# Some news about 'irgend-' and 'algún'

## 1 Introduction

German *irgend*-indefinites and Spanish *algún* are indefinites that give rise to implications that are absent with regular indefinites. The most well-known implications are modal in nature: These special indefinites indicate that some person or other source of obligation is ignorant or indifferent with respect to the witness of the indefinite. In particular because of the 'indifference' implication, *irgend*-indefinites have been called 'free-choice items'. The first extensive formal-semantic treatment of these indefinites is in Kratzer and Shimoyama (2002).

The label 'free-choice item' suggests that these are of a kind with items like English *any* (Kadmon and Landman 1993, Dayal 1998, among many others), Spanish *qualquier*, Catalan *qualsevol* (Quer 1999) or Italian *qualsiasi* (Chierchia 2006, Aloni and van Rooij 2007) even though, on close inspection, they function substantially differently.[1] In order to distinguish items of the *irgend*-kind from these other items, *irgend*-indefinites are often called 'existential' or 'weak' free-choice items. It may be argued that it is misleading to call these items 'free-choice items' at all. Aloni and Port (2010) use the term 'modal variation' for the effects induced by this group of items. However, as we will see in Section 3.3, this is a misnomer, as well: The implications triggered by these items are not generally modal, though they can be. Giannakidou and Quer (2010) introduce the term 'referential vagueness' to distinguish these items from those that involve 'true free-choice'. I shall generally refer to the items I am concerned with as simply as *irgend*-style items.

This contribution has two main aims: Firstly, it sets the record straight on some empirical facts about *irgend*, in particular showing that it is much more similar to Spanish *algún* as previously thought (Section 3). Secondly, it presents a dynamic semantics account of *irgend*-type free-choice-indefinites that predicts the observed facts (Section 5). The paper concludes with a brief discussion of some outstanding issues.

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[1] I mention these 'strong' or 'universal' free-choice items here only to set them aside. In addition to the references given in the text, see Giannakidou (2001), Giannakidou and Cheng (2006), Vlachou (2007), Sæbø (2001), among many others.

## 2 IRGEND-indefinites: Some well-known impressions

When *irgend*-indefinites occur unembedded, they convey that the speaker is uncertain about, or does not care to identify a witness for the existential claim:

(1)    Irgendjemand hat angerufen.
       IRGEND-one    has called.
       '*irgend*-one has called'
       IMPLICATION: I DON'T KNOW OR CARE TO SAY WHO HAS CALLED.

When *irgend*-indefinites occur in the scope of a deontic modal, they give rise to a 'free-choice' implication:

(2)    Maria muss irgendeinen Arzt        heiraten.
       Maria must IRGEND-one physician marry.
       'Maria has to marry *irgend*-one phyiscian.'
       IMPLICATION: ANY PHYSICIAN IS AN ALLOWED OPTION.

When *irgend*-indefinites occur in the scope of an epistemic modal or attitude verb, they give rise to an ignorance implication:

(3)    Peter muss in irgendeinem Zimmer in diesem Haus   sein.
       Peter must in IRGEND-one   room     in this       house be.
       'Peter must be in *irgend*-one room in this house.'
       IMPLICATION: SPEAKER DOES KNOW KNOW IN WHICH ROOM OF THE HOUSE PETER IS.

(4)    Maria glaubt,   dass irgendjemand ihre Kuh gestohlen hat.
       Maria believes, that IRGEND-one   her  cow  stolen    has.
       'Maria thinks that *irgend*-one has stolen her cow.'
       IMPLCATION: MARIA IS UNCERTAIN ABOUT THE IDENTITY OF THE THIEF.

In what follows, it is useful to keep in mind that the embedded cases always also have wide-scope readings that come with speaker-directed implications just as those in (1). Thus, (4) also has a reading on which there is a specific person who Maria believes has stolen her cow. In this case, it is the **speaker** who does not know or care to say who this person is.

## 3 irgend-indefinites: Some new facts

The aim of this section is to clear up some misconceptions about *irgend* indefinites and show that they largely behave very much like Spanish *algún*, with only some subtle, but important differences.

    To anticipate, I will argue . . .

    · that *irgend* indefinites do not respect scope islands, they take 'free upward scope', just as regular indefinites do.

- that *irgend* indefinites do not (always) induce 'maximal domain-widening', and that, in particular under epistemic modals, any perceived widening is far form maximal.

- that *irgend*'s contribution is not inherently modal; if anything, it is inherently linked to quantificational operators.

- that *irgend*'s implications do not behave uniform: In embedded contexts it behaves presupposition-like, but *irgend* is not embedded, it does not behave like a presupposition at all.

This last fact will lead us to the analysis proposed in Section 5: *irgend* is taken to uniformly contribute a presupposition-like definedness requirement, which triggers implicatures in unembedded contexts.

## 3.1 IRGEND-indefinites and scope islands

Unlike other quantifiers, but like regular indefinites German and many other languages, *irgend*-indefinites are not subject to scope island constraints, they can 'take free upward scope'.

As an example, take *ob*-clauses. Like their English equivalents, *whether*-clauses, *ob*-clauses are 'quantificational islands': In (5), the *bona fide* quantifier *die meisten Bücher* ('most books') cannot take scope outside the *ob*-clause. That is, (5) is not compatible with a situation in which the teacher asked, for most books $x$ on the reading list, *Did Hans read $x$?* Instead, for the sentence to be true, the teacher must have asked whether Hans read most of the books.

(5) Der Professor hat gefragt, ob  Hans die meisten Bücher (auf der
   The professor has asked, whether Hans the most  books (on the
   Literaturliste) gelesen hat.
   reading list) read  has.
   'The professor asked whether Hans read most of the books on the reading list.'

As is well-known, regular indefinites in both English and German do not 'obey scope islands': That is, indefinites **can** take scope out of islands[2] such as *ob*-clauses: (6) has a reading on which there is a particular book $x$ on the reading list, and the teacher asked whether Hans read $x$.

(6) Der Professor hat gefragt, ob  Hans ein Buch (von der
   The professor has asked, wether Hans a  book (from the
   Literaturliste) gelesen hat.
   reading list) read  has.
   'The professor asked whether Hans read a book (from the reading list).'

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[2]'Scope out of islands' should be understood as a shorthand for an empirical description ('are interpreted as if the indefinite had scoped out of the island'). I remain neutral, for now, with respect to the question whether these readings are produced by standard scope shifts or not.

Kratzer and Shimoyama (2002) (henceforth, K&S) claim that *irgend*-indefinites must obey quantificational island constraints, citing the example in (7) (their (22)):

(7)      Der Lehrer  hat gefragt, ob      Hans irgendein    Buch gelesen hat.
         The teacher has asked,  whether Hans IRGEND-one book read     has.
         'The teacher whether Hans had read irgend-one book.'

According to K&S, (7) does not have a reading on which there is a particular book (the speaker does not know or care to say which one), such that the teacher asked whether Hans read that book. Instead, they claim, the sentence has to be interpreted with surface scope, and can only mean that the teacher asked Hans wether he read any book (with either the speaker or the teacher being ignorant or indifferent about the identity of the book).

