



## Optional and Obligatory Modal Subordination\*

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**Abstract.** This paper raises the empirical point that modal subordination is not always obligatory, and that moreover, this is a point of lexical variation. Some modals, like *will*, which I call definite modals, undergo modal subordination obligatorily, and some, like *gonna*, which I call nondefinite modals, do so optionally. I propose a dynamic framework in which, following from Frank (1997), information states are possible discourse referents. I also propose that these referents are potentially subject to familiarity presuppositions, whose presence makes a modal definite, and whose absence makes a modal nondefinite.

### 1 Introduction

This paper presents novel data concerning the optionality (or lack thereof) of implicit conditional readings in various contexts, and proposes to account for these by adopting a dynamic semantic theory of modal subordination which crucially involves lexically variable familiarity presuppositions. The central contrast, first partially observed and discussed by Binnick (1971).

- (1) a. Don't go near that bomb! It'll explode!
- b. Don't go near that bomb! It's going to explode!

As Binnick noted, the second sentence in (1a) must be understood as meaning “If you go near it, it'll explode”, i.e., it is an implicit conditional. Binnick also claimed that the corresponding sentence in (1b) cannot have such a conditional reading, but this is not true; indeed, (1b) *can* have an implicit conditional meaning; the difference is that it does not have to, while *will* does. To drive this empirical point home, consider (2), a context in which only the implicit conditional meaning is sensible.

- (2) a. Don't drink that coffee. You'll burn your mouth.

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- b. Don't drink that coffee. You're gonna burn your mouth.

Clearly, if *gonna* was incompatible with the implicit conditional meaning, (2b) would be infelicitous; but a conditional reading is found. Observe also the reverse case, one where the context demands the non-conditional reading, demonstrates that *will* indeed cannot support such a reading.

- (3) a. Go check the incubators. # The eggs'll hatch.
- b. Go check the incubators. The eggs are gonna hatch.

Despite the oddness of the conditional reading, that the eggs will hatch if you check them, the non-conditional reading cannot be forced in the case of *will*; the data here robustly shows *will* cannot support a non-conditional reading.

This paper provides an analysis of these facts, which have never been considered in the formal literature. I follow Roberts (1989), Geurts (1995), and Frank (1997) in analyzing these implicit conditional readings, which Roberts terms *modal subordination*, as cases of implicit domain restriction on modal expressions, but with the added feature of familiarity presuppositions (Heim 1982) whose presence gives rise to obligatory modal subordination, and whose absence allows for optionality.

Importantly, this distinction is not only relevant to *will* and *gonna*; rather, it is a distinction that pervades the entire class of modals. Modals generally can be divided into two subclasses: those that obligatorily undergo modal subordination, which I will call **definite modals** and those that do so optionally, which I will call **nondefinite modals**. Below are some examples.

- (4) *Definite modals: modal subordination obligatory*
  - a. Don't go near that bomb! It would explode.
  - b. Don't go near that bomb! It could explode.
- (5) *Nondefinite modals: modal subordination optional*
  - a. Don't go near that bomb! It's bound to explode.
  - b. Don't go near that bomb! It might explode.

This paper focuses on *will* and *gonna* as exemplars of these two classes, particularly because they form a minimal pair – besides their dynamic behavior, they are identical in meaning (observe that there is no truth-conditional difference between (1a) and the conditional reading of (1b)). The contrast in dynamic behavior therefore cannot be ascribed to any quality of the expressions other than simple lexical idiosyncrasy.

In section 2 I summarize arguments from the literature which show that *will* and *gonna* are modals and do undergo modal subordination, which is a

crucial point for the analysis. In section 3 I provide the formal analysis of optional and obligatory modal subordination and show that it predicts the relevant data. In section 4 I consider previous analyses. In section 5 I conclude.

## 2 Establishing Modality

Kratzer (1986) argues that conditionals simply consist of modals (which involve quantification over worlds) whose quantificational domain is restricted to the set of worlds denoted by the *if*-clause. The proposal by Roberts (1989) to consider implicit conditional readings like in (6b) as involving implicit domain restriction goes hand-in-hand with this account.

- (6) a. You should eat a bagel.  
b. It would fill you up. (Roberts 1989)

Roberts's original account does not treat *will* as a modal, however; rather it assumes it to be a simple tense (as is often the case in the literature, *gonna* is not discussed). The basic analysis of modal subordination developed by Roberts therefore cannot be sensibly applied to *will*. Instead she proposes an alternate strategy to account for cases like (7).

