When *if* or *when* Specify Modals

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1. Introduction

A prominent analysis of conditional sentences takes *if*-clauses to function as restrictors of modal operators (the "restrictor analysis" of conditionals, von Fintel, 2011). In this paper I consider cases in which *if*-clauses and *when*-clauses interact with modal operators in a different way. Consider the following examples, both drawn from the iWeb corpus:[1]

(1) Sensitive information about you <u>may</u> also <u>be collected</u>, **for example** if you provide that information in your resumes.

(2) Working as a filmmaker <u>can be taxing</u>, **namely** if you're required to get sleek product shots.

In both cases, the first part of the sentence contains an existential force modal (underlined), and the second part an *if*-clause. Informally speaking, in both cases the modal expression makes salient a set of circumstances: circumstances in which information is collected, and circumstances in which working as a filmmaker is taxing. The second part of the sentence (1) then provides an example of such a circumstance, whereas (2) (exhaustively) specifies the circumstances. This paper will focus on specification by the adverb 'namely', and provide an account of 'namely' in combination with modal expressions, in order to understand what "exhaustive specification of modal circumstances" means.[2]

'Namely' is a specificational adverb that introduces an answer to an implicit question that is raised by a previous expression in the linguistic context. (3) is a typical example, in which the indefinite DP 'a famous mountain' raises a question that can be paraphrased as 'Which famous mountain did Mary climb?'. The answer is then specified by the phrase 'Mt. Blanc'. I will refer to the question triggering phrase and the answer phrase as the *antecedent* and *complement* of 'namely', respectively.[3]

(3) Mary climbed <u>a famous mountain</u>, **namely** Mt. Blanc.

In the literature on specificational adverbs (Onea & Volodina (2011); Onea (2016); AnderBois & Jacobson (2018), among others), the typical antecedents of 'namely' are considered: indefinite DPs, as in (3), certain definite descriptions, as in (4), and free relatives, as in (5).

(4) Fred scaled <u>the tallest building in the world</u>, namely Burj Khalifa.

(AnderBois & Jacobson, 2018:392)

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[1] iWeb is a corpus of English web pages, available at www.english-corpora.org/iweb.
[2] The choice to focus on 'namely' is mainly due to space limitations, and should not be taken as a denial of the relevance of the modal exemplification cases as in (1). I refer the interested reader to Schwager (2005) for some notes on the German counterpart *zum Beispiel* 'for example' as an operator that forces inexhaustive modality. I thank Maria Aloni (p.c.) for referring me to this work.
[3] The antecedent is called 'anchor' in Onea (2016), and 'antecedent' or 'host' in AnderBois & Jacobson (2018).

(5) I ate <u>what Mary cooked</u>, namely ratatouille.   (AnderBois & Jacobson, 2018:392)

In this paper I will consider cases such as (2), for which I will argue that the modal expression serves as the antecedent of 'namely'. Hence, I will refer to the construction at hand as a *modal 'namely' construction*, contrasted with *nominal 'namely' constructions* in (3), (4), (5). Two more modal 'namely' constructions found in the iWeb corpus are given in (6):

(6) a. The resultant equilibrium distribution <u>can be</u> different from a Maxwell distribution, namely if the situation is not isotropic.

   b. It means that in a world that is always mediated by different media, one <u>can still be free</u>, namely if one knows how to operate the media that dominate one's world.

These instances exemplify a larger empirical terrain of 'namely'-constructions that are different from the canonical nominal ones. In addition to an *if*-clause, the complement of 'namely' can be a *when*-clause (examples (7), (8), (9) are all drawn from iWeb):

(7) a. IIN <u>may ask</u> for personal data, namely **when** you: request a catalog or magazine, order books, take our quiz, subscribe to our newsletters, or request customer service.

   b. Mixing colors on the computer <u>can be challenging</u>, namely **when** you are trying to translate specific colors to work in a four-color printing process.