However, (7) has a reading on which the *irgend-* indefinite takes scope outside the *ob*-clause, it just happens to be pragmatically odd out of context. This reading becomes the preferred one if we change the example only slightly:

(8)      Der Lehrer  hat gefragt, ob      Hans irgendeinen obskuren
         The teacher has asked,  whether Hans IRGEND-one obscure
         französischen Roman gelesen hat.
         French        novel read    has.
         'The teacher asked whether Hans had read irgend-one obscure French novel.'

In this case, surface scope reading is implausible—*Did you read some obscure French novel, Hans?* is not a particularly natural thing for a teacher to ask. By contrast, given that the novel is labeled 'obscure' and is in a foreign language, the reading on which there is a particular obscure French novel about which the teacher asked his question, is quite natural: *irgend* indicates, in this case, that the speaker does not know/remember the name of the novel.

It may well be that there are general restrictions, or at least strong inter-pretational tendencies, that tend to disfavor the wide-scope readings of *irgend*-indefinites with respect to some islands. Alonso-Ovalle and Menéndez-Benito (2007) describe such tendencies for Spanish *algún* (as well as for the regular indefinite *un*). More research is necessary to determine whether the same tendencies are exhibited by *irgend*-indefinites and how these tendencies should be best accounted for. (8) is clear enough an example, though, to show that exceptional wide scope is at least **possible**.

*irgend*-indefinites take 'free upward scope', just like regular indefinites do. Impressions to the contrary are often due to the fact that, if the *irgend*-indefinite takes wide scope, the contribution of *irgend* needs to be justifiable on the discourse level: In both (7) and (8), that means that it must be plausible that the speaker does not know (or care to say) who the witness for the indefinite is. In checking whether wide-scope readings are possible, we must take care to look at contexts where this reading is plausible.

## 3.2 irgend and domain widening

In this section I want to establish that is is not correct to assume that the basic contribution of *irgend* is 'maximal domain widening', as K&S propose. To anticipate the shape of the argument: First, I will discuss the data that gave rise to K&S's assumption, and will point out that this fits with intuition only for a subset of the data. I will then articulate the hypothesis that this is due to varying behavior of *irgend* embedded under deontic and epistemic modality. Finally, I will reject this dichotomy by showing that, even for deontic modals, there is considerable contextual variation with respect to how 'wide' the domain of the *irgend*-indefinite is. I will conclude that *irgend* never induces strong widening, and that the difference between epistemic and deontic modals is that, under the latter, *irgend* **without any context** tends to be interpreted as if maximally widened, while with the former, that is not the case.

For present discussion of (perceived) domain widening, I want to put aside the question of how, precisely, the perceived implication of *irgend* (ignorance or indifference) arises. Regardless of how one derives this implication, the domain widening K&S observe needs to be reckoned with: The widening, if present, applies to the implication contributed by *irgend*. In the deontic case, what K&S call maximal widening means that every element in the widest domain of the indefinite is an allowable candidate (a 'live deontic option'), in the epistemic case, what they call widening means that every element in the widest domain is a 'live epistemic option'. The empirical question I want to discuss in this section thus can be discussed directly in terms of the perceived implication of *irgend*. This is what I shall do in the following.

K&S claim that *irgend* induces âĂŸmaximal domain wideningâĂŹ. This seems intuitively correct for an example like (9):

(9)  Maria muss/darf irgendeinen Arzt    heiraten.
     Maria must/may IRGEND-one doctor marry.
     'Mary has to marry IRGEND-one doctor.'

(9) does seem to convey that any doctor whatsoever is a 'live deontic option': If Maria marries **any** doctor, all is well according to the source of the obligation. But there are many examples that cast doubt on K&S' claim, such as (10):

(10)  Peter muss/könnte in irgendeinem Raum in diesem Haus   sein.
      Peter must/could   in IRGEND-one  room in this      house be.
      'Peter must/could be in IRGEND-one room in this house.'

(10) does not require, in any way, that all of the rooms in the house are 'live epistemic options': The sentence would be perfectly felicitous if the interlocutors just have exhaustively searched a number of rooms in the house. All that seems required for (10) to be adequate is that there are **multiple** 'live epistemic options', i.e. that there are multiple rooms in which, for all the speaker knows, Peter could be. This contrasts sharply with the behavior of English *any,* for which widening was proposed as basic contribution by Kadmon and Landman

(1993):

(11)    Peter could be in any room in this house.

(11) conveys that every room in the house is a 'live epistemic option' for Peter's location. (10) does not.

Alonso-Ovalle and Menéndez-Benito (2008) cite the Spanish equivalent of (11) (with *algún*) as evidence that *algún* is not a 'free-choice indefinite' (i.e. not of the *irgend* kind). This claim has to be reevaluated: *irgend* behaves exactly like *algún* in this case.

### 3.2.1   Epistemic vs. deontic modality?

There is an obvious difference between (9) and (10): The former contains a deontic modal, while the latter contains an epistemic one. Could this be reason why (9), out of context, appear to induce maximal domain-widening, while (10) does not? Indeed, (12), a minimal variation of (9) with an epistemic modal does not induce maximal domain widening; while (13), a minimal variation of (10) with a deontic modal, does seem to induce maximal widening.

(12)    Ich weiß nichts  genaues, aber sie  muss irgendeinen Arzt
        I    know nothing precise,  but  she must IRGEND-one doctor
        geheiratet haben.
        married    have.
        'I don't know the particulars, but she must have married IRGEND-one
        doctor.'
        *Compatible with speaker/interlocutors being able to exclude a large num-
        ber of doctors, even topical ones.*

(13)    [explaining the rules for hide-and-seek]
        Okay, jeder muss sich innerhalb des Hauses verstecken. Ich zähle laut
        bis hundert, bevor ich zu suchen anfange. Ihr dürft rausgehen und die
        Aussentreppe benutzen, aber wenn ich bei hundert angekommen bin,
        **muss jeder in irgendeinem Raum im Haus sein**.
         'Okay, everyone must hide inside the house. I will count out loudly up
        to one hundred before I start searching. You may go outside an use the
        external staircase, but when I reach one hundred, **everyone must be in
        IRGEND-one room of the house**.'

On the face of it, it thus seems that domain widening is 'maximal' under de-ontic modals, but non-maximal (or non-existent) under epistemic modals. One way to account for this is to assume that the effect of *irgend* does not derive from a uniform source: There are in fact two distinct processes that give rise to *irgend*'s perceived contribution. This is the path taken by Aloni and Port (2010): They take *irgend* to contribute domain-widening only under root modals. Un-embedded occurrences of *irgend*, and those embedded under epistemic modals and attitude verbs, are explained by a separate mechanism of **conceptual cover**

**shift**, which generates implicatures of variation (mostly variation with respect to epistemic alternatives, that is, ignorance implicatures).

### 3.2.2 Gradation of 'widening' unter deontic modals

Assuming that *irgend*'s contribution arises through different processes under epistemic modals and deontic modals may not be as uniform as one might desire, but it is motivated somewhat if widening under deontic modals appears to be universally present and 'maximal', while the same is not true for epistemic modals. And indeed, looking at sentences out of context, this seems to be what is the case. In this section, however, we shall see that, even with deontic modals, we find contextual variation in the domain of the *irgend*-indefinite. We will see that, even under these modals, widening is not always 'maximal' and indeed does not seem to be present at all in some cases.

