

However, there is an alternative for the representation of the non-specific (or rather, in Zimmermann's terms, the underspecific) reading that is compatible with the 'exact match'-analysis. As Condoravdi et al. (2001) and Zimmermann (2006) proposed, the indefinite can have wide scope if it is taken to quantify over *properties* or *concepts*, in particular, sub-properties (sub-concepts) of its restrictor.[34] On such an analysis, *want* is not upward-entailing in its propositional argument, but it appears to be when its complement contains an indefinite that is construed non-specifically.

On both the Quine-Hintikka (71b) and the exact-match (71c) analysis, we can selectively validate conjunction introduction for the effective preference construal without validating it for other construals by imposing an appropriate closure condi-

of the agent is frustrated (i.e., if ϕ is false), in contrast to (71a), which specifies the conditions under which a preference of the agent is satisfied (i.e., if ϕ is true).

34 Condoravdi et al. and Zimmermann focus on predicates that take DP arguments (either to the exclusion of infinitival complements, such as *prevent* and *seek*, or optionally, such as *want*). For these, it can be assumed that the predicates in question take a property/concept as an argument, and hence, e.g., the logical form of *John seeks a sweater* is essentially $\exists P\colon\ P \sqsubseteq sweater \wedge seek(j,P)$. But quantification over sub-properties can also be at play with an overt propositional argument. The logical form of (72a) then would be: $\exists Q\colon\ Q \sqsubseteq dog \wedge want_P(j, \exists x\colon\ Q(x) \wedge get(j,x))$.

tion on effective preference structures, which can be viewed as another rationality constraint akin to *Consistency* and *Realism*.

We do not have to decide between (71b) and (71c) in this paper, but we note that (71c) is a more viable alternative than might appear at first sight. In addition, the arguments of Condoravdi et al. (2001) and Zimmermann (2006) likely extend to intensional predicates with clausal complements, ultimately favoring the exact-match analysis over the Quine-Hintikka analysis for *want*. For the sake of concreteness and perspicuity, in the following we stick with the version of the exact-match analysis in (70).

5.6 Summary

In this section, we have taken a closer look at the semantics of *want* and shown that it has multiple readings — which we claim arise through underspecification, much as in the case of modals. On one of these readings, *want* asserts that its complement proposition is among the agent's action-relevant ('effective') preferences, which need to be consistent. As we have seen, anankastic and near-anankastic interpretations arise when the antecedent contains intention-related predicates (*intend*, *plan*, *goal*), but not when it contains predicates that can only express 'mere desires' or appetites (*feel like*, *crave*, cf. also Section 7.2.3). This is a first indication that for a conditional with *want* to get such an interpretation the 'effective preference' construal is required. As we will show in Section 7.1.1, when *want* receives this construal, the problem of conflicting goals is taken care of in virtue of the consistency constraint on effective preference structures. First, however, we have to settle how the conditional itself is interpreted so that the hypothesis made with the antecedent can influence the ordering source of the modal in the consequent at all. This is what we do in Section 6.

6 Conditionals with double-modal structure

In Section 2, we saw that one of the issues raised by anankastic conditionals is the problem of conditioning on norms. In the Kratzerian set-up, the problem is how to ensure that the internal antecedent is part of the ordering source of the modal in the consequent. As we will see below, the problem is not particular to anankastics. Frank (1997) identified other instances of the same problem and proposed a natural solution in the Kratzer framework in terms of a double-modal structure.

The solution has already been considered in the context of anankastic conditionals by von Fintel & Iatridou (2005, 2006) and Huitink (2008). For von Fintel & Iatridou, it offers a way to derive the informational equivalence of conditional and non-conditional purpose constructions (cf. Section 3.2), but it is not part of their proposed solution to the problem of conditioning on norms, since, on their

analysis, this problem is side-stepped by providing the hypothetical goal by means of the purpose clause. Huitink, by contrast, considers the double-modal analysis as an answer to the problem of conditioning on norms, but also explores alternative options. Ultimately, she cautiously adopts the double-modal analysis as the "more conventional" approach (p. 132).

We adopt Frank's double-modal solution here, not only because it is a natural move to make, but also because there is converging evidence from various independent sources that, within the Kratzer framework, a double-modal structure is necessary anyways. For example, Arregui (2010) argues for such a structure for completely independent reasons, concerning the temporal interpretation of deontic conditionals conditioning on facts, and Kaufmann & Schwager (2009) provide another independent argument for a double-modal construal in the case of *conditional imperatives.*

In this section, we will illustrate the more general nature of the problem of conditioning on norms and present Frank's (1997) solution. We then show that Kaufmann & Schwager's argument applies to conditionals with priority modals more generally, including anankastic conditionals.

6.1 A general problem for the interpretation of priority modals

The problem of conditioning on norms surfaces whenever the hypothetical assumption made with the antecedent influences the contents of the ordering source of the modal in the consequent, regardless of the type of the ordering source.[35] Consider (74) (after von Fintel & Iatridou 2005).

(74) If jaywalking is illegal here, then (in view of what the law provides) this dude has to pay a fine.

The antecedent in (74) makes a hypothesis about what the law provides — which is just the ordering source of the modal in the consequent. Assuming that the *if*-clause restricts the modal base will give the wrong result: Described algorithmically, a simple restrictor analysis amounts to (75).

35 A related problem surfaces when the antecedent is about facts that influence the value of the modal base, as in (i).

(i) [Bill has been bragging about how much money he made.] If we/you believe what Bill said, he has to / will have to pay a lot of taxes this year.

Adding the fact that we believe John's claims to the modal base of the overt modal in the consequent will not make it so that the modal base entails that these claims are true. Consequently, if John's tax liability depends on the veracity of his claims, a simple-minded restrictor analysis of (i) will not yield the correct result.

(75) We collect all worlds in which the relevant circumstances hold (including the fact that the dude just jaywalked), and then we eliminate all those worlds in which there is no law against jaywalking, which may well include the actual world. Then we rank these jaywalking-is-illegal worlds according to the *actual* laws. Finally, we check if in all the highest-ranked worlds, the dude pays a fine.

This is the same problem as the one identified by Sæbø (2001) for anankastics — consider the parallels between (75) and (12). According to this analysis, (74) comes out false in case jaywalking is legal in the actual world. Just as with anankastics, this contrasts with the intuitive truth conditions of the sentence. Whether or not jaywalking is *actually* illegal should be immaterial for the truth of the conditional claim in (74).

Based on such considerations,[36] Frank (1997) argued that conditionals with root modals in the consequent generally have a 'double-modal' structure, schematized in (76b) for (74), instead of, or in addition to, the structure in (76a).