- (7) a. If Edna forgets to fill the birdfeeder, she will feel bad.  
b. The birds will get hungry. (Roberts 1989)

In the case of (7b), she proposes that *will* has a temporal-anaphoric relation with (7a). According to Roberts, there is a time salient in the discourse, namely the time associated with the hypothetical feeling-bad event in (7a); *will* in (7b) then picks up on this time, and the time of the getting-hungry event is taken to be after that of feeling-bad event, by the usual mechanism of temporal anaphora. However, in order to make sense of this, the getting-hungry event must occur in the same worlds as the feeling-bad event; (7b) is therefore accommodated as being under the scope of the modal in (7a).

Moreover, the claim that *will* is a tense is a fairly common one in the literature on modal subordination; for example, Asher & McCreedy (2007) claim that *will* indeed *cannot* have implicit conditional readings (apparently contrary to Roberts) due to its status as a tense<sup>1</sup>, on the basis of (8) below.

- (8) a. A wolf<sub>i</sub> might walk in. It<sub>i</sub> would eat you.  
b. A wolf<sub>i</sub> might walk in. # It<sub>i</sub> will eat you.

<sup>1</sup> This is by no means a central argument for Asher & McCreedy, but it is worth clearing the air on this empirical point.

However, as seen above, *will* is clearly compatible with implicit conditional readings. The problem with (8a) is that the possibility is too implausible to be picked up by *will*, whereas *would* gives rise to an inference of unlikelihood when used in cases like (8a) (Iatridou 2000). Observe the following contrast:

- (9) a. You can't go outside. You'll freeze.
- b. You can't go outside. You'd freeze.

Both of these sentences are felicitous, but (9a) indicates that the hearer's going outside is relatively likely (and is accompanied well by a worried tone of voice) whereas the latter gives rise to an inference of unlikelihood (and goes well with a dismissive tone.)

Given the relative unlikelihood of wolves entering in any given context, *would* is highly appropriate in (8), and *will* may be degraded in this context due to scalar implicature. By fixing the context to include a more reasonable possibility, *will* (and *gonna*) can certainly have implicit conditional readings, along with a cross-sentence anaphoric dependency.

- (10) Don't leave your journal out on the table. Someone<sub>i</sub> could read it!
- a. They<sub>i</sub>'ll discover your secrets!
- b. They<sub>i</sub>'re gonna discover your secrets!

The singular gender-neutral pronoun *they* is linked to *someone*, mirroring (8).

While (10) can be explained by Roberts (1989), there are many reasons to take *will* (and *gonna*) to be modals, as discussed in Klecha (2009). One that is particularly relevant is the fact itself that they undergo modal subordination. If *will* and *gonna* are taken to be modals, all cases of implicit conditional readings can be unified as cases of implicit domain restriction of a modal. Moreover, while Roberts's approach accounts for *will*, it is predicted to extend to past and present tenses as well; any simple tense which undergoes temporal anaphora should be able to trigger accommodation of the type proposed by Roberts for (10b). However, this prediction is not borne out.

- (11) a. If Martina went to New York, she bought lots.
- b. #She had fun.
- c. If she went to New York and bought lots, she had fun.

(11b) cannot have the same meaning as (11c), contrary to Roberts's prediction. Rather, as argued in Klecha (2009), the fact that *will* (and *gonna*) undergo modal subordination and tenses do not is a strong argument for treating these expressions as modals, not tenses. See Klecha (2009) for further arguments for

a modal treatment of *will* and *gonna* as well as refutation of Kissine's (2008) arguments against a modal treatment.

Going forward I will therefore assume *will* and *gonna* to be modals, particularly necessity modals whose modal base is contextually variable (à la Kratzer 1977), but under the future reading at issue is a metaphysical modal base (e.g., Kaufmann 2005). In order to simplify the semantics, I will assume, contra Kaufmann (2005), that there is no ordering source.

### 3 Familiarity and Modality

I adopt a dynamic theory of implicit arguments along the lines of that developed by Condoravdi & Gawron (1996), (which in turn follows from Heim (1982)) but which also adapts proposals from Frank (1997). In this theory utterances are taken to update the information state. An information state is a representation of the information in a discourse that is shared and mutually updated by the conversational participants; both information about the world and information about the discourse itself, particularly the discourse referents.

