Another Look at Indefinites in Islands

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[Submitted. Comments are welcome.]

Abstract

This paper contributes to the semantic typology of indefinites by presenting experimental evidence on the scopal behavior of the Spanish indefinites *un* and *algún*, and by discussing the theoretical implications of these data.

Two off-line experiments investigate exceptional scope in relative clauses and in conditionals. These studies show that while in relative clauses exceptional scope is possible for both indefinites (although it is harder for *algún*), in conditionals, exceptional scope is blocked for *algún* and available (but difficult) for *un*. The difference between the two types of islands is challenging for most theories of scope, which predict any indefinite to have the same scopal properties across islands.

We propose an account cast within Kratzer and Shimoyama's 2002 alternative semantics, in which indefinites denote sets of alternatives that expand until they meet an appropriate operator. The 'scope' of an indefinite extends up to the position occupied by the operator. To account for the contrast between the two islands, we claim that conditionals introduce an operator that blocks alternative expansion (Alonso-Ovalle, 2006) but relative clauses allow alternatives to project further up. The difference between the two indefinites is attributed to the fact that *un* can be a singleton indefinite, in the sense of Schwarzschild (2002) but *algún* is a domain widener (Alonso-Ovalle and Menéndez-Benito, 2003).

1   Introduction

The scopal behavior of indefinites has been an active topic of research in formal semantics at least since the early eighties. By now, it is well known that some

indefinites display scope properties that are unavailable to run-of-the-mill quantifiers (see Fodor and Sag 1982; Farkas 1981; King 1988; Abusch 1993-1994; Cresti 1995; Kratzer 1998; Matthewson 1999; Reinhart 1995, 1997; Ruys 1992 and Winter 1997, among others.) There are certain syntactic environments ("syntactic islands") which limit the scope of quantifiers. Relative clauses and the antecedent of conditional are among them, as illustrated by (1) and (2) below: the sentence in (1a) cannot be paraphrased as in (1b), where the quantifier phrase *each of the six candidates* scopes out of the relative clause; (2a) cannot be read as in (2b), where *each of the six candidates* scopes out of the conditional.

(1) a. John read the paper that each of the six candidates had submitted.
     b. ≠ For each of the six candidates: John read the paper that she submitted.

(Schwarzschild, 2002)

(2) a. If each of the six candidates submits a paper, then John will recuse himself.
     b. ≠ For each of the six candidates: if she submits a paper, then John will recuse himself.

(Schwarzschild, 2002)

The situation is different for indefinites like English *a* and *some*. The classic examples in (3) below show that these indefinites can be interpreted as if they had scoped out of *if*-clauses and relative clauses. The sentence in (3a) can convey that there is a certain friend of the speaker's whose death would have resulted in the speaker inheriting a fortune, the sentence in (3b), that there is a particular poem by Pindar such that every student who recited it got a prize, and the sentence in (3c) that there is some condition proposed by Chomsky for which all students must propose three solutions. The sentence in (3c) can also be read as if *some* had intermediate scope (narrower than the scope of *each student* but wider than the scope of *three arguments*): it can convey that for each student there is a certain proposal by Chomsky that he or she must show to be flawed.

(3) a. If a friend of mine had died in the fire, I would have inherited a fortune.

(Fodor and Sag, 1982)

     b. John gave an A to every student who recited a difficult poem by Pindar.

(Farkas, 1981)

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    c. Each student has to come up with three arguments that show that some condition proposed by Chomsky is wrong.

<div align="right">(Farkas, 1981)</div>

Not all indefinites behave alike with respect to exceptional scope, though. Focusing just on English, we see that while *some* and *a* can have narrow, wide, or intermediate scope readings, *a certain* can only have wide or intermediate scope (Kratzer 1998; Hintikka 1986), *at least n* indefinites resist exceptional wide scope (Liu 1997; Beghelli 1993; Kratzer 1998; Szabolcsi 1995) and bare plurals can only have the narrowest possible scope. Recent work has further shown that, in other languages, indefinites also differ amongst them with respect to their scope possibilities (see, for instance, Matthewson 1999 on Lilloet Salish, Farkas 2002 on Romanian, Yanovich 2005 on Russian, Lin 2004 and Kim 2004 on Mandarin Chinese, and Martí 2007 on Spanish.) Investigating the behavior of yet more indefinites across languages will be crucial to develop a fully comprehensive theory of exceptional scope.

The investigation of the scope properties of indefinites has often relied on generalizations drawn on the basis of the researcher's own intuitions. Unfortunately, judgments in this area have proved to be extremely hard, as the history of the research on this topic illustrates: Fodor and Sag's seminal paper (Fodor and Sag, 1982), for instance, explicitly denied the existence of intermediate scope readings, only to be followed by a number of studies showing that these readings were in fact possible (see, among others, Farkas 1981 and King 1988). Quite recently, some experimental work on indefinite scope has seen the light: Frazier and Bader (2007) discuss four experiments on the availability of reconstructed scope for three German indefinites (*ein*, *irgendein* and the existential generalized quantifier *mindestens ein*), and Martí (2007) investigates the scope possibilities of the Spanish plural indefinite *algunos*.[1] The conclusions of the latter study go against previous descriptions of the behavior of *algunos* which were based only on intuitions: Martí's experiment shows that the scope of *algunos* is restricted by syntactic islands, unlike what had been claimed in Martí 2005, Gutiérrez-Rexach 1999a,b and Gutiérrez-Rexach 2001. This suggests that we must use experimental work to find out whether there are general reliable scopal patterns. In discussing the results of her study, Martí explicitly calls for more experimental research on the scope of indefinites. She suggests "that we review and test experimentally our empirical generalizations about the scope of indefinites in other languages, and

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[1]See Frazier and Bader 2007 for an overview of previous psycholinguistic studies on quantifier scope.

other indefinites in Spanish, perhaps following methodology similar to the one used here and in other (experimental) work on scope . . . "(Martí, 2007, 18). The present work can be seen as a response to this call.

This paper presents two experiments on the scopal behavior of the Spanish indefinites *un* and *algún*. The results show that the availability of exceptional scope readings varies with the type of indefinite and with the type of syntactic island: while in relative clauses intermediate scope is possible for both *un* and *algún* (although it is harder for *algún*), in conditionals it is impossible for *algún* and possible (although hard) for *un*. The contrast between relative clauses and conditionals is surprising from the standpoint of well-known theories of indefinite scope, which predict the scope properties of any given indefinite to be constant across types of islands. We will argue that Kratzer and Shimoyama's alternative semantics for indefinites (Kratzer and Shimoyama, 2002) provides us with the right tools for explaining these puzzling results.[2]

The paper is organized as follows. Section 2 presents Experiment 1, a study that looks at the availability of intermediate scope readings for *un* and *algún* in relative clauses and embedded conditionals. Sections 3 and 4 put forth our analysis of the results, and lay out some of its predictions. Section 5 reports a second study which tests these predictions. Finally, section 6 concludes by discussing an open issue and summarizing the main results.

2   Experiment 1

Experiment 1 is motivated by the theory of exceptional scope presented in Schwarzschild 2002. Schwarzschild claims that indefinites are quantifiers, and, that, therefore, their scope is limited by syntactic islands. Apparent island violations result from restricting the domain of the indefinite to a singleton set. The Spanish indefinites *un* and *algún* provide an ideal testing ground for Schwarzschild's theory, because, as we will see below, narrowing the domain down to a singleton is possible with *un*, but not with *algún*. Thus, Schwarzschild's account predicts

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[2]As noted above, Martí (2007) shows that the scope of the plural indefinite *algunos* is constrained by a wide range of syntactic islands. Furthermore, her data suggest that wide scope readings are harder in the conditional case. This reflects the same type of difference found in our studies. However, it is not clear to which extent we can draw a comparison between her data and ours: Alonso-Ovalle and Menéndez-Benito (2007) have found several semantic differences between singular *algún* and plural *algunos* that go beyond what we would expect if *algunos* is simply the plural version of *algún*.

that *un* will be able to get exceptional scope, but *algún* will not. Experiment 1 tests this prediction by looking at the availability of intermediate scope readings for *un* and *algún* in two types of islands: relative clauses (subexperiment 1A) and the antecedent of conditionals (subexperiment 1B).

This section is organized as follows: section 2.1 presents Schwarzschild's theory, section 2.2 shows that only *un* can range over a singleton, and section 2.3 discusses Experiment 1.

2.1   Schwarzschild 2002

Schwarzschild (2002) takes indefinites to be existential quantifiers. Their scope, just like that of any other quantifier, is constrained by islands. Apparent cases of exceptional scope are instances of scope-neutralization. To see how scope neutralization may come about, consider the following example.

(4)   Everyone at the party voted to watch a movie that Phil said was his favorite.

(Schwarzschild, 2002)

If indefinites are quantifiers with existential force, (4) will be true if and only if for every individual that was at the party, there is a movie that Phil said was his favorite and which that individual voted to watch. Suppose that Phil only said of one movie, namely "Casablanca", that it was his favorite. Then, the domain of quantification of the indefinite in (4) will be the singleton set in (5) below.

(5)   {"Casablanca"}

Given this, sentence (4) will be true if and only if for every individual that was at the party there is a movie in the set in (5) which that individual voted to watch. In other words, (4) will be true if and only if there is a particular movie that everyone in the party voted to see. Restricting the domain of the indefinite to a singleton results in scope neutralization.

For an indefinite to range over a singleton, there need not be an explicit domain restriction, as in the case of the sentence in (4). We can get a singleton domain via contextual restrictions. Consider, for instance, the indefinite in (6).

(6)   Everyone at the party voted to watch a movie that Phil liked.