(76) a. MUST [jaywalking is illegal here] [This dude pays a fine]
b. NEC [jaywalking is illegal here] [MUST [This dude pays a fine]]

The outer operator NEC is a silent modal operator similar (or identical) to the one that Kratzer-style analyses assume for conditional sentences that do not contain an overt modal. When it is present, the *if*-clause restricts NEC. The construal rule in (9) would accordingly have to be revised to (77):[37]

(77) $$\textit{If}\,\psi,\chi \;\rightsquigarrow\; \begin{cases} \textsc{Modal}[\psi][\phi] \text{ or } \textsc{nec}[\psi][\chi] & \text{if } \chi = \textsc{Modal}\phi \\ \textsc{nec}[\psi][\chi] & \text{otherwise} \end{cases}$$

The double-modal analysis (76b) gives the correct result: NEC quantifies over jaywalking-is-illegal worlds, which are used as the world of evaluation for the inner

36 Frank's own examples involve counterfactual and futurate deontic claims, such as (i) (her ex. 50, p. 198) and (ii) (her ex. 151, p. 199):

(i) If Luther hadn't brought about the reformation, we would still have to pay indulgence[s].

(ii) If the new laws for opening hours of shops go through, salespeople will have to work longer.

37 We remain neutral on how the 'or' in the first clause should be taken. On a free-choice interpretation, each conditional with an overt modal is potentially ambiguous. Geurts (2004) and Arregui (2010) provide arguments for this view. Alternatively, the nature of the modal could determine which disjunct is chosen. This is the view of Frank (1997), who claims that root modals are never restricted by *if*-clauses.

modal. Algorithmically, on an epistemic interpretation for NEC (assuming, for now, an empty ordering source):[38]

(78) Collect all worlds compatible with what is known, and eliminate all those in which jaywalking is not illegal. For each of the remaining worlds v, use the laws at v to rank all worlds in which the relevant circumstances hold (including the fact that the dude just jaywalked). Check whether for all v, the most highly ranked worlds v' are such that the dude pays a fine.

6.2 Strengthening of the antecedent with anankastics

Kaufmann & Schwager (2009) argue that a double-modal analysis is also necessary to account for *conditional imperatives*. Specifically, taking the imperative operator IMP to be a Kratzerian modal, they argue that (79a) should have the structure in (79b), rather than the structure in (79c).

(79) a. If you get lost, call me at the office.
b. NEC [you get lost] [IMP [you call me at the office]]
c. IMP [you get lost] [you call me at the office]

Besides adapting some of the earlier arguments made by Frank for root modals, they advance a novel argument in favor of a double-operator analysis (cf. their Section 3.1.2).

They argue that the worlds ranked by the ordering source of IMP should not be all the antecedent worlds but only the most stereotypical among them. This would be expected if there is an outer operator with a stereotypical ordering source, corresponding to a variably strict analysis for the conditional. Their argument has the general structure of counterexamples to 'Strengthening of the Antecedent' (SA), i.e., the inference pattern in (80).

(80) If A, then C

If $A \wedge B$, then C

Kaufmann & Schwager (2009) present the example in (81) and point out that the speaker of (81a) "can continue with [(81b)] without contradicting himself."

(81) a. If you lose your job, take a lower-paying one.
b. But if you lose your job and have a comparable offer, don't take a lower-paying one.

38 With this assumption, the double-modal analysis is equivalent to what is called a 'strict-conditional' analysis of conditionals. Without it, it is equivalent to a 'variably strict' one.

If conditional imperatives had the structure in (79c), the antecedents in (81) would be restricting the modal base of the imperative modal, and the only way (81a) and (81b) could be jointly true would be if none of the best losing-your-job worlds were worlds in which you have a comparable offer. In other words, the two sentences in (81) would jointly entail a preference of the speaker for you not having a comparable offer. But intuitively, there is no such entailment.

Kaufmann & Schwager articulate the intuition that "the reason why [(81)] lacks this implication is that losing one's job with a comparable offer in hand may be so remote or far-fetched a possibility that it does not enter the interpretation of [(81a)] at all. Seen this way, the selection of the antecedent-worlds relevant for the interpretation of each of the [conditional imperatives] appears to be driven by criteria like salience, likelihood, or stereotypicality. We do not take a stance on which of these related but distinct notions is at play in our particular example. [. . .] What is important is that whichever notion is operative, it is separate from and independent of the speaker's preferences".

On the double-modal analysis, on the other hand, (81a) and (81b) can be consistent. If the outer modal NEC comes with a stereotypical ordering source, the imperative in (81a) will be evaluated only in stereotypical losing-your-job worlds (in which you do not have a comparable offer), while the imperative in (81b) will be evaluated in (stereotypical) losing-your-job-with-a-better-offer worlds.

We can observe the same pattern with overt deontic modals, using cases of *defeasible obligation*.[39] Suppose that dog owners have to pay a special dog tax, but that service dogs for the blind are exempt from this tax. Suppose further that John's eyesight is currently perfect and that he does not currently have a dog. (82a) and (82b) are arguably both true:

(82) a. If John gets a dog, he will have to pay more taxes.
b. But if John loses his eyesight and gets a dog, he will not have to pay more taxes.

The only way the two sentences in (82) can be true on a single-modal analysis is if the legally best worlds in which John gets a dog do not include worlds in which John loses his eyesight. But that would mean that losing one's eyesight (or losing one's eyesight and getting a dog) is against the law! On the double-modal analysis, there is no problem, as we can assume that the overt modal in (82a) is evaluated only in typical worlds, in which John does not go blind.

Finally, we can make a similar point with anankastic conditionals:

39 van der Torre & Tan (1997) argue that the kind of case we discuss here (which they call 'strong overridden defeasibility') is different from classic cases of *prima facie obligation* (Ross 1930, which they call 'weak overridden defeasibility').

(83) [Context: Getting a ride is the most preferable way to get to the airport.]
a. If you want to get to the airport by noon, you should take the train.
b. If you want to get to the airport by noon and there is repair work on the tracks, I should give you a ride.

(83a) and (83b) can both be true at the same time, if we suppose that the speaker is unwilling to make the extra effort of driving the addressee if the trains run on time. But then, the worlds quantified over by *should* in (83a) should not include worlds in which there are track repairs, for these would be better for the addressee than those worlds in which there are no track repairs.

On the double-modal analysis, (83a) only says that the optimal way to get to the airport in time in *typical* worlds (in which, presumably, there are no track repairs) is to take the train. This can be consistent with what (83b) says, namely that in the most *typical track-repair* worlds the optimal way of getting to the airport on time is to get a ride from the speaker.[40]

So far, following Kaufmann & Schwager, we have used the failure of SA to motivate the appeal to an implicit outer operator and to have stereotypicality be part of it. But does the failure of SA necessitate appeal to an ordering for the outer operator (or equivalently, a variably strict analysis of conditionals)? Traditionally, SA has been used to motivate a variably strict analysis, in particular of counterfactuals. A standard example is the *Sobel sequence* in (84), whose felicity provides evidence that the two conditionals can be consistent, paralleling the arguments for a (stereo-)typicality ordering given above.

(84) If Sophie had gone to the parade, she would have seen Pedro.
But if Sophie had gone to the parade and been stuck behind a tall person, she would not have seen Pedro.

