Modal indefinites

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Abstract Across languages, we find indefinites that trigger modal inferences. This article contributes to a semantic typology of these items by contrasting Spanish *algún* with indefinites like German *irgendein* or Italian *uno qualsiasi*. While *irgendein*-type indefinites trigger a Free Choice effect (Kratzer and Shimoyama 2002; Chierchia 2006), *algún* simply signals that at least two individuals in its domain are possibilities. Additionally, *algún*, but not *irgendein*, can convey that the speaker does not know how many individuals satisfy the existential claim in the world of evaluation. We contend that the two types of indefinites impose different constraints on their domain of quantification: *irgendein* and its kin are domain wideners (Kratzer and Shimoyama 2002), whereas *algún* is an 'anti-singleton' indefinite (its domain cannot be restricted to a singleton). This, together with the fact that *algún* does not require uniqueness, allows us to derive the contrast between *irgendein* and *algún* by using the pragmatic reasoning presented by Kratzer and Shimoyama.

Keywords Indefinites · Free Choice · Domain widening · Exhaustivity

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1 Introduction

Across languages, we find indefinites that trigger modal inferences. One such indefinite is Spanish *algún*. Consider, as an illustration, (1) below. This sentence makes an existential claim (that there is a student that María married), and additionally conveys that the speaker does not know who the witness of this claim is (i.e., the speaker doesn't know which student María married). Hence, adding the continuation *namely, Pedro*, which explicitly identifies the witness, results in oddity, as (2) illustrates. In contrast, the 'plain' indefinite *un* allows for this type of continuation, as in (3).

(1) María   se   casó   con   algún   estudiante   del   departamento
     María   SE   married   with ALGÚN   student   of the   department
     de   lingüística.
     of   linguistics
     'María married a linguistics student.'

(2) ♯ María   se   casó   con   algún   estudiante   del
       María   SE   married   with ALGÚN   student   of the
       departamento   de   lingüística: en concreto   con   Pedro.
       department   of   linguistics: namely   with   Pedro
       'María married a linguistics student, namely Pedro.'

(3) María se   casó   con   un   estudiante   del   departamento   de
     María SE   married   with UN   student   of the   department   of
     lingüística: en concreto   con   Pedro.
     linguistics: namely   with   Pedro
     'María married a linguistics student, namely Pedro.'

In a possible world semantics, the ignorance component of sentences like (1) can be modeled by saying that *algún* imposes a constraint on the speaker's epistemic alternatives (the set of worlds compatible with what the speaker believes), namely that María didn't marry the same linguistics student in all those worlds. When *algún* is in the scope of an intensional operator, it imposes the same type of constraint on the worlds that the operator quantifies over. This is illustrated by (4) below, where *algún* is in the complement clause of a propositional attitude verb, *pensar* ('to think'):

(4) Pedro   piensa   que   María   se   casó   con   algún   estudiante
     Pedro   thinks   that   María   SE   married   with ALGÚN   student
     del   departamento   de   lingüística.
     of the   department   of   linguistics
     'Pedro thinks that María married a linguistics student.'

In (4), *algún* can have scope over or under the attitude verb. On the wide scope reading of *algún*, (4) conveys that there is a particular student that Pedro thinks María married, but the speaker does not know who. This is the speaker's ignorance

reading that we saw above. When *algún* has narrow scope, (4) says that Pedro is uncertain about the identity of the student that María married. In other words, Pedro's epistemic alternatives vary with respect to the identity of the student that María married.

In cases like (1) and (4) above, we are likely to make a uniqueness assumption: in each accessible world, María married only one student. When uniqueness cannot be taken for granted, *algún* can convey ignorance with respect to the total number of individuals that satisfy the existential claim. The example in (5), for instance, strongly suggests that the speaker does not know how many dents her car has.[1]

(5) Mi   coche tiene algún   abollón.
     My   car   has   ALGÚN   dent

A number of recent works focus on indefinites that convey a modal component, henceforth 'modal indefinites'.[2] These studies differ widely with respect to the description and analysis of the modal component. Since no systematic crosslinguistic investigation of this class of indefinites has been undertaken, it is not clear whether these divergences correspond to typological differences. This sets the stage for a research program which aims to understand along which lines modal indefinites can vary, and to seek a unifying core underlying the observed diversity.

This paper contributes to this enterprise by describing the modal component of *algún* and contrasting it with that of modal indefinites like German *irgendein* or Italian *uno qualsiasi*. These indefinites have been characterized in the literature as Existential Free Choice Items because they convey, roughly, that each of the individuals in the domain of quantification can satisfy the existential claim—the 'Free Choice component': see Kratzer and Shimoyama (2002), Kratzer (2005), Chierchia (2006). The sentence in (6), for instance, claims that Mary had to marry a doctor, and, additionally, that *any* doctor in the domain of quantification was a permitted option.

(6) Mary   musste irgendeinen   Arzt   heiraten.
     Mary   had to irgend-one   doctor   marry   (Kratzer 2005, p. 129)

Kratzer and Shimoyama (2002), who analyze the Free Choice component associated with *irgendein*-type indefinites, put forward an account for this component that crucially relies on the assumption that these indefinites are domain wideners, i.e., they cannot be contextually restricted. For instance, *irgendein Arzt* picks out the

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[1] A note about the translations of our example sentences: we use English *a* in the translations of the examples in which *algún* conveys ignorance regarding the identity of the witness, even though *a* lacks the modal component of *algún*. In cases like (5), where *algún* conveys ignorance with respect to the number of witnesses, we will only provide a gloss. The use of *a* or (singular) *some* in those cases would convey that there is a unique individual satisfying the existential claim.

[2] Some examples of modal indefinites are: English singular *some* (Strawson 1974; Becker 1999; Farkas 2002), German *irgendein* (Kratzer and Shimoyama 2002; Aloni and van Rooij 2004; Aloni 2007), the *-to* series in Russian (Yanovich 2005; Kagan 2007), the *-kin* series in Finnish (Kagan 2007), Romanian *vreun* and *un NP oarecare* (Farkas 2006; Ciucivara 2007), French *quelque*, *un NP quelconque*, and *n'importe quoi* (Zabbal 2004; Tovena and Jayez 2006), and Italian *(un) qualche* and *uno qualsiasi* (Aloni and van Rooij 2004; Chierchia 2006; Zamparelli 2007).

set of *all* doctors in the world of evaluation, rather than a contextually salient subset of doctors. In this paper, we show that the modal effect induced by *algún* is weaker than Free Choice: *algún* only requires that there be at least two individuals in the domain of quantification that satisfy the existential claim. Furthermore, we propose that this difference between *irgendein* and *algún* comes about because the two indefinites impose different constraints on their domains: rather than requiring that its domain be as wide as it can be, *algún* simply requires that its domain contain more than one individual.

The article is organized as follows. Section 2 argues that the modal component of *algún* is weaker than Free Choice. Section 3 shows that the modal component of *algún* is due to a conversational implicature. Section 4 illustrates the derivation of the implicature in contexts where it is assumed that there is at most one individual satisfying the existential claim. Unlike *irgendein* or *uno qualsiasi*, however, *algún* does not convey uniqueness. Section 5 shows that in contexts where uniqueness is not taken for granted, the implicature triggered by *algún* conveys that the speaker does not know how many individuals satisfy the existential claim. Section 6 discusses some open issues for further research.

2 The modal component of *algún*

This section is devoted to describing the modal inference triggered by *algún*, and to showing that it is different from the Free Choice effect displayed by indefinites like *irgendein* or *uno qualsiasi*. In Section 4, we will put forward an analysis that derives this contrast in a principled way.

2.1 *Algún* with necessity modals

Let us start by considering the example in (7) below, on the epistemic reading of the necessity modal *tener que*. On this reading, the modal can quantify over the speaker's epistemic alternatives. When *algún* is in the scope of the modal, (7) asserts that in all the worlds compatible with the speaker's evidence, Juan is in a room of the house. Additionally, (7) is felicitous only if Juan is not in the same room in all the epistemic alternatives of the speaker. Hence, it would be odd for the addressee to ask which room Juan is in, as in (8), or for the speaker to name that room, as in (9).

(7)   Juan   tiene   que   estar   en   alguna   habitación   de   la   casa.
      Juan   has   to   be   in   ALGUNA   room   of   the   house
      'Juan must be in a room of the house.'

(8)   A: Juan   tiene   que   estar   en   alguna   habitación   de   la   casa.
           Juan   has   to   be   in   ALGUNA   room   of   the   house
           'Juan must be in a room of the house.'