In addition to the modal antecedents we have seen before, an *if*- or *when*-clause complement can also combine with an explicit nominal antecedent headed by a word such as 'case' or 'circumstance':

(8) In <u>the most common cases</u>, namely when we're adding or subtracting the constant 1, C provides another set of shortcuts.

(9) A breach of the peace may take place on private premises but only in <u>defined circumstances</u>, namely if a member or members of the public are likely to be disturbed.

Modal 'namely' constructions are worth analyzing for three reasons. First, they demonstrate the question-raising potential of modal operators. Recently, there has been some initial work on the inquisitive nature of modals (Ciardelli & Roelofsen, 2018), but these authors are mainly concerned with modal operators' sensitivity to inquisitive content, and not the inquisitive potential of modals themselves. As we shall see in section 2, not all modal expressions are good antecedents for 'namely', so the question-raising potential of modal operators varies.

Second, the constructions with an *if*-clause have it in a non-canonical position (not part of a conditional sentence). The *if*-clause in the examples above takes a different position, and has a different semantic role, as compared to *if*-clauses as adjuncts in conditional sentences. Both constructions have an interaction between a modal expression and an *if*-clause, but differently so: modal restriction and modal specification are distinct. This is the topic of section 3.

Finally, the modal 'namely' construction is not covered by proposed generalizations about the distribution of 'namely'. In section 4, I discuss how Onea's (2016) and AnderBois & Jacobson's (2018) accounts of nominal 'namely' constructions do not extend to the modal cases discussed here. I formulate a licensing condition for modal 'namely' constructions that is based on the type of formal object various operators quantify over, and speakers' ability to single out and identify such objects, i.e. specify them.

2. Quantificational modals

Not all modal expressions make good antecedents for 'namely'. In this section I argue for the descriptive generalization in (10).

(10)   **Generalization**
        Only existential quantificational modals can serve as modal antecedents of 'namely'.

I will first defend the 'quantificational' part of the claim, and then the 'existential' part.

Quantificational modals are a class of modals defined by Portner (2009:§4.4.2). A quantificational modal "incorporates the semantics of an adverb of quantification together with some sort of additional, more properly 'modal,' meaning" (p. 213). 'Can' and 'will' are examples of English modal auxiliaries that can have a quantificational modal reading, which Portner illustrates by paraphrasability by the adverbs 'sometimes' and 'always':

(11)   a.   A dog **can** bite.   ↔   A dog **sometimes** bites.   (Portner, 2009:213)
        b.   A dog **will** bite.   ↔   A dog **always** bites.

            | quantificational modal | | adverb of quantification |

In the examples of modal 'namely' we have seen so far ((2), (6), and (7)), each modal can indeed be paraphrased with an adverb of quantification: "working as a filmmaker is *sometimes* taxing", "IIN *sometimes* asks for personal data", etc.

In the other direction, (12) is an example that contains the modal 'can', but it is not a good antecedent for 'namely':

(12)   John can get a refund, ??namely if there was a production fault.

Intuitively, if one says "John can get a refund", it doesn't mean that there exist circumstances in which John gets a refund, but it is contextually restricted to mean that in *John's* circumstances, he gets a refund. Using the paraphrasability test, "John can get a refund" does not mean "John sometimes get a refund", so 'can' does not have a quantificational modal reading in (12).

Another case for which the modal 'namely' construction is degraded, is with epistemic modals:

(13)   (For all I know) Linda may be in her office, ??namely if she has a meeting with her student.

Under the epistemic reading, "Linda may be in her office" does not mean "Linda is sometimes in her office", so 'may' does not have a quantificational modal reading here.

In addition to the paraphrasability test, further support for the restriction to quantificational modals in (10) comes from the observation that overt temporal quantifiers such as 'sometimes' or 'occasionally' can serve as antecedents for 'namely' (examples from iWeb corpus):

(14)   a.   Fear also hardens <u>sometimes</u>, namely when it is not great.

        b.   It has been pointed out that in British English at least, the "of" in "could of" etc. is <u>sometimes</u> clearly audible, namely when the word is stressed.

        c.   She only <u>occasionally</u> wears that engagement ring from Jeff, namely when she wants extra attention.