More recently, however, the infelicity of *reverse Sobel sequences* like (85), has been taken to cast doubt on this conclusion (von Fintel 2001, Gillies 2007).

(85) If Sophie had gone to the parade and been stuck behind a tall person, she would not have seen Pedro.
But if Sophie had gone to the parade, she would have seen Pedro.

Based on such data, von Fintel and Gillies instead opt for a dynamic strict analysis of conditionals designed to capture the contrast between (85) and (84). Moss (2012)

40 (83b) also speaks against an analysis according to which anankastics are biscuit conditionals (with an elided purpose clause), as proposed by von Stechow et al. (2006) and considered as an option by von Fintel & Iatridou (2005): *I should give you a ride to get you to the airport in time* is not true unconditionally in the described circumstances, but only on the condition that there are track repairs.

counters this move, arguing instead that the infelicity of reverse counterfactual Sobel sequences like (85) can be explained pragmatically, while maintaining a static variably strict analysis (see also Klecha 2014, 2015).

The issue with respect to counterfactuals is still open, and we do not want to take a stance on that issue here. In the case of anankastic Sobel sequences like (83), however, there is reason to think that the two sentences are, in fact, consistent. While reverse anankastic Sobel sequences are generally odd, they become fine if the right material is added in between the two conditionals, as in (86).[41]

(86) a. If you want to go to the airport and there are track repairs, you should take a taxi.
b. But the taxi would be very expensive and track repairs are very unlikely, so if you want to go to the airport, you should take the Caltrain.

If the two sentences of the sequence are consistent in the presence of an extra premise, they ought to be consistent without this premise, as well. This strongly suggests that, at least in the interpretation of anankastic conditionals, there *is* a (stereo-)typicality or likelihood ordering at play, just as the double-modal analysis would have it.[42]

6.3 Summary

None of the considerations in favor of the double-modal analysis advanced in this section are particular to anankastics. Any adequate analysis of conditional sentences with a priority modal in the consequent has to deal with conditionals whose antecedent is about the value of the ordering source of the modal (i.e., the problem of conditioning on norms), and will also have to deal with the fact that the interpretation of priority modals (and conditional imperatives) appears to be restricted to (stereo-)typical circumstances. Consequently, any adequate analysis of conditionals in general will take care of these aspects of anankastic conditionals.

41 It may be that reverse counterfactual Sobel sequences can also become felicitous if the right kind of material is added in between the two conditionals. In fact, Moss (2012) notes that there are particular contexts in which reverse counterfactual Sobel sequences are felicitous.

42 On a dynamic account, consistency could, in principle, depend on material occurring between the two sentences. In so far as such a proposal has yet be to spelled out, however, examples like (86) constitute a *prima facie* argument for a variably strict analysis. von Fintel's and Gillies's dynamic strict accounts for counterfactuals are unidirectional in the sense that they provide for ways in which preceding material can make a conditional *false* (even if it would otherwise be true), but they do not provide for a dynamic mechanism by which preceding material can make a conditional true (if it otherwise would be false in the context). For dynamic accounts that accommodate the latter possibility, the crucial question is: Why should a statement about the low likelihood of a possibility render a subsequent conditional true?

In many ways, the progression of this section traces the development of 'variably strict' analyses (of which Kratzer's analysis is a prominent instance). Once we have been convinced, by Sæbø's compositionality problem, that the antecedent of anankastic conditionals cannot be taken to restrict the overt modal in the consequent, it might be tempting to simply assume that anankastic conditionals express a material conditional operator that happens to have a modal in its consequent. This is problematic for familiar reasons, e.g., we predict that the Harlem sentence is vacuously true in the Hoboken scenario, regardless of whether or not the A train goes to Harlem. A tempting move would then be to assume that anankastic conditionals are instances of a *strict* conditional operator with a modalized consequent. That takes care of the problem of vacuous truth, and as argued in Section 6.1, is sufficient for solving Sæbø's problem (which we have called the problem of conditioning on norms). But a strict conditional analysis of anankastics will predict that SA is uniformly valid for anankastic conditionals, contrary to fact. The obvious next move would be to assume that anankastics express a *variably strict* conditional operator with a modalized consequent. But this is equivalent to the double-modal analysis.[43]

At various points in this argumentative sequence, there are alternative moves that could be made, and which in fact have been proposed outside of the study of anankastic conditionals (from Grice's (1989[1967]) defense of the material conditional, to Willer's (2013) strict conditional analysis in a dynamic setting designed to deal with failures of Strengthening of the Antecedent). Furthermore, in recent years, various alternatives to Kratzer's analysis of conditionals, as well as new approaches to the logic of conditional *ought* statements, have been proposed (e.g., Gillies (2010), Kolodny & MacFarlane (2010), Willer (2014)). To the extent that these alternative analyses can simultaneously account for the problem of conditioning on norms and for failures of SA, which is at present an open issue, they can be combined with an effective-preference analysis of *want* to yield an account of anankastic and near-anankastic conditionals.

7 Our Analysis

Our main claim in this paper is that nothing special needs to be assumed about anankastic conditionals. A conditional of the form *If want* ϕ*, must/should* ψ gets an anankastic interpretation if the contextual parameters align in the right way, viz., if *want* targets an agent's effective preferences and the priority modal is construed teleologically, in a sense to be made precise presently. Near-anankastics result when one of the two parameters is fixed differently.

43 See Kaufmann & Kaufmann (2015) for discussion of whether and how a variably strict conditional operator analysis could be distinguished empirically from an analysis that assumes a covert modal that gets a variably strict interpretation.

These conditionals uniformly assert that the prejacent is necessary, given the hypothesis about preferences made with the antecedent. We view additional implications, including (in appropriate contexts) the means-of implication, as pragmatic inferences as to why the conditional would be true, i.e., why the prejacent would be necessary, given the antecedent. The variety of implications arises from different contextual assumptions that influence the resolution of the contextual parameters and the pragmatic reasoning triggered by the use of a conditional.

7.1 The semantics: Anankastics

We assume a double-modal structure in order to address the issues discussed in Section 6. The Harlem sentence, repeated in (87a), hence has the structure in (87b).[44]

(87) a. If you want to go to Harlem, you have to / should take the A train.
b. $\text{NEC}_{f^1,g^1}[want_P(Ad, Harlem)]$ [MUST_{f^2,g^2} [*ATrain*]]

We take the parameters of the covert outer modal f^1, g^1 to be the same across contexts, and to have the same values as those of the covert modal occurring in indicative conditionals lacking an overt modal. For concreteness, we assume that the modal base is constituted by the speaker's true beliefs,[45] which we designate as f_{belS}, and that the ordering source, designated as g_{norm}, is stereotypical, for the reasons discussed in Section 6.2. In the case at hand, at a world of evaluation w, $f_{belS}(w)$ comprises facts such as 'Train A goes to Harlem', 'PATH train goes to Hoboken', and $g_{norm}(w)$ comprises propositions like 'No strikes', or 'No track repair work'.