Even though K&S explicitly link their account to the influential account of English *any* proposed by Kadmon and Landman (1993), their account of *irgend* is different from Kadmon and Landman's, in that they characterize the widening as 'maximal'. Kadmon and Landman are very clear that their proposed widening is not to be construed as 'maximal' (p. 361):

> "The widening associated with any need not be total (the denotation of the CN does not have to be extended maximally). Instead, widening is often restricted by some salient opposition in the context, adding certain objects to the CN denotation while leaving others out."

Taking K&S's characterization at face value, then, we might assume that *irgend* (unlike *any*) must always have the widest domain possible: *irgendein Arzt* must absolutely include every physician in the world. We can easily demonstrate that this is not correct. One way to see this is that it is easy to exclude certain members (even topical ones) from the domain of *irgend*:[3]

(14)  Du  weisst, dass du  auf keinen Fall  Dr. Klöbner heiraten darfst. Du
      You know    that you in  no      case Dr. K.      marry    may. You
      musst aber irgendeinen     Arzt   heiraten.
      musst but  IRGENDphysician marry.
      'You know that you may not marry Dr. K. under any circumstances. But
      you must marry IRGEND-one physician.'

In addition, there are cases in which it is unclear whether any widening, at least in Kadmon and Landman's sense, is happening. A particularly striking example are sentences involving *irgend* in partitives:

(15)  Maria muss/kann irgendeinen von diesen fünf Ärzten     heiraten.
      Maria must/may  IRGEND-one of   these five  physicians marry.
      'Maria has to marry *irgend*-one of these five physicians.'

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[3]I am grateful for Daniel Büring for pointing this particularly telling example out to me.

The problem with partitives, in particular with partitives that involve a specified, small domain-size as in (15), is that, intuitively, the domain of the indefinite is identical to the domain that the plain indefinite would have had—before, during, and after the interpretation of the sentence. The domain cannot be widened beyond the five physicians in question, and it is implausible to assume that the domain would have been smaller without *irgend*.[4] At best, in this case, we could say that what *irgend* contributes is 'non-narrowing', i.e. it signals that the domain is not narrowed from the contextual setting it has before the sentence is interpreted.

Finally, here is a case in which a certain, unmentioned subset of the domain of the *irgend*-indefinite is excluded. The scenario is a slight extension of one given by Alonso-Ovalle and Menéndez-Benito (2010).

(16)  [The department of linguistics is hiring a new professor. Several candidates have applied, but some of them donâĂŹt have a Ph.D. According to University policies, only candidates with a PhD can be hired. After a laborious selection process, the department makes an offer to its chosen candidate, who ultimately declines. A faculty member says:]

Das  ist nicht so schlimm, wir können doch irgendeinen von den
That is  not  so bad,      we can    PRT  IRGEND-one of   the
anderen Bewerbern einstellen.
other    applicants hire.

'That's not a catastrophe. We can hire one of the other applicants.'

The same kind of example can be constructed with a necessity modal: In the same situation, the dean might inform the department head that they cannot conduct a new search. If the department wants to fill the position . . .

(17)  . . . dann müsst ihr  irgendeinen von den aktuellen Bewerbern
. . . than must  you IRGEND-one of   the current    applicants
einstellen.
hire.
'then you must hire IRGEND-one of the current applicants.'

In both (16) and (17), there are parts of the domain of *irgendeinen von den (aktuellen) Kandidaten* which cannot be hired at all—namely those without a PhD. And yet, the *irgend*-sentence is felicitous, and does not imply that the PhD-less candidates can be hired. These candidates are implicitly excluded from the domain of quantification. Note again that the same is not true with English *any*:

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[4]Partitives like this are problematic also for Kadmon and Landman's (1993) analysis of *any*, as the same considerations apply to the English translation of (15).

(i)    Mary may to marry any of these five physicians.

(18)    That is not a catastrophe. We can hire any of the other applicants.

Both *irgend* and *algún* allow for implicit domain restrictions that influence the 'free choice' implication under deontic modals. In that, they contrast with 'true' or 'strong' free choice items, like English *any*.

### 3.2.3   *irgend* vs. *algún*

Given K&S's description of the *irgend*-facts, Alonso-Ovalle and Menéndez-Benito (2010) contrast *algún* with *irgend*, saying that the Spanish item is different from the German one in that the former does not induce domain widening, while the latter does. We have seen above that the differences between the two items (with respect to domain widening[5]) are much more subtle.

There are two related differences. Firstly, out of context and under deontic modals, *irgend* tends to get a 'widest domain' interpretation, while *algún* does not. Secondly, *algún* is actually often dispreferred in cases where the widest domain satisfies the distribution requirement. That is, the Spanish version of (17) would not be the preferred expression if indeed all applicants could be hired. Indeed, choosing *algún* in such a situation may well be taken to indicate that **not** all applicants are viable options. The same is not true for *irgend*.

Now, suppose we take the basic contribution of both *irgend* and *algún* to be the same, namely something weaker than widening, say, a variation requirement ('there are multiple epistemic/deontic options'), perhaps derived from Alonso-Ovalle and Menéndez-Benito's 'anti-singleton' domain constraint. Could we explain these differences still? At least with respect to the second difference, we could: Spanish has another item, *cualquier*, that directly induces a 'widest-free-choice' implication. For example, the Spanish version of (17) competes with a *cualquier* version of the same sentence (Alonso-Ovalle and Menéndez-Benito 2010, p. 9/10):

(19)    El   departamento puede contratar a cualquiera   de los candidatos
        The department   can   hire       CUALQUIERA of  the candidates
        que han  solicitado el      puesto.
        that have applied    to the position.
        'The department can hire any of the candidates that have applied to the position.'

Alonso-Ovalle and Menéndez-Benito point out that (19) is not adequate to describe the situation in the given scenario, because not all of the candidates are viable alternatives. But that means that *cualquier* is a stronger alternative to *algún* in cases like this. We would hence assume that a cooperative speaker uses the *cualquier*-version if it is licensed. In the usual way, this can give rise

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[5]There are additional differences, which I set aside here: For one, *algún* seems is restricted with respect to the method of identification relative to which the ignorance implication holds ((?)). Secondly, *algún* can have the implication that the number of witnesses, rather than the identity of the witness is unknown. *irgend* cannot have such an implication, presumably because it is marked for number.

to the implicature that *cualquier* is **not** licensed when *algún* is used instead, that is, the *algún* version can implicate that **not** all members of the domain are viable alternatives. This could explain why *algun* is sometimes dispreferred if this is not the case.

This leaves the question why, out of context, *irgend* tends to get a 'maximal widening'-like implication, while *algún* does not.

### 3.2.4 Epistemic vs. deontic modals, again

In general, an account that assumes that *irgend*, by itself, only induces an implication of variation must explain why *irgend* tends to get this 'widening' (or at least 'non-narrowing') implication under deontic modals (but not under epistemic ones). I won't be giving a complete answer to this question, but sketch a plausible possibility that hopefully could be fleshed out to a complete answer.