I now move to the restriction to existential modals in (10). We find that modals with universal force, as well as veridical verbs, are disallowed in a 'namely' construction:

(15)   a.   Working as a filmmaker <u>must be</u> taxing, #namely if you're required to get sleek product shots.

        b.   Working as a filmmaker <u>is</u> taxing, #namely if you're required to get sleek product shots.

        c.   I <u>know</u> that working as a filmmaker is taxing, #namely if you're required to get sleek product shots.

A contrast between existential and universal quantification is familiar from other constructions involving implicit or unpronounced questions. Example (16), taken from Chung et al. (1995:254), illustrates this for sluicing:

(16) a. Joan ate dinner with <u>several</u> students in her class, and we're all wondering (with) who.

b. *Joan ate dinner with <u>every</u> student in her class, and we're all wondering (with) who.

In AnderBois's (2014) theory of sluicing, the antecedent of a sluice must make an inquisitive contribution. In the standard theory of Inquisitive Semantics (Ciardelli et al., 2018), existential quantification is an inquisitive operator, but universal quantification is not. This explains that the existential in (16a) raises an issue for the sluice to target, but the universal in (16b) does not. We can assume that in the case of the 'namely' constructions, something similar is going on. They involve specification of an answer to implicit question, but a universal expression leaves nothing to be specified. This will be made precise in section 4 below, when I consider various licensing conditions for 'namely'.

3. Modal restriction and modal specification

Now that we have the empirical situation of the modal 'namely' construction more clear, I move on to the issue of how quantificational modals raise implicit questions that can be picked up by 'namely'.

Portner (2009:218) provides a semantics for quantificational modals, (17b), that is based on an analysis of adverbs of quantification in the framework of situation semantics (Kratzer, 2019), (17a):

(17) a. $[\![\text{sometimes}]\!](\alpha, \beta) = \{s : \exists s'[s' \leq s \,\&\, s' \in \text{COUNTING}(\alpha) \,\&\, \exists s''[s' \leq s'' \,\&\, s'' \in \beta]]\}$

b. $[\![\text{can}_{\text{quant}}]\!](\alpha, \beta) = \{s : \exists s'[R(s, w_{s'}) \,\&\, s' \in \text{COUNTING}(\alpha) \,\&\, \exists s''[s' \leq s'' \,\&\, s'' \in \beta]]\}$

These definitions adopt the standard assumptions in situation semantics that a proposition denotes a set of situations, $\leq$ is a part-of relation on situations, and possible worlds are maximal situations (see Portner, 2009:217 for more discussion on this, as well as earlier versions of (17a) from the literature). The predicate COUNTING is important. Kratzer (2019) discusses various problems when it comes to identifying and counting situations and eventualities (for example ones that denote atelic events), and these are relevant for constructing a semantics for adverbs of quantification. Leaving details aside, Portner takes these adverbs to quantify over the "natural units" for counting situations. These are what Portner calls the "counting situations from a proposition α", and what Kratzer (2019) refers to as the situations that exemplify the proposition α, and are maximally self-connected. 'COUNTING(α)' in (17) thus denotes the set of counting situations from α.

In this analysis, quantificational modals adopt two properties of adverbs of quantification that set them apart from other modal operators. First, quantificational modals quantify over (counting) situations, whereas other modal operators quantify over possible worlds. Second, quantificational modals take two arguments instead of just one: the modal prejacent β, and the *if*-clause α. An example in which both arguments are overtly realized is as follows:

(18) a. A spider can be dangerous if it is attacked.

b. $[\![\text{can}_{\text{quant}}]\!](\{s : s \text{ is a situation in which a spider in } s \text{ is attacked}\}, \{s' : s' \text{ is a situation in which the unique spider in } s' \text{ is dangerous}\})$

c. informal result of applying (17b): "some counting situation in an accessible world of a spider being attacked, extends to a situation in which that spider is dangerous"