B: ♯ ¿En   cuál?
       in   which
       'In which one?'

(9)   ♯ Juan   tiene   que   estar   en   alguna   habitación   de   la   casa,
      Juan   has   to   be   in   ALGUNA   room   of   the   house,
      en concreto   en   la   cocina.
      namely   in   the   kitchen
      'Juan is in a room of the house, namely in the kitchen.'

The sentence in (7) contrasts sharply with its counterpart with *un*, in (10), which is felicitous in a situation where the speaker knows which room Juan is in. (Hence, the hearer could ask 'where' after the speaker has uttered (10), and the speaker could specify the room in question, as in (11).)

(10)   A: Juan   tiene   que   estar   en   una   habitación   de   la   casa.
         Juan   has   to   be   in   UNA   room   of   the   house
         'Juan must be in a room of the house.'
     B: ¿En   cuál?
        in   which
        'In which one?'

(11)   A: Juan   tiene   que   estar   en   una   habitación   de   la   casa,
         Juan   has   to   be   in   UNA   room   of   the   house,
         en concreto   en   la   cocina.
         namely   in   the   kitchen
         'Juan must be in a room of the house, namely in the kitchen.'

As anticipated above, the modal component of *algún* differs from that of Existential Free Choice items like *irgendein* or *uno qualsiasi*. The Free Choice effect induced by *irgendein* can be illustrated with the example in (12), from above. According to Kratzer (2005), on the narrow scope reading of the indefinite, (12) conveys that Mary had to marry a doctor, and that *any* doctor was a permitted possibility for her—that is, for *every* doctor *d*, there is some permitted world in which Mary marries *d*.

(12)   Mary   musste   irgendeinen   Arzt   heiraten.
      Mary   had to   irgend-one   doctor   marry   (Kratzer 2005, p. 129)

In general, a sentence with an LF of the form in (13a) will convey, on top of the assertion in (13b), the Free Choice component in (13c):[3]

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[3] Menéndez-Benito (2005) argues that in order to characterize the Free Choice effect displayed by universal Free Choice items (i.e., English *any* or Spanish *cualquiera*) we need to introduce an exclusivity condition. In what follows, we will ignore this complication.

(13) a. $\Box[\text{irgendein}(P)(Q)]$
      b.   Assertion: $\lambda w.\forall w' \in \mathscr{A}_w \exists x[P(w)(x) \ \& \ Q(w')(x)]$
      c.   The Free Choice component: $\lambda w.\forall x[P(w)(x) \rightarrow \exists w' \in \mathscr{A}_w[Q(w')(x)]]$
           (where $\mathscr{A}_w$ is the set of worlds accessible from the evaluation world
           w and P and Q are two properties)

If *algún* were a Free Choice indefinite, we would expect the sentence in (7), repeated in (14) below, to convey that Juan may be in *any* of the rooms of the house (for every room r there should be some world compatible with the speaker's evidence in which Juan is in r).

(14) Juan   tiene   que   estar   en   alguna   habitación   de   la   casa.
      Juan   has   to   be   in   ALGUNA   room   of   the house
      'Juan must be in a room of the house.'

To see that this is not the case, consider the scenario below:

(15) SCENARIO: HIDE AND SEEK. María, Juan, and Pedro are playing hide-and-seek
      in their country house. Juan is hiding. María and Pedro haven't started
      looking for Juan yet. Pedro believes that Juan is not hiding in the garden or in
      the barn: he is sure that Juan is inside the house. Furthermore, Pedro is sure
      that Juan is not in the bathroom or in the kitchen. As far as he knows, Juan
      could be in any of the other rooms in the house.

In this scenario, Pedro can felicitously utter the sentence in (14), even though not all the rooms are epistemic possibilities for him—he knows that Juan is not in the bathroom or in the kitchen. *Algún* does not convey that *all* rooms are possibilities, i.e., it does not trigger a Free Choice effect.

The scenario in (16) makes the same point:[4]

(16) SCENARIO. We are playing a board game whose goal is to find out in which
      stop of the Boston subway system Mr. X is hiding. The Boston subway
      system has four lines: the blue, red, green, and orange lines. The players can
      rule out certain subway stops where, according to what they know, Mr. X is
      not in. At this stage of the game, player B knows that Mr. X is not in the
      blue, red or orange lines, but player A thinks that he is in a station of the blue
      line. The following dialogue takes place:

(17) A: Mr. X   tiene   que   estar   en   alguna   parada   de la   línea   azul.
           Mr. X   has   to   be   in   ALGUNA   stop   of the line   blue
           'Mr. X has to be in a blue line stop.'
      B: ¡No!   Mr. X.   tiene   que   estar   en   alguna   parada   de
           No   Mr. X.   has   to   be   in   ALGUNA   stop   of
           la   línea   verde.
           the   line   green
           'No! Mr. X. has to be in a green line stop.'

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[4] This scenario is inspired by Zimmermann (2001).

B's remark is appropriate, and, given what she knows, true. Note, however, that B knows that there are some green line stops where Mr. X cannot be, because some of the green line stops also belong to the blue, red, or orange lines.[5] Hence, if *algún* conveyed a Free Choice component, it should be ruled out in this scenario. But it is not.[6]

From these examples, we can conclude that the modal component of *algún* is weaker than Free Choice: *algún* simply requires that at least two individuals in the domain be possibilities. This constraint, which we will dub the 'Modal Variation' component, can be formalized as in (18), following a suggestion that von Fintel made for *some* (von Fintel 1999b).

(18) LF: $\Box$ [algún$(P)(Q)$]
  The Modal Variation component:
  $\exists w', w'' \in \mathscr{D}_w[\{x : P(w')(x) \,\&\, Q(w')(x)\} \neq \{x : P(w'')(x) \,\&\, Q(w'')(x)\}]$
  (where $\mathscr{D}_w$ is the set of worlds compatible with what the speaker believes in w, and P and Q are two properties)

The Modal Variation effect arises also when *algún* is not in the scope of a modal element, as in (1) (repeated in (19) below).

(19) María se casó   con algún estudiante del   departamento
  María SE married with ALGÚN student   of the department
  de lingüística.
  of linguistics
  'María married a student in the linguistics department.'

As we have seen in Section 1, the sentence in (19) conveys that the speaker doesn't know who María married—that is, María didn't marry the same student in all of the speaker's epistemic alternatives. To capture the parallelism between the cases in which *algún* combines with an overt modal and the cases in which it doesn't, we will build upon a suggestion in Kratzer and Shimoyama (2002) and assume that assertions are implicitly modalized.[7] For concreteness, we will assume that a covert assertoric operator (20) occupies the topmost position at LF. In sentences like (19), *algún* is in the scope of this assertoric operator, as illustrated by (21) below. Making this move will allow us to use the same mechanism to derive the Modal Variation component both with and without an overt modal.

(20) $[\![\text{ASSERT}]\!]^c = \lambda p.\lambda w. \forall w' \in \text{Epistemic}_{\text{speaker of c}}(w)[p(w')]$

(21) LF: ASSERT (María se casó con algún estudiante del departamento de lingüística)

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[5] B knows that Mr. X cannot be in North Station, Haymarket, Government Center, or Park Street.

[6] Of course, if B were convinced that Mr. X was in a particular stop of the green line, e.g., in Copley Square, the sentence in (17) would be inappropriate (while its counterpart with *un* would be fine).

[7] See also Alonso-Ovalle and Menéndez-Benito (2003) and Chierchia (2006).

In (20), the assertoric operator ranges over the speaker's epistemic alternatives and, as a result, the Modal Variation effect amounts to speaker's ignorance. However, in sentences like (19) the Modal Variation component can affect the context set—the set of worlds that are compatible with the common ground of the conversation. This is illustrated by the dialogue below:[8]

(22)   A: Juan   está   en   la   cocina.
            Juan   is   in   the   kitchen.
            'Juan is in the kitchen.'
       B: ¡No,   Juan   está   en   el   baño!
            No,   Juan   is   in   the   bathroom
            'No, Juan is in the bathroom.'
       A: Bueno, Juan   está   en   alguna   habitación. Eso seguro, ¿no?
            Well,   Juan   is   in   ALGUNA   room   that sure   no
            'Well, Juan is in some room. We are sure of that, aren't we?'

In all worlds compatible with what A believes, Juan is in the kitchen. In all worlds compatible with what B believes, Juan is in the bathroom. A's last remark indicates that it is not settled in the common ground where Juan is. The fact that the epistemic component of *algún* in unembedded sentences sometimes refers to the belief state of the speaker and sometimes to what is common knowledge should perhaps not come out as a surprise, since we know that overt epistemic modals like English *may* can be sensitive to different bodies of information (von Fintel and Gillies 2008a, b).