Let us consider for a moment what has to be the case for a 'non-widened' interpretation of *irgend* to arise under epistemic modals or outside of embeddings. The context has to be one in which (a) the witness for the existential statement is not known, (b) both (a) and the existential statement are relevant pieces of information, but (c) there is some information that would exclude some possible witnesses, and (d) this information is not relevant.

Now, it seems to me that it is quite possible that (a)-(d) are true in the epistemic case: Sometimes it is enough to know that the identity of the witness cannot be nailed down completely, without specifying some possibly irrelevant way of further constraining the possible witnesses. I want to suggest that it is much more difficult to come up with scenarios in which (a)-(d) are satisfied in the deontic case. In the deontic case, the topical question is *What is allowed/required?* By contrast, in the epistemic case, the question is often not *What is known about X?*, but rather just *X*. And some facts about *X* may be irrelevant in context. If this is correct, then there is a greater pressure to be maximally informative in the deontic case than in the epistemic case. Consequently, giving a certain description of the deontic facts and, at the same time, indicating that this description is not exhaustive will give rise to the implicature that the speaker has no more specific information. Paired with an assumption of speaker competence, we can derive the implicature that the stated constraints are the only ones.

The foregoing surely is too vague to be a completely satisfying explanation, but I hope it points the way to how a satisfying explanation could be derived. Some supporting evidence for the idea that the 'widest-free-choice' implication is an implicature is that the implication fails precisely in cases in which there is prior information in the context that excludes some of the members of the domain: In (14), a certain individual has just been explicitly excluded, and in (16) and (17), the information that applicants without a PhD are not viable choices can be assumed to be known. Accordingly, there is no need to make this further constraint explicit, and the implicature derivation sketched above will not go through. So the 'widest-free-choice' implication is absent in cases in which we would expect it to be absent, given the sketched implicature account. It remains

to be seen, though, whether an account like this can derive the impression widening/non-narrowing in all cases where it is perceived.

What, however, about *algún*? Why does the same reasoning not apply in this case? Again, the reason would be that Spanish has alternative expressions that make the widest-free-choice implication explicit. The availability of such an expression can block the implicature derivation sketched above, in virtue of the fact that the speaker could have, without any extra effort, made clear that widest-free-choice is true. The fact that he did not indicates that widest-free-choice does not hold.

In this section, we have seen that with respect to the domains of quantification, *irgend* and *algún* are much more similar than they have been thought to be. Neither item generally induces widest-free-choice. However, under deontic modals, *irgend* tends to get interpreted as if it did, while *algún* does not. This tendency of *irgend* can potentially explained by the fact that informational needs are more stringent in cases of deontic information.

## 3.3 A 'connection to modality'?

K&S claim that *irgend*'s implication is essentially modal:

> "The connection with modality provides the key to an understanding of the free choice effect. [...] There is currently no compositional account of the link between free choice indefinites and modals, nor an explanation why there should be such a link."   Kratzer and Shimoyama (2002)

I claim that this supposition is misguided. While modals are the stereotypical licensers of *irgend*, and the 'requirement of variation' they impose is often with respect to a set of possible worlds, this is by no means always the case.

For one, quantifiers can license *irgend* without any modal implications:[6]

(20)  Jedes Mädchen hat irgendeinen Jungen eingeladen.
      Each girl     has IRGEND-one boy     invited.
      'Every girl invited IRGEND-one boy.'
      *There was one boy such that every girl invited him, but I do not know or care to say which one.*
      *OR:*
      *Every girl invited a boy, different girls invited distinct boys.*

In this case, it is the quantifier *jedes Mädchen* ('every girl') whose domain satisfies the variation requirement: Not every girl can have invited the same boy.

*When*-conditionals and adverbs of quantification also can license *irgend* without any modal implications:

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[6]Again, the same is true for *algún*, as Alonso-Ovalle and Menéndez-Benito (2007) note. They do not explain, however, how their variant of the Kratzer and Shimoyama reasoning derives this.

(21)    Wenn Susanne etwas      vom Abendessen übrig    hat, gibt   sie   es
        When Susanne something of    dinner       leftover has, gives she   it
        irgendeinem Nachbarn.
        IRGEND-one  neighbor.
        'When(ever) Susanne has leftovers from dinner, she gives them to IR-
        GEND-one neighbor.'
        *There is one neighbor, I do not know or care to say which, such that when*
        *Susanne has leftovers from dinner, she gives them to him*
        *OR:*
        *Whenever Susanne has leftovers, she gives it to some neighbor, but not*
        *always the same one.*

(22)    Normalerweise schenkt Susanne ihre Bilder      irgendeinem
        Normally        gives   Susanne her  paintings IRGEND-one
        Verwandten.
        relative.
        'Normally, Susanne gives her paintings to IRGEND-one relative.'
        *There is a relative, I don't know or care to say which, such that Susanne*
        *normally gives him her paintings.*
        *OR:*
        *Normally, Susanne gives her paintings to a relative, she does not always*
        *give it to the same one.*

The correct generalization is this: Unless construed as speaker-directed, *irgend*
indefinites need to be licensed by a quantificational operator that outscopes
them. The domain of this operator has to satisfy the variation requirement.

## 3.4   The status of irgend's implication

While it is generally agreed that *irgend*'s semantic contribution is not part of
asserted content, there is little agreement about what the status of the contri-
bution is. K&S analyze it as a conversational implicature. They support this
idea with two observations: Firstly, they claim that *irgend*'s implication can be
'called off', or cancelled. Secondly, they observe that the implication appear to
be absent under negation. I will discuss the two claims in turn.

    K&S cite (23) to show that *irgend*'s implication can be cancelled.

(23)    Du   musst irgendeinen Arzt  heiraten, und das      darf niemand
        You must   IRGEND-one M.D., and        that cannot be    anyone
        anders sein  als Dr.      Heintz.
        other   then Dr. Heintz.
        'You have to marry some doctor or other, but it cannot be anyone be-
        sides Dr. Heintz.'

However, (23) only makes sense if the two modals *müssen* and *dürfen* have dis-
tinct modal backgrounds, e.g. the requirement to marry a doctor may be due
to the addressee's parents, while the speaker thinks that the addressee must

marry Dr. Heintz.[7] But then, (23) does not show that *irgend*'s implication can be cancelled: The implication is present with respect to the first modal (the requirement imposed by the parents leaves free choice among the available doctors), and is not contradicted by the second modal, as this is about requirements deriving from a different source.

Secondly, K&S observe that *irgend*'s implication appears to be absent in downward-entailing contexts:

(24)  Niemand musste irgendjemanden heiraten.
      No-one   had to  IRGEND-one      marry.
      'No-one had to marry anyone.'
      NOT: 'No-one had to marry someone, but had the free option to choose whom.'

However, this only shows that *irgend*'s implication is not part of asserted content, not necessarily that it is a conversational implicature: In particular, suppose that the implication 'projects' out of the negation in this case, potentially getting modulated in the process. Depending on the precise content of the implication, and the nature of the projection mechanism, it may well be that the resulting utterance-level implication ends up being entailed by the asserted content, or made irrelevant (s.a. Condoravdi (this volume)). For concreteness, suppose that the implication in (24) (after projection) is that everyone who was required to marry had free choice. Given that the asserted content says that no-one was required to marry, the implication is vacuous, and hence undetectable.