(Schwarzschild, 2002)

If Phil likes more than one movie, the NP *movie that Phil likes* does not denote a singleton set. However, it is well-known that quantifiers can be contextually restricted. When uttering, for instance, the sentence in (7), we do not mean to talk about everybody in the whole world, but rather about all the individuals with a contextually relevant property (say, all individuals that were at my birthday party yesterday.) Following much research, we will assume that quantifiers restrict their domain with the help of an implicit resource domain variable (represented by C in (7b)) whose value is determined by the context (see von Fintel 1994, Stanley and Szabó 2000 and Martí 2003, among others).

(7) a. Everybody had a good time.
     b. Everybody$_C$ had a good time.

Indefinite noun phrases, like other quantifiers, can be contextually restricted. The truth-conditions of the sentence in (6), for instance, will be represented as in (8). That is, the sentence in (6) will be true if and only if for every x that was at the party, there is a movie y that Phil liked, which also has the property picked up by the resource domain variable C, and x voted to watch y.

(8) $\forall x[\textbf{at-the-party}(x) \rightarrow \exists y[\textbf{movie}(y) \,\&\, \textbf{liked}(\textbf{Phil}, y) \,\&\, C(y) \,\&\, \textbf{voted}(x,y)]]$

Assume now that we evaluate the sentence in (6) with respect to a variable assignment g that maps C to the set of Woody Allen's movies, and assume, furthermore, that there is only one Woody Allen movie that Phil liked, say "Annie Hall". In this context, the indefinite in (6) will be a singleton indefinite. The sentence in (6) would then be true in that particular context if and only if there is a particular movie that everyone at the party voted to watch. Again, we get scope neutralization.

Scope neutralization can also yield apparent intermediate scope readings. To see how, consider now the sentence in (9).

(9) Every member of the club was convinced that if a friend of his from Texas had died in the fire, he would have inherited a fortune.

<div align="right">(von Fintel, 2000)</div>

The sentence in (9) can be interpreted as if the indefinite had intermediate scope (scope under the universal quantifier in subject position, but over the conditional): it can convey that every member of the club is convinced that she would have inherited a fortune if a particular friend of hers from Texas had died in the fire. According to Schwarzschild, to get this reading, we consider, for every member of

the club, a set containing only one of her friends. That is, we consider a singleton set for each value of the variable bound by the higher quantifier. This, Schwarzschild maintains, is no different from what happens with other quantifiers. The implicit restriction of quantifiers may contain a bound variable (see, e.g., von Fintel 1994 and Stanley and Szabó 2000). A case at point is the sentence in (10).

(10)   Only one class was so bad that no student passed the exam.
                                        (Heim 1991; quoted in von Fintel 1999)

The domain of the quantifier *no student* in (10) varies with the classes that *only one class* ranges over. The sentence conveys that there is only one class *x*, such that no student in *x* passed the exam. We can capture that reading by assuming that the domain resource variable ranges over functions mapping a class x to the set of students in x, as in (11) below.

(11)   Only one class *x* was so bad that no$_{C(x)}$ student passed the exam.
                                        (Heim 1991; quoted in von Fintel 1999)
        (intended value of *C*: the function $f_{\langle e,\langle e,t\rangle\rangle}$ that takes a class and yields the students in that class (see von Fintel 1999).)

Likewise, the indefinite in (9) can be restricted by a function mapping each member of the club to a set containing only one her friends. Given that restriction, for (9) to be true it has to be the case that for each member of the club *x*, there is a particular friend of *x* from Texas, such that if that friend had died in the fire, *x* would have inherited a fortune. This gives us the 'intermediate scope' reading.

(12)   For every member of the club *x*: *x* was convinced that if a friend of *x* from Texas in *C*(*x*) had died in the fire, *x* would have inherited a fortune.
                                        (von Fintel, 2000)
        (intended value for *C*: the function $f_{\langle e,\langle e,t\rangle\rangle}$ that takes members of the club and returns a singleton containing only one of his friends).

2.2   *Un* Can be a Singleton Indefinite, *Algún* Cannot

Schwarzschild's account predicts that if an indefinite cannot have a singleton domain, it will not display exceptional scope properties. Spanish *algún* seems to be such an indefinite. Following Kratzer and Shimoyama's analysis of German *irgendein* (Kratzer and Shimoyama, 2002), Alonso-Ovalle and Menéndez-Benito (2003) claimed that *algún* is a "domain widener", in the terminology introduced

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by Kadmon and Landman 1993. That is, *algún* forces us to consider the widest possible domain compatible with the noun phrase that it combines with. If this analysis is on the right track, we expect that the domain of *algún* will never be a singleton. This seems to be the case, as illustrated by the examples below.

Suppose that Juan has only said of one movie that it was his favorite, and suppose further that all my friends watched that movie yesterday. While the sentence in (13a), with *un*, can appropriately describe that situation, the sentence in (13b) cannot do so.[3] We take this contrast to indicate that restriction of the domain to a singleton set is possible with *un* but not with *algún*.

(13) a. Ayer   mis   amigos   vieron   una película que Juan dijo que
          Yesterday, my:PL friend:PL watched a   movie   that Juan said that
             era su favorita.
          pro was his favorite.

          'Yesterday, my friends watched a movie that Juan said was his favorite.'

      b. # Ayer   mis   amigos   vieron   alguna   película que
            Yesterday, my:PL friend:PL watched ALGÚN:FEM movie   that
          Juan dijo que   era su favorita.
          Juan said that pro was his favorite.

          'Yesterday, my friends watched a movie that Juan said was his favorite.'

The sentences in (14) illustrate the same point. The noun phrase *libro que era el más caro de la librería* denotes a singleton set (since only one book can be the most expensive in the bookstore). Combining that noun phrase with *un*, as in (14a), yields a perfectly acceptable sentence, but combining it with *algún* results in oddity, as (14b) illustrates.

(14) a. Ayer   Juan compró un libro que era el más caro   de la
          Yesterday Juan bought a   book that was the most expensive in the
          librería.
          bookstore

          'Yesterday, Juan bought a book that was the most expensive in the bookstore.'

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[3]For some of our consultants, (13b) improves if the speaker explicitly says that she does not know which film Juan said to be the one that is his favorite.

b. # Ayer   Juan compró algún   libro que era el más caro
Yesterday Juan bought ALGÚN book that was the most expensive

de la   librería.

in the bookstore

'Yesterday, Juan bought a book that was the most expensive in the bookstore.'

The contrasts above indicate that *un* can be a singleton indefinite, but *algún* cannot. Thus, under Schwarzschild's analysis, we expect that exceptional scope readings will be available only with *un*. Experiment 1 tests this prediction in two islands: relative clauses and the antecedent of embedded conditionals.
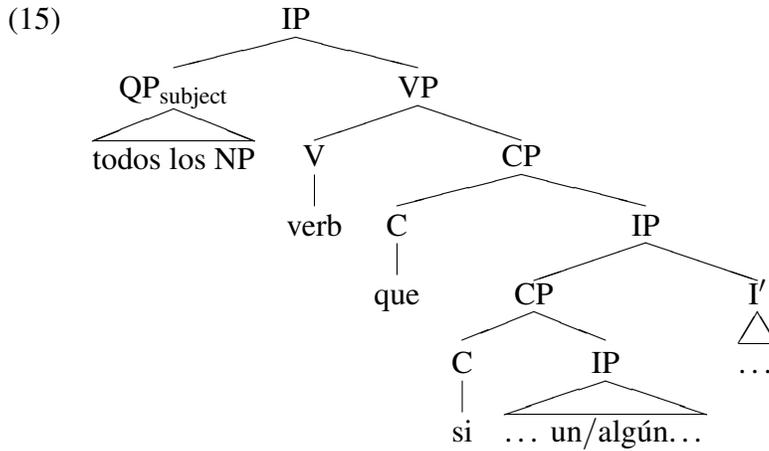
2.3 Experiment 1

2.3.1   Materials and Procedure

An off-line questionnaire was prepared in which target sentences were preceded by a paragraph describing a scenario. Subjects were asked whether the target sentences were appropriate descriptions of the preceding scenarios. The questionnaire comprised two subexperiments, with ten experimental items each.[4] Subexperiment 1A looked at *un* or *algún* in the antecedent of embedded conditionals, and subexperiment 1B in relative clauses.

Subexperiment 1A.   The ten experimental items used in subexperiment 1A featured the universal quantifier *todos los NP* in subject position and a conditional embedded under an attitude verb (*pensar* 'to think', *creer* 'to believe', *decir* 'to say'). The tree in (15) below shows the structure of these items and (16) provides a sample item.

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[4]The full list of experimental items is available from the authors' webpages: http://people.umass.edu/paulamb and http://www.alonso-ovalle.net.

(15)

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                        IP
          ┌─────────────┴──────────────┐
     QP_subject                        VP
      ┌──┴──┐              ┌────────────┴────────┐
  todos los NP             V                     CP
                           │           ┌─────────┴────────┐
                          verb         C                  IP
                                       │          ┌────────┴──────┐
                                      que         CP              I′
                                            ┌─────┴─────┐         △
                                            C          IP        …
                                            │      ┌────┴────┐
                                            si  … un/algún…
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(16)   a. C1: Todos los   investigadores piensan que si   envían
               all   the:PL researcher:PL think   that if pro send:3PL

           algún   artículo suyo,   conseguirán la beca.
           ALGÚN article   of them, pro will get   the fellowship.

           'All the researchers think that if they send a paper of theirs, they will
           get the fellowship.'

       b. C2: Todos los   investigadores piensan que si   envían   un
               all   the:PL researcher:PL think   that if pro send:3PL UN

           artículo suyo,   conseguirán la beca.
           article   of them, pro will get   the fellowship.

           'All the researchers think that if they send a paper of theirs, they will
           get the fellowship.'