2.2 *Algún* with possibility modals

So far all our examples contain necessity modals, but the Modal Variation component is also present in cases where *algún* combines with a possibility modal: the sentence in (24) is deviant in the scenario in (23) in which there is *only one* room of the house where Juan might be (while the sentence in (25), with *un*, is fine).

(23)   SCENARIO. We are in the hide-and-seek situation described before, but now, according to what Pedro knows, if Juan is in the house, he could only be in the bathroom.

(24)   ♯ Juan   puede   estar   en   alguna   habitación   de   la   casa.
         Juan   may   be   in   ALGUNA   room   of   the   house
         'Juan may be in a room of the house.'

(25)   Juan   puede   estar   en   una   habitación   de   la   casa.
        Juan   may   be   in   UNA   room   of   the house
        'Juan may be in a room of the house.'

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[8] This dialogue is adapted from Condoravdi (2005), where similar examples are used to argue that the ignorance component of English *whatever* can be common ground oriented.

Again, we can see that the modal inference triggered by *algún* is *not* a Free Choice effect. In fact, the case can be made even sharper for possibility sentences. Spanish has a universal Free Choice item, *cualquiera*, which conveys Free Choice truth-conditionally: the sentence in (26), for instance, is true only if the addressee is allowed to take *any* card, i.e., if for every card in the domain of quantification, there's a different permitted world where the addressee takes that card (on *cualquiera*, see Quer 2000; Menéndez-Benito 2005).

(26) Puedes   coger   cualquiera   de   las   cartas   de   esta   baraja.
      You can   take   CUALQUIERA   of   the   cards   in   this   deck
      'You can take any of the cards in this deck.'

Algún and *cualquiera* contrast sharply in scenarios where not all the individuals in the domain of quantification are possibilities.[9] Consider, for instance, the scenario in (27) below. As expected, the sentence in (28a), with the Free Choice determiner *cualquiera*, is false. In contrast, its counterpart with *algún* (28b) is true (and appropriate).

(27) SCENARIO. We are playing hide-and-seek and Juan is hiding, as before. Pedro is convinced that Juan is not in the bathroom or in the kitchen, but for all Pedro knows, Juan could be in any of the other rooms in the house, or even outside the house (say, in the barn).

(28) a. Juan   puede   estar   en   cualquier   parte   de   la   casa.
          Juan   may   be   in   CUALQUIER   part   of   the   house
          'Juan may be anywhere in the house.'
      b. Juan   puede   estar   en   alguna   parte   de   la   casa.
          Juan   may   be   in   ALGUNA   part   of   the   house
          'Juan may be in a part of the house.'

The scenario in (29) provides another illustration:

(29) SCENARIO. The department of linguistics is hiring a new professor. Several candidates have applied, but some of them don't have a Ph.D. According to University policies, only candidates with a Ph.D. can be hired.

While (30a), with *cualquiera*, is false in the scenario above, (30b), with *algún*, is true and appropriate.

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

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9 This comparison is not available in the necessity sentences above, where *cualquiera* is ruled out.

b. El   departamento puede contratar a   alguno de   los
    The   department   can   hire   ALGUNO of   the
    candidatos que   han   solicitado el   puesto.
    candidates that   have applied   to   the   position
    'The department can hire one of the candidates that have applied to the
    position.'

To summarize, *algún* requires that at least two individuals in its domain be possibilities, but, unlike Existential Free Choice Items, it does not require that *all* individuals in the domain be possibilities. This raises two questions: (i) how can the Modal Variation component be derived?, and (ii) how can we account for the differences between *algún* and *irgendein*-type indefinites? To be able to address these questions, we first need to figure out what the status of the Modal Variation component is. Is it part of the truth conditions? A presupposition? A conversational implicature? A conventional implicature? The next section is devoted to this issue.

3 The Modal Variation component is a conversational implicature

The analyses of modal indefinites in the literature differ widely with respect to the status of the modal component of these items. Kratzer and Shimoyama (2002) argue that the modal component of German *irgendein* is a conversational implicature. Aloni and van Rooij (2004) and Chierchia (2006) assume that the same is true for Italian *uno qualsiasi*. Tovena and Jayez (2006), however, argue against analyzing the modal component of French *un NP quelconque* as a conversational implicature. Kagan (2007) claims that the modal component of Russian *-to* and *koje-* indefinites is a conventional implicature, and Zabbal (2004) that the modal component of French *n'importe quoi* is truth conditional. It is not clear whether these discrepancies correspond to typological differences or not, but the variety of proposed analyses calls for a close look at the modal component of *algún*. In this section, we will argue that the modal component of *algún* is a conversational implicature. We will start by eliminating other options, namely that the modal component is a presupposition (Section 3.1), or a conventional implicature (Section 3.2).

3.1 The Modal Variation component is not a presupposition

The ignorance component that *algún* conveys in non-modal sentences is reminiscent of the ignorance effect triggered by Hindi *-bhii* correlatives or English *-ever* free relatives (Dayal 1997; von Fintel 2000b; Tredinnick 2005). Consider, for instance, the sentences in (31) below: the correlative in (31a) conveys that the speaker is ignorant about the identity of the girl who is making an effort and the free relative in (31b) signals that the speaker doesn't know what Arlo is cooking.[10]

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[10] *Whatever* has also an indifference reading in sentences like (i) below (see von Fintel 2000b; Tredinnick 2005).

(i) Bill needed a paperweight, so he grabbed whatever was on the desk. (Tredinnick 2005, p. 1)

(31) a. jo   bhii laRkii mehnat kar   rahii hai vo   safal   hogii
          wh   ever girl   effort is   making she successful   will be
          'The girl who is making an effort will be successful.'

                                                              (Dayal 1997, p. 9)
      b. There's a lot of garlic in whatever (it is that) Arlo is cooking.
                                                              (von Fintel 2000b)

Given the parallelism between the examples in (31) and the *algún* examples, attempting a unified analysis for *whatever*-like items and modal indefinites of the *algún*-type seems appealing.[11] In what follows, we will consider, and ultimately reject, this possibility. We will start by presenting von Fintel's account of the ignorance component of *whatever* (von Fintel 2000b), and then argue that this analysis cannot be successfully extended to *algún*.

Following Jacobson (1995) and Dayal (1997), von Fintel (2000b) analyzes *whatever* as a definite description . Additionally, he proposes that *whatever* triggers the presupposition that the individual that it picks out is not the same in all worlds in the modal base F (the set of worlds consistent with what the speaker believes, in cases like the above.) That is:

(32) LF: whatever (w) (F) (P)
      a. presupposes: $\exists w', w'' \in F[\iota x.P(w')(x) \neq \iota x.P(w'')(x)]$
      b. denotes: $\iota x.P(w)(x)$ (von Fintel 2000b)

For instance, the phrase *whatever Arlo is cooking* denotes, in a world w, the unique thing that Arlo is cooking in w, and presupposes that the thing that Arlo is cooking is not the same in all of the worlds in the modal base (in the default case, the set of worlds that are compatible with what the speaker believes).

This analysis is supported by the compositional behavior of the ignorance component of *whatever*. This component projects up to the matrix level when it is in the scope of 'holes' for presupposition projection (Karttunen 1973) like, for instance, *unless* or negation. The sentence in (33) conveys that the speaker will eat out unless there is a lot of garlic in the thing that Arlo is cooking and that the speaker does not know what Arlo is cooking. The example in (34) can be read as saying that the speaker doesn't know what Arlo is cooking but that the thing that Arlo is cooking has a lot of garlic in it.

(33) Unless there's a lot of garlic in whatever Arlo is cooking, I will eat out
      tonight.   (von Fintel 2000b)
      $\neq$ Unless I don't know what Arlo is cooking and there is a lot of garlic in
      what he is cooking, I will eat out tonight.

(34) It is not true that there's a lot of garlic in whatever Arlo is cooking.

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[11] See Kai von Fintel (1999b) and Condoravdi (2005) for discussion.