Summing up: It seems that we **do not** find cancellation of *irgend*'s implication, in particular not when *irgend* is embedded under a modal. Further, while *irgend*'s implication appears to be suspended in downward-entailing contexts, this does not strongly argue in favor of it being an implicature. And, as we will see presently, *irgend*'s implication sometimes behaves very much like a presupposition.

### 3.4.1  Presuppositional behavior in embedded uses

Looking at embedded contexts, we find effects that look suspiciously like presupposition filtering: In both (25) and (26), there is no global implication of variation across the domain of the quantificational operator. Indeed, the presupposition of the counterfactual conditional contradicts such a potential global implication.

(25)  Wenn Hans nicht wüsste, dass ich *Barriers* gekauft habe, so wüsste er
      If    Hans not   knew,   that I  *Barriers* bought have, so knew   he
      doch,     dass ich irgendein   Buch gekauft habe.
      PARTICLE, that I   IRGEND-one book bought  have.
      'If Hans did not know that I bought *Barriers*, he still would know that I bought IRGEND-one book.'

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[7]Condoravdi (unpublished) makes the same observation, citing p.c. with Stefan Kaufmann.

Sentences in which *irgend* is not embedded under a quantificational operator behave very differently:

(26)    Wenn ich nicht wüsste, dass Hans *Barriers* gekauft hat, so hätte er
        If    I   not   knew,   that Hans *Barriers* bought  has, so had   he
        doch #irgendein    Buch gekauft.
        still   #IRGEND-one book bought.
        'If I did not know that Hans bought *Barriers*, he still would have bought
        #IRGEND-one book.'

In (26), *irgend*'s ignorance implication survives the attempt at cancelation, and projects to the matrix level. This implication is then incompatible with the identification of *irgend*'s referent in the antecedent of the conditional.

## 4    Towards an analysis

K&S and accounts following their general strategy propose that the basic contribution of *irgend*-style items is a conventional requirement of domain-widening, or some other domain-related constraint (such as Alonso-Ovalle and Menéndez-Benito's (2010) 'anti-singleton' constraint). From this, the variation requirement (that there are multiple possible witnesses) or distribution requirement (that every element in the domain of the indefinite is a possible witness) are derived as an implicature. There is an obvious alternative: Assume instead that the variation or distribution requirement itself is the basic conventional contribution of *irgend*-style items.

There are several reasons to doubt that the domain-constraint+implicature account is not on the right track: For one, we have seen that, at least when embedded under a quantificational operator, *irgend*'s implication behaves presupposition-like, and it is not clear how an account that derives this implication as an implicature would account for that. Secondly, there are multiple problems with the proposed implicature calculation.

The first problem is that the calculation outlined by K&S does not quite fit the usual Gricean pattern. Like in many Gricean implicature calculations, a set of alternatives to the expression the speaker used (the *irgend*-indefinite) are considered, and the implicature is derived by inferring a reason why these alternatives were not asserted instead. However, the alternatives invoked by K&S are not alternative natural language expressions—they are alternative **domain restrictions** that the non-*irgend*-indefinite might have had. This seems problematic, since alternative domain restrictions **cannot be pronounced** and hence it is not clear how the initial question *Why did he not say* **that***?* can get the implicature calculation going.

Secondly, there **are** expressions, at least in many contexts, that are more specific than an indefinite with a widened domain—names, say, or indefinites with a more specific descriptive content. However, these are also alternatives

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to the **plain** indefinite,[8] and hence it seems that K&S are unable to predict the difference between *irgend*-indefinites and their plain analogues.

A third problem concerns a later step in the reasoning proposed by K&S: Like Kadmon and Landman (1993) for *any*, they assume that the widening induced by *irgend* must be motivated—but while Kadmon and Landman only have one possible reason—strengthening the statement made—K&S propose that there are other reasons. In particular, they propose that another reason may be to **weaken** the statement, in order to avoid a false claim. But if we assume that both *any* and *irgend* induce domain widening, and widening can, among other reasons, be motivated by a desire to weaken the asserted proposition, it becomes a puzzle why this weakening cannot motivate the use of *any* in UE contexts. For example, why can't (27) not be used to say that owls hunt a type of mouse, with the speaker not knowing what kind?

(27)     Owls hunt any kind of mouse.

The problems with the implicature derivation proposed by K&S, has led to various alternative proposals. Aloni and van Rooij (2007), for example, use Schulz's (2003) operator $grice$ to formalize an implicature derivation for both kinds of free-choice items. They derive differential predictions by invoking different kinds of alternative sets for weak and strong items. While this avoids some of the problematic aspects of K&S's account, it raises a conceptual problem: Gricean implicatures are usually thought to arise 'extra-grammatically'—that is, they operate on the output of the grammatical system. If this is the case, how can the presence of a free-choice item conventionally determine the set of alternative propositions used in the implicature calculation?

In the face of this problem, it is perhaps not surprising that Chierchia (2006) proposes a 'grammaticalized-implicature' account. He invokes a separate 'dimension of meaning' in which implicatures are calculated, and free-choice items operate on this dimension.

However, the grammatical account of scalar implicatures has been argued to be conceptually problematic, empirically unnecessary (as the correct predictions it makes can be replicated by a purely Gricean account) and as making incorrect predictions (see, e.g. Greenhall (2008), Geurts (2009)). This debate has not been resolved, but I want to point out that free-choice items like *irgend* and *any*, in themselves, are not a good argument for the grammaticization of implicatures. After all, the question they raise is 'What is the **conventional** semantic contribution of these items, such that they can have the implications that they have?'—that is, they raise a question about conventional meaning. It hence seems more natural to conclude that the implication of free-choice items should **not** be derived as a conversational implicature after all.

In the rest of this contribution, I propose that the variation requirement is a direct conventional implication of *irgend*, here modeled as presupposition-

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[8]Of course, which alternative expressions are considered in any given context is an open question. But it seems safe to assume that if an *irgend*-indefinite would be compared to a certain expression, so would the corresponding plain indefinite.

like definedness condition. Implicatures will play a role, but only to a rather limited extent, and only for non-embedded uses of *irgend*. Assuming these implicatures will allow us to derive these implications without assuming that all declarative sentences are implicitly modalized, an assumption K&S make in order to reduce speaker-ignorance readings to the ignorance readings found under epistemic modals.

## 5 Free Choice By Postsupposition: A dynamic semantics for irgend

At the end of Section 3.3, I summarized the implication of embedded *irgend* as follows:

(28)     When embedded under a quantificational operator $Q$, *irgend* conveys that the witness for the existential statement is not constant across the domain of $Q$.

For quantifiers over individuals and adverbs of quantification, this spells out fairly directly the contribution that *irgend* intuitively makes. For modals, it spells out the ignorance/indifference implication just as straightforwardly, assuming that modals are understood to be quantifiers over possible worlds.

So, leaving aside the impression of domain-widening in case of deontic modality, (28) summarizes the **content** of the implication of embedded uses rather well. But how could it be implemented? If we are looking for a semantic solution, we are faced with the problem that, in the usual formal languages into which we translate natural language sentences, an operator $O$ generally does not have access to the domain of an operator $Q$ in whose scope it appears.