The experimental items were presented in two conditions: in condition 1, the antecedent of the conditional contained *algún*, and in condition 2, *un*. Half of the items with *un* contained the partitive version *uno de los*, and half of the items with *algún*, its partitive version *alguno de los*. All the indefinite noun phrases contained a bound variable pronoun (we wanted to give as many chances as possible to the intermediate reading, and bound variable pronouns have been reported to facilitate this reading (see Kratzer 1998).

The scenario accompanying each sentence was the same in both experimental conditions, and forced an intermediate scope reading for the indefinite. The scenario preceding the items in (16) above follows.

(17)   Para solicitar la beca de investigación del Ministerio es necesario enviar
       un artículo inédito. Cada uno de los investigadores cree que uno de sus

artículos inéditos es muy bueno y piensa que si envía ese artículo (pero no si envía cualquier otro) conseguirá la beca.

'To apply for the Government Research Fellowship it is necessary to send an unpublished article. Each of the researchers thinks that one of her unpublished articles is very good, and that if she sends that article (but not if she sends any other article) she will get the fellowship.'

Between the scenario and the target sentence, subjects were presented with a question asking whether the sentence was an appropriate description of the preceding context. Subjects were asked to answer by circling either 'yes' or 'no'.

(18) ¿Crees que la oración siguiente es una descripción apropiada de esta situación? Sí / No.

'Do you think the following sentence is an appropriate description of this situation? Yes / No.'

Subexperiment 1B. The ten experimental sentences of subexperiment 1B featured the universal quantifier *todos los NP* both in subject and object position. The indefinites were inside a relative clause within the object QP, as shown in (19) below.

(19)
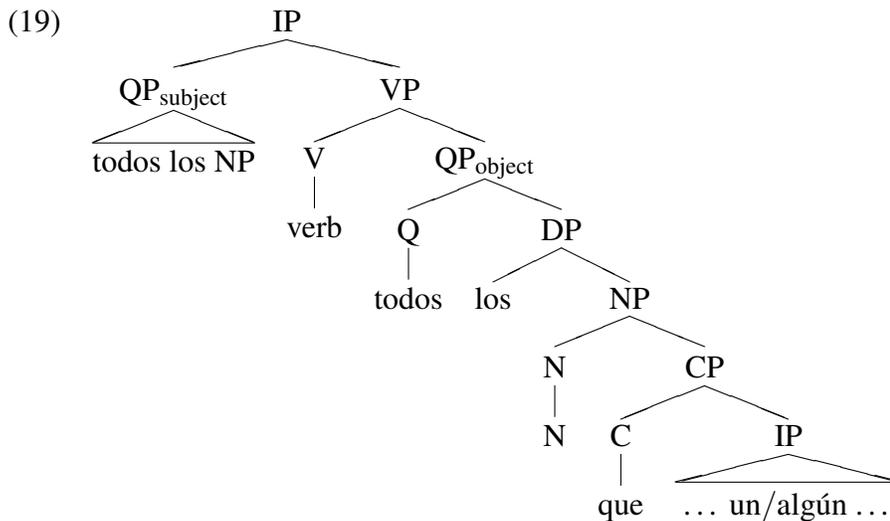
Each experimental item came in two versions. In the first version (condition 1) the relative clause contained *algún*, and in the second version (condition 2), *un*. A sample item is provided below.

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(20) a. C1: Todos los   profesores de lengua   enviaron al   concurso
           all   the:PL teacher:PL of language sent:3PL TO-THE contest
de redacción todos los   trabajos que les   había entregado
of writing   all   the:PL paper:PL that TO-THEM had   given
algún   alumno suyo.
ALGÚN student of-them.

'All the language teachers sent to the writing contest all the papers that they had got from a student of theirs.'

b. C2: Todos los   profesores de lengua   enviaron al   concurso
           all   the:PL teacher:PL of language sent:3PL TO-THE contest
de redacción todos los   trabajos que les   había entregado
of writing   all   the:PL paper:PL that TO-THEM had   given
un alumno suyo.
UN student of-them.

'All the language teachers sent to the writing contest all the papers that they had got from a student of theirs.'

Half of the items with *un* featured the partitive version *uno de los*, and half of the items with *algún*, its partitive version *alguno de los*. As before, all the indefinite noun phrases contained a bound variable pronoun.

The items were preceded by a paragraph describing a scenario. The paragraph was the same for both conditions, and it described a situation that made the intermediate scope reading true, and the narrow scope reading false. The paragraph in (21) below is the context corresponding to the item in (20a) above.

(21) Cada uno de los profesores de lengua prefiere a un alumno diferente y ha enviado al concurso de redacción todos los trabajos que le entregó ese alumno. Ningún profesor envió al concurso ningún trabajo aparte de los de su alumno preferido.

'Each language teacher prefers a different student and has sent all the papers that that student had given her to the writing contest. No teacher sent any papers other than her favorite student's to the contest.'

As before, subjects were presented with a question asking whether the sentence was an appropriate description of the preceding context.

Pilot study. Additionally, each questionnaire included a small pilot experiment with four experimental items, each of which consisted of a sentence with a blank

and a context. Subjects were asked to say which of the two indefinites, *un* or *algún*, would be more appropriate in the blank, and whether the dispreferred indefinite was still possible. Two of the experimental sentences were of the form of the experimental sentences used in subexperiment 1A, and the other two were of the form of the experimental sentences used in subexperiment 1B. As in the two experiments described above, the context forced the intermediate scope reading of the indefinite. A sample item follows.

(22) a. Los estudiantes de literatura han escrito varios trabajos a lo largo del curso. Cada uno de ellos piensa que si envía el trabajo que más le gusta a la revista de la universidad se lo publicarán, y cree que si envía cualquiera de los otros se lo rechazarán.

'The literature students have written several papers throughout the year. Each of them thinks that if she sends the paper that she likes the most to the University journal, they will publish it, and believes that if she sends any of the others, they will reject it.'

b. Todos los estudiantes de la clase de literatura piensan   que si
all   the:PL student:PL of the class of literature think:3PL that if
envían   ___ trabajo suyo   a la revista de la universidad   se
send:PL ___ paper   of-them to the journal of the university   pro SE
lo publicarán.
it will publish:3PL

'All the students in the literature class think that if they send a paper of theirs to the university journal, it will get published.'

This pilot experiment was included in case the comparative judgment turned out to be more sensitive. Since the pilot was at the end of the questionnaire, there was no risk that the comparative judgement would contaminate the other data.

Materials were fully counterbalanced, so that each subject saw each experimental item in only one condition. The experimental items were interspersed with twenty fillers. Like the experimental items, fillers consisted of a context, a target sentence, and a question asking subjects whether the target sentence was an appropriate description of the preceding context.

The experimental materials were preceded by a set of instructions, in which subjects were asked to read the contexts carefully and to follow their first intuition when answering questions. As practice, before completing the questionnaire, the subjects were asked whether the sentence in (23) was appropriate in a context forcing a sloppy reading (in which Pedro told his own mom about the discussion)

and in a context forcing a strict reading (in which Pedro told María's Mom about the discussion).

(23)   María habló de la discusión con su madre, y   Pedro también.
        María talked DE the discussion with her Mom, and Pedro too.

        'María talked about the discussion with her Mom, and Pedro too.'

The questionnaires were administered to a group of forty-six undergraduate students of journalism from the University of San Pablo CEU in Madrid. All were native speakers of Iberian Spanish and monolingual. Subjects received no incentive for participating in the experiment.

2.3.2   Results

Table 1 shows the average percentage of 'yes' responses in each condition of subexperiment 1A (*algún* and *un* in conditionals). An ANOVA test was run. The difference between the two conditions was not significant (by subjects F= 0.20, p = .7, by items F= 0.19, p = .7.)

Condition	C1: *algún*	C2: *un*
% of 'yes' answers	14	16

Table 1: *Algún* and *un* in conditionals.

Table 2 shows the average percentage of 'yes' responses in each condition of subexperiment 1B (*algún* and *un* in relative clauses). An ANOVA test was conducted for these results. The difference between the two conditions was highly significant, both by subjects (F= 15.10, p < .001), and by items (F = 25.73, p < .001). (Unfortunately, item number 8 was found defective after doing the experiment (it contained no relative clause). It was removed before doing the statistical analysis, which resulted in a slight imbalance.)

Condition	C1: *algún*	C2: *un*
% of 'yes' answers	33	54

Table 2: *Algún* and *un* in relative clauses.

Table 3 summarizes the results of the pilot experiment included at the end of the questionnaire.[5]

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[5]Given the small number of items tested, we did not do a statistical analysis. The data from two subjects was missing.

	un	*algún*
% of 'yes' (conditionals)	84	16
% of 'yes' (relative clauses)	93	6

Table 3: Pilot experiment

The results of subexperiments 1A and 1B can be summarized as follows: (i) there is no significant difference between *un* and *algún* in the antecedent of conditionals, (ii) there is a highly significant difference between the two indefinites in relative clauses (the number of 'yes' answers is higher for *un* than for *algún*), and (iii) there is a large numerical difference between conditionals and relative clauses (the average number of 'yes' answers is higher in relative clauses than in conditionals for both indefinites.)

Additionally, the pilot experiment shows an overall preference for *un* over *algún*. This agrees with the results of experiment 1B. The results of experiment 1A, however, show no significant difference between *un* and *algún*. The pilot study suggests that there might be one. We will come back to this issue in section 5, where we will present the results of a second study.

2.3.3 Discussion

When interpreting the results, we will take a positive answer to the question of whether a sentence is an appropriate description of the preceding context to indicate that the sentence was true in the given context. Since our contexts always force the intermediate scope reading of the indefinite, a positive answer tells us that the intermediate scope reading is available for the sentence in question.