As we have seen, both *whatever* and *algún* impose a variation constraint on the set of accessible worlds, which, in the default case, are the worlds compatible with the speaker's beliefs. The differences between the two constraints follow from the fact that *whatever* phrases are definite descriptions while *algún* phrases are indefinite descriptions. This parallelism suggests the analysis in (35), in which the modal component of *algún* is treated as a presupposition:[12]

(35) LF: algún $(w)(F)(P)(Q)$
      (where F is the set of worlds compatible with what the speaker knows, and P and Q are properties)
      Presupposition: $\exists w',w'' \in F\,[\{x : P(w')(x)\ \&\ Q(w')(x)\} \neq \{x : P(w'')(x)\ \&\ Q(w'')(x)\}]$
      Assertion: $\{x : P(w)(x)\ \&\ Q(w)(x)\} \neq \emptyset$

The projection properties of the modal component triggered by *algún* argue against the analysis in (35). Consider the example below:

(36) No es   verdad que   Juan salga   con   alguna   chica   del
      not is   true   that Juan goes-out   with ALGUNA   girl   from the
      departamento   de   lingüística.
      department   of   linguistics
      'Juan is not dating any of the girls in the linguistics department.'

If the modal component of *algún* were a presupposition, it should be able to project up to the matrix level in (36). But in that case, we would get a contradictory statement: the sentence would presuppose that the set of girls that Juan is dating is not the same in all the worlds compatible with what the speaker believes, while asserting that the set of girls Juan is dating *is* the same in all of the speaker's epistemic alternatives, namely the empty set. However, no contradiction arises: (36) is interpreted as saying that Juan is not dating any girl in the department.

We know that presuppositions can also be accommodated locally, as in (37) below, where negation operates over the set of worlds in which there *is* a mathematician who proved Goldbach's conjecture.

(37) The mathematician who proved Goldbach's conjecture is not a woman, because nobody has proved Goldbach's conjecture!
                                          (a version of an example in von Fintel 2003)

Since the option of projecting the presupposition of *algún* to the top level would yield a contradictory statement in examples like (36), perhaps in this case the modal component must be accommodated locally (van der Sandt 1992). However, that option does not seem to be available, either. If the ignorance component were

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[12] This is essentially the analysis for English *some* considered in von Fintel (1999b).

accommodated locally, the sentence in (36) could convey that the speaker knows which girl Juan is dating, contrary to fact.[13]

In view of the projection behavior of the modal component of *algún* we conclude that this component of *algún* is not a presupposition. Next, we will argue that the modal component of *algún* is not a conventional implicature, in the sense of Potts (2005).

3.2 The Modal Variation component is not a conventional implicature

Conventional implicatures (in the sense of Potts 2005) are speaker-oriented entailments that are independent of at-issue (truth-conditional) entailments. Appositive expressions like 'a confirmed psychopath' in (38a) are prime examples of this class of meanings. The sentence in (38a) commits the speaker, not Sheila, to the claim that Chuck is a confirmed psychopath, as illustrated by the oddity of (38b).

(38) a.   Sheila says that Chuck, a confirmed psychopath, is fit to watch the kids.
      b.   Sheila believes that Chuck, a psychopath, should be locked up. # But
           Chuck is not a psychopath.   (Potts 2007)

The modal component of *algún* crucially differs from conventional implicatures in that it does not have to be speaker-oriented, as examples in (39) and (40) illustrate. These examples convey ignorance on the part of Juan's, rather than the speaker's.

(39) Juan   sabe   que   María   se   casó   con   algún   estudiante
      Juan   know:3s that María   SE   marry:past3s with ALGÚN   student
      del   departamento. Él   no sabe   con   quién, ¡pero   yo   sí!
      of the department   He   not know:3s with whom, but   I   do
      'Juan knows that María married a student in the department. He doesn't
      know who, but I do!'

(40) Llevamos unos   cuantos días   intentando averigüar   quién   es
      take:1pl a   few   days   trying   to find out who   is
      el   nuevo   amor   de   María. Todo lo   que   Juan   sabe es
      the   new   love   of   María   all   it   that Juan   knows is
      que   María   sale   con   algún estudiante del   departamento.
      that   María   goes   out   with   ALGÚN student   of the department

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[13] In the examples above we are using *it is not true that*, rather than the sentential negation *no*, because *algún* cannot be in the scope of sentential negation. We believe that this does not affect our argument: as far as we can tell, *it is not true that* behaves like a hole for presupposition projection—the examples below allow for global accommodation of the definite descriptions' presupposition.

(i)   a.   No   es   verdad que   el   rey   de   Francia sea   calvo.
           not   is   true   that the king   of   France   is   bald
           'It is not true that the king of France is bald.'
      b.   No   es   verdad que   el   marido de   Pepa   sea   bajo.
           not   is   true   that the husband of   Pepa   is   short
           'It is not true that Pepa's husband is short.'

¡Pero	yo	ya	sé	con	quién	sale	María!
but	I	already	know:1s	with	whom	goes out	María

'We've been trying to find out for days who María's new love is. All Juan knows is that María is going out with some student of the department or other. But I know who María is going out with!'

Further evidence against analyzing the modal component of *algún* as a conventional implicature comes from the fact that, unlike conventional implicatures (41), the modal component can be cancelled, as (42) shows.

(41) a.   Edna, a fearless leader, started the descent.   (Potts 2007)
      b.   ♯ Edna, a fearless leader, started the descent. In fact, Edna is not a
           fearless leader.

(42) María   se   casó   con   algún   estudiante   de   lingüística.
      María   SE   marry:3sPast   with   ALGÚN   student   of   linguistics.
      De   hecho,   sé   exactamente   con   quién.
      In   fact,   I know   exactly   with   whom
      'María married a linguistics student. In fact, I know exactly who!'

3.3 The Modal Variation component is a conversational implicature

In the previous section, we have seen that the Modal Variation component can be cancelled (42). Furthermore, we know that it disappears under negation (43). More generally, this component is undetectable under downward entailing operators, like *dudar* ('to doubt'). This is illustrated by (44), which says that Pedro doubts that Juan is dating any girl in the linguistics department. Cancellation and disappearance under downward entailing contexts are the hallmarks of quantity-based conversational implicatures.

(43) No   es   verdad   que   Juan   salga   con   alguna   chica
      not   is   true   that   Juan   date: SUBJ3s   with   ALGUNA   girl
      del   departmento   de   lingüística
      from the   department   of   lingüistics
      'Juan is not dating any girl in the linguistics department.'

(44) Pedro   duda   que   Juan   salga   con   alguna   chica
      Pedro   doubts   that   Juan   date: SUBJ3s   with   ALGUNA   girl
      del   departmento   de   lingüística.
      from the   department   of   linguistics
      'Pedro doubts that Juan is dating any girl in the linguistics department.'

The modal component of *algún* also behaves like a conversational implicature in that it can be reinforced without redundancy. As we can see in the examples below, reinforcing the content of a conventional implicature (45a), a presupposition (45b),

or a semantic entailment (45c) is redundant. In contrast, reinforcing the content of the Modal Variation component, as in (45d), is not.[14]

(45) a.   ♯ Edna, a fearless leader, started the descent, and Edna is a fearless leader.
      b.   ♯ The king of France is bald, and there is a king of France.
                                                                        (Presupposition.)
      c.   ♯ Jim kissed Kim passionately, and Kim was kissed.   (Entailment.)
      d.   María   sale   con   algún   estudiante   del   departamento
           María   goes out with   ALGÚN   student   of the   department
           de   lingüística, pero   no   sé   con   quién.
           of   linguistics, but   not   I know   with   whom
           'María is dating some student in the linguistics department, but I don't
           know who.'

If the modal component of *algún* is a conversational implicature, it should be derivable from general conversational principles. In the next section, we will show that this is indeed the case.

4 Deriving the Modal Variation component

As noted above, Kratzer and Shimoyama (2002) analyze the modal component of *irgendein* as a conversational implicature that arises because *irgendein* widens the domain.[15] In this section, we propose that the modal implicature triggered by *algún* also arises via a constraint that *algún* imposes on its domain of quantification. Rather than signaling that its domain is maximal, as *irgendein* does in the Kratzer and Shimoyama analysis, *algún* simply signals that its domain of quantification cannot be a singleton. In this way, the differences between the two indefinites fall out from the differences between the restrictions they place on their domains.

The section is organized as follows: we will first show in 4.1 that *algún* imposes an anti-singleton constraint; then, we argue in Sections 4.2 and 4.3 that the Modal Variation effect can be derived from this constraint via the pragmatic reasoning entertained in Kratzer and Shimoyama (2002). Section 4.4 concludes with a comparison between our derivation of the Modal Variation component of *algún* and the Free Choice component of *irgendein* in the Kratzer and Shimoyama (2002) analysis.

4.1 The anti-singleton constraint

In recent years, domain shifting operations have played an important role in semantic analyses of indefinite phrases. Domain shrinking, for instance, has been

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[14] Thanks to an anonymous reviewer for suggesting this argument as well as providing the examples in (45).