This leaves three contextual parameters to be determined: the preferential background P targeted by *want* and the modal base f^2 and ordering source g^2 of the priority modal in the consequent. In anankastics, *want* targets an agent's effective preferences and the priority modal is construed 'teleologically'. This means that its ordering source, which we write g_{epA}, is constituted by the top-ranked effective preferences of the same agent. Thus, if the relevant agent is the addressee, as in (87a), for any w, $g_{epA}(w) = \max[EP(Ad, w)]$. Given that an agent's effective preferences are world-dependent, the value of g_{epA} will vary from world to world.[46] For the

44 Recall that in this paper we do not address the distinction in strength between necessity modals. MUST stands for any overt necessity modal in the consequent.

45 In so doing, we wish to avoid the question whether the truth of an indicative conditional is determined by what obtains in the world of evaluation, or by the speaker's beliefs, or some other information state (e.g., the common ground) at the world of evaluation.

46 In this way, g_{epA} is crucially different from g_{desG} employed in von Fintel & Iatridou's (2005) analysis, which yields the same (singleton) set of propositions at every world (cf. Section 3.2.2).

modal base, we follow Kaufmann & Schwager (2009) and take it to be 'historical', a choice that we discuss further below.

The idea is to look at future continuations of worlds in which the addressee has an effective preference for **Harlem** and check whether those worlds in which the addressee's goals, including **Harlem**, are optimally realized are all **ATrain** worlds. We thus take the modal base to determine the historical alternatives of a world at a relevant time t at which the antecedent is true, designated as f^t_{Hist}.

With these assumptions, we obtain (88) with all parameters filled in. The modals are interpreted in the standard Kratzer fashion, i.e., according to (10) in Section 2.1. (89) gives a natural language paraphrase of the resulting truth conditions.

(88) $\text{NEC}_{f_{belS},g_{norm}}[want_{EP}(Ad,Harlem)]$ $[\text{MUST}_{f^t_{hist},g_{epA}}$ $[ATrain]]$

(89) All the most typical worlds consistent with what the speaker knows in which the addressee has the goal of going to Harlem are such that all their possible future continuations in which the addressee's goals are eventually realized in an optimal way are such that the addressee takes the A train.

Since *want* is a stative predicate, in the present tense, the time of realization of the antecedent is the time of utterance by default. It can be forward shifted in the presence of overt temporal adverbials, *ever*, or contextual cues. In Condoravdi & Lauer (2015), we spell out the underlying assumptions about the temporal interpretation of conditionals and show that they do not result in any constraint on the temporal ordering of the internal antecedent and the prejacent of the modal. That is, the truth conditions do not specify that taking the A train will, by necessity, be realized *before* you are in Harlem, or that taking the A train is a *means* to get to Harlem. This is crucial in order to account for some of the near-anankastics we discussed in Section 4, which we will return to below. But the truth conditions are *compatible* with both assumptions, and given world knowledge, they constitute one (and in certain contexts, the only) plausible way to explain why the asserted necessity would hold. This is what happens, in particular, on typical advice uses of anankastics, as discussed in Section 7.1.2 and in more depth in Lauer & Condoravdi 2014.

If, on such advice uses, the conditional is used to (indirectly) convey some factual information, the modal base of the inner modal must encode facts about the world of evaluation. The historical modal base that we have opted for achieves this. An alternative, which is used, for example, by von Fintel & Iatridou (2005), is a 'circumstantial' modal base, which at a world of evaluation yields a set of relevant factual propositions. With respect to the issues discussed in this paper, our analysis would work equally well, *mutatis mutandis*, on the assumption that the modal base is circumstantial rather than historical.

Regardless of which precise modal background is chosen as the modal base, there is some additional complexity to be considered. In principle, the inner modal can 'undo' the restriction to (stereo-)typical worlds effected by g_{norm}, bringing back into play quite atypical worlds. This is a general issue affecting the analysis of any kind of conditional that requires a double-modal structure (see also Kaufmann & Schwager 2009: Section 3). For a circumstantial modal base, the issue is how to ensure that all worlds that verify a set of relevant facts are 'typical' ones. For a historical modal base, the problem is that a world that has been (stereo-)typical up to time t may well have atypical future continuations.

Of particular relevance to our concerns here are *beneficial chance events*, i.e., unlikely events that will make the fulfillment of the relevant agent's effective preferences easier. For example, it may well be metaphysically possible that shortly after the utterance of the Harlem sentence outside a subway station, a friend of *Ad* happens to come by in a car on his way to Harlem, offering *Ad* a (quicker, free) ride. We would like the existence of such possibilities to not interfere with the truth of the Harlem sentence.

A conservative direction to pursue is to assume that the (stereo-)typicality ordering g_{norm} is not the only mechanism that keeps unexpected courses of affairs out of consideration. In addition, there are contingencies that are not taken into account in a typical conversation, either because they are judged to be very unlikely, or simply because the interlocutors fail to attend to them. Such possibilities are ignored, globally and *ex ante*, in the interpretation of utterances. From the viewpoint of semantic analysis, this can be implemented simply by assuming that the models on which our language is interpreted do not contain any worlds in which, e.g., free rides become available out of the blue.[47]

The idea that there are *two* interacting mechanisms keeping certain possibilities from being taken into account — a variably strict analysis of the conditional *plus* 'ignoring of possibilities' — has precedent in the recent literature on counterfactuals. Moss (2012) proposes that both mechanisms are at play in Sobel sequences and reverse Sobel sequences, and Klecha (2014, 2015) goes further, arguing that counterexamples to Strengthening of the Antecedent for counterfactuals fall into two distinct classes, each of which is to be explained by one of the two mechanisms.[48]

47 This requires an appropriate understanding of the models we employ in formal semantics. In particular, it requires that we do not take them to represent the 'real world' (or 'real logical space') directly. Instead, we should construe models as representation of language-users' *conceptualization* of the world.

48 Ultimately, we will want to formally model 'ignoring of possibilities', and its dynamics. The most promising way to achieve this, in our view, is to adopt something like the model of Franke & de Jager (2007), in which a standard 'background' possible worlds model (representing all possibilities that the agent could possibly attend to) is 'filtered' through an awareness state, with the result being a new possible worlds model of the familiar kind, on which utterances are interpreted. Crucially,

7.1.1 Conflicting goals and non-conflicting goals

The differential behavior of conflicting and non-conflicting goals follows simply from the way we interpret conditional sentences. Given that effective preferences need to be consistent, the two sets in (90) are disjoint, assuming that one cannot go to both places within the same time frame and that the addressee knows that.

(90) $\{w \mid \textsf{Hoboken} \in \max[EP(Ad,w)]\}$
$\{w \mid \textsf{Harlem} \in \max[EP(Ad,w)]\}$

But then, making the hypothetical assumption that *Ad* has an effective preference for **Harlem** amounts to making the assumption that he does not have an effective preference for **Hoboken**. A standard analysis of the conditional automatically takes care of the problem of incompatible goals.