Portner (p. 219) argues that when there is no overt *if*-clause is present, as for example in (11), the α argument is filled in by either context, or determined by linguistic material in the sentence. Informally applied to one of our earlier examples of modal 'namely' constructions, these are illustrated in (19a) and (19b), respectively:

(19) Working as a filmmaker can be taxing.

a. $[\![\text{can}_{\text{quant}}]\!](C, \text{working as a filmmaker is taxing})$ [C determined by context]

b. $[\![\text{can}_{\text{quant}}]\!](\text{working as a filmmaker, working as a filmmaker is taxing})$
informal result of applying (17b): "some counting situation in an accessible world of working as a filmmaker, extends to a situation in which that work is taxing"

Note that in example (18a), 'if' can be substituted for 'when' without a significant meaning change. This is a property shared with the modal 'namely' constructions, as can be verified in the examples given above. Farkas & Sugioka (1983) analyze these clauses under the name 'restrictive *if/when* clauses' (this turns out to be a bit of a misnomer, because my point below is that they can be specificational as well as restrictive). The substitutability of 'if' and 'when' is one of the diagnostics these authors use to set these types of *if/when*-clauses apart from canonical conditional (hypothetical) *if*-clauses, or temporal *when*-clauses. The cases analyzed by Farkas & Sugioka do not have an overt modal:

(20)   Bears are intelligent if/when they have blue eyes.   (Farkas & Sugioka, 1983:225)

They analyze them as containing a covert generic modal operator (see their §4.2). I take it that cases such as (18a) are equivalent to (20), but have an overt modal expression that the *if/when* clause restricts.

   With this machinery in place, we can now look at the difference between modal restriction and modal specification. A minimal pair contrasts a regular conditional sentence (21a), in which an *if*-clause *restricts* the quantificational modal 'can', with a modal 'namely' construction (21b), in which the *if*-clause *specifies* the quantificational modal 'can':

(21)   a.   A spider can be dangerous if it is attacked.   (=(18))

        b.   A spider can be dangerous, namely if/when it is attacked.

Unlike (18)/(21a), the *if*-clause or *when*-clause in (21b) does not end up as the argument α of $[\![can]\!]$: the first part of (21b) expresses that there are counting situations in which a spider is dangerous, along the lines of (19). The complement of 'namely' then proceeds to specify these situations.

   The meaning difference between both sentences lies in the presence or absence of an implicature of *exhaustivity*. The 'namely' construction in (21b) implicates that the situations in which a spider is dangerous are fully specified as the attacking situations. In other words, it implicates that whenever a spider is attacked, it is always dangerous. In contrast, (21a) does not have an implicature of exhaustivity: it merely says that in some (not necessarily all) situations in which a spider is attacked, it is dangerous.

   The same contrast is observed with temporal quantifiers such as 'sometimes', which may make the contrast in (21) clearer.

(22)   a.   I am sometimes sad when it rains.
            ≈ 'some raining situations are situations in which I am sad'
            does not implicate: whenever it rains, I am sad

        b.   I am sometimes sad, namely when it rains.
            ≈ 'there are some situations in which I am sad; this set of situations is the set of rain situations'
            implicates: whenever it rains, I am sad

The exhaustivity in (21) and (22) must be classified as an implicature, and not a semantic entailment, because it is quite easy to cancel it in subsequent discourse ("I am sometimes sad, namely when it rains. Oh, and also when it is cold").

   A link between 'namely' and exhaustive answers has been made in the nominal domain: German *nämlich* provides a complete answer to the implicit question that was raised by the antecedent (Onea & Volodina, 2011:§4.2 and Onea, 2016:§6.2.2). The same has been observed for English (Condoravdi, 2015:224), and (21)/(22) show that this exhaustivity with 'namely' extends from the nominal to the modal domain (this can also be seen in earlier examples, e.g. in (7a) an exhaustive list is given in the complement of 'namely').