Recall what the predictions of the initial hypothesis are: According to Schwarzschild, the only way an indefinite can get exceptional scope is by restricting its domain to a singleton set. In section 2.2, we have argued that while *un* can be a singleton indefinite, *algún* cannot. Thus, if Schwarzschild is right, exceptional scope readings should be available for *un* but not for *algún*. We would therefore expect to get a significant difference between *un* and *algún* in both of our subexperiments, with a very low percentage of 'yes' responses for *algún* across the board. Subexperiments A and B, however, yield a different pattern:

1. While in the relative clause experiment (subexperiment 1B) we do see a significant difference between *un* and *algún* that goes in the expected direction (exceptional scope is harder for *algún* than for *un*), the fact that *algún* gets a

33% of 'yes' answers indicates that intermediate readings are available for this indefinite to some extent (assuming that they are not would amount to disregarding a third of our data as noise). The availability of intermediate readings for *algún* is unexpected under the initial hypothesis.

2. The large numerical difference between conditionals and relative clauses suggests that, while intermediate readings are possible for both indefinites in relative clauses, they are impossible (or very hard) in conditionals. According to the initial hypothesis, however, intermediate readings should be available for *un* regardless of the syntactic configuration.

(The results of subexperiment 2A do not allow us to determine whether there is a difference between *un* and *algún* in the antecedent of conditionals. Even though the statistical analysis shows no significant difference between the two indefinites, this could be a floor effect due to the low percentage of 'yes' responses (14 - 16 %).)

Table 4 below shows the mismatch between the predictions and the results ('yes' stands for 'intermediate readings available' and the cells in bold type correspond to the predictions that are not borne out.)

	Predictions		Results	
	Relative Clauses	Conditionals	Relative Clauses	Conditionals
un	yes	yes	yes	**NO**
algún	no	no	**YES**	no

Table 4: Predictions and results for Experiment 1

The difference between relative clauses and conditionals shown in Table 4 is not only challenging for Schwarzschild's hypothesis, but also for most well-known theories of exceptional scope (see, among others, Reinhart 1995; Kratzer 1998; Winter 1997 and Matthewson 1999.) These theories are designed to capture the behavior of indefinites that exhibit the same scopal properties across islands, and hence cannot handle indefinites that are sensitive to island-type without further assumptions. In section 3, we will put forward an account of this puzzling contrast which makes crucial use of the Hamblin semantics for indefinites presented in Kratzer and Shimoyama 2002.

A complete account of the results should also provide an explanation for the difference between *un* and *algún* found in the relative clause experiment. Section 4 will explore the possibility that this contrast has to do with the fact that *algún* is a domain widener.

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3 The Contrast between Conditionals and Relative Clauses

In experiment 1, intermediate readings were found to be possible in relative clauses, but very hard in conditionals. We would like to argue that the proposal put forward in Kratzer and Shimoyama (2002) gives us the tools to handle this surprising difference. In this framework, indefinites introduce sets of alternatives that expand until they meet a suitable operator. The scope of an indefinite will appear to extend until the position occupied by the operator it 'associates' with. Thus, an indefinite will be trapped within a particular syntactic environment only if that environment contains an operator that prevents the alternatives from projecting further up. This setup gives us a way of understanding why different types of islands might differ with respect to indefinite scope: only the islands that contain an operator that stops alternative expansion will appear to limit the scope of indefinites. The difference between conditionals and relative clauses will then be accounted for if the former introduce such an operator (as argued for independently by Alonso-Ovalle (2006)) but the latter do not. This is, we contend, what lies at the heart of the contrast between our two types of islands.

In what follows, we will first present the core features of Kratzer and Shimoyama 2002's framework (section 3.1) and then discuss how the behavior of *un* and *algún* in conditionals and relative clauses can be accounted for within this framework (section 3.2). Section 3.3 presents an alternative explanation that will be taken up in Experiment 2.

3.1 Background

In the Hamblin semantics put forth in Kratzer and Shimoyama 2002, expressions of type τ are mapped into sets of denotations in D_τ. Indefinite noun phrases denote sets of individual alternatives, as illustrated in (24) below for an English *a*-noun phrase.

(24) $[\![\text{a man}]\!]^{w,g} = \{x|\ \mathbf{man}_w(x)\} = \{\text{Juan, Carlos, Pedro} \dots\}$

Other lexical items denote singleton sets that contain their standard denotations. The verb *arrived*, for instance, will denote the singleton containing the property that is true of an individual x in a word w if and only if x arrived in w.

(25) $[\![\text{arrived}]\!]^{w,g} = \{\lambda x \lambda w'.\mathbf{arrived}_{w'}(x)\}$

In this framework, Functional Application is defined pointwise, as in Hamblin (1973): the result of combining an expression α denoting a set of functions of type $\langle \sigma, \tau \rangle$ with an expression β denoting a set of objects of type σ is the set of objects of type τ that we get by applying each of the functions denoted by α to each of the objects denoted by β.

(26) *Pointwise Functional Application*
For any expressions α of type $\langle \sigma, \tau \rangle$ and β of type σ,
$[\![\alpha(\beta)]\!]^{w,g} = \{c \in D_\tau | \exists a \in [\![\alpha]\!]^{w,g} \exists b \in [\![\beta]\!]^{w,g} [a(b) = c]\}$

The individual alternatives introduced by indefinites into the semantic derivation 'expand' (i.e., give rise to alternatives of a higher type) via pointwise functional application. The combination of the indefinite in (24) with the verb in (25), for instance, gives us the set of propositions in (27).

(27) $[\![\text{arrived}]\!]^{w,g}([\![\text{a man}]\!]^{w,g}) =$
$\{p_{\langle s,t \rangle} \mid \exists x[\mathbf{man}_w(x) \ \& \ p = \lambda w'.\mathbf{arrived}_{w'}(x)]\} =$
$\{\text{that Juan arrived, that Carlos arrives, that Pedro arrived, \dots}\}$

Alternatives keep expanding until they meet one of several operators that take sets of propositional alternatives as arguments. The denotation of the sentence in (28), for example, is the result of combining the set of propositions in (27) with the Existential Closure operator in (29), which gives us the (singleton containing the) proposition in (30).

(28) A man arrived

(29) For any set of propositions $\mathbb{A}$: $[\![\exists]\!]^{w,g}(\mathbb{A}) = \{\lambda w'.\exists p \in \mathbb{A} \ \& \ p(w')\}$

(30) $\{\lambda w'.\exists p \in (27) \ \& \ p(w')\} = \{\text{ that at least one man arrived }\}$

Apart from the Existential Closure operator, Kratzer and Shimoyama (2002) consider the propositional operators in (31) below.[6]

(31) For any set of propositions $\mathbb{A}$,
 a. $[\![\forall]\!]^{w,g}(\mathbb{A}) = \{\lambda w'.\forall p[p \in \mathbb{A} \rightarrow p(w')]\}$
 b. $[\![\neg]\!]^{w,g}(\mathbb{A}) = \{\lambda w'.\neg\exists p[p \in \mathbb{A} \ \& \ p(w')]\}$
 c. $[\![?]\!]^{w,g}(\mathbb{A}) =$
 i. $\{\mathbb{A}\}$ (Hamblin, 1973)

---

[6]Kratzer and Shimoyama also introduce operators that range over individual alternatives. In what follows, we will ignore this type of operator.

ii. $\{\lambda w'. \forall p[p \in \mathbb{A} \to (p(w) = p(w'))]\}$ (Groenendijk and Stokhof, 1984)

In the Kratzer and Shimoyama system, some indefinites are non-selective: the propositional alternatives they introduce can be quantified over by any of the operators in (31). This is what we see in the case of Japanese 'indeterminate pronouns', which can have existential, universal, interrogative, negative or free choice readings depending on what operator they associate with. Other indefinites, however, are selective. For instance, Spanish *ningún* is always negative, and Spanish *quién* is always interrogative. In the framework presented above, this amounts to saying that the alternatives generated by *ningún* can only be operated on by $[\neg]$, while the alternatives introduced by *quién* can only be operated on by $[?]$. In the Kratzer and Shimoyama framework, this selectivity is treated as agreement: selective indefinites carry meaningless agreement morphology that signals agreement with matching interpretable operators: *ningún* would agree with a negative operator ($[\neg]$), and *quién* with a question operator ($[?]$).

(32) a. $[\neg] \dots$ *ningún*$_{[\neg]}$
      b. $[?] \dots$ *quién*$_{[?]}$

The alternatives introduced by indefinites can only expand until they meet an operator the indefinite can associate with. We expect, therefore, intervention effects: Given a configuration like (33) below, the alternatives introduced by the indefinite will only be able to associate with Operator 2. If the indefinite must agree with Operator 1, we will get an ungrammatical configuration.

(33) *operator$_1$ operator$_2$ indefinite$_1$
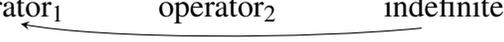
Consider, as illustration, the examples in (34), discussed in Kratzer 2005. The alternatives introduced by *was* must be operated on by the question forming operator. While this is unproblematic in (34a), in (34b) there is an intervening negation operator (*nicht*). This results in an intervention effect, and, thus in ungrammaticality.

(34) a. Wer hat was   nicht gegessen?
         Who has what not   eaten
         'Who didn't eat what?'
      b. * Wer hat nicht was   gegessen?
           Who has not   what eaten
         'Who didn't eat what?'   (Kratzer, 2005)

In what follows, we will present an account of the difference between relative clauses and conditionals found in Experiment 1 which makes crucial use of Kratzer and Shimoyama 2002. The main pieces of the analysis are the following: (i) Both *un* and *algún* are Hamblin indefinites: they introduce sets of alternatives in the semantic computation; (ii) conditionals introduce a universal propositional operator (as argued in Alonso-Ovalle 2006), which stops alternative expansion, hence blocking exceptional scope readings; (iii) relative clauses do not block alternative expansion and, thus, they allow for exceptional scope.