Definite descriptions refer to familiar or salient objects in the discourse which are presupposed to already be present in the information state. Indefinite descriptions introduce novel objects into the information state, which are presupposed to have not already been present in the previous information state. Below I lay out a dynamic semantic framework which formalizes this.

#### 3.1 The Basic Dynamic Framework

First, some basic definitions.

**Definition 1: Basic Ontology**  $W$  is the domain of worlds;  $E$  is the domain of individuals;  $\{1, 0\}$  is the domain of truth values;  $F$  is the domain of assignment functions, functions from variables to objects of any type.

**Definition 2: Information States**  $S$  is the set of information states such that  $S := \{\sigma \in Pow(W \times F) \mid \forall \langle w, f \rangle \in \sigma . \forall \langle u, g \rangle \in \sigma . Dom(f) = Dom(g)\}$

Definition 2 above says that information states (ISs) are sets of world-assignment function pairs, and moreover that every assignment function in a given IS has the same domain.

**Definition 3: Sentences** If  $X$  is a sentence,  $\llbracket X \rrbracket = \phi : S \mapsto S$

Objects within double brackets  $\llbracket . \rrbracket$  are taken to be sentences. Definition 3 above says that sentences are interpreted as update conditions, or functions from ISs to ISs. Usual function-argument notation is eschewed in favor of the more iconic  $\sigma + \phi = \sigma'$ , where  $\sigma$  is the old IS,  $\phi$  is a sentence meaning, and  $\sigma'$  is the new IS.

**Definition 4: Relating Assignment Functions**  $\forall f, g \in F$ :

1.  $f < g$  iff  $Dom(f) \subset Dom(g)$  and  $\forall v \in Dom(f). f(v) = g(v)$
2.  $f \leq g$  iff  $f < g$  or  $f = g$
3.  $f <_x g$  iff  $f < g$  and  $Dom(g) = Dom(f) \cup \{x\}$
4.  $f^{x/a} = \iota g. g(x) = a \ \& \ \forall v \in Dom(f). v \neq x \rightarrow f(v) = g(v) \ \& \ \forall v \in Dom(g). v \neq x \rightarrow f(v) = g(v)$

Definition 4.1 above says that an assignment function  $g$  is an extension of  $f$  if its domain is a proper superset of  $f$ 's and for all the variables they have in common, they map to same objects. Definition 4.2 defines non-proper extension. Definition 4.3 says that  $g$  extends  $f$  by  $x$  if  $g$  is an extension of  $f$  and the only thing  $f$  has in its domain which  $g$  does not is  $x$ . Definition 4.4 says that  $f^{x/a}$  defines the function which is just like  $f$ , except that it maps  $x$  to  $a$ ; this neither presupposes that  $f(x)$  is defined nor that  $f(x)$  is not  $a$ .

For a simple example of (in)definiteness in this framework, consider (12).

- (12) a. A dog <sub>$x$</sub>  walked in.  
 b.  $\sigma_0 + \llbracket \text{a dog}_x \text{ walked in} \rrbracket = \sigma_1 =$   
 $\{ \langle w, f \rangle \mid \exists \langle w, g \rangle \in \sigma_0 : g <_x f \ \& \ \text{dog}(f(x))(w) \ \& \ \text{walked-in}(f(x))(w) \}$   
 if  $\forall \langle w, f \rangle \in \sigma_0 : x \notin Dom(f)$ , else undefined.

In (12), the IS is changed from one which previously did not include an assignment for  $x$ ,  $\sigma_0$ , to one which does,  $\sigma_1$ ; moreover any worlds where a dog did not walk in are eliminated. This IS can then serve as the context for an utterance with a definite DP with index  $x$ . Note that this update only proceeds if  $x$  was not defined in  $\sigma_0$ ; i.e., it bears a novelty presupposition.

- (13) a. It <sub>$x$</sub>  sat down.  
 b.  $\sigma_1 + \llbracket \text{it}_x \text{ sat down} \rrbracket = \sigma_2 =$   
 $\{ \langle w, f \rangle \in \sigma_1 \mid \text{sat-down}((f(x))(w)) \}$   
 if  $\forall \langle w, f \rangle \in \sigma_1 : x \in Dom(f)$ , else undefined.