   I take the fact that 'namely' introduces exhaustive answers rather than non-exhaustive answers (such as in (1)) as a lexical property of the adverb. English has only one specificational adverb, but other languages may have several. In the work on German, it is shown that some specificational adverbs introduce exhaustive answers and others do not: *nämlich* introduces exhaustive answers, while *und zwar*, another specificational adverb in German, can also introduce partial answers (Onea, 2016:226, see also Onea & Volodina, 2011:§4.2 for some discussion on the nature of the exhaustivity property).

   I now move on to discussing the core properties of 'namely': the licensing conditions of this adverb, and the nature of the implicit question that it introduces an answer to.

4. Licensing conditions of 'namely'

Different theories have been proposed that aim to account for the licensing of 'namely' (which antecedents are allowed?), and the nature of the implicit question to which 'namely' introduces an answer. In this section I will discuss two prominent proposals: Onea (2016) (related to Onea & Volodina, 2011), and AnderBois & Jacobson (2018).

4.1. Onea: potential questions

Onea (2016) argues that the implicit question that 'namely' answers is directly derivable from its antecedent. This is an example of what Onea calls a *potential question*, part of his general theory of how utterances have the potential to raise implicit questions into the discourse, which are relevant for a variety of linguistic phenomena. I will leave the technical details of the theory – which is couched in the framework of Inquisitive Semantics – aside, and briefly lay out the main ideas relevant to 'namely'. The basic notion of a *standard potential question* (SPQ) is based on entailment. In short, because 'Mary danced' entails that she danced at some time and place, the utterance raises the SPQs 'When did Mary dance?' and 'Where did Mary dance?', among others:

(23)   Mary danced.   (Onea, 2016:125)
       ↝ SPQs generated: {When did she dance?, Where did she dance?, Who is Mary?, . . . }

This is thus a rather weak notion, and in Onea's account 'namely' is sensitive to a more restricted type of potential question, namely a *primary potential question* (PPQ). A potential question is defined to be primary when it is "compositionally derived" from, or "made salient" by, the triggering utterance (p. 133). For example, utterances containing an indefinite expression compositionally derive a PPQ by replacing the indefinite with a *wh*-word: (23) does not generate PPQs, whereas the utterance 'Someone danced' generates the PPQ 'Who danced?'.

Onea then formulates the following generalization about 'namely':

(24)   **Onea's 'namely' generalization** (Onea, 2016:43)
       "In English, 'namely' only addresses primary potential questions (PPQs) which can be derived from the main utterance by replacing the anchor [=antecedent] with a *wh*-word."

This account does not fare well with the modal data brought forward in this paper. The modal data constitute a counterexample to Onea's generalization: the modal expressions do not license a PPQ according to Onea's definition. In particular, there is no *wh*-word that can replace the modal expression, as is required by (24). Maintaining Onea's account would require that the modal raise a PPQ of the sort "Under what conditions/When is working as a filmmaker taxing?" for (15a), but this does not follow from the definition of a PPQ. I will not consider here how the notion of a PPQ can be amended in order to capture the modal cases, but instead move on to the account by AnderBois & Jacobson (2018).

4.2. AnderBois & Jacobson: discourse referents

AnderBois & Jacobson (2018) (henceforth AB&J) claim that the antecedent of 'namely' needs to introduce a *discourse referent*. The implicit question that is raised is then a specificational question about the identity of that discourse referent. By appealing to discourse referents, they can account not only for indefinite antecedents of 'namely', but also uniqueness definites (as in (4)). They propose the following:

(25)   **AnderBois & Jacobson's 'namely' generalization** (AB&J:395)
       "*Namely* is licensed iff (i) there is material in the preceding discourse which supports a discourse referent, and (ii) the fragment serves to further specify that discourse referent."