Dynamic semantic accounts of presupposition and epistemic modality such as Heim (1983), Veltman (1996), Beaver (2001), among others give us a limited way to access the domain of outscoping quantifiers: Presuppositions are constraints on (local) input states, and quantificational operators create just such local information states.

This section proposes a novel semantic analysis of *irgend*, which does not rely on domain-widening (or other constraints on domains, such as A&B's 'non-singleton' constraint). The contribution of *irgend* is modeled as a presupposition-like definedness constraint in a satisfaction semantics for presupposition. Unlike regular presuppositions, however, this constraint is a constraint on **output** information states, not input information states.[9]

The notion of a postsupposition may seem slightly odd at first glance: While it seems intuitively natural to have **pre**suppositions, things that must be assumed to hold in order to perform an update, why should there be such constraints on the output context? However, in the usual satisfaction semantics

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[9]Brasoveanu (to appear) also introduces a notion that he calls 'post-supposition', but it functions quite differently from the notion introduced here. Farkas (2002) proposes an analysis of unstressed *some* (or 'sm') that can be construed as postsuppositional in my sense.

for presuppositions, postconditions are just as natural to define as preconditions. One way to conceptualize postsuppositions is as saying 'only perform this update if the result is of the following kind'.

## 5.1 Basic system

I will employ a dynamic satisfaction semantics for presupposition along the lines of Beaver (2001), in which sentences denote **partial functions** from information states to information states. Information states are sets **possibilities**, which are pairs of a possible world and an assignment function.[10] A possibility $\langle w, g \rangle$ is a **descendant** of another, $\langle w', g' \rangle$ if and only iff $w = w'$ and $g$ differs at most from $g'$ by mapping additional variables, that is $g \restriction dom(g') = g'$. A possibility **subsists** in an updated information state $s$ if it has a descendant in $s$. An information state $s$ as a whole subsists in another $s'$ if all its possibilities subsist in $s'$. I assume that worlds determine interpretation functions for individual constants and predicate letters. Variables are interpreted by the assignment function. With this, we can define the updates with atomic formulas and connectives:

(29)  a.  $s[R(t_1, \ldots, t_2)] = \{i \in s \mid \langle i(t_1), \ldots i(t_n) \rangle \in i(R)\}$
      b.  $s[\neg\phi] = \{i \in s \mid i \text{ does not subsist in } s[\phi]\}$
      c.  $s[\phi \wedge \psi] = s[\phi][\psi]$

These are standard dynamic semantics definitions. Other connectives can be defined as abbreviations of these in the usual way.

Quantification will be defined in a novel way. We need an auxiliary notion:

(30)  $\langle w, g \rangle \{x/D\} = \{\langle w, g' \rangle \mid \exists d \in D : g' = g \cup \langle x, d \rangle\}$.

$i\{x/D\}$ is an information state based on a single possibility $i$. All possibilities in this information state are identical to $i$, except that their assignment maps the variable $x$ to an individual in the domain $D$, and there is a possibility for each such individual.

With this:[11]

(31)  $s[\exists_x \phi] = \bigcup_{i \in s} i \{x/D\} [\phi])$

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[10]For simplicity, I work with simple assignment functions, and assume variables are never reused. To allow re-use of variables without loosing information, I could employ **referent systems** as done in Groenendijk, Stokhof and Veltman (1995). For present purposes, this complication is not necessary.

[11]Once we introduce presuppositions, this definition will give rise to the problem, familiar from Heim (1983), that *A fat man pushed his bicycle* will be predicted to presuppose that every fat man has a bicycle. This can be remedied by letting $s_\phi$ be the largest subset $X$ of $s$ for which $X[\phi]$ is defined and replacing the definition above with

(i)  $s[\exists_x \phi] = \bigcup_{i \in s} i \{x/D\}_\phi [\phi])$

Since this problem is orthogonal to the issues we are concerned here, I work with the simpler version of the definition.

In Groenendijk et al. (1995) and Beaver (2001), quantifiers are defined differently: There, a local information state is created for every individual in the domain. Here, a local information state is created for each possibility in the input information state. This difference is crucial for the treatment of *irgend* below, but it does not destroy the success of Beaver's analysis of presupposition. We can define Beaver's presupposition operator in the usual way:

(32)    $s[\partial\phi] = s$ iff $s$ subsists in $s'$, undefined otherwise.

The system defined so far largely reproduces the considerable success of Beaver's (2001) system, despite the difference in how quantifiers are defined.

   This difference, however, makes the system defined here incompatible with a Veltman (1996)-style *might*, which operates as a test on an information state. Instead, epistemic modals will be interpreted as point-wise, eliminative updates. This actually has some advantages in terms of the interaction of (dynamically bound) pronouns and epistemic modals: Büring (1998) has shown convincingly that the predictions made by Groenendijk et al. (1995), which employ a Veltmanian *might* are empirically incorrect for *bona fide* pronouns like *he* and *she*, and that a pointwise interpretation makes the right predictions.[12] The update for modals and attitude verbs is as in (33).

(33)    $s[\Box\phi] = \{i \in s \mid A_i \text{ subsists in } A_i[\phi]\}$
        where for some set of worlds $W_w$ accessible from $w$:
        $A_{\langle w,g \rangle} = \{\langle v,g \rangle \mid v \in W_w\}$

This definition straightforwardly imports a the classic static Kripke/Hintikka-style analysis of modality.[13] It does not matter here how the sets $W_w$ are determined: They could be determined via the usual accessibility relations, or in the manner of Kratzer (1981) through the interaction of a modal base and an ordering source.

## 5.2   Proposal and predictions

With everything in place, we can state the meaning of *irgend* (for now, we only enforce minimal variation):

(34)    $s[\text{irgend-}\exists_x\phi] = s[\exists_x\phi]$ if there are $i, j \in s[\exists_x\phi]$ such that $i(x) \neq j(x)$, else undefined.

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[12]Groenendijk et al. (1995) base their system exclusively on sentences involving *it*, such as (i), which behave very differently from sentences involving *he* and *she*.

(i)    Somebody ate the cake. It might be Jane.

Given these differences, Büring suggests that these are instances of a reduced it-cleft—that is, *it* is not a referential pronoun in these cases.

[13]I shall ignore a well-known problem for such a classical treatment of non-epistemic attitude verbs: These tend to presuppose that the agent of the attitude believes the presuppositions of their prejacent, a prediction that the system here does not make without modification.

The update in (34) comes with a definedness condition, but unlike for run-off-the-mill presuppositions, the condition is imposed on the **output context**: The update with *irgend* is only defined if, in the output context, the variable bound by the *irgend*-indefinite refers to distinct elements at different possibilities. That is, the witness for the *irgend*-indefinite cannot be constant through output information state.

### 5.2.1 Predictions: Unembedded uses

Now let us look at unembedded uses of *irgend*-indefinites. I make the common assumption that the information state updated with the CCP denoted by the matrix clause is the conversational common ground, in the sense of Stalnaker (1978). The use of an *irgend*-indefinite will ensure, then, that the post-assertion common ground (or rather, the common ground after the assertion is accepted by the hearer) satisfies the variation requirement/

The ignorance or weak indifference ('I do not care to say who'), I claim, is an implicature after all. In particular, observe that using an indefinite that does not resolve the identity of its witness (using a suitably restrictive descriptive content, say) is incompatible with the following four conditions:

(35)    a. **Cooperativity:** The speaker is willing to commit the identity of the witness to the common ground.
        b. **Feasibility:** There is nothing preventing adding information about the witness to the common ground.
        c. **Informedness:** The speaker is informed about the identity of the witness
        d. **Relevance:** The identity of the witness is relevant to the conversational purposes of the interlocutors.