3.2   The Proposal

We will claim that both *un* and *algún* are Hamblin indefinites, in the Kratzer and Shimoyama 2002 sense, and thus, that they both introduce sets of alternatives. In section 2, we saw that *un* and *algún* differ in that *un* can be a singleton indefinite and *algún* cannot. We will assume that the reason the domain of *algún* cannot be restricted to a singleton set is that this indefinite is a domain widener (Alonso-Ovalle and Menéndez-Benito (2003)). In the current framework, this means that an *algún* NP denotes, in a given world, the set of all individuals that are in the extension of the noun phrase in that world (as in (35a)). In contrast, *un* phrases can denote a subset of the individuals denoted by the noun phrase, via contextual restriction (as in (35b)).

(35)   a. $[\![$algún estudiante$_C]\!]^{w,g} = \{x \mid \exists g'[\textbf{student}_w(x) \ \& \ g'(C)(x)]\}$
            (or simply, $\{x \mid \textbf{student}_w(x)\}$)
       b. $[\![$un estudiante$_C]\!]^{w,g} = \{x \mid \textbf{student}_w(x) \ \& \ g(C)(x)\}$

We will see next how the alternatives that these indefinites denote behave in the course of the semantic derivation of conditionals and relative clauses.

3.2.1   Conditionals

In Experiment 1, intermediate scope readings in the antecedent of conditionals were found to be very hard for both *un* and *algún*. In order to account for this result, we will draw a parallel between the behavior of these indefinites and the behavior of disjunction. Alonso-Ovalle (2006) argues that disjunction should be analyzed as introducing a set of propositional alternatives into the semantic derivation. Furthermore, he claims that a universal propositional operator stops the expansion of the alternatives introduced by disjunction in the antecedent of conditionals. If the alternatives introduced by both *un* and *algún* are also stopped by this

operator, we expect intermediate scope readings to be blocked in the antecedent of conditionals. The following section briefly presents Alonso-Ovalle's analysis, which will then be extended to indefinites (see appendix A for the technical details of the proposal).

A Universal Intervener. Alonso-Ovalle (2006) discusses an old problem concerning the interpretation of counterfactual conditionals with disjunctions in their antecedents. The problem, in a nutshell, is this: if we adopt a standard Lewis-Stalnaker ordering semantics for counterfactuals and a standard semantics for disjunction, the truth-conditions that we predict for counterfactuals with disjunctive antecedents are too weak.[7] As an illustration, consider the sentence in (36).

(36) If we have had good weather this summer or the sun had grown cold, we would have had a bumper crop.
      (Alonso-Ovalle 2006, a minimal variation on an example from Nute 1975.)

Assume now a minimal change semantics for counterfactuals of the Lewis-Stalnaker variety (Lewis, 1973): on this view, *would*-counterfactuals are true in a world w if and only if the worlds w' in which the antecedent is true that are closest to w, are all worlds where the consequent is true.[8] Assume also the standard semantics for disjunction, under which *or* maps two propositions to their set theoretical union. Under this semantics, the antecedent of the counterfactual in (36) denotes the union of the set of worlds where we have a good summer and the set of worlds where the sun grows.

(37) $[\![$we have had a good summer or the sun had grown cold$]\!]^{w,g} =$
      $\{w' \mid$ we have a good summer in $w'\} \cup \{w' \mid$ the sun grows cold in $w'\}$

Given all that we have said so far, the counterfactual in (36) should denote the proposition that is true in a world w if and only if all the worlds w' where the proposition in (37) is true that are closest to w are worlds where we have a bumper crop. These truth-conditions are too weak. According to the intuitive notion of similarity under which we are likely to evaluate the sentence in (36), the worlds

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[7]For overview and discussion see Nute 1984; for an early response to the problem see Lewis 1977.

[8]We are making what Lewis calls 'The Limit Assumption' (Lewis, 1973), namely that given a proposition p, there will always be a non-empty set of worlds w' in which p is true that come as close as possible to the world of evaluation. Ties in similarity are allowed. For a survey of the different flavors a minimal change semantics might come in, see Nute 1984.

where we have a good summer are more similar to the actual world than the worlds where the sun grows cold. Thus, all the worlds where (37) is true that are closest to the actual world are worlds where we have a good summer. Therefore, (36) is predicted to be true in the actual world if and only all the worlds in which we have a good summer are worlds in which we have a bumper crop. The sentence in (36) is intuitively false in the actual world, but we predict it to be true.[9]

Alonso-Ovalle (2006) shows that the problem can be solved by (i) assuming an alternative semantics for disjunction, and (ii) assuming that conditionals are correlative constructions (von Fintel, 1994; Izvorski, 1996; Bhatt and Pancheva, 2006; Schlenker, 2004) that convey universal quantification over the propositions introduced by the disjunction.[10]

In the Hamblin semantics for disjunctions assumed in Alonso-Ovalle 2006, *or* introduces a set of propositional alternatives into the semantic derivation (see also Aloni 2003 and Simons 2005). For instance, the disjunction in the antecedent of (36) denotes the set containing the proposition that we have a good summer and the proposition that the sun grows cold, as in (38).

(38) $[\![$we have had a good summer or the sun had grown cold$]\!]^{w,g} =$
$$\left\{ \begin{array}{l} \lambda w'.\text{we have a good summer in } w', \\ \lambda w'.\text{the sun grows cold in } w' \end{array} \right\}$$

A universal quantifier ranges over these propositional alternatives. For instance, the counterfactual in (36) denotes the proposition that is true in a world w if and only if the consequent holds for *every* proposition p in the set of propositions introduced by the disjunction. That means that for (36) to be true in a world w, both conditions in (39) have to be met. Since the condition in (39b) is not satisfied, we capture the intuition that (36) is false in the actual world.

(39) a. In all worlds w' where we have a good summer that are the closest to the world of evaluation w we have a bumper crop.

b. In all worlds w' where the sun grows cold that are the closest to the world of evaluation w we have a bumper crop.

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[9]The problem arises with *might* counterfactuals, and, in general, with other conditionals for which an ordering semantics is assumed (a downward monotone analysis licenses the inference from $(p \vee q) \rightarrow r$ to $p \rightarrow r$ and $q \rightarrow r$, but see Alonso-Ovalle 2006 for reasons to believe that the inference we are after is not a downward entaling inference.)

[10]Alonso-Ovalle 2004, van Rooij 2006 and Herburger and Mauck 2007 discuss alternative solutions.

Un **and** ***Algún*** **in the Antecedent of Conditionals.** Let us now compute the denotation of the sentence in (40), which contains *algún* in the antecedent of a conditional.

(40) Si Juan hubiera mandado algun   artículo suyo,   hubiera
     If Juan had   sent   ALGÚN article   of his, pro would have
     conseguido la   beca.
     gotten   the grant.
     'If Juan had sent some article of his, he would have gotten the grant.'

Assume that Juan has written three articles in w: "Principles of A", "Principles of B" and "Principles of C". The denotation of the indefinite noun phrase *algún artículo de Juan* will then be the set in (41):

(41) $[\![$algún artículo de Juan$]\!]^{w,g} =$
     { "Principles of A", "Principles of B", "Principles of C" }

Combining this set with the denotation of the verb (disregarding tense and mood), and the result with the denotation of the subject, yields the set of propositions in (42).

(42) $[\![$Juan hubiera mandado algun artículo suyo$]\!]^{w,g} =$
$$\left\{ \begin{array}{l} \lambda w'.\text{Juan sends ``Principles of A'' in } w', \\ \lambda w'.\text{Juan sends ``Principles of B'' in } w', \\ \lambda w'.\text{Juan sends ``Principles of C'' in } w' \end{array} \right\}$$

Given our assumptions about the semantics of conditionals, the conditional in (40) will have the denotation in (43).[11]

(43) $[\![$Si Juan hubiera mandado algun artículo suyo, hubiera conseguido la beca$]\!]^{w,g,\leq}$
     $= \{\lambda w'.\forall p \in (42) : \text{J. gets the grant in all } w'' \text{ closest to } w' \text{ in which } p \text{ is true}\}$

That is, (40) will be true in the actual world if and only if the three conditions in (44) below are satisfied:

(44)   a. In all the worlds closest to the actual world in which Juan sends "Principles of A", he gets the grant.

       b. In all the worlds closest to the actual world in which Juan sends "Principles of B", he gets the grant.

---

[11]In (43) we relativize the interpretation function to a similarity ordering. We have omitted the ordering parameter when irrelevant.

c. In all the worlds closest to the actual world in which Juan sends "Principles of C", he gets the grant.

This means that (40) will be true in the actual world if and only if Juan would have got the grant if he had sent *any* of his papers. The semantic computation, then, yields a 'narrow scope reading'. This explains why speakers rejected the *algún* sentences in Experiment 1, where contexts forced an intermediate scope reading.

Things are somewhat more complicated in the case of *un*. As long as *un* introduces two or more alternatives, it will only have a narrow scope reading in the antecedent of conditionals, just like *algún*. However, we know that *un* can be a singleton indefinite (section 2.2). In the current framework, this means that *un*–phrases can denote a set containing just an individual alternative. When that happens, we should get the illusion of exceptional scope, as Schwarzschild explains.

Suppose, for instance, that the sentence in (45) is uttered in a context that makes salient the article "Principles of C". This sentence will be then true in the actual world if and only if in all the closest worlds where Juan sends "Principles of C", he gets the grant. In that case, there will be a particular paper of his that will get him the grant, just as if the indefinite had scoped out the antecedent of the conditional.

(45) Si Juan manda un artículo suyo,   conseguirá la beca.
     If Juan sends UN paper   of his, pro will get   the grant
     'If Juan sends a paper of his, he will get the grant.'