[15] Aloni and van Rooij (2004) also analyze the Free Choice Effect of *irgendein* as an implicature, but they derive the implicature in a different way. A comparison between their proposal and Kratzer and Shimoyama's is beyond the scope of this article.

linked to exceptional scope: Schwarzschild (2002) put forth the hypothesis that exceptional scope indefinites are existential quantifiers ranging over a singleton domain. Domain widening has been taken to be responsible for the distribution of negative polarity items (Kadmon and Landman 1993) and the Free Choice component of Existential Free Choice Items (Kratzer and Shimoyama 2002). Additionally, Dayal (1998) proposes that intensional domain widening (quantification over possible individuals) explains the distribution of Free Choice *any*.

Kratzer (2005) suggests that domain shifting might be at the very core of the semantics of indefinites. On this view, different indefinite determiners may trigger different constraints on their domain of quantification:[16]

> ''Like many Indo-European indefinites, those of the *irgendein* series have elaborate determiners. What do those determiners mean? What kind of possible meanings are available for them? [...] *Irgendein Arzt*, for example, picks out the whole set of doctors in the evaluation world, while *ein Arzt* might pick out a contextually determined smaller set. 'Specific indefinites' could create singleton alternatives, possibly with the help of choice functions. Generalizing from this sample, it seems that, quite generally, indefinite determiners might be domain shifters, operations on quantification domains.''
>
> (Kratzer 2005, p. 134)

The contrast between *un* and *algún* fits well into this picture. Consider first the sentence in (46) below:

(46)   Juan   compró   un   libro   que   resultó   ser   el   más
       Juan   bought   UN   book   that   happened   to be   the   most
       caro   de   la   librería.
       expensive one   of   the   bookstore
       'Juan bought a book that happened to be the most expensive one
       in the bookstore.'

The extension of the noun phrase that *un* combines with is a singleton set, since there can only be one book that turned out to be the most expensive one in the bookstore.[17] The sentence is perfectly acceptable, showing that the domain of *un*

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[16] See also von Fintel (1999a), Matthewson (2001), Farkas (2002), Giannakidou (2004), and Etxebarria and Giannakidou (2007) for the role of determiners as domain shifters.

[17] Generally, *un* cannot combine with NPs whose extension is known to be a singleton, as illustrated by (ia) (Heim 1991; Sauerland 2003a, b; Percus 2006). However, it can do so when the singleton restriction is contributed by a relative clause, as in (ib) (Alonso-Ovalle et al. (to appear)).

(i)   a. ♯ Subí   a una montaña más alta de Massachusetts.
            I climbed to a   mountain most tall in Massachusetts
            'I climbed a tallest mountain in Massachusetts.'
      b.   Subí   a una montaña que es la más alta de Massachusetts.
            I climbed to a   mountain that is the most tall in Massachusetts
            'I climbed a mountain that is the tallest of Massachusetts.'

can be reduced to a singleton set. Replacing *un* by *algún*, as in (47) results in oddity. Unlike *un*, *algún* does not tolerate singleton domains.[18]

(47) ♯ Juan   compró   algún   libro   que   resultó   ser   el   más
      Juan   bought   ALGÚN   book   that   happened   to be   the   most
      caro   de   la   librería.
      expensive   in   the   bookstore
      'Juan bought a book that happened to be the most expensive one in the store.'

The sentences in (48–49) below make the same point.[19] There can only be one candidate that is the most incompetent among the ones that applied. The sentence with *un* in (48) is perfectly appropriate, but the sentence in (49) is not. We can then conclude that *un* allows for domains of quantification that contain only one individual, but *algún* doesn't.

(48) Pedro   contrató   a   un   candidato   que   era   el   más
      Pedro   hired   a   UN   candidate   that   was   the   most
      incompetente   de   los   que   se   presentaron.
      incompetent   of   the   ones   that   SE   applied
      'Pedro hired a candidate that was the most incompetent of the ones that applied.'

(49) ♯ Pedro   contrató   a   algún   candidato   que   era   el   más
       Pedro   hired   a   ALGÚN   candidate   that   was   the   most
      incompetente   de   los   que   se   presentaron.
      incompetent   of   the   ones   that   SE   applied
      'Pedro hired a candidate that was be the most incompetent of the ones that applied.'

In what follows, we will use subset selection functions (functions from sets to subsets) to model contextual domain restrictions (von Fintel 2000a; Kratzer 2003, 2005). *Un* ranges over a contextually relevant subset of the extension of the NP that

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[18] Note that the relative clauses in these examples are restrictive. First, there is no intonational break, unlike in the case of non-restrictive clauses. Second, unlike non-restrictive relative clauses, the relative clauses in these examples do not have to be have speaker-oriented (Potts 2005), as shown by the example below:

(i) Juan   piensa   que   María   habló   con   una   chica   que   sale   con   Samuel   (pero
     Juan   thinks   that   María   spoke   with   UNA   girl   that   goes out   with   Samuel   (but
     la   chica   en   cuestión   sale   con   Marcos.)
     the   girl   in   question   goes out   with   Marcos)
     'Juan thinks that María spoke with a girl that is dating Samuel, but the girl is actually dating Marcos.'

[19] Thanks to Chris Potts for suggesting this example.

it combines with.[20] We will assume that that subset is picked out by a subset selection function f that *un* takes as its argument:

(50) $[\![un]\!] = \lambda f_{\langle et,et \rangle} \lambda P_{\langle e,t \rangle} \lambda Q_{\langle e,t \rangle}.\exists x[f(P)(x) \ \& \ Q(x)]$

According to this, the sentence in (51a) asserts that María married at least one of the students in the subset of students in the linguistics department that f selects:[21]

(51) a.   María   se   casó   con   un   estudiante   del   departamento
            María   SE   married   with UN   student   of the   department
            de   lingüística.
            of   linguistics
            'María married a linguistics student.'
      b.   Assertion: $\Box[\exists x[x \in f(\textbf{student}) \ \& \ \textbf{María married } x]]$

Domain shifting constraints can be modelled as constraints on the possible values of the subset selection function. We can have singleton subset selection functions, as in (52), which would yield 'specific' indefinites (Schwarzschild 2002), and, conversely, we can have anti-singleton subset selection functions: functions that never return a singleton domain, as in (53).[22]

(52)   Singleton subset selection functions:
       f is a singleton subset selection function iff for any set P, $f(P)$ is a singleton.

(53)   Anti-singleton subset selection functions:
       f is an anti-singleton subset selection function iff for any set P, $f(P)$ is *not* a singleton.

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[20] An anonymous reviewer wonders whether *un* can really be contextually restricted, given that Martí (2009) claims that *unos*, the plural form of *un*, does admit contextual restrictions. In the example below, adapted from Martí (2009), *un país* can range over a domain containing sub-Saharan countries. We take this as evidence that *un* can indeed pick out a domain made salient by the context.

  (i)   Question asked by reader in on-line interview:
        In which areas of the world is the AIDS problem the worst?
        Answer by doctor: In sub-Saharan Africa, undoubtlessly …

  (ii) Hay   un país   que podría desaparecer si no se   presta ayuda para
        there is UN country that could disappear if not SE to-it offer help to
        combatir la   enfermedad.
        fight   the disease
        'There is a (sub-Saharan) country that could disappear if it is not offered help to fight the disease.'

[21] We will use 'f' as the name of the variable over subset selection functions and also, sometimes, as the name of the function that is the value of that variable. We use '$\Box$' to represent the covert assertoric operator in the semantics.

[22] See von Fintel (1999a) for the definition of a singleton subset selection function.

We would like to propose that *algún* introduces an anti-singleton subset selection function into the semantic representation:[23]

(54) $[\![\text{algún}]\!] = \lambda f_{\langle et,et \rangle} \lambda P_{\langle e,t \rangle} \lambda Q_{\langle e,t \rangle}$: **anti-singleton**$(f).\exists x[f(P)(x) \text{ \& } Q(x)]$

Consider, for instance, the sentence in (1), repeated in (55a) below. The sentence in (55a) claims that in all worlds compatible with what the speaker believes, Mary married a guy in the subset that f picks out from the set of students in the linguistics department.[24] *Algún* signals that this subset is not a singleton.