The definiteness of the DP *it* is represented by a familiarity condition, as in Heim (1982), i.e., a requirement that the variable associated with the DP (above,  $x$ ), be in the domain of every assignment function in  $\sigma_1$ ; this condition is satisfied because  $x$  was introduced into  $\sigma_1$  by *a dog* in (12).

**3.2 Information States as Referents**

I analyze modal subordination as involving reference to ISs, or modal bases, following Frank (1997). A modal base is a subordinated IS; i.e., an IS which

serves not as the input to a matrix sentence, but as the conversational background of a modal expression, along the lines of Kratzer (1977, 1981).

Top-level ISs, i.e., those that serve as the input to a matrix sentence, may include assignment functions which map variables to ISs (i.e., modal bases). An expression may therefore carry an index which maps to a modal base. By default, however, there are no such mappings in an IS; they must be introduced.

Some expressions, like *will*, require that some IS be familiar in the context. Others, like *gonna*, allow for reference to a familiar IS, but in the absence of one, can introduce an IS into the context. In order to handle this, I introduce the default notation below.

**Definition 5: Default Information States**  $\forall f \in F . \forall x \in \text{VAR}_S . f[x] = [1g.[x \in \text{Dom}(f) \ \& \ g = f] \vee [x \notin \text{Dom}(f) \ \& \ g = f^x / \{\langle w, h \rangle \in W \times F : h = f\}]](x)$

Definition 5 says that  $f[x]$  is defined for two conditions. If  $x$  is defined in  $f$ ,  $f[x] = f(x)$ . If  $x$  is not defined in  $f$ ,  $f[x]$  returns the minimal IS, one which includes all worlds, and for which the assignment function is simply  $f$ . This is the default IS because it entails no information and introduces no new referents.

As also discussed in Kratzer (1977), modal expressions may be lexically specified for which categories of modal base they may take, e.g., deontic, metaphysical, epistemic, etc. I will limit my discussion mainly to metaphysical modals to avoid any discussion of ordering sources, which will complicate the picture. Moreover, the discussion will be limited to metaphysical modality, the modality of the predictive readings of expressions like *will*, *gonna*, *might*, etc. (Condoravdi 2002, Kaufmann 2005).

**Definition 6: Accessible Information States**  $\text{MET}(w, f) = \{\langle u, g \rangle \mid u \text{ branches from } w \text{ at utterance time} \ \& \ \forall v \in \text{Dom}(f) : f(v) \notin S . v \in \text{Dom}(g) \ \& \ f(v) = g(v) \ \& \ \neg \exists v' . g(v') \in S\}$

As defined above, MET is an accessibility relation which takes a world-assignment pair and gives back the IS that is metaphysically accessible from it. What this entails is that i) the worlds in the accessible IS branch from the input world at utterance time<sup>2</sup>, meaning they are identical up to utterance time but may diverge beyond that; ii) the assignments are identical to the input assignment, except that they may not themselves include mappings to ISs. This prevents any multiply-sudordinated ISs.<sup>3</sup> In order to show how the modal base restricts the domain of a modal, I introduce the operator  $\uparrow$ .

<sup>2</sup> I will avoid any discussion of times beyond this for simplicity.

<sup>3</sup> This move is for simplicity. Whether or not this is desirable is an empirical question.

**Definition 7: Restricted Information States**  $\forall \sigma, \sigma' \in S$ 

$$\sigma \uparrow \sigma' = \{ \langle w, f \rangle \in \sigma' \mid \exists \langle u, g \rangle \in \sigma . w = u \ \& \ f \geq g \}$$

Definition 7 allows for the definition of complex ISs. It says roughly that the worlds in  $\sigma \uparrow \sigma'$  are in both  $\sigma$  and  $\sigma'$ , and the assignments in  $\sigma \uparrow \sigma'$  are those in  $\sigma'$  which are equal to or extensions of those in  $\sigma$ .