So far, our data does not reflect this possibility — there is no significant difference between *un* and *algún* in the conditional experiment (although the pilot experiment does show a preference for *un* in conditionals.) We will come back to this issue later, when we discuss the results of Experiment 2.

3.2.2 Relative Clauses

The results of Experiment 1B indicate that intermediate scope readings are available for both *un* and *algún* in relative clauses. This can be accounted for in the current framework by claiming that (i) relative clauses do not (necessarily) block the expansion of alternatives and (ii) the Existential Closure operator is freely available up to interpretability.

The behavior of Japanese indeterminate pronouns provides evidence for (i). In Japanese, indeterminate pronouns that are inside a relative clause are able to

associate with an operator outside the relative clause. Consider, as an illustration, the sentence in (46) below:

(46) [[Dono hon-o yonda] kodomo] -mo yoku nemutta.
 which book:ACC read child -MO well slept
 'For every book *x*, the child who read *x* slept well.'

(Kratzer and Shimoyama 2002)

This sentence features an indeterminate pronoun, *dono*, inside a relative clause. The indeterminate *dono* gets a universal interpretation via association with the universal quantifier *mo*, which is outside the relative clause. In order for this to happen, the alternatives introduced by *dono* must expand beyond the relative clause boundary. Unlike conditionals, then, relative clauses do not force the introduction of an operator that stops alternative expansion.

In order to get intermediate scope readings for examples such as (47) the alternatives that expand beyond the relative clause must be captured by an Existential Closure Operator located between the higher and the lower quantifiers, as in (48) below:

(47) Todos los profesores leyeron todos los trabajos que
 all the:PL professor:PL read:3PL all the:PL paper:PL that pro
 les había entregado algún estudiante.
 to-him had:3S given ALGÚN student.
 'All the professors read all the papers that a student had given them.'

(48) [$_{IP_1}$ Todos los profesores [∃] leyeron todos los trabajos [que [$_{IP_2}$ les había entregado algún estudiante]]]

This shouldn't be the only possible locus of Existential Closure, however. Narrow scope readings are also readily available for examples like (47). We will assume that the Existential Closure operator is freely available up to interpretability, that is, that it can be inserted at any point where it can quantify over a set of propositional alternatives, and where it doesn't give rise to an intervention effect.[12,13]

The sentence in (49a), for instance, allows for insertion of [∃] in two positions, namely in the two sites where it can combine with a set of propositional

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[12]This predicts that wide scope readings are also available for *un* and *algún* in relative clauses. Initial intuitions suggest that this is indeed the case, but experimental testing is needed to confirm that this intuition generalizes across speakers.

[13]To see a case where insertion of [∃] would give rise to an intervention effect, consider (i) below.

alternatives: right above the lower IP (as in (49b)), and above the higher IP (as in (49c)).[14]

(49) a. Juan leyó todos los   trabajos que le   había entregado
Juan read all   the:PL paper:PL that TO-HIM had   given
algún   alumno suyo.
ALGÚN student OF-HIS

'Juan read all the papers that a student of his had given him.'

b. [$_{IP_1}$Juan leyó todos los trabajos que [∃] [$_{IP_2}$ [le había entregado {algún / un} alumno suyo]]

c. [∃] [$_{IP_1}$ Juan leyó todos los trabajos que [$_{IP_2}$ le había entregado {algún / un} alumno suyo]]

The configuration in (49b) yields a narrow scope reading: (49b) denotes the proposition that is true in a world w if and only if Juan read all papers that at least one student of his had given to him in w (see computation in Appendix B). The structure in (49c) gives us a wide scope reading: it denotes the proposition that is true in a world w if and only if there is a particular student all whose papers Juan read (as shown in Appendix B.)

Note that assuming that [∃] can only be inserted inside the relative clause would give us the right results for *un*, but not for *algún*. As we have noted repeatedly, *un* is able to narrow the domain down to a singleton set. If the domain of relevant students is a singleton set, say, {Laura}, then (49b) above would be true in the actual world if and only if Juan read all the papers that at least one individual in {Laura} had given him. Hence, we would get the illusion of exceptional scope. *Algún*, however, cannot be a singleton indefinite, so if insertion of [∃] were local, exceptional scope should be blocked.

(i) No vino nadie.
not came anybody

The negative concord indefinite *nadie* must agree with the negative operator (*no*). Insertion of [∃] in between *nadie* and *no* would result in an intervention effect.

(ii) * No [[∃] vino nadie$_{[¬]}$]

[14]For ease of exposition, we will illustrate with sentences with only one universal quantifier, but the reasoning above extends to our items, with two. In that case, the quantifier in subject position can be interpreted above the second site for Existential Closure, resulting in an intermediate scope reading.

To sum up, relative clauses crucially differ from conditionals in that while the latter contribute an intervener that stops the expansion of the alternatives introduced by the indefinites (hence, blocking exceptional scope), the former can let alternatives project up.[15] Putting this together with the hypothesis that Existential Closure is freely available up to interpretability predicts that exceptional scope should be available for *un* and *algún* when they are in a relative clause.

3.3 An Alternative Explanation? The Complexity Hypothesis

We have proposed that the numerical difference between relative clauses and conditionals found in Experiment 1 is due to the fact that conditionals contribute an operator that stops alternative expansion (thereby blocking intermediate readings) while relative clauses let alternatives expand and associate with an existential operator outside the relative clause boundary (hence allowing for intermediate readings.) There is however a plausible alternative explanation, namely that the difference between conditionals and relative clauses is a complexity effect.

Our conditional items have one more layer of embedding than the relative clauses, as illustrated below.[16]

(50) a. [$_{CP_1}$ Todos los estudiantes leyeron todos los trabajos [$_{CP_2}$ que les había entregado {algún / un} estudiante]]

b. [$_{CP_1}$ Todos los profesores pensaban [$_{CP_2}$ que [$_{CP_3}$ si enviaban {algún / un} artículo suyo] conseguirían la beca]]

If complexity (measured by number of embedded clauses) correlates with degree of processing difficulty, we expect our conditional items to be harder than our relative clause items. Perhaps, then, speakers are rejecting the conditionals more often than the relative clauses simply because the former are harder (for reasons not having to do with the indefinites).[17] Experiment 2 will address this concern by contrasting structures of varying complexity and testing whether higher complexity does indeed result in a higher number of 'no' responses.

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[15]Note that this proposal predicts that both *un* and *algún* will be able to get intermediate scope readings when in a relative clause regardless of whether their restriction contains a bound variable pronoun or not. In this regard, our analysis makes the same prediction as Abusch's (1993-4) analysis. We plan to test this prediction experimentally in future work

[16]We are assuming that the antecedent of conditionals is a CP, and abstracting away from the issue of whether *if* is a complementizer itself, or a specifier of CP. See Bhatt and Pancheva (2006) for an overview of the debates surrounding the syntactic structure of conditionals.

[17]Thanks to Kai von Fintel for discussions related to this point.

4 The Contrast between *Un* and *Algún* in Relative Clauses

Our account correctly predicts intermediate scope readings to be possible for both *un* and *algún* in relative clauses. However, we have seen that *algún* is significantly harder than *un* in that configuration. We would like to suggest that this has to do with the fact that *algún* is a domain widener.

As mentioned in section 2, Alonso-Ovalle and Menéndez-Benito (2003) claim that *algún* induces maximal widening of the set of alternatives. Let us assume that widening should always happen for a reason (Kadmon and Landman, 1993; Kratzer and Shimoyama, 2002). Following Kratzer and Shimoyama (2002), Alonso-Ovalle and Menéndez-Benito (2003) claim that in the case of *algún*, widening gives rise to an ignorance implicature, which is illustrated by (51) below: the sentence in (51) can only be felicitously uttered if, for all the speaker knows, Mary could be dating any of the guys in the department (see Alonso-Ovalle and Menéndez-Benito 2003 for the derivation of the implicature.)[18]

(51) María está saliendo con algún   chico del   departamento.
      María is   going out with ALGÚN guy   from the department
      'María is dating a guy from the department.'

The ignorance implicature is absent when *algún* is in the scope of a universal quantifier over individuals, as in (52) below.

(52) Todos los   jugadores dominan algún   país   europeo.
      all   the:PL player:PL rule:3PL ALGÚN country European
      'All the players rule a European country.'

Suppose that I have been watching my friends Ana, Pedro and Laura play the world-domination game Risk. I can clearly see that Ana controls Spain and Costa

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[18]The fact that this inference disappears in downward entailing contexts provides evidence of its implicature status. The sentence in (i) below conveys that Mary is not dating any of the guys in the department, and cannot mean that Mary is dating some guy in the department and the speaker knows which one.

(i) No es verdad que María esté saliendo   con algún   chico del   departamento.
     Not is true   that María is   going out with ALGÚN guy   from the department
     'It is not true that María is dating some guy from the department.'

Rica, that Pedro has taken over France and South Africa, and that Laura dominates Norway. In this scenario, I can felicitously utter (52), even though I know which European countries each of the players controls. There is then no ignorance inference.

Another potential role that widening can have is strengthening the claim (as in Kadmon and Landman's analysis of *any*.) This obviously cannot be at work in examples like (52), where *algún* is in an upward entailing context. In such contexts, widening in fact makes the claim weaker: that every player controls a European country is a weaker statement than that every player controls a Northern European country (that is, the latter statement asymmetrically entails the former).

Our relative clause items behave like (52) above in that, on the intended reading, (i) no ignorance implicature is generated, and (ii) widening the domain would weaken (rather than strengthen) the claim: In the intermediate scope reading of examples like (53) the indefinite is in an upward entailing environment, as the paraphrase in (54) shows.

(53) Todos los   profesores   leyeron todos los   trabajos que había
     all   the:PL professor:PL read:3PL all   the:PL paper:PL that had:3S
     escrito algún   estudiante.
     written ALGÚN student

     'All the professors read all the papers that a student had written.'