Formally, this is achieved through the standard restriction of NEC's modal base by the antecedent. This restriction will automatically remove all worlds w from the domain of NEC which are such that $\textsf{Hoboken} \in \max[EP(Ad,w)]$. Consequently, the consequent of NEC, $\textsc{must}_{f^t_{hist},g_{epA}}$ [*ATrain*], will be evaluated only in worlds in which the addressee has no goal that conflicts with going to Harlem. That is, for any such world v, $g_{epA}(v)$ will contain **Harlem**, but no proposition that is incompatible with it.

In the Hoboken scenario, the addressee actually has an effective preference for going to Hoboken, hence $\textsf{Hoboken} \in \max[EP(Ad,w_0)]$. While $w_0 \in \bigcap f_{belS}(w_0)$, the consistency requirement for effective preferences ensures that

$$w_0 \notin \bigcap(f_{belS}(w_0) \cup \{\{w \mid \textsf{Harlem} \in \max[EP(Ad,w)]\}\}),$$

on the assumption that *Ad* knows that **Harlem** and **Hoboken** are incompatible. Therefore, the fact that the addressee in reality wants to go to Hoboken instead of Harlem does not influence the interpretation of (1).

What if for some w, $\bigcap f_{belS}(w)$ does not contain any worlds in which the addressee has an effective preference for **Harlem**? In this case:

$$\bigcap(f_{belS}(w) \cup \{\{w \mid \textsf{Harlem} \in \max[EP(Ad,w)]\}\}) = \emptyset$$

Technically, we predict the conditional to be vacuously true. But this turns out to be just another way in which anankastic conditionals behave like other conditionals. In general, *indicative* conditionals are only felicitous if their antecedent is epistemically possible (Stalnaker 1975, Karttunen & Peters 1979).[49] If the antecedent is known to

interpretation of utterances can also affect the awareness state, and therefore bring previously ignored possibilities to attention.

49 Leahy (2011) argues that the correct way to account for this constraint is to assume that there is a conventional constraint on *indicative* conditionals that ensures this (something that had also

be false, a *subjunctive* conditional has to be used. Anankastic conditionals behave just this way. An indicative anankastic conditional is not appropriate if the speaker *knows* about an incompatible effective preference. Suppose that the speaker asserts that he knows that John wants to go to Hoboken. Then he *cannot* follow his utterance with (91a). Instead, he has to use the subjunctive version (91b).[50]

(91) I know John wants to go to Hoboken today, not to Harlem.
   a. #But if he wants to go Harlem today, he has to take the A train.
   b. But if he wanted to go to Harlem today, he would have to take the A train.

While non-compatible goals are automatically excluded from consideration, compatible goals (if salient) can be taken into account. von Stechow et al. (2006: p. 168) make the point that "expressing necessary conditions is a context-sensitive matter" using (92).

(92) [Context: There are two trains to Vladivostok, one Russian and one Chinese. The Chinese train is much more comfortable.]
If you want to go to Vladivostok, you have to take the Chinese train.

Given that traveling comfortably is not incompatible with going to Vladivostok in this scenario, the restriction performed by the antecedent will not rule out worlds in which the addressee has an effective preference for comfort. If it is *known* that he has such a preference, then *all* worlds in the restricted domain of NEC will be such that the addressee prefers both to go to Vladivostok and to travel comfortably. This is why (92) comes out true in the described scenario: In all worlds in which both preferences are fulfilled, the addressee takes the Chinese train.

von Fintel & Iatridou (2005) report a variability of judgments regarding (92). Our account offers an explanation: (92) may be judged as false if cost is taken to be ranked over comfort (i.e., if comfort is not an effective preference, even though the addressee desires it), for instance, or if the desire for comfort is non-salient. Thus, along with von Stechow et al. (2006) and Rubinstein (2012), we view this as contextual variability, rather than variability across speakers' grammars.

Our discussion of near-anankastics in Section 4 demonstrated several cases where multiple preferences, not just the goal mentioned in the antecedent, must be

been hypothesized by Karttunen & Peters (1979)), but that there is no corresponding constraint on subjunctive conditionals. As far as we can tell, the behavior of anankastic conditionals is consistent with this assumption.

50 To illustrate this, it is useful to use a third-person subject for *want* and force an episodic interpretation (done here by *today*). The indicative version of the standard Harlem sentence may be acceptable (as one would expect) on a generic construal even in case it is known that (right now) the addressee has no desire to go to Harlem.

taken into account, such as (93) (near-anankastic about teleological consequences), (94) (strengthened goal) and (95) (what-kind-of near-anankastic).

(93) If you want to go to Disneyworld, you should / have to spend at least five days there.

(94) If you want to travel there, you should / have to get a vaccine first (to be safe).

(95) If you want to go to the disaster area, you should / have to go there quickly.

In all these examples the setting of the contextual parameters of the modal and *want* are the same as in the core anankastic cases. The conditionals can be true (in appropriate circumstances), since compatible preferences need not be ranked in effective preference structures, and hence, e.g., both **Travel** and **Not-Infected** can be maximal elements of $EP(Ad, w)$. At the same time, they do not convey a means-of implication, and hence are not construed as advice on how to realize the goal mentioned in the antecedent.

So far, we have seen various examples where compatible goals can or must be taken into account when evaluating anankastic and near-anankastic conditionals. Huitink (2005, 2008) discusses a case where most speakers agree that such compatible goals *cannot* be taken into account. Suppose there are two trains that go to Harlem, and that Ruud van Nistelrooij is on one of them. Then (96) is intuitively false even if the addressee has an effective preference for meeting van Nistelrooij.

(96) If you want to go to Harlem, you have to take the A train.

However, the variant with a weak necessity modal in (97), is intuitively true if the addressee's preference for meeting van Nistelrooij is salient (though it does not constitute advice on how to get to Harlem).

(97) If you want to go to Harlem, you should take the A train.

We leave open how the contrast between (96) and (97) is to be accounted for, as we are not addressing the difference between strong and weak modals in this paper.[51]

51 Nissenbaum (2005) claims that (i) is false in a context where Pedro Martinez is known to be on the train that goes to Harlem, and the addressee has a preference for meeting Martinez.

(i) If you want to go to Harlem, you can meet Pedro Martinez.

We take (i) to be true in the described scenario, though it does not constitute advice on how to get to Harlem. This was already suggested by Janneke van Wijnbergen-Huitink (in p.c. reported in Nissenbaum's paper). We agree with her assessment that any sense of oddness for (i), in the described scenario, is due to the fact that, given the very weak existential claim made in the consequent, the *if*-clause is essentially superfluous, i.e., the consequent would be true without it.

In any case, in view of the previous examples involving strong modals and multiple goals, we can conclude that the contrast is not to be captured by requiring strong modals to only take into account the single goal mentioned in the antecedent, as von Fintel & Iatridou's (2005) analysis has it.