**3.3 The Core Analysis**

The necessary formalisms now being in place, the relevant denotations can be given. First, I give the denotation for *will*, which obligatorily undergoes modal subordination. I will assume that all relevant modal expressions combine with a vP, which denotes an update, and carry an index.<sup>4</sup>

**will** If  $\llbracket \text{vP} \rrbracket = \phi$ , then  $\sigma + \llbracket \text{will}_m \text{ vP} \rrbracket =$   
 $\{ \langle w, f \rangle \mid \exists \langle u, g \rangle \in \sigma . w = u \ \& \ f = g^{m/g[m] + \phi} \ \&$   
 $\forall \langle v, h \rangle \in \text{MET}(u, g) \uparrow g[m] . \exists h' . \{ \langle v, h \rangle \} + \phi = \{ \langle v, h' \rangle \} \}$   
 if  $\forall \langle u, g \rangle \in \sigma . m \in \text{Dom}(g)$ , else undefined.

The denotation says that *will*<sub>m</sub> combines with a vP denoting  $\phi$  to return a function from  $\sigma$  to  $\sigma'$  such that, for every  $\langle w, f \rangle$  in  $\sigma'$ , there is some  $\langle u, g \rangle$  in  $\sigma$  such that i)  $u$  is  $w$ ; ii)  $f$  is just like  $g$  except that  $f(m)$  is the result of updating  $g[m]$  with  $\phi$ ; iii) for every metaphysically accessible  $\langle v, h \rangle$  in  $g[m]$ ,  $v$  survives update with  $\phi$ . Moreover,  $m$  is required to be familiar in  $\sigma$ .

This means that *will* basically does two things. The first is that it updates the subordinated ISs with  $\phi$ ; any novel discourse referents in  $\phi$  are added to the assignment functions of each subordinated IS.<sup>5</sup> This is the main dynamic of effect of *will*, and every other modal; it updates the subordinated IS with its sister vP, potentially introducing modally subordinated discourse referents.

The second thing *will* does is to say that every metaphysically accessible world in the subordinated IS survives update with  $\phi$ . In other words, any  $\langle w, f \rangle$  in the old IS such that all the worlds in  $\text{MET}(w, f)$  are not  $\phi$  worlds will be eliminated. This is the core meaning of *will* – it requires that  $\phi$  is true in all the

<sup>4</sup> This denotation is actually simplified in at least one way: it suggests that the modal base of *will* is lexically determined to be the metaphysical modal base; however, like most modals, it is compatible with at least one other category of modal base, not just metaphysically accessible ones. Thus the third line of the denotation should read as in (i), such that all the modal bases *will* can take are enumerated.

(i)  $\text{ACC} = \text{MET}(u, g) \vee \text{ACC} = \text{X}(u, g) \vee \dots \ \& \ \forall \langle v, h \rangle \in \text{ACC} \uparrow g[m] \dots$

<sup>5</sup> It also causes any worlds in which  $\phi$  is not true to be removed from the subordinated ISs, although this is not relevant for necessity modals since they require that  $\phi$  be true in all worlds of the subordinated IS.



salient accessible worlds.

As an example, consider (1a), repeated as (14). Without delving into the semantics of the imperative (or for that matter, negation), I will assume a denotation for the first sentence which does the minimal work necessary: making a certain set of worlds salient.

- (14) a. Don't go near that bomb. It'll explode.  
 b.  $\llbracket \text{you go near that bomb} \rrbracket = \phi$   
 $\sigma_0 + \llbracket \text{don't}_m \text{ go near that bomb} \rrbracket = \sigma_1 =$   
 $\{ \langle u, g \rangle \mid \exists \langle w, f \rangle \in \sigma_0 \dots g = f^{m/\lambda+\phi} \dots \}$   
 c.  $\llbracket \text{it explodes} \rrbracket = \psi$   
 $\sigma_1 + \llbracket \text{it will}_m \text{ explode} \rrbracket = \sigma_2 =$   
 $\{ \langle w, f \rangle \mid \exists \langle u, g \rangle \in \sigma \dots w = u \ \& \ f = g^{m/g[m]+\psi} \ \&$   
 $\forall \langle v, h \rangle \in \text{MET}(u, g) \uparrow g[m] \dots \exists h' \dots \{ \langle v, h \rangle \} + \psi = \{ \langle v, h' \rangle \} \}$   
 if  $\forall \langle u, g \rangle \in \sigma \dots m \in \text{Dom}(g)$ , else undefined.