(54) For every professor *x*, there is a student *y* in the set of students of *x* such that *x* read all the papers that *y* had written.

Perhaps, then, the reason that *algún* is dispreferred in our experimental items is that there is no reason to widen the domain, and hence the use of *algún* is not motivated. We will refer to this hypothesis as the 'Domain Widening Hypothesis'. According to the Domain Widening Hypothesis, we expect that there should be no difference between cases like (53), where indefinites appear within a relative clause, and cases where the indefinites are not within an island, but where they are in an upward entailing context: *un* should be preferred over *algún* in upward entailing contexts, regardless of whether the indefinites are within an island or not.[19] Experiment 2 will test this prediction.

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[19]Of course, we would also expect *un* to be preferred over *algún* in examples like (53) above. We hope to be able to test this prediction experimentally in future research.

5 Experiment 2

The goal of Experiment 2 is to address the following questions:

1. Is the difference between conditionals and relative clauses stable? While Experiment 1 yielded a large numerical difference between conditionals and relative clauses, this difference comes from a comparison between two different subexperiments of the study. As we cannot compare relative clauses and conditionals directly (it is not clear how we could construct the relevant minimal pairs), we will attempt to establish whether this pattern is solid by trying to replicate the result in yet another group of speakers.

2. If the difference between conditionals and relative clauses is stable, can it be due to syntactic complexity (the Complexity Hypothesis, section 3.3)?

3. Is the Domain Widening Hypothesis (namely, that there is a penalty for using *algún* in cases where the domain widening it induces is not motivated (section 4) on the right track?

4. Is there a difference between *un* and *algún* in the antecedent of conditionals? As discussed in section 3, our analysis predicts such a difference. Experiment 1, however, showed only a small numerical difference between the two indefinites — 14% of 'yes' answers for *algún* and 16 % for *un*. This result is inconclusive, since the lack of significance could be due to a floor effect.

These questions are addressed by contrasting (i) embedded conditionals and unembedded conditionals (subexperiment 2A), as illustrated in (55), and (ii) relative clauses with sentences that do not contain any subordinate clauses (subexperiment 2B), as illustrated in (56).

(55) Embedded vs. Unembedded Conditionals (subexperiment 2A)

    a. Todos los   investigadores piensan   que si   envían {algún   /
       all   the:PL researcher:PL think:3PL that if pro send   {ALGÚN /
       un} artículo suyo,   conseguirán la   beca.
       UN} paper   of them, pro will get:3PL the fellowship
       'All the researchers think that if they send a paper of theirs, they will get the fellowship.'

b. Si Pedro envía   {algún   / un} artículo suyo,   conseguirá la
If Pedro send:3s {ALGÚN / UN} paper   of his, pro will get:3s the
beca.
fellowship
'If Pedro sends a paper of his, he will get the fellowship.'

(56) Relative Clauses vs. Sentences with no Subordination (subexperiment 2B)

a. Todos los   profesores   de lengua   enviaron al   concurso de
all   the:PL professor:PL of language sent:3PL to-the contest   of
redacción todos los   trabajos que les   entregó algún
writing   all   the:PL paper:PL that to-them sent:3s ALGÚN
alumno suyo.
student of them
'All the language teachers sent to the writing contest all the papers
that a student of theirs gave them.'

b. Todos los   profesores   dieron   todos sus   trabajos a {algún
all   the:PL professor:PL gave:3PL all   their paper:PL to {ALGÚN
/ un} estudiante.
/ UN} student
'All teachers gave all their papers to a student.'

If the difference between conditionals and relative clauses found in Experiment 1 constitutes a solid pattern, we expect (at least embedded) conditionals to be rejected more often than relative clauses. If this difference is due to syntactic complexity (and complexity is measured in terms of number of subordinate clauses), embedded conditionals (with two subordinate clauses) will be rejected more often than unembedded ones (with one), and relative clauses will be rejected more often than sentences with no embedded clauses. Additionally, the Domain Widening Hypothesis predicts that *un* should be preferred to *algún* whenever these indefinites are in the nuclear scope of an upward entailing quantifier. Since the indefinites are in the nuclear scope of *todos* both in the relative clause conditions and in the no-subordination conditions, we expect that *algún* should be dispreferred in both cases.

5.1 Materials and procedure

A second off-line questionnaire was prepared with twenty-four experimental items in two subexperiments. Experiment 2A tests the availability of exceptional scope

readings for both *un* and *algún* in embedded *vs.* unembedded conditionals; experiment 2B, in relative clauses and sentences with no subordinate clauses.

Subexperiment 2A tested twelve items in four experimental conditions. For conditions 1 and 2, ten of the items were adapted from Experiment 1A, and two new ones were added.[20] The items in condition 3 have *algún* in the antecedent of an unembedded conditional, and the items in condition 4 have *un*. A sample item is provided in (57):

(57) a. C1: Todos los   investigadores piensan   que si   envían
           all   the:PL researcher:PL think:3PL that if pro send:3PL
           algún   artículo suyo,   conseguirán la beca.
           ALGÚN paper   of them, pro will get:3PL the fellowship
           'All the researchers think that if they send a paper of theirs, they will get the fellowship.'

      b. C2: Todos los   investigadores piensan   que si   envían   un
           all   the:PL researcher:PL think:3PL that if pro send:3PL UN
           articulo suyo,   conseguirán la beca.
           paper   of theirs, pro will get:3PL the fellowship
           'All the researchers think that if they send a paper of theirs, they will get the fellowship.'

      c. C3: Si Pedro envía   algún   artículo suyo,   conseguirá la
           If Pedro send:3S ALGÚN paper   of his, pro will get:3S the
           beca.
           fellowship
           'If Pedro sends a paper of his, he will get the fellowship.'

      d. C4: Si Pedro envía   un artículo suyo,   conseguirá la
           If Pedro send:3S UN paper   of his, pro will get:3S the
           beca.
           fellowship
           'If Pedro sends a paper of his, he will get the fellowship.'

As in Experiment 1, each sentence was preceded by a paragraph forcing the exceptional scope reading. Subjects were asked to decide whether each sentence was an appropiate description of its acompanying context. Conditions 1 and 2 shared the same context (taken or adapted from Experiment 1A for the first ten

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[20]The full list of experimental items is available from the authors' webpages: http://people.umass.edu/paulamb and http://www.alonso-ovalle.net.

items). Conditions 3 and 4 also shared a context. The context for conditions 3 and 4 of the item above follows.

(58) El Ministerio de Educación concede una beca a todos los investigadores que hayan publicado un artículo en una revista extranjera. Para solicitar la beca, es necesario enviar el artículo al comité de selección. Pedro tiene varios artículos publicados, pero sólo uno de ellos está publicado en una revista extranjera.

'The Ministry of Education gives a fellowship to all the researchers who have published a paper in an international journal. To apply for the fellowship, it is necessary to send the paper to the selection committee. Pedro has published several papers, but only one abroad.'

Subexperiment 2B tested another twelve items in four experimental conditions. The first ten sentences in conditions 1 and 2 were adapted from experiment 1B. Two new ones were added. The sentences in conditions 3 and 4 are versions of the experimental sentences from subexperiment 1B in which the indefinites are not within an island. They all contain the universal quantifier *todos* in direct object position, and *algún* (condition 3) or *un* (condition 4) in an indirect object position, as illustrated below:[21].

(59) [subject todos los NP [VP V [direct object todos los NP][indirect object algún / un NP]]]

A sample item in the four experimental conditions is given below:

(60) a. C1: Todos los   profesores   de lengua   enviaron al   concurso
           all   the:PL professor:PL of language sent:3PL to-the contest
       de redacción todos los   trabajos que les   entregó algún
       of writing   all   the:PL paper:PL that to-them sent:3S ALGÚN
       alumno suyo.
       student of them

       'All the language teachers sent to the writing contest all the papers that a student of theirs gave them.'

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b. C2: Todos los   profesores   de lengua   enviaron al   concurso
        all   the:PL professor:PL of language sent:3PL to-the contest
   de redacción todos los   trabajos que les   entregó un alumno
   of writing   all   the:PL paper:PL that to-them sent:3S UN student
   suyo.
   of them

   'All the language teachers sent to the writing contest all the papers
   that a student of theirs gave them.'

c. C3: Todos los   profesores   de lengua   enviaron todas sus
        all   the:PL professor:PL of language sent:3PL all   their
   publicaciones a algún   alumno suyo.
   publication:PL to ALGÚN student of them

   'All the language teachers sent all their publications to a student of
   theirs.'

d. C4: Todos los   profesores   de lengua   enviaron todas sus
        all   the:PL professor:PL of language sent:3PL all   their
   publicaciones a un alumno suyo.
   publication:PL to UN student of theirs

   'All the language teachers sent all their publications to a student of
   theirs.

Again, each sentence was preceded by a paragraph describing a situation forc-
ing the intermediate scope reading. As above, each context was followed by a
question asking subjects whether the target sentence was an appropriate descrip-
tion of the scenario. The first ten scenarios for conditions 1 and 2 were taken or
adapted from experiment 1B. As before, the items in conditions 1 and 2 shared
the same scenario. The items in conditions 3 and 4 also shared a context, but the
contexts for conditions 3 and 4 were not taken from experiment 1B, since they
had to suit the new sentences. The context for the items above in conditions 3 and
4 follows.

(61) Cada uno de los profesores de lengua prefiere a un alumno diferente. A
      final de curso, cada profesor envió todas sus publicaciones a su alumno
      preferido. Ningún profesor envió ningún libro a ningún alumno más.

      'Each of the language professors prefers a different student. By the end of
      the course, each professor sent all her publications to her favorite student.
      No professor sent any publication to any other student.'