(55)   a.   María   se   casó   con algún estudiante del   departamento
            María   SE   married with ALGÚN student   of the department
            de   lingüística.
            of   linguistics
            'María married a linguistics student.'
       b.   Assertion: $\square[\exists x[x \in f(\mathbf{student}) \text{ \& } \mathbf{María\ married}\ x]]$
       c.   Anti-singleton constraint: $|f(\mathbf{student})| > 1$

Consider now the sentence in (56a). Under our current assumptions, *algún* and *un* only differ in that the former requires a non-singleton domain. Thus, a speaker who uses *algún* flags that she is not restricting the domain D to a singleton. It seems then reasonable to assume that *algún* triggers a competition with all the singleton subsets of D. After all, restricting the domain to a singleton would have resulted in a stronger claim. For concreteness, let us assume that the set of actual rooms is (57). Uttering the sentence in (56a) raises the issue of why the speaker didn't make any of the (stronger) claims in (58).

(56)   a.   Juan   tiene   que   estar   en   alguna   habitación   de   la   casa.
            Juan   has   to   be   in   ALGUNA   room   of   the house
       b.   Assertion: $\square[\exists x[x \in f(\mathbf{room}) \text{ \& } \mathbf{Juan\ is\ in}\ x]]$
       c.   Anti-singleton constraint: $|f(\mathbf{room})| > 1$

(57)   {the bedroom, the living room, the bathroom}

(58)   a. $\square(\exists x[x \in \{\mathbf{the\text{-}bedroom}\} \text{ \& } \mathbf{Juan\ is\ in}\ x])$
            $(= \square(\mathbf{Juan\ is\ in\ the\ bedroom}))$

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[23] For the sake of concreteness, we will assume that the anti-singleton constraint is a presupposition on the value of the selection function, much as ϕ-features on pronouns are modelled as presuppositions on the value of their possible referents (Cooper 1983; Dowty and Jacobson 1989; Sauerland 2003b; Heim and Kratzer 1998; Heim 2007). The function in (54) is partial. Following the notation in Heim and Kratzer (1998), the expression right before the colon indicates the definedness condition.

[24] As we have pointed out before, the implicit epistemic modality in these examples might be common-ground oriented.

 b. $\square(\exists x[x \in \{\text{\textbf{the-living-room}}\} \ \& \ \textbf{Juan is in } x])$
   $(= \square(\textbf{Juan is in the living room}))$
 c. $\square(\exists x[x \in \{\text{\textbf{the-bathroom}}\} \ \& \ \textbf{Juan is in } x])$
   $(= \square(\textbf{Juan is in the bathroom}))$

We will assume —following Kratzer and Shimoyama's analyis of *irgendein*— that the hearer concludes that the speaker uttered (56a), rather than any of the competitors in (58), in order to either (i) avoid making a false claim, or (ii) prevent the hearer from drawing a false exhaustivity inference. In what follows, we will consider each of these two reasons in turn.

4.2 Avoid making a false claim

Upon hearing the sentence in (56a), the hearer might infer that the speaker did not reduce the domain to a singleton to avoid making a false claim, i.e., because the singleton competitors in (58) are false. Putting together this implicature with the assertion, we will get the strengthened meaning in (59):[25]

(59) Strengthened meaning: assertion & implicature.
  a. Assertion: $\square$ (**Juan is in bedroom** $\vee$ **in the living room** $\vee$ **in the bathroom**)
  b. Implicature: $\neg\square(\textbf{bedroom}) \ \& \ \neg\square(\textbf{living room}) \ \& \ \neg\square(\textbf{bathroom})$

The conjunction of (59a) and (59b) entails the Modal Variation effect: it rules out scenarios in which the speaker knows which room Juan is in, yet, it does not require all rooms to be possibilities: The implicature in (59b) would be satisfied, for instance, in cases where the speaker is sure that Juan is not in the bathroom.

Assuming that all the pragmatic competitors are false derives the Modal Variation component when *algún* is embedded under a necessity modal.[26] However, appealing to this reasoning does not give us what we want in the case of possibility modals (see Aloni and van Rooij 2004). Since (60a) entails that at least one of the pragmatic competitors in (61) is true, the hearer cannot assume that the speaker takes all these competitors to be false.

(60) a. Juan puede estar en alguna habitación de la casa.
   Juan may be in ALGUNA room of the house
  b. Assertion: $\lozenge[\exists x[x \in f(\textbf{room}) \ \& \ \textbf{Juan is in } x]]$
  c. Anti-singleton constraint: $|f(\textbf{room})| > 1$

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[25] Tovena and Jayez (2006, p. 224) point out that the French modal indefinite *un* N *quelconque* is also incompatible with singleton domains. In their analysis, that constraint is a consequence of a modal condition imposed by *un quelconque*, which they claim is not an implicature. Our claim is different. We argue that *algún* imposes a non-singleton constraint on its domain and that its modal component is an implicature derived from that constraint.

[26] Be it covert or overt. The same reasoning derives the ignorance effect in cases like (1), given our assumption that these cases contain a covert necessity operator.

(61)   *Pragmatic competitors*:
    a.   ◊ (**Juan is in the bedroom**)
    b.   ◊ (**Juan is in the living room**)
    c.   ◊ (**Juan is in the bathroom**)

Let us consider a second reason why the speaker might be using an anti-singleton subset selection function: avoiding a false exhaustivity inference (Kratzer and Shimoyama 2002).

4.3 Avoid a false exhaustivity inference

According to Kratzer and Shimoyama (2002), the hearer can assume that the speaker is widening the domain to avoid a false exhaustivity inference. Applied to our case, this reasoning will give us the Modal Variation component when *algún* is in the scope of a possibility modal: the hearer can assume that the speaker is using an anti-singleton indefinite to prevent her from drawing a false exhaustivity inference. What does this mean? Consider the dialogue in (62) below, which takes place in the hide-and-seek scenario that we presented before:

(62)   A: We know that Juan must be in the house, but where in the house is he?
       B: (He is) either in the bathroom or in the living room.

A can conclude from B's reply that all propositions in (63) below are true: B's answer is naturally understood as an exhaustive enumeration of the rooms where B thinks that Juan might be (Zimmermann 2001).

(63)   a.   Juan might be in the bathroom.
       b.   Juan might be in the living room.
       c.   There is no other room of the house where Juan might be.

The same exhaustivity inference arises when *algún* is used with an explicit domain of quantification, as in (64) below:

(64)   A: We know that Juan must be in the house, but where in the house is he?
       B: Está   en   alguna   de   estas   dos   habitaciones: en   el
            he is   in   ALGUNA   of   these   two   rooms: in   the
            baño   o   en   la   salita.
            bathroom   or   in   the   living room

As before, A can conclude from what B said that, according to what B knows, Juan can *only* be in those two rooms.

Shrinking the domain down to a singleton would have led to an exhaustivity inference as well. Suppose that instead of asserting (60b) the speaker had chosen a singleton domain and asserted, for instance, the proposition in (65). The hearer could have reasoned as follows: the speaker uttered (60a) because she was trying to

avoid the potential exhaustivity inference in (66). The hearer will then conclude that (66) is false, or in other words, that (67) is true.[27]

(65) $\Diamond(\exists x[x \in \{\textbf{the bedroom}\} \ \& \ \textbf{Juan is in } x])(= \Diamond(\textbf{Juan is in the bedroom}))$

(66) $\Diamond(\textbf{Juan is in the bedroom}) \ \& \ \neg\Diamond(\textbf{Juan is in the living room})$
        $\& \ \neg\Diamond(\textbf{Juan is in the bathroom})$

(67) $\Diamond \ (\textbf{in the bedroom}) \rightarrow \Diamond \ (\textbf{in the living room} \vee \textbf{in the bathroom})$

   Applying the same reasoning to the other two competitors, the hearer ends up with the strengthened meaning in (68). The assertion conveys that there is at least one epistemically accessible world in which Juan is in one of the rooms. The anti-exhaustivity inference rules out scenarios in which there is only one room where Juan might be. For suppose, for instance, that, according to what the speaker knows, Juan might be in the bedroom, but not in the living room or in the bathroom. In that case (68b-i) would be false. Yet, the strengthened meaning does not require that all rooms be possibilities. To see why, suppose that Juan might be in the bedroom or in the living room, but not in the bathroom. In that case, (68b-i) and (68b-ii) would be true, since in both cases the antecedent and the consequent of the conditional are true, and the conditional in (68b-iii) would also be true—in that case, trivially true, since its antecedent is false.[28]

(68)   Strengthened meaning: assertion & implicature.
        a.   Assertion: $\Diamond[\exists x \in f(\textbf{room}) \ \& \ \textbf{Juan is in x}]]$
        b.   Implicature:
              i. $\Diamond \ (\textbf{in the bedroom}) \rightarrow \Diamond \ (\textbf{in the living room} \vee \textbf{in the bathroom})$
              ii. $\Diamond \ (\textbf{in the living room}) \rightarrow \Diamond \ (\textbf{in the bedroom} \vee \textbf{in the bathroom})$
              iii. $\Diamond \ (\textbf{in the bathroom}) \rightarrow \Diamond \ (\textbf{in the bedroom} \vee \textbf{in the living room})$

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[27] An anonymous reviewer points out that (i) below need not trigger an exhaustivity inference, although it might do so when pronounced with certain intonational patterns. We agree. Likewise, (ii) does not necessarily trigger the inference that the speaker believes that there is only one room of the house where he might be.