A similar conclusion is reached by Condoravdi (2015:224) (work mostly dealing with free relatives, not predominantly 'namely' constructions), who writes: "The generalization we can draw about *namely* appositives is that they provide an exhaustive specification which further narrows down the potential referents of the phrase they are in apposition to.".

What it means to "further specify" a discourse referent in Condition (ii) in (25) is not formalized, but this condition is for example used to account for the unavailability of disjunction as an antecedent for 'namely':

(26)   We'll hire Sally or Ted, *namely Sally.   (AB&J:404)

The disjoined phrase does introduce a discourse referent (pronominal anaphora is possible), satisfying Condition (i), but AB&J argue that the ungrammaticality of (26) is because the discourse referent cannot be further specified.

In order to see if AB&J's account extends to the modal data introduced in this paper, one has to take a position on whether a modal expression introduces a discourse referent or not. In analyses of modal subordination and tense anaphora it has indeed been proposed that modal and temporal operators introduce a discourse referent (see e.g. Stone, 1999; Brasoveanu, 2010, among others). In the example below (simplified from Brasoveanu, 2010:499), the indefinite introduces a discourse referent u_1, and the modal introduces discourse referent p_1:

(27)   A^{u_1} wolf might^{p_1} enter the cabin. It$_{u_1}$ would$_{p_1}$ attack John.

A number of questions arise if the line is taken that discourse referents like p_1 in (27) interact with 'namely' in the way intended in (25). First, it is not clear that the discourse referents that modals introduce are of the sort that can be "further specified" by an *if-* or *when*-clause of the type that we have considered. In Brasoveanu (2010:483), modals introduce *possible world discourse referents*, i.e. discourse referents that store a set of worlds. In contrast, in our case we have a quantificational modal that makes salient a set of circumstances that is then specified by the complement of 'namely'. In other words, what is carried over in modal subordination, is not the same as what is specified in a modal 'namely' construction.

A second issue relates to the contrast between a very restricted class of modals that can serve as the antecedent of 'namely' (see (10)), and discourse referents being posited for modal and temporal operators in general. For example, the past tense in (28) introduces a discourse referent (it is available for subsequent temporal anaphora), yet specification by 'namely' is not available:

(28) *Mary came home, namely at 5 o'clock.

It is worth making a small detour to sluicing constructions at this point. Sluicing is similar to 'namely' constructions in that they both involve implicit questions of some sort (AnderBois, 2014). However, AB&J point out a number of differences between both constructions, leading them to conclude that the two constructions involve different sorts of implicit questions. One difference is the availability of so-called *sprouting*, i.e. sluicing without an overt antecedent, as in (29a) (see Barker, 2013, AnderBois, 2014, and references there for much more discussion on sprouting). The corresponding sentence with 'namely' (29b), however, is unavailable:[4]

(29)   a.   Juan celebrated his graduation, but I don't know where.   (AB&J:399)

         b. *Juan celebrated his graduation, namely on the beach.

AB&J explain the contrast by saying that in (29b) no discourse referent is introduced for 'namely' to relate to, hence Condition (i) in (25) is not satisfied. This explanation does not extend to our example in (28). Whereas (29b) does not introduce a discourse referent, the past tense operator in (28) does introduce a discourse referent (because temporal anaphora is possible). It is plausible to assume that past tense can be "further specified" by the adverb '5 o'clock', hence (25) does not account for the

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[4] This contrast raises the question to what extent it is possible to do 'modal sluicing', i.e. the sluicing counterpart of a modal 'namely' construction. This would look as follows:

(i)   IIN may ask for personal data, but I don't remember when.

I am not aware of discussion of such examples in the sluicing literature.

unavailability of (28). This again suggests that discourse referents introduced by tense/modal operators do not interact with 'namely' in the way nominal ones do as intended in (25).

Returning to the modal cases, the only option for AB&J to explain the distribution of modal expressions combining with 'namely' is then to appeal to Condition (ii) in (25), and postulate that only the existential quantificational modals can be "specified further". However, without formalizing this notion, this reasoning is somewhat circular, and the account lacks explanatory power.