If all these conditions are met, a rational speaker would commit information about the identity of the witness to the common ground. That is, he would **not** use an *irgend*-indefinite, which explicitly signals that he does **not** add this information to the common ground.

Hence, when a speaker uses an unembedded *irgend*-indefinite, the addressee must conclude that at least one of (35-a-d) is not true of the current context. If he infers that **Informedness** is false, we get an ignorance implication. If he instead infers that **Relevance** is false, we get a 'Do not care to say'-indifference implication. While not discussed frequently, there are also uses of unembedded *irgend*-indefinites that are licensed because the one of the other two conditions do not hold: (36) is a case in which **Cooperativity** does not hold (modeled after an example of von Fintel (2000)).

(36)    [*A* tries to guess what *S* is cooking. *S* taunts *A* with:]

        Ein Tipp: Ich koche irgendwas    vegetarisches ...
        A   hint: I    cook   *irgend*-what vegetarian     ...

'A hint: I am cooking IRGEND-what vegetarian ...'

And (37) is a case in which the speaker clearly has a certain belief about the witness of his indefinites, but uses *irgend* to acknowledge the disagreement with the addressee (modeled after an example due to Condoravdi (unpublished), (37-a) and (37-c) are uttered by the same speaker):

(37) a. Hans hat den Kuchen gegessen.
        Hans has the cake    eaten.
        'Hans ate the cake.'
     b. Nein, Paul hat den Kuchen gegessen!
        No,   Paul has the cake    eaten!
        'No, Paul ate the cake!'
     c. OK, also irgendjemand hat den Kuchen gegessen ...
        OK, so   IRGEND-one   has the cake    eaten   ...
        'OK, so *irgend*-one ate the cake ...'

Since one of the conditions in (35-d) **must** be unmet for an utterance containing unembedded *irgend* to be felicitous, we are guaranteed that **some** implication is triggered by any use of unembedded *irgend*. Even though this implication can sensibly be called an implicature, it hence cannot be completely 'canceled' or called off.

### 5.2.2  Predictions: Embedded uses

Unlike many previous proposals, the current proposal does not aim to derive the implications of *irgend*-indefinites that are embedded under quantificational operators as implicatures. Instead, these are direct (conventional) consequences of *irgend*'s definedness requirement.

Let us begin with modals: A sentence like (38-a) can be translated as (38-b) and, in virtue of *irgend*'s postsupposition, it will only be defined in contexts satisfying (38-c):

(38) a. Peter muss in irgendeinemd Raum sein.
        Peter must in IRGEND-one    room be.
        'Peter must be in *irgend*-one room.'
     b. $\Box[\text{irgend-}\exists_x : room(x) \land in(peter, x)]$
     c. $\exists_x : \exists_y : x \neq y \land \Diamond in(peter, x) \land \Diamond in(peter, y)$

That is, (38-a) ensures that there are two rooms $r$ in which Peter could be. Deontic modals work the same way, though in many cases, the implication must be strengthened in this case. See Section ?? above and ?? below for discussion.

Quantifiers work very similarly: Note that the prediction in (38) arises because *irgend*'s local information state is the one created by the modal, which is an information state that holds the assignment constant, but where the world-component varies from possibility to possibility. For quantifiers, the opposite is the case, and hence (39-a), which we can translate as in (39-b) is only defined with respect to an information state that validates (39-c).

(39) a. Jedes Mädchen hat irgendeinen Jungen eingeladen.
 Every girl has IRGEND-one boy invited.
 'Every girl invited *irgend*-one boy.'
 b. $\forall_x : girl(x) \rightarrow$ irgend-$\exists_y : boy(y) \wedge invite(x,y)$
 c. $\exists_x : \exists_y : girl(x) \wedge girl(y) \wedge \exists_z : \exists_{z'} : invite(x,z) \wedge invite(y,z') \wedge z \neq z'$

*Wenn*-conditionals and adverbs of quantification can be treated similarly, assuming that they are operators that quantify over some kind of entity (events, situations, cases, times …).

### 5.2.3 Predictions: Filtering

Recall that we can filter the implications of embedded *irgend* in much the same way as we can filter presuppositions:

(40) Wenn ich nicht wüsste, dass Hans *Barriers* gekauft hat, so wüsste ich
 If I not knew, that Hans *Barriers* bought has, so knew I
 doch, dass er irgendein Buch gekauft hat.
 PRT, that he IRGEND-one book bought has.
 'If I did not know that Hans bought *Barriers*, I still would know that he bought *irgend*-one book.'

(41) (Selbst) Wenn Maria nicht weiss, dass Hans *Barriers* gekauft hat, so
 (Even) if Maria not know, that Hans *Barriers* bought has, so
 weiss sie doch, dass er irgendein Buch gekauft hat.
 know she PRT, that he IRGEND-one book bought has.
 '(Even) if Maria doesn't know that Hans bought *Barriers*, she knows that he bought *irgend*-one book.'

I have not given a treatment for counterfactuals, so let us concentrate on the example in (41): The antecedent will create a temporary information state that contains only worlds in which Maria does not know that John has bought *Barriers*. That is, only such worlds which have epistemically accessible worlds in which Hans bought a different book. The consequent of (41) is then processed in this temporary information state, and imposes the condition that Maria is uncertain what was bought in each such world. Globally, the sentence will hence only be defined if the conditional *If Maria does not know that Hans bought Barriers, she does not know what he bought* is true. That is, the postsupposition gets filtered in just the way in which presuppositions get filtered in a conditional.

Finally, let us turn to a case of unembedded *irgend*. In this case, we **need** to look at a counterfactual case, as the implication is speaker-direct and the speaker will generally not be uncertain as to whether he has a certain belief about the identity of the witness:

(42)　Wenn ich nicht wüsste, dass Hans *Barriers* gekauft hat, so hätte er
　　　If　　I　not　knew,　that Hans *Barriers* bought　has, so has　he

　　　doch # irgendein　　Buch gekauft.
　　　PRT　IRGEND-one book bought.

　　　'If I did not know that Hans bought *Barriers*, he still would have bought
　　　*irgend*-one book.'

Let us assume a similarity-based analysis of the counterfactual: For each world
in the input state, the antecedent creates an information state that consists
of those worlds that are most similar to the actual world, but makes the an-
tecedent true. The consequent is then processed in that information state. Now,
if we move to the closest worlds in which the speaker is uninformed about the
identity of the book, this will, at least in most cases, not change the identity of
the book that was bought: In all those wolrds, Hans still bought BARRIERS. But
then, the postsupposition of *irgend* in the consequent cannot be satisfied. That
is why filtering does not work in this case, and the sentence is infelicitous.