   (i)   He might be in the bedroom.
   (ii)   Puede   estar en una habitación de la   casa.
          he might be in UNA room   of the house
          'He might be in a room of the house.'

For our reasoning (and Kratzer and Shimoyama's) to go through, it is enough that a sentence like (ii) can trigger an exhaustivity inference, even if that inference does not always arise. The anti-exhaustivity inference that we are dealing with is an implicature that blocks an inference that may have been drawn in connection with a particular utterance, a ''meta-implicature'' in the terminology of Chierchia et al. (to appear).

[28] The reader can verify that avoiding a false exhaustivity inference also gives us the right results for sentences in which *algún* is in the scope of a necessity modal. In that case, the strengthened meaning we derive is compatible with a scenario in which all individuals satisfy the existential claim in every accessible world (van Rooij 2006). We assume that a run-of-the-mill scalar implicature, which results from the competition between *algún* and *todos* ('all') rules out that type of scenario.

4.4 Domain widening versus anti-singleton constraint

We have argued that the Modal Variation component comes about via the pragmatic reasoning that Kratzer and Shimoyama (2002) put forward to derive the Free Choice component of German *irgendein*. The reason why *algún* triggers a weaker inference than *irgendein* is that the pragmatic competitors are different in each case. Kratzer and Shimoyama (2002) assume that *irgendein* is a domain widener. Consequently, the pragmatic competitors for an *irgendein*-sentence are determined by *all* subsets of the maximal domain of quantification.[29]

To see the contrast, consider the proposition in (69). If *algún* were a domain widener, the competitors to (69) would be all the propositions in (70):

(69)   Claim: $\Diamond$ $[\exists x \in f(\textbf{room})$ & **Juan is in** $x]]$

(70)   *Competitors for a domain widener:*
    a. $\Diamond$ (**Juan is in the bedroom**)
    b. $\Diamond$ (**Juan is in the living room**)
    c. $\Diamond$ (**Juan is in the bathroom**)
    d. $\Diamond$ (**Juan is in the bedroom** $\vee$ **in the living room**)
    e. $\Diamond$ (**Juan is in the bedroom** $\vee$ **in the bathroom**)
    f. $\Diamond$ (**Juan is in the living room** $\vee$ **in the bathroom**)

If *all* subdomains are competitors, on top of the anti-exhaustivity implicatures in (68b) (repeated below in (71)) we should get the anti-exhaustivity implicatures in (72).

      $\Diamond$ (**in the bedroom**) $\rightarrow$ $\Diamond$ (**in the kitchen** $\vee$ **in the bathroom**)
(71) $\Diamond$ (**in the living room**) $\rightarrow$ $\Diamond$ (**in the bedroom** $\vee$ **in the bathroom**)
      $\Diamond$ (**in the bathroom**) $\rightarrow$ $\Diamond$ (**in the bedroom** $\vee$ **in the living room**)

      $\Diamond$ (**in the bathroom** $\vee$ **in the living room**) $\rightarrow$ $\Diamond$ (**in the bedroom**)
(72) $\Diamond$ (**in the bedroom** $\vee$ **in the bathroom**) $\rightarrow$ $\Diamond$ (**in the living room**)
      $\Diamond$ (**in the bedroom** $\vee$ **in the living room**) $\rightarrow$ $\Diamond$ (**in the bathroom**)

Putting the implicatures in (71) together with the implicatures in (72) and the assertion yields the Free Choice effect (i.e., that *all* rooms are epistemic possibilities). To see why, assume, for instance, that Juan might be in the bedroom or in the living room, but not in the bathroom. The third conditional in (72) would be false.

The picture that emerges from this investigation so far is that different domain shifting constraints (widening versus the anti-singleton constraint) give rise to different modal effects (the Free Choice Effect versus the Modal Variation Effect).

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[29] An anonymous reviewer raises the question of whether domain constraints involve an implicit comparison of domains (i.e., whether they require the domain to be larger or smaller than a contextually determined domain D) or whether they simply impose a condition on the size of the domain. To the best of our understanding, in Kratzer and Shimoyama's (2002) analysis, widening the domain amounts to requiring the domain to be as large as it can possibly be (not necessarily enlarging a previously established domain). Likewise, our anti-singleton constraint requires the domain to be of a particular size (bigger than a singleton).

In the cases that we have looked at so far, the Modal Variation component conveys ignorance about the identity of the individual satisfying the existential claim. Notice, however, that in all the scenarios that we have considered, there was at most one individual that could satisfy the existential claim in a given world (Juan can only be in one room in a given world (at a given time), and María can only marry one student at a given time). The following section shows that in cases where uniqueness cannot be taken for granted, the Modal Variation component conveys ignorance with respect to the number of individuals satisfying the existential claim.

5 Non-uniqueness

In all the examples that we have discussed so far, uniqueness is either forced or strongly suggested by world knowledge (Juan can only be in one room at at time, Mary is likely to only marry one person at a given time). Consider now the example in (73) below, which is compatible with non-uniqueness. (There could in principle be more than one fly in the soup.)

(73)   Hay   alguna   mosca   en   la   sopa.
       There is   ALGUNA   fly   in   the   soup

This sentence conveys that there is at least one fly in the soup but that the speaker is not sure how many. In contexts where uniqueness is not taken for granted, then, *algún* can trigger the inference that the speaker does not know how many individuals satisfy the existential claim. The sentences in (74) illustrate this 'ignorance of number' component further. The sentence in (74a) says that the speaker's car has some unspecified number of dents, and (74b) indicates that Juanito has some baby teeth, but the speaker is not sure how many.[30]

(74)   a.   Mi   coche   tiene   algún   abollón.
            My   car   has   ALGÚN   dent
       b.   Juanito   todavía   tiene   algún   diente   de   leche.
            Juanito   still   has   ALGÚN   tooth   of   milk

The 'ignorance with respect to number' component is a conversational implicature. First, it disappears in downward entailing environments: The example in (75a), for instance, just means that the soup is 'fly-less', and cannot be interpreted as conveying that the speaker *knows* how many flies the soup has. Second, this component can be cancelled, as illustrated by (75b). Third, it can be reinforced without redundancy, as in (75c).

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[30] In this respect, *algún* patterns with Italian *qualche*. According to Zamparelli (2007), *qualche* is compatible with both a plural and a singular interpretation. Like *algún*, *qualche* seems to convey ignorance with respect to the identity of the witness when singular, and ignorance with respect to the number of witnesses on its plural interpretation. However, the two determiners do not seem to have exactly the same distribution. A detailed investigation of the differences between *algún* and *qualche* is likely to contribute important insights into the typology of modal indefinites. We hope to undertake this task in future research.

(75) a. No   es   verdad que   haya   alguna mosca en   la   sopa.
          not   is   true   that   there is ALGUNA mosca in   the soup
      b. Hay   alguna mosca en   la   sopa ... De hecho, hay
          there is   ALGUNA fly   in   the soup ... In fact,   there are
          tres.
          three
      c. Hay   alguna mosca en la   sopa, pero no   sé   cuántas.
          there is   ALGUNA mosca in the soup, but   not know:1s   how many

Given the assumptions that we are making, this implicature can be derived as
follows: A singleton domain could have triggered the exhaustivity inference that
(the speaker believes that) there is exactly one individual per world that satisfies the
existential claim:

(76)   In all worlds compatible with what the speaker believes, there is *only one*
        fly in the soup.

The hearer may infer that the speaker chose an anti-singleton indefinite to prevent
her from concluding (76). This could be because

(a)   the speaker believes that there's more than one fly in the soup, but doesn't
       know how many;
(b)   the speaker believes that there's more than one fly in the soup and knows
       exactly how many; or
(c)   the speaker believes that there is at least one fly in the soup but does not know
       how many flies there are.

Possibility (a) is ruled out by the competition with the sentence in (77), which
explicitly conveys that there is more than one fly in the soup.

(77)   Hay   moscas en   la   sopa
        there are flies   in   the soup

Possibility (b) is out because if the speaker knew exactly how many flies there are
in the soup, then, assuming that this information is relevant, he would have used a
numeral, as in (78).