4.3. Licensing 'namely'

This paper does not have anything more to say about the nominal 'namely' constructions, and I assume that the account by AnderBois & Jacobson (2018) works well for these. For the modal cases, as argued above, an account based on discourse referents is difficult to maintain. Instead, I argue that when it comes to non-nominal antecedents of 'namely', what matters is whether or not the formal object that is existentially quantified over, can be singled out and identified.

A key insight from the past work on 'namely' is that indefinite DPs do not only introduce a discourse referent, but also raise implicit questions about their identity that may be picked up in later discourse (cf. Onea, 2016:251). The link between indefinites and their question-raising potential has been explained by either appealing to these discourse referents (AnderBois & Jacobson), or by the status of existential quantification over individuals $\exists x$ as an inquisitive operator (Onea).[5] I have argued that extending the discourse referents account to the modal domain is untenable, but we can consider what existential quantification looks like in non-nominal cases.

In this paper we have seen linguistic constructions that correspond to existential quantification over other objects in the formal ontology than individuals, such as possible worlds, times, and situations. Their question-raising potential can be measured by the ability of their linguistic counterparts to appear in configurations such as sluices and 'namely' constructions. This is summarized in Table 1 for 'namely'.

$\exists$-quantification over:	'namely' possible?	examples
possible worlds	No	non-quantificational modals; (12), (13)
events	No	sprouting; (29b)
times	No	tense operators; (28)
individuals	Yes	regular nominal cases; (3), (4), (5)
counting situations	Yes	quantificational modals / temporal adverbials of quantification; (2), (6), (7), (14)

Table 1: Existential quantification over various objects, and compatibility with 'namely'

The main finding is that existential quantification alone is not sufficient to result in a question-raising potential for 'namely' constructions. For example, under Portner's account, modal operators other than the quantificational ones quantify over possible worlds (recall (17) and the discussion there). They are no good antecedents for 'namely': it is not possible to identify a possible world by specification – see (12), (13).

Events and times are interesting, because here 'namely' constructions and sluices come apart. AnderBois (2014) proposes that existential quantifiers over events raise an issue about the identity of the event, in order to account for the behavior of sprouting (as in (29a)). The possibility of temporal sprouting ("Mary came home, but I don't know when") suggests a similar line for existential quantification over times (see also Tellings, 2019). However, events and times cannot be specified by a 'namely' construction, witness (29b) and (28).[6] This underlines the point made by AnderBois & Jacobson (2018), already alluded to above, that sluicing and 'namely' constructions relate to different types of implicit questions.

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[5] In the standard Inquisitive Semantics framework InqB existential quantification is an inquisitive operator (Ciardelli et al., 2018:§4.7), basically because it introduces alternatives. In more recent variants of inquisitive semantics, e.g. the dynamic fragment Inq_B^D (Dotlačil & Roelofsen, 2019) views on existential quantification have shifted.

[6] With a nominal antecedent that refers to time, such specification is possible:

I argue that there is a *granularity effect* when it comes to licensing 'namely'. Since 'namely' involves specification, it may only combine with antecedents that involve the sort of object that can be singled out and identified. Individuals obviously have this property, and the modal data show that counting situations ("natural units" for counting eventualities, recall) do too. Concretely, quantificational modals and adverbs of quantification make a set of circumstances salient. These circumstances, formalized by Portner by the notion of counting situations (recall (17)), are suitable objects that raise an implicit question about their identity for 'namely' to target. On the other hand, the other formal objects in Table 1, such as possible worlds and times, which in a technical sense are dense in their domain, are too 'fine-grained' to be singled out and identified.