7.1.2 The means-of-implication

We have seen that conditionals of the form *if want p, must/should q* in a context assigning *want* an *EP* preferential background and a teleological ordering source to the modal can get a variety of implications. These implications correlate with the temporal relation that is inferred to hold between *q* and *p*. Temporal precedence correlates with an implication that *q* is a means of achieving the goal corresponding to *p*, as in the Harlem sentence, or of a strengthened goal, as in the near anankastic (29b). Temporal inclusion correlates with a necessary precondition implication, such as with the anankastic in (28). Temporal coincidence correlates with 'what kind of' near-anankastics, such as (40a). Temporal precedence in the opposite direction correlates with a teleological consequence implication, as for the near-anankastic in (31). Neither the temporal relationship between *p* and *q*, nor the implications concerning the connection between the two propositions should be hard-coded into the semantics of anankastic or near-anankastic conditionals.

The strengthened readings have to arise pragmatically. We view them as the result of a sense-making inference about why the asserted conditional necessity would hold and why the speaker chose to utter a conditional necessity as opposed to a plain necessity. For instance, why are all worlds in which *Ad* optimally realizes his preferences **ATrain**-worlds in case he has a preference for **Harlem**? And why is a preference for **Harlem** relevant to the necessity expressed by the consequent? We leave the derivation of the pragmatically strengthened readings for future work. In Lauer & Condoravdi 2014 we discuss the further question of how pragmatically strengthened anankastic conditionals can feed practical reasoning, and hence serve as advice.

7.1.3 Purpose constructions

Many anankastic conditionals (as well as some near-anankastics) are perceived to be equivalent to the corresponding purpose construction. Intuitively, *If you want to go to Harlem, you have to take the A train* in many contexts conveys the same information as *To go to Harlem, you have to take the A train*.

According to analyses that assume that anankastic conditionals contain a covert purpose clause (like those of von Fintel & Iatridou and von Stechow et al.), this is due to the fact that anankastic conditionals *are* purpose constructions, albeit

conditionalized ones. For them, the challenge is to explain how the conditionalized purpose construction comes to be perceived as informationally equivalent to an non-conditionalized one. Regardless of how this is achieved, Doris Penka (p.c.) points out that such accounts will have difficulty with sentences like (46), since for them the antecedent does not influence the interpretation of the conditional in any significant way, beyond providing the content of the purpose clause. Our analysis effortlessly accounts for (46), correctly predicting it to express a negated necessity conditioned on the absence of a preference.

(46) If you don't want to get a letter grade for the course, you don't have to take the exam.

On our account, a conditional will be informationally equivalent to a purpose construction only in virtue of its pragmatically enriched meaning. We do not give a semantic analysis of purpose constructions here, but we hypothesize that the modal that occurs in them gets a teleological construal, i.e., it quantifies over the historical alternatives of the evaluation world that are best according to the agent's effective preferences.

In order to obtain an anankastic-like interpretation, the proposition expressed in the purpose clause must also be treated as a (hypothetical) effective preference of the agent. This suggests that purpose constructions are essentially interpreted conditionally.[52] Besides the fact that this would result in intuitively appropriate truth conditions, there is another reason to think that purpose constructions are essentially conditional in nature. Just like conditionals, a subjunctive variant must be chosen if the speaker is aware that the agent does not have the hypothetical preference (cf. (91) above).

(98) I know John wants to go to Hoboken today, not to Harlem.
  a. #But to go to Harlem, he has to take the A train.
  b. But to go to Harlem, he would have to take the A train.

Even though they may have a conditional interpretation, purpose constructions are semantically stronger than anankastic conditionals. Minimally, they impose a requirement on the temporal relation between the purpose clause and the complement of the modal: the latter cannot be subsequent to the former. As a result, 'teleological consequence' readings on a par with (31) are ruled out in purpose constructions.

(99) #To go to Disneyworld, you have to spend at least five days there.

52 In a sense, we are inverting the order of explanation. While von Fintel & Iatridou and von Stechow et al. start with purpose constructions and reduce anankastic conditionals to them, we approach purpose constructions through our understanding of anankastic conditionals.

However, even purpose constructions do not semantically encode the means-of implication. They are compatible with mere necessary preconditions:

(100) a. To go to Harlem, you have to stay on this platform.
b. For us to invite everyone to dinner, your table has to seat at least 20.

This suggests that the means-of implication is, even for purpose constructions, a pragmatic strengthening of a weaker content. But this content is stronger than the content of the corresponding anankastic conditional.

In sum, we observe that purpose constructions require that the prejacent of the modal is realized (in the optimal worlds) before (or at least, not after) the time the goal in the purpose clause is realized, a constraint that is not present in anankastic conditionals. It is still an open question whether the purpose construction has additional entailments that distinguish it from anankastics. Quite possibly, some of the additional entailments that have been considered in the literature on anankastics might exist, after all, for purpose constructions. Maybe purpose constructions require that the prejacent is 'part of an essential way of achieving' the goal expressed in the purpose clause, in the sense sketched in von Fintel & Iatridou (2005). How the means-of relation can be captured as an entailment is the central focus of Fernando (2005) and Werner (2006). While we have demonstrated extensively that anankastic conditionals should not have such an entailment, their analyses (or a weakening thereof, in light of examples like the ones in (100)) may be appropriate for purpose constructions.

7.1.4 Informational asymmetry and conflicting goals

According to our analysis, conflicting goals are guaranteed to not interfere with the evaluation of an anankastic conditional, as long as the relevant agent is *aware* that the goals are in conflict (and the speaker knows that). This raises the question whether the correctness of the agent's beliefs counts, or ought to count, for the truth of anankastics.

Given that effective preferences (minimally) satisfy consistency and realism, in making a hypothetical assumption about an agent's effective preferences, a speaker, generally, also hypothesizes something about the agent's beliefs. Generally and by default he can assume that the agent is sufficiently informed about the relevant facts, so as to not have incompatible effective preferences (given the facts). What about the case, however, where it is a salient possibility for the speaker that the agent is mistaken about the relevant facts?

To investigate the question, we give a variant of the 'virus scenario' from Lauer & Condoravdi 2014, modified here to create an informational asymmetry between the speaker and the addressee.[53]

(101) [Context: The speaker knows that a deadly virus has just been set free in Harlem, and that anyone who goes there is likely to be infected. As far as the speaker knows, the addressee is unaware of this.]
If you want to go to Harlem, you should / have to take the A train.

In this context, there is a conflict between the hypothetical goal of going to Harlem, and the (presumed) effective preference for staying alive, but the addressee is unaware of this conflict because of his ignorance about the virus. We hence predict the sentence (on its anankastic, non-generic reading) to be false, seeing as the ordering source of the modal contains both preferences, despite their incompatibility, given the actual facts. Is this correct? The speaker's utterance is clearly not good, cooperative advice, but is the sentence he utters *false*? Intuitions are not clear-cut, but there is good reason to think that it is not true on the anankastic reading and that there is an interfering reading arising in these special contexts.

Let us consider a variant of (101) that makes explicit that the addressee does not know all the relevant facts. Suppose we are in the virus scenario but *B* is presently unable to inform *A* about the virus (they are in public, and if someone overhears the utterance, this may trigger a mass panic):[54]

(102) *A*: How do I get to Harlem?
B: You don't know all the facts, so don't do anything until I brief you in private, but if you want to go to Harlem, you should take the A train.