In (14b), the imperative constrains the context so that for every world-assignment pair, the assignment maps  $m$  to the set of worlds where the addressee goes near some previously established bomb. In (14c), *will* updates each assignment of  $m$  with  $\psi$ . It then requires that every metaphysically accessible world-assignment pair in which you go near the bomb is a world-assignment pair in which the bomb explodes. Its presupposition – that  $m$  be defined in all assignments in  $\sigma_1$  – is met, since the imperative made sure that  $m$  was defined.<sup>6</sup>

Notice that *will* does not require that all worlds in  $f(m)$  be metaphysically accessible (though some have to be); in other words, the IS that serves as its domain of quantification is not the same IS as the one which it makes salient. This is a crucial property of all modals, since modal subordination can take place across modal base types.

- (15) a. I might get a dog<sub>x</sub>. But I have to walk it<sub>x</sub> every day.  
 b. You have to wear a tie. But you won't like it.

Notice that the second sentence of (15b) means “If you wear a tie, you won't like it” not “If you wear a tie, you won't have to like it” or anything along those lines. In other words, the IS made salient by *have to* is not restricted to just deontically accessible worlds.

Now consider *gonna*; it is exactly like *will* except that it does not have a familiarity presupposition.<sup>7</sup>

<sup>6</sup> Whether it introduced  $m$  or presupposed it is beyond the scope of this paper.

<sup>7</sup> As with *will*, *gonna*'s modal base variability is glossed over.

**gonna** If  $\llbracket \text{vP} \rrbracket = \phi$ , then  $\sigma + \llbracket \text{gonna}_m \text{ vP} \rrbracket =$   
 $\{ \langle w, f \rangle \mid \exists \langle u, g \rangle \in \sigma . w = u \ \& \ f = g^{m/g[m] + \phi} \ \&$   
 $\forall \langle v, h \rangle \in \text{MET}(u, g) \uparrow g[m] . \exists h' . \{ \langle v, h \rangle \} + \phi = \{ \langle v, h' \rangle \} \}$

Note that if *will* is replaced with *gonna* in (15), the exact same update will proceed. This is desired since *gonna* can have the same reading *will* does. However, consider the same situation, but where *gonna* carries a different index from that carried by the imperative.

- (16) a. Don't go near that bomb. It's gonna explode.  
 b.  $\llbracket \text{you go near that bomb} \rrbracket = \phi$   
 $\sigma_0 + \llbracket \text{don't}_m \text{ go near that bomb} \rrbracket = \sigma_1 =$   
 $\{ \langle u, g \rangle \mid \exists \langle w, f \rangle \in \sigma_0 \dots g = f^{m/\lambda + \phi} \dots \}$   
 c.  $\llbracket \text{it explodes} \rrbracket = \psi$   
 $\sigma_1 + \llbracket \text{it is gonna}_n \text{ explode} \rrbracket = \sigma_2 =$   
 $\{ \langle w, f \rangle \mid \exists \langle u, g \rangle \in \sigma . w = u \ \& \ f = g^{n/g[n] + \psi} \ \&$   
 $\forall \langle v, h \rangle \in \text{MET}(u, g) \uparrow g[n] . \exists h' . \{ \langle v, h \rangle \} + \psi = \{ \langle v, h' \rangle \} \}$

Since  $n$  is not in the domain of the assignments in  $\sigma_1$ ,  $g[n]$  denotes the minimal IS. This means that *gonna* quantifies over the whole set of metaphysically accessible worlds rather than some subset of them. Thus the non-conditional reading is achieved. However, if *will* were to replace *gonna* in (16), it would fail to update, as  $n$  is not defined in the assignments in  $\sigma_1$ .

- (17) a. Don't<sub>m</sub> go near that bomb. It's gonna<sub>m,n</sub> explode.  
 b. Don't<sub>m</sub> go near that bomb. It'll<sub>m,\*n</sub> explode.

This is the desired result. Modal subordination is thus analyzed as fully analogous to reference in the individual domain, in line with Frank (1997). It is mediated by assignment function and potentially restricted by presuppositions on the context, as determined by lexical idiosyncrasy. It is this second fact that is new here, and which lends further support to Frank's hypothesis; the usual machinery of assignment functions and familiarity presuppositions is completely adequate to predict the data.