I will finish by presenting some insights that this proposal offers in relation to 'namely' constructions. First, recall that *if*- and *when*-clauses have a non-canonical semantic role as complements of 'namely'. The account suggests that these clauses in a 'namely' construction denote a circumstance (set of situations) in which the modal prejacent is true. This is supported by data such as (8) and (9) above, in which an overt nominal functions as antecedent to 'namely' with an *if*- or *when*-clause. In general, a nominal antecedent provides some information about the denotation of the complement of 'namely'. For example, a VP complement combines well with the noun 'plan', which suggests a nominalization of some action:

(30)   We had other plans, namely do a little hiking. [www]

The view of *if*- and *when*-clauses as denoting circumstances is reminiscent of approaches that do not take *if*-clauses (in conditionals) as mere modal restrictors, but rather analyze them as definite descriptions of possible worlds (e.g. Schlenker, 2004).

On a related point, earlier literature on the information-structural properties of conditionals has pointed out that *if*-clauses tend to be topics (Haiman, 1978; Ebert et al., 2014 among others), although the *if*-clause can also be focal, namely when the conditional appears in a context in which its *if*-clause is congruent to a question asking about circumstances (such contexts are rather uncommon, but see e.g. Farr, 2011 for some examples of this). The modal 'namely' construction provides another, more natural, example of an *if*- or *when*-clause functioning as an answer to a question.

Finally, the proposal offers an explanation for why there is some gradability in the judgments about modal 'namely' constructions. Cases of 'namely' with a non-quantificational modal (such as (12) and (13)) are typically not judged completely impossible, but degraded. I argued that what is important is that a modal expression can raise a specificational question about the identity of a suitable object. I assume that contextual factors can cause a non-quantificational modal to be interpreted in such a way that separate circumstances or conditions are made salient. If that happens, a modal 'namely' construction is licensed, and judged as (more) acceptable than when such contextual factors are absent.

5. Conclusion

We have seen that 'namely' can take a wider variety of antecedents than just the nominal phrases that are typically studied, and predicted by earlier generalizations such as those by Onea (2016) and AnderBois & Jacobson (2018). An antecedent such as a modal or an adverbial operator is possible, but only when the formal objects that are existentially quantified over can be singled out and identified. This is the case for quantificational modals, which quantify over counting situations (Portner, 2009). Then 'namely' introduces an exhaustive answer that specifies the circumstances that the modal expression or adverb of quantification ('sometimes', 'occasionally') makes salient.

The data analyzed here show that some modal operators have a question-raising potential, but the discussion has made clear that various provisions should be made in relation to this notion: not all modal operators behave the same in this respect, and question-raising potential differs between constructions relating to various formal objects in the ontology, as it depends on speakers' ability to single out and identify these objects (Table 1). Moreover, question-raising potential is not a single property: the

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(i)   John arrived at a certain day, namely October the 19th.

I refer here to the impossibility of tense operators (seen as quantifiers over times) as antecedents for 'namely', as pointed out by (28) above.

observation by AnderBois & Jacobson (2018) that there are differences between sluicing and 'namely' constructions resurfaced in my discussion of modal data and discourse referents.

In the data discussed here, *if*- and *when*-clauses do not restrict a modal operator, but specify it. This corresponds to a difference in meaning relating to exhaustivity, as shown in (21)/(22). This gives an insight in the special information-structural role that *if*- and *when*-clauses in this configuration play as answers to questions.

This paper has focused on English 'namely', but taking a cross-linguistic perspective is the obvious next step in this research. Many languages have specificational adverbs, including Dutch, German, French, Italian, Hungarian, Romanian, Russian, and Chinese (see Onea, 2016:§6.1.1 for examples). Languages vary in how many specificational adverbs they have (e.g. German *nämlich* and *und zwar* mentioned above), and whether or not specificational adverbs have additional readings (in Dutch and German, the counterparts of 'namely', in addition to the specificational reading, also has an *explanative* reading, which Onea & Volodina, 2011 focus on mostly). How these parameters of variation stand in relation to the availability of non-nominal antecedents of specificational adverbs, is an important question in order to get a view of implicit questions in discourse from a cross-linguistic perspective.

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