To our ears, (102) sounds at least mildly incoherent, which indicates that if it is a given that the agent lacks relevant information about conflicting goals, the sentence cannot be assigned its usual anankastic interpretation without some extra assumptions, e.g., that the speaker has changed his mind about the possible conflict, or that the conditional is to be interpreted generically. To prevent a generic construal, we can employ a third-person subject and anchor the sentence temporally, as attempted in (103).

53 In Lauer & Condoravdi 2014, we used the scenario to make a different point, and hence assumed that it is common ground between the interlocutors that a virus has been set free.

54 A reviewer points out that in this example, the subjunctive version of the conditional sounds fine, and arguably gets an anankastic interpretation. We agree, but the behavior of both versions needs explaining: Why is the subjunctive fine, even though *A* has just indicated that he (likely) has a preference for going to Harlem? And why is the indicative problematic, if the sentence is true on the anankastic reading?

(103) [Context: *A* and *B* are watching a disaster movie in which a virus is set free in Harlem. After a scene of people dropping dead in the street, the movie cuts to the hero, *C*, who is going about his day in Manhattan, oblivious to the outbreak. *C* is studying the schedule for the A train.]
A : Why is he doing that?
B : Well, if he wants to go to Harlem right now, he has to / should take the A train.

B's utterance is clearly felicitous, but the sentence gets a construal different from run-of-the-mill anankastics. In particular, it appears to get a *subjective* construal that only takes into account the facts known to *C*. That is, the outer modal NEC appears to get a third-person construal, like the *might* in Egan et al.'s (2005) example (104).[55] On this construal, the virus outbreak will not figure in the evaluation of (103), because it is unknown to *C*.

(104) [Bill and Chris are covertly watching Ann, who does not want to be seen by Bill. When a bus goes by, Ann jumps into some bushes.]
Chris: Why did she do that?
Bill: (Because) I might be on that bus.

To sum up, we see that if it is a salient possibility that the agent is unaware that the hypothetical preference expressed in the antecedent is in conflict with one of his other preferences, the conditional must be construed in a non-anankastic way. Accordingly, our analysis of the anankastic reading as only excluding goals that are *believed by the agent* to be in conflict with the hypothetical goal is on the right track.

7.2 In the neighborhood of anankasticity

Various kinds of near-anankastic conditionals arise when the ordering source of the overt modal and the contextual parameter of *want* are not both constituted by the effective preferences of the same agent.

7.2.1 Non-effective preferences for *want* or *should*

A true anankastic reading arises only if both the desire predicate in the antecedent and the modal in the consequent receive an effective preference construal. If one of the two gets a different construal, a non-anankastic reading results. One example is the chocolate example (5), repeated here for convenience. On the most accessible reading of the sentence, the modal is construed teleologically (as in anankastics),

55 We thank an anonymous reviewer for pointing out this parallel between (103) and Egan et al.'s cases.

while *want* gets a mere-desire construal, leading to the logical form in (105) with the parameters filled in.[56]

(5) If you want to eat chocolate, you should try thinking about something else (to take your mind off of it).

(105) $\text{NEC}_{f_{belS},g_{norm}}[want_{DesP}(Ad, chocolate)]$ [$\text{MUST}_{f^t_{hist},g_{epA}}$ [*think sth. else*]]
where *DesP* is a preferential background that maps any a, w to the preference structure representing a's mere desires/appetites at w.

On this reading, *want* does not appear vacuous in any way. It is really a consequence of having the (mere) desire to eat chocolate that one should try and think of something else, not a consequence of eating chocolate.

Other construals are possible. To bring this out, consider (106), which is highly ambiguous without any context. The intended reading can be brought out with various possible continuations:

(106) If you want to drop out of school, you should talk to the guidance counselor.
a. . . . He will help you with the necessary paper work.
b. . . . So we can figure out what makes you unhappy, and find ways to address the issues.
c. . . . Maybe he can convince you to change your mind.

The continuation in (106a) brings out the anankastic reading of (106), in which *want* receives an effective preference construal, and *should* is likewise construed to be about the addressee's effective preferences, i.e., hearer-teleologically. By contrast, (106b) brings out a reading on which *want* is construed, as in the chocolate example, with a mere-desire reading — in a context where this is intended, the antecedent could be paraphrased with *If you are unhappy in school* . . . . The modal receives either a hearer-teleological construal, asserting that you should talk to the guidance counselor in order to satisfy your (presumed) preference to not be unhappy at school; or a speaker-teleological construal, against the background of a (presumed) effective preference on the part of the administration for not having unhappy students. Finally, the continuation in (106c) brings out a reading on which *want* receives an effective preference construal, but the modal does not get a hearer-teleological one. A salient

56 If we allow for priority modals to be restricted by *if*-clauses (see n. 37), non-anankastic conditionals like (105) could also be given a single-modal structure, resulting in essentially the same truth conditions. In that case, anankastics will also get a construal on which the teleological modal is directly restricted by the *if*-clause, in addition to the desired double-modal construal. Even if there is such an ambiguity, on the single-modal construal, the hypothesis contributed by the *if*-clause would be inert (see Section 2.2), which arguably would account for the fact that the ambiguity is not perceived.

alternative construal is a speaker-teleological one (assuming the speaker has a preference for the addressee not dropping out).

Thus we see that the two parameters — construal of *want* and ordering source of *should* — indeed vary independently, with different combinations giving rise to different readings which can be put to different uses in context.

7.2.2 Near-anankastics about deontic consequences

Deontic near-anankastics like (38), repeated below, arise if *want* targets effective preferences, but the modal in the consequent gets a deontic rather than a teleological construal.

(38) If you want to use the exemption now, you must / will have to pay more taxes next year.

As we pointed out in Section 4, examples like (38) raise some of the same issues as true anankastic conditionals. First, in the evaluation of (38), actual desires of the agent that are incompatible with taking the exemption are ignored, just as they are in anankastics. Secondly, *want* appears 'vacuous': Having to pay more taxes is not a consequence of having a desire to take the exemption, but rather of taking the exemption.

Incompatible goals The first property is directly explained on the assumption that *want* gets an effective preference construal in (38). Alternative analyses that try to capture the treatment of incompatible goals by means of a purpose clause argument of the modal will not extend to (38). While an extra purpose clause argument may seem plausible for teleological construals, it is unclear why deontic modals should have one. More importantly, (38) does not permit of a purpose clause paraphrase, attempted in (107). But then, (38) cannot be a (reduced) conditionalized purpose construction.

(107) #To use the exemption now, you must / will have to pay more taxes next year.

Vacuous 'want' On our account, the apparent vacuity of *want* in proper anankastics like the Harlem sentence is due to the fact that the preference structure targeted by the desire predicate matches the ordering source of the modal in the consequent. As such, this explanation does not directly extend to (38), as *want* must be about some sort of preference, while the modal receives a deontic or legal construal ('according to what (tax) law provides').