### 5.2.4　Presupposition 'holes' are not postsupposition 'holes'

Given that the postsuppositions examined here project largely like presuppo-
sitions, one may wonder how the behavior of *irgend* under negation and other
presupposition 'holes' is to be accounted for: After all, we have seen that the
contribution of *irgend* does not survive embedding under negation unscathed:
(43), repeated from above, does not have the same implication the non-negated
sentence would have.

(43)　Es ist nicht der Fall,　dass Hans irgendwen　angerufen hat.
　　　It is　not　the case, that Hans IRGEND-one called　　has.

　　　'It is not the case that Hans has called irgend-one.'
　　　↝ It is not known who has (not) called.

The analysis presented here can account for this fact: With respect to 'holes',
postsuppositions do **not** project in the same as presuppositions do. To see why
this is so, let us reconsider how the 'hole-y' behavior of operators like negation
is accounted for in a dynamics such as the one employed in this paper:

(44)　**Negation**
　　　$s[\neg\phi] = \{i \in s \mid i \text{ does not subsist in } s[\phi]\}$

In order to determine which possibilities 'survive' the update of an information
state $s$ with $\neg\phi$, $s$ is updated with $\phi$, and all possibilities that survive this
update are removed from $s$ to yield the updated information state. That is,
the formula $\phi$ in the scope of the negation is applied to the input information
state $s$ of $\neg\phi$ in the process of calculating the update. Hence any definedness
requirement that $\phi$ imposes on its input information state will be imposed on
the input information state of $\neg\phi$. And so, all presuppositions of $\phi$ will survive
in $\neg\phi$ unmodified.

The same is not true for postsuppositions, which are conditions on output information states: These will not be imposed on the output state of $\neg\phi$. Instead, they will be imposed on the 'temporary' information state $s[\phi]$.

For an unembedded assertion of (43), this means that it will pragmatically presuppose that **there would not be a unique witness for jemanden if $s$ would be updated with 'Hans hat jemanden angerufen'**, that is, in the input information state, it is not resolved who Hans may have called.

We hence see that the current account does not quite predict that the contribution of *irgend* completely vanishes under negation and other presupposition 'holes': Instead, this contribution gets modified, and becomes much weaker. It is a condition about a **counterfactual** update with the non-negated sentence.

Due to the weak nature of the predicted implication, it is difficult to directly test whether this prediction is adequate. However, we can consider what would happen if (43) is uttered in a context that violates the predicted implication. This would be a context in which it is (possibly) still unresolved whether Hans called somebody, but in which it is resolved that if he called somebody, it would have been some particular person, say Jill. Jill is the only person he could have called, but it is unknown if he called her. In such a context, (44) is infelicitous.

Similarly, imagine a context in which it is resolved that if anyone made a phone call, it was to Jill. (45) is again infelicitous in such a context:

(45)    Niemand hat irgendjemanden angerufen.
        No-one    has Irgend-one        called.
        'No-one called anyone.'

If the implication of *irgend* completely disappeared in downward-entailing contexts, these infelicities would be unexplained. If, by contrast, the implication gets modulated in the way predicted by the account presented here, they are expected: In the provided contexts, *irgend*'s postsuppostion cannot be satisfied, and hence, the sentence is infelicitous.

# 6   Some remaining issues

This paper surely is not the last word on the topic of *irgend*-style free choice items. However, it has made some advances in our understanding of these items: It has shown that *irgend*-indefinites are much more similar to *algún* and similar items than previously thought and has corrected some further misconceptions about the relation of *irgend*-indefinites to scope islands and the nature of *irgend*'s implication. Perhaps most crucially, it has shown that *irgend*'s implication is by no means inherently modal, rather, it is inherently related to quantification.

On the theoretical side, I have proposed an account of *irgend* and similar items that treats the perceived implication as arising directly as a conventional definedness-requirement, side-stepping some of the difficulties of deriving this implication indirectly through a basic requirement of domain-widening.

In the remaining pages, I want to briefly outline what I consider the most pressing open issues about *irgend*-style items.

**The impression of domain-widening**   Despite the fact that *irgend* does not generally induce domain-widening, it is beyond question that, especially out of context, it **seems** that it does when embedded under deontic modals. I have gestured at a way to derive this default-implication as an implicature, but it remains to be seen whether the proposed reasoning applies in all cases in which we perceive the putative widening / non-narrowing.

**Aloni and Port's account and 'split readings'**   I have compared my account throughout to existing accounts of *irgend* (and *algún*), but I have not made any direct comparison to a recent paper by Aloni and Port (2010). In part, this is due to space constraints, and an in-depth comparison will have to wait another occasion. However, I want to draw out one differential prediction that the two accounts make: The account presented in this paper predicts that *irgend*'s implication 'takes scope' where the indefinite takes scope: If *irgend* takes widest scope, we get a speaker directed reading. If it takes narrow scope with respect to an attitude verb, we get an implication with respect to this attitude verb. The account rules out 'split readings' where the indefinite takes scope under an operator, but the implication is speaker-oriented. Aloni and Port do not rule out such cases (though they do not discuss them). Which account is correct? I must admit that I am not sure. The crucial examples are ones like (46):

(46)   Maria glaubt   dass irgendjemand ihre Kuh gestohlen hat.
        Maria believes that IRGEND-one   her  cow stolen      has.
        'Maria believes that *irgend*-one has stolen her cow.'

If (46) can have a split-reading, then it would be adequate in a context in which the speaker is uncertain as to whether Maria has a particular person in mind or not. This is distinct from the wide-scope reading, where the speaker knows Maria suspects a particular person, but does not know who that person is, and from the narrow scope reading, according to which Maria is uncertain. At first blush, it appears to me that the split reading is not available, and hence my prediction is correct. But more research is necessary to establish the facts. This is made difficult by the fact that the split reading requires rather particular set-ups, making it difficult to query naïve speakers.

**Methods of identification and individuation**   I have spelled out a very simple-minded version of my account, that models uncertainty/indifference about the identity of an individual by saying that different individuals serve as witness in different worlds. However, the ignorance implication in particular often depends on a **method of identification**: In some contexts, *irgend* may be licensed because the speaker does not know the name of the witness, in others, it may be licensed because, though the speaker does not know the name, he cannot

pick the witness out of a crowd, and so forth. This could taken into account by integrating Aloni's (2001) 'conceptual covers'. However, there is another problem, namely that of individuation. Condoravdi (this volume) discusses this issue with respect to English *ever* free relatives. And we find a variant of her 'ratatouille problem' with *irgend*-indefinites: Suppose that the speaker knows (and is willing to say, etc.) that Arlo is cooking ratatouille, but he does not know whether it is the kind of ratatouille that contains more onions than tomatoes or the kind that has more tomatoes than onions. Intuitively, *irgend* is not licensed in (47), even though there are 'distinct' possible witnesses for the indefinite.

(47)    Arlo kocht irgendein    Gericht.
        Arlo cooks IRGEND-one dish.
        'Arlo is cooking *irgend*-one dish.'

I think the problem could be addressed by adapting Condoravdi's concept lattices to the analysis presented here. Indeed, if we use concept lattices, we do not need conceptual covers: These can be viewed as the bottom layer of Condoravdi's lattices. Finally, demanding, as Condoravdi does, that each more specific alternative description is instantiated somewhere is stronger than just requiring variation—and it might give us just the right tools to predict the apparent domain-widening under deontic modals.

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