(78)   Hay   tres   moscas en   la   sopa
        there are three   flies   in   the soup.

This leaves us with possibility (c), which is the inference that we are trying to
derive.[31]

The crucial difference between examples like (73) and the cases discussed in the
previous sections is that in those earlier cases it is assumed that only one individual

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[31] Zamparelli (2007) claims that the plural interpretation of *qualche* arises from competition with *un*,
cardinal numbers and vague quantifiers. On his view, this competition only arises when *qualche* is
interpreted in a particular syntactic position within a DP (NumP). A comparison between Zamparelli's
proposal and ours is beyond the scope of this work.

can satisfy the existential claim in a given world. Computing the 'ignorance with respect to number' component would yield a conflict with the common ground. In examples that in principle do not require uniqueness, both implicatures are possible, and which one we get depends on the contextual assumptions we are making. Consider, for instance, (79) below:

(79) Vino   algún   estudiante.
      came   ALGÚN   student

Our system derives two possible strengthened meanings. When it is assumed that only one student came, we get the inference that the speaker does not know who that student was. If uniqueness is not assumed, the sentence can convey that the speaker does not how many students came. Both readings are attested. Suppose, for instance that both A and B passed by Juan's office and saw Juan talking to a young man. B knows that this man is a student of Juan's. In that context, if A asks B who came to Juan's office, and B answers with (79), B's answer will naturally convey that he is ignorant about the identity of the student who came to Juan's office. Suppose now that B utters the sentence in (79) as an answer to the question of whether a lot of people came to the party. In this case, B would be understood as saying that he doesn't know how many students came to the party.

The 'ignorance with respect to number' implicature is not available for *irgendein* or *uno qualsiasi*. The sentence in (80a), for instance, can only be interpreted as saying that there is exactly one fly in the soup (and the speaker does not know which one).[32] As a result, (80a) is odd, much as the example in (80b), due to Strawson, which "... with its suggestion of a possible identification of the wasp in question seems absurd.'' (Strawson 1974, pp. 110–111).

(80) a. Da   ist   irgendeine   Fliege   in   der   Suppe.
          there is   IRGENDEINE   fly   in   the   soup
      b. I've been stung by some wasp.   (Strawson 1974, pp. 110–111)

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[32] An anonymous reviewer points out that the sentence in (i) does not commit the speaker to the belief that there is exactly one spice in the soup that she doesn't like. We would like to point out that *un* behaves like *irgendein* in this example. Normally, *un* conveys an 'exactly one' component, but the sentence in (ii) is fine in a context in which the speaker is not assuming that there is exactly one spice that she doesn't like (intonation may play a role here).

(i)   Da   ist irgendein   Gewürz   an   der   Suppe,   das   ich   nicht   mag.
      there is   IRGENDEIN spice   in   the   soup   which   I   not   like
      'There is some spice in the soup that I don't like.'

(ii) Hay   una   especia   en   la   sopa   que   no   me   gusta.
      there is UNA spice   in   the soup   that not to me   likes
      'There is some spice in the soup that I don't like.'

One could think about these examples in the following way: suppose that the 'exactly one' component of indefinites like *un* and *irgendein* is a scalar implicature (these indefinites have an 'at least' meaning and compete with numerals: see Heim 1991). In this scenario, the speaker is tasting a soup and she identifies a taste that she doesn't like. Unless she has an extremely delicate palate, she cannot plausibly be sure of how many spices are causing the unpleasant taste. Thus, the speaker is not well informed with respect to the quantity of spices involved, and the inference doesn't go through.

Table 1 Predicted typology of indefinites

	Widening	Anti-singleton
Uniqueness	1: *irgendein*, *uno qualsiasi*	2: ?
	[Free Choice, no ignorance wrt number]	[Modal variation, no ignorance wrt number]
Non-uniqueness	3: ?	4: *algún*
	[Free Choice, also wrt number]	[Modal variation, ignorance wrt number]

Our account of the contrast between *irgendein* and *algún* makes some typological predictions, and raises a number of issues for further research. We will briefly discuss these in the next section.

6 Issues for further research

In the analysis that we have presented, the contrast between *irgendein*-type and *algún*-type indefinites comes about through the interaction of two parameters: uniqueness versus non-uniqueness, and anti-singletonness versus widening. Indefinites like *irgendein* require uniqueness and widen the domain (Kratzer and Shimoyama 2002); indefinites like *algún* are compatible with non-uniqueness and impose an anti-singleton constraint. Given the two parameters that we have identified, we would in principle expect two other types of indefinites to be attested: (i) anti-singleton indefinites that impose uniqueness, and (ii) domain wideners that do not require uniqueness. The former class of items would exhibit a Modal Variation effect, and no ignorance with respect to number. The latter should be able to convey Free Choice or ignorance with respect to number, depending on the context. The predicted typology is summarized in Table 1.

The possibility in cell 4 of the table may be exemplified by Italian *qualche*, which according to Zamparelli (2007) can convey ignorance with respect to the number of witnesses as well as an 'epistemic Free Choice Effect' (Alonso-Ovalle and Menéndez-Benito 2003). Further research is needed to determine whether other modal indefinites fit in the proposed typology.

This typology also raises the issue of whether the parameters above might have additional values. First of all, are there indefinites that impose domain constraints that result in yet more modal effects?[33] Second, are there indefinites that trigger an anti-uniqueness requirement? The first question will have to be left for future research. As for the second, while we cannot provide a full-fledged answer, we would like to offer some preliminary remarks. The plural forms of *irgendein* and *algún*, *irgendwelche* and *algunos*, do require anti-uniqueness (see Martí 2007 on *algunos*): the sentences in (81a) and (81b) are true only if Juan lives with two or more students.

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[33] A related question is whether there are indefinites that do not impose any domain constraints. Spanish *un* and English *a* seem to belong to this category.

(81)   a.   Juan   wohnt   mit   irgendwelchen   Studenten   aus   dem
            Juan   lives   with   IRGENDWELCHEN   students   in   the
            Institut zusammen.
            department
            'Juan lives with some students from the department.'
       b.   Juan   vive   con   algunos   estudiantes   del   departmento.
            Juan   lives   with   ALGUNOS   students   of-the   department
            'Juan lives with some students from the department.'

Given what we have claimed, one would expect *irgendwelche* and *algunos* to convey ignorance with respect to groups, just as their singular forms convey ignorance with respect to atomic individuals. That is, the sentences above should be appropriate only if the speaker does not know exactly what group of students Juan is living with. According to our consultants, the German sentence in (81a) behaves as expected: it conveys that the speaker does not know who Juan is living with. Thus, a continuation with *namely*, as in (82a) below, is deviant. In contrast, the sentence in (81b), with *algunos*, does not convey ignorance with respect to the students that Juan is living with, as the acceptability of (82b) below shows. Investigating the puzzling behavior of *algunos* will likely shed new light on the typology of modal indefinites, as well as on the semantics of plural morphology. We hope to be able to undertake this investigation in future research.

(82)   a.   # Juan   wohnt   mit   irgendwelchen   Studenten   aus   dem
            Juan   lives   with   IRGENDWELCHEN   students   in   the
            Institut zusammen   und zwar   mit   Peter   und   Sally.
            department,   namely   with   Peter   and   Sally
            'Juan lives with some students in the department, namely Peter and
            Sally.'
       b.   Juan   vive   con   algunos   estudiantes   en   el   departmento,
            Juan   lives   with   some   students   in   the   department,
            en concreto   Pedro   y   María.
            namely   Pedro   and   María
            'Juan lives with some students in the department, namely Pedro and
            María.'

7 To conclude

We have shown that in contexts that require uniqueness, *algún* conveys that there are at least two individuals that can satisfy the existential claim (Modal Variation). When uniqueness is not taken for granted, *algún* may also express ignorance with respect to number. In our proposal, both inferences come about because *algún* imposes an anti-singleton constraint on its domain of quantification.

On this analysis, different modal inferences can be traced back to different domain shifting constraints: the Free Choice effect is due to domain widening

(Kratzer and Shimoyama 2002), and the Modal Variation component, to the anti-singleton constraint. This supports a view, suggested by several recent studies, according to which the semantics of determiners is crucially linked to domain shifting operations (see for instance Matthewson 2001; Kratzer 2005; Giannakidou 2004; Etxebarria and Giannakidou 2007.)

By describing and analyzing the contrast between *irgendein*-type indefinites and *algún*, this research has deepened our understanding of the behavior of modal indefinites. In future research, we hope to be able to investigate how other modal indefinites discussed in the literature fit into the picture we have sketched here.

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