Notice that the treatment of modal subordination as analogous to individual reference makes a prediction: definite modals like *will* should be bad in discourse initial contexts, just like other definite descriptions which carry familiarity presuppositions. This prediction is borne out; as observed by Binnick (1971), *will* is much worse than *gonna* discourse-initially.<sup>8</sup>

<sup>8</sup> Register matters greatly here. In more formal and literary registers *will* behaves much more like *gonna*, which is absent these registers. (i) would be felicitous in a newspaper setting, as read by a

(18) *Max walks into a room and says...*

- a. #I'll fail my exam.
- b. I'm gonna fail my exam.

Notice that this is not because *will* is temporally anaphoric; unlike the progressive, a temporal adverbial like *tonight* does not improve *will* discourse initially.

(19) *Jasmin walks into a room and says...*

- a. #I'll watch a lot of TV (tonight).
- b. I'm gonna watch a lot of TV (tonight).
- c. I was watching a lot of TV #(last night).

Crucially, while *will* has a familiarity presupposition and is thus analagous to a definite DP, *gonna* does not bear a novelty presupposition and so is not analagous to an indefinite DP. Rather, it is unspecified for definiteness; there is no constraint on the novelty/familiarity of its index.

There is, however, a constraint on what it introduces if its index is novel; it introduces the minimal IS (and then updates it with its prejacent). This behavior, referring either to a familiar referent or to a default, is not unique to nondefinite modals. Consider the contrast between *near there* and *nearby*, as discussed by Condoravdi & Gawron (1996).

(20) *Graham walks into a room and says...*

- a. #There's an ice cream truck near there!
- b. There's an ice cream truck nearby!

(21) a. I hate going to the gym<sub>x</sub>. Anna is always hanging out near there<sub>x</sub>.  
 b. I hate going to the gym<sub>x</sub>. Anna is always hanging out nearby<sub>x</sub>.

This pattern is identical to that displayed by *will* and *gonna*; *nearby* can refer to a salient location or simply the speaker's location, but *near there* cannot have this default reference.

This account does not predict that *will* always have a conditional meaning. Haegeman (1989) observes that *will* can be used after a use of *gonna*.

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news anchor, and many other formal contexts.

(i) The president will send 20,000 more troops to Afghanistan.

Crucially, the same sentence uttered in a casual context is infelicitous discourse initially. This paper thus constitutes a study of the grammar of colloquial Standard American English in casual registers.

- (22) It's gonna rain. The roads'll be wet.

Here *the roads'll be wet* looks like a simple prediction, but my account predicts this. *will* picks up on the worlds where it rains, as made familiar by *gonna*, but since all the metaphysically accessible worlds are worlds where it rains (as required by *gonna*), *will* ends up not looking conditional. Any other expression that introduces a superset of the metaphysically accessible worlds as the subordinated IS will thus allow *will* to have a nonconditional reading.

## 4 Previous Analyses

### 4.1 Modal Subordination

The only other work to address the fact that some modals are better than others in discourse initial contexts is Asher & McCreedy (2007, henceforth A&M), although it is not the focus of their paper. In their account, ISs are sets of 4-tuples  $\langle w, f, G, F \rangle$  where  $G$  is the set of global possibilities and  $F$  is the set of local possibilities, akin to the subordinated IS in my framework.

For A&M, in the default state,  $F = G$ . This is crucially different from the analysis presented here, wherein by default no indices are mapped to ISs, which accounts for definite modals' inability to appear discourse initially. They do, however, note that *would* is "not as good" in (23) as the reverse case.

- (23) A wolf would walk in. It might eat you first.

A&M claim that their "account explains this because in an out of the blue context, both the local and global possibilities are initially set to a very large set of epistemic possibilities, and it seems implausible that all of those possibilities contain a wolf that walks in. But that is what would have to happen in order for the *would* statement in (23) to go through" (Asher & McCreedy 2007: 114). This isn't a satisfying explanation, however. Consider (24).

- (24) A wolf is about to walk in.

In most contexts, this is an absurd statement. It depicts a highly unlikely event and is almost certainly false, for example, at the time and place of the writing of this paper. However, it is not infelicitous; it is perfectly meaningful and understandable. That is not the issue with (23); the first sentence is utterly meaningless, and would still be even if it were uttered in a context where a wolf walking in is a real possibility. Moreover, this strategy for explaining discourse initial infelicity is unlikely to account for the *will/gonna* distinction, since they are a minimal pair, taking the same modal base/ordering source. The only adequate analysis is one which says that these lexical items simply place different

presuppositions on the context of utterance.