But there is an obvious alternative explanation of the apparent vacuity of *want*: We can reasonably assume that someone who has an effective preference for claiming a particular exemption (that he qualifies for) will do so. So we hypothesize that deontic near-anankastics only work in the presence of a contextual assumption that if the agent has an effective preference for p, then p will be actualized (which, in many cases, just amounts to the assumption that p is under the full control of the agent). If a context happens to satisfy this condition, we get a deontic near-anankastic interpretation, otherwise we do not.

That this is correct is demonstrated by (108). In this case, the necessary contextual assumption is extremely implausible (unless the lottery is rigged). Consequently, *want* does not appear to be vacuous, and (108) can only be true (rather implausibly) if having the mere goal of winning the lottery increases your tax liability, regardless of whether you win or not.[57]

(108) If you want to win the lottery, you must / will have to pay more taxes next year.

Now, one might wonder whether we should not appeal to a similar contextual assumption for proper anankastics, obviating the need for a double-modal construal. (109) shows that this idea is a non-starter: For proper anankastics, it is *not* necessary to assume that the speaker will realize the preference, if indeed he has it:

(109) If you want to win the lottery, you have to buy a ticket.

So while we trace the apparent vacuity of *want* in deontic near-anankastics ultimately to the same source as in anankastics — the effective preference construal of *want* — it arises in different ways. In proper anankastics, it arises by necessity due to the alignment of construals for *want* and the modal. For deontic near-anankastics, it

57 The dependence on such a contextual assumption is present only for examples like (38), that are about deontic consequences. The same is not required, as a reviewer points out, for near-anankastics that convey information about a deontic precondition, such as (i), after von Stechow et al. (2006).

(i) If you want to get a driver's license [in Germany], you have to be at least 18 years old.

We think that the modal in (i) does not get a deontic construal (if it did, the conditional would assert that the law regulates when one can have a preference), but rather is construed teleologically: since you will not get a license if you are under 18, your hypothetical preference can only be fulfilled if you are of age — for legal reasons. Just as the Harlem sentence conveys information about public transportation, (i) conveys information about the law — without thereby being construed deontically. Note also that, for such preconditions that are due to the law, the purpose clause variant is perfectly felicitous ((ii) is von Stechow et al.'s original example).

(ii) To get a driver's license, you have to be 18 years old.

arises contingently if the context is of the right kind. Our analysis captures this behavior easily, as 'vacuity' is ensured in proper anankastics, but the way this is ensured (alignment of construals) is blocked in the deontic cases.

7.2.3 Weak consequents and weak antecedents

von Fintel & Iatridou (2005, 2006) discuss the following kind of example (their examples involve non-conditional purpose constructions), which their analysis predicts to be "unremarkably true".

(110) a. If you want to go to Harlem, you have to breathe.
b. If you want to go to Harlem, you have to be a person.

Our analysis likewise predicts these conditionals to be true. We agree with von Fintel & Iatridou, who say (p. 17): "We do not think this is a problem, because these sentences do seem to be true. They are less than helpful of course, because for example, *just* breathing won't get you to Harlem. But that doesn't make them false to our ears." Still, the fact that (110a) and (110b) do not exhaustively specify how to get to Harlem is not sufficient to explain their intuitive oddness. (111) shows that even a relatively partial specification of a mere precondition may be informative enough to warrant assertion.

(111) If you want to go to Harlem, you have to wait on this platform.

The sentences in (110) sound odd (though they are, in our view, true) because their consequents will generally be true unconditionally. In terms of our analysis, it can be safely assumed in most contexts that the addressee has some (other) effective preference that requires him to breathe and be a person. Oddity will thus arise in normal contexts, where it is unclear why the speaker chose to make a conditional statement rather than asserting the simpler consequent.

In addition to anankastic conditionals with 'weak consequents', von Fintel & Iatridou (2006) also discuss the following conditionals with 'weak antecedents' (the examples are due to Brian Weatherson).

(112) a. If you'd like to go to Harlem, you have to take the A train.
b. If you'd care to go to Harlem, you have to take the A train.
c. If you're inclined to go to Harlem, you have to take the A train.
d. If you're thinking about going to Harlem, you have to take the A train.
e. If you think you might (want to) go to Harlem, you have to take the A train.

Generally, these sentences do not get an anankastic construal, and hence come out as false unless the speaker has independent reasons for taking the A train (in which case, once again, the conditionalization is hard to justify). It is unclear how this would be accounted for on an implicit-purpose-clause analysis.[58] These sentences make salient a potential desire for going to Harlem, just as the original Harlem sentence does. So why can this salient potential desire not serve as the purpose clause argument of the modal in the consequent? On our analysis, it is clear why these sentences fail to get an anankastic construal: The desire predicates in the antecedent cannot target effective preferences, but the modal in the consequent is teleological. So the anankastic interpretation cannot arise in the way it normally does.

However, a (near-)anankastic reading can arise in much the same way as it does with deontic near-anankastics. Suppose we are in a context where it is presumed that a potential weak desire to go to Harlem will be acted upon (i.e., will become an effective preference). For example, suppose the addressee is on vacation in New York, has no plans for the day yet, and there are no other reasons (lack of funds, etc.) that would keep him from acting on a mere whim. In this context, the sentences in (112) are true on a (near-)anankastic reading and our analysis predicts this. Under the contextual assumption that any mere desire (to go to Harlem) is treated as an effective preference, the antecedents contextually entail that there is an effective preference. In other words, in such a context, making the hypothetical assumption that there is such a weak desire amounts to making the hypothetical assumption that the corresponding effective preference exists. Our account thus sheds light on why sentences like the ones in (112) have a (near-)anankastic reading when used in very specific contexts, but not otherwise.

8 Conclusion

Sæbø (1985, 2001) showed that anankastic conditionals pose a range of challenges for semantic analysis. The present paper has argued that anankastic, near-anankastic, and non-anankastic conditionals nonetheless are amenable to a uniform treatment. The puzzling behavior of anankastic conditionals arises, compositionally and predictably, from a range of interacting factors that play a role in the interpretation of conditionals, of modals and of desire predicates more generally. Anankastic conditionals thus are, really, just conditionals.

This does not detract from the relevance and importance of Sæbø's observations — to the contrary. As has become clear throughout, investigating anankastic

58 We believe this is probably the reason why Weatherson presented these examples.

conditionals helps us to better understand and appreciate the various factors in the interpretation of the expressions involved.

While we have implemented our solution in the Kratzer framework, we conjecture that, regardless of semantic framework, any successful analysis of anankastic conditionals that also accounts for the similarities and differences between anankastics and near-anankastics will rely on the assumption that the modal in the consequent and the desire predicate are construed in the same way, that this construal is linked to action choice, that it brings with it a substantive consistency constraint, and that such an account will otherwise only make analytical choices that are necessitated by conditionals more generally. That is, we conjecture that any successful analysis of anankastic conditionals will, in essence, be a variant of the analysis presented here.

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