## 4.2 Futures

Besides establishing a parameter of variation among all modal lexical items, i.e., whether or not they have a familiarity presupposition, this paper also addresses a long-standing debate on the difference between *will* and *gonna*. A recent and noteworthy account of the *will/gonna* contrast is in Copley (2002). Her account is centered around the following contrast:

- (25) *Carissa*: Can anyone help set up for the reception?  
 a. *Jackson*: I will.  
 b. *Jackson*: I'm going to.

Copley's observation is that (25a) is a good offer, while (25b) is not. (25b) is felicitous, but only as a prediction. (25b) sounds presumptive and inconsiderate, (25a) sounds polite. Copley's account is that while *will* is a simple metaphysical necessity modal (very much like the character I ascribe to *gonna*), *gonna* is a metaphysical necessity modal scoped over by an imperfective operator; it thus quantifies over worlds which branch from the evaluation world during an interval containing now. The effect of this is that *gonna*  $\phi$  entails that  $\phi$  has been settled for a little while, whereas *will*  $\phi$  only entails that it is settled now.

This is intended to capture the inference in (25b) Jackson was already planning to help set up for colloquium. According to Copley, a felicity condition on offers says that for an utterance to be an offer, it must mean (roughly) "if you want *p*, then *p*". The denotation given to *gonna* rules this out, since Jackson is entailed to have already decided. However, this account makes wrong predictions; notice that it is not entailed by (25b) that Jackson has already decided; it is also true in a context where Jackson has decided on the spot to help set up (but is still being rude about it). Furthermore, Copley does not make the right predictions regarding the data discussed in Section 3.

However, there is still the issue of the offer data to be discussed. I argue that there are two *wills*: one which has the meaning I have argued for, and the other being a dedicated offering expression. First of all, consider that in Spanish, the simple present is used to make offers, not the future, as seen in (26). This suggests that the expression used for offers in a given language can't be derived from some principle behind the meaning of offers, rather, each language has some arbitrary lexicalized form for expressing offers.

- (26) Ya abro la ventana yo.  
 "I'll open the window."

Moreover, there is also a performative aspect to offer-*will* not present in the other *will*, in (27), which is explainable if they are simply separate lexical items.

- (27) a. *Alice*: I'll make coffee. *Ryan*: # That's not true!  
 b. *Alice*: Don't go near that! It'll blow up! *Ryan*: That's not true!

I therefore exclude offer-*will* from the analysis.

## 5 Conclusion

This paper raises the empirical point that modal subordination is sometimes obligatory and sometimes optional, and moreover that this is a point of lexical variation. Modals can be divided into at least two classes: definite modals, which must have some antecedent in the discourse, and which include at least *will*, *would*, and *could*; and nondefinite modals, which include *gonna*, *might*, *may*, *bound to*, *have to*, *should*, and possibly many others. An analysis is then put forward which provides a distributive, eliminative semantics for modal subordination, one which makes use of familiarity presuppositions (Heim 1982) to derive the crucial contrasts.

The upshot of this proposal is that modal subordination is really nothing special; it is simply a case of contextual domain restriction, which is itself a special case of anaphora. It is simply a property of the lexical entailments and presuppositions of the expressions in a given sentence, and is thus subject to lexical variation. This lexical variability suggests that we might find a third category of modals, in fact, which complete the paradigm and never undergo modal subordination. One such modal may be *must*.

- (28) a. *Julia*: Someone<sub>x</sub> might be waiting for me.  
       *Rebekah*: # They<sub>x</sub> must know you're not there.  
 b. *Tim*: There might be blood in there.  
       *Ezra*: He must be the killer.

Ezra's utterance in (28b) cannot mean "If there's blood in there, he must be the killer". The existence of such a modal comes as no surprise in the framework I have laid out, since it allows for lexical variability on this front. Moreover, there is nothing special about modals – any semantic category of expressions can in principle display these basic properties.

- (29) *Past Habituals*  
 a. My family used to go to Albion. We would drive through Ontario.  
 b. #My family would go to Albion. We used to drive through Ontario.

(29) shows that *used to* can introduce some kind of habitual timeframe, which *would* can then pick up on anaphorically. Discourse initially, however, *would* is infelicitous. The abundance of anaphoric relations across categories make it no surprise that modals display this behavior as well.

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