Four counterbalanced lists were created with the twenty-four experimental items, and twenty-four fillers (twenty of which were taken from the ones used in experiment 1). The same practice items as in experiment 1 were used. The lists were administered to forty native speakers of Iberian Spanish. Subjects were instructed to read the contexts and target sentences carefully and to respond according to their first intuitions. They were given no incentive to participate in the experiment.

5.2 Results

Table 5 gives the percentages of 'yes' answers for Experiment 2A (conditionals) — like before, a 'yes' answer is taken to mean that an intermediate scope reading is available.

	Conditionals			
	embedded		unembedded	
	algún	*un*	*algún*	*un*
Conditions	C1	C2	C3	C4
% 'yes'	13	23	1	23

Table 5: Experiment 2A (embedded *vs.* unembedded conditionals): results.

An ANOVA test was conducted for these results, with both subjects and items as random effects. The difference between *un vs. algún* was significant both by subjects (F = 9.9, p = .003) and by items (F = 8.8, p = .013). The interaction between type of indefinite and embedding was not significant. There was no main effect of embedding either.

Table 6 summarizes the results of subexperiment 2B.

	relative clauses		no island	
	algún	*un*	*algún*	*un*
Condition:	C1	C2	C3	C4
% 'yes'	36	48	36	45

Table 6: Experiment 2B (relative clauses *vs.* no islands): results.

An ANOVA test yielded a marginally significant effect of *un* vs. *algún* by items (F = 3.6, p = .08), and a practically significant effect by subjects (F = 3.9, p = .055). There was no significant main effect of syntactic environment (relative

clause vs. indirect object), and no significant interaction between type of indefinite and syntactic environment (islands vs. no island) either.

These results can be summarized as follows:

1. There was an effect of type of indefinite in both subexperiments: In conditionals (both embedded and unembedded), intermediate readings were found to be possible with *un* but impossible (or very hard) with *algún*. In the relative clause experiment, intermediate readings were harder for *un* than for *algún* (the latter contrast was marginally significant in the item analysis.)

2. No main effect of embedding was found.

3. There was no significant interaction between type of indefinite and embedding.

4. Like in Experiment 1, there is a big numerical difference between conditionals and relative clauses, both in the *un* conditions and in the *algún* conditions: exceptional scope is easier in relative clauses than in conditionals (36% of 'yes answers for *algún*, and 48% for *un*) than in conditionals (in embedded conditionals there was an 13% of 'yes' answers for *algún* and a 23% of 'yes' answers for *un*, in unembedded conditionals, there was a 1% of 'yes' answers for *algún* and a 23% of 'yes' answers for *un*).

5.3 Discussion

5.3.1 The difference between conditionals and relative clauses and the Complexity Hypothesis

The results replicate the difference between conditionals and relative clauses found in Experiment 1. This suggests that the difference is indeed a solid pattern. Additionally, this difference does not seem to be due to syntactic complexity. The Complexity Hypothesis predicts a main effect of embedding in both subexperiments (that is, it predicts the embedded conditions to get less 'yes' responses than the unembedded conditions in experiment 2A, and the relative clause conditions to get less 'yes' responses than the no subordination conditions in experiment 2B). This effect was not found, as table 7 illustrates. This provides indirect support for the analysis presented in section 3.

Complexity Hypothesis			
Predictions		Results	
2A	main effect of embedding	2A	**no main effect of embedding**
2B	main effect of embedding	2B	**no main effect of embedding**

Table 7: Predictions of the Complexity Hypothesis contrasted with the results.

5.3.2   The Domain Widening Hypothesis

The Domain Widening Hypothesis predicts a lack of interaction between embedding and type of indefinite in subexperiment 2B. This is exactly what was found—the difference between *algún* and *un* is roughly the same in the relative clause conditions and in the no subordination conditions, with *algún* being harder than *un* in both cases (see table 8 below.)

Domain Widening Hypothesis	
Predictions	Results
(% 'yes' answers)	(% 'yes' answers)
$(C1 - C2) = (C3 - C4)$	$(C1 - C2) = (C3 - C4)$

Table 8:   A prediction of the Domain Widening Hypothesis contrasted with the results.

5.3.3   *Un* vs. *Algún* in Conditionals.

As we discussed in section 3, our analysis predicts a difference between *algún* and *un* in the antecedent of conditionals, regardless of whether they are embedded or not: intermediate readings should be blocked for *algún* and possible for *un*. The results of Experiment 2A bear this prediction out. This raises the issue of why this effect was not found in Experiment 1A.

Looking at the subject distribution of the data in experiment 1A will help us understand the difference between the two experiments. The data is listed in table 1, in page 57. We can see that a majority of subjects (72 %) behaves as the majority of subjects (87.5 %) in experiment 2A: they give to *un* at least as many 'yes' answers as they do to *algún*. There was no significant difference between *un* and *algún* in Experiment 1A because there was a 28 % of subjects (marked in bold type on table 1) that gave less 'yes' answers to *un* than to *algún*. In contrast, in Experiment 2A, only 12.5% of the subjects gave more 'yes' answers to 'un' than

to 'algún' in embedded conditionals. We will stick to the statistical significance of the results of experiment 2A. Any further differentiation between the results of the two experiments would require a larger study.

5.3.4   *Un* in Conditionals.

The results so far raise an additional issue. Both Experiment 1 and Experiment 2 display a higher percentage of 'yes' answers for *un* in relative clauses than in conditionals. This suggests that intermediate scope readings are harder for *un* in conditionals than in relative clauses. Given our analysis, this would indicate that restricting the domain of alternatives to a singleton set is harder when the alternatives are operated on by a universal quantifier (like the one contributed by the conditional) than when they are quantified over by an existential. In what follows, we will examine a couple of possible reasons for this difficulty, reject the first one, and tentatively assume the second.

Non-singletonness Implicature.   The first possibility we would like to consider is that the difficulty of restricting the domain to a singleton in the antecedent of conditionals is related to the fact that determiner quantifiers with universal force implicate that their domain is not a singleton: the example in (62), for instance, seems infelicitous if Phil only said of one movie that it was his favorite.

(62)   Everyone at the party voted to watch every movie that Phil said was his favorite.   (Schwarzschild 2002, 48)

Schwarzschild argues that this non-singletonness inference is likely to be an implicature: the inference is cancellable, as the discourse in (63) shows, and seems to result from a comparison between what was actually asserted with a set of comparable alternatives (it is odd to utter the example in (64) if one knows that each instructor has only one student with a disability — using *a student* or *the student* would be more appropriate in that case.)

(63)   Everyone in the Italian department is happy with Cipriano's proposal, since there is just one person in the Italian department and that's Cipriano.

(Schwarzschild 2002, 49)

(64)   Every instructor noticed that every student of his who had a disability had taken the exam anyway.

(Schwarzschild 2002, 49)

Now, suppose that this non-singletonness implicature arises not only with determiner quantifiers like *every* but also with universal propositional quantifiers. That is, suppose that the universal propositional quantifier introduced by a conditional structure triggers the implicature that its domain consists of at least two propositions. Since narrowing down the set of alternatives to a singleton set clashes with the implicature, we might expect that operation to be costly.

This hypothesis is, however, problematic. First, as we said above and Schwarzschild discusses, implicature computation involves comparing the assertion with a set of alternative assertions. It is hard to see what the alternatives to the universal propositional operator would be. Second, given the analysis of conditionals we are assuming, there are cases where the universal propositional quantifier in fact ranges over only one alternative: all those counterfactuals whose antecedent does not contain a Hamblin indefinite or disjunction. Take, for instance, the sentence in (65), where the universal would range over the singleton set containing the proposition that Juan came.

(65) Si Juan hubiera venido,   lo hubiéramos pasado muy bien.
      If Juan had   come,   pro it would have passed very well.
      'If Juan had come, we would have had a good time.'

Unlike what happens in the case of run-of-the-mill universal quantifiers ranging over a singleton, there seems to be no penalty associated with quantification over a singleton domain in (65), which sounds perfectly natural.

Preference for Strong Meanings.   An alternative possibility is that restriction of the domain of a universal to a singleton domain is difficult because it clashes with a general preference for selecting the strongest possible meaning. Consider one of our experimental items in its context:

(66)   a. El Ministerio de Educación concede una beca a todos los investigadores que hayan publicado un artículo en una revista extranjera. Para solicitar la beca, es necesario enviar el artículo al comité de selección. Pedro tiene varios artículos publicados, pero sólo uno de ellos está publicado en una revista extranjera.

'The Ministry of Education gives a fellowship to all the researchers who have published a paper in an international journal. To apply for the fellowship, it is necessary to send the paper to the selection committee. Pedro has published several papers, but only one abroad.'

    b. Si Juan hubiera enviado un artículo suyo,   hubiera
       If Juan had   sent   UN paper   of his, pro would have
       conseguido la   beca.
       got   the grant
       'If Juan had sent a paper of his, he would have got the grant.'

Under the present analysis, the phrase *un artículo suyo* can denote different sets of alternatives, depending on the value of the resource domain variable. Assume again that Juan has published three articles: "Principles of A", "Principles of B", and "Principles of C". Assume furthermore that, of these articles, the only one published abroad is "Principles of C". Two sets made salient by the context above are then:

(67)   a. D_1 : {"Principles of A", "Principles of B", "Principles of C"}
       b. D_2 : {"Principles of C"}

Given our setup, if the indefinite is taken to denote D_1, the conditional in (66b) will denote the proposition that is true in a world w if and only if (i) in all the worlds that are closest to w where Juan sends "Principles of A", he gets the grant, (ii) in all the worlds that are closest to w where Juan sends "Principles of B", he gets the grant, and (iii) in all the worlds that are closest to w where Juan sends "Principles of C", he gets the grant. If the indefinite is taken to denote D_2, the sentence will denote the proposition that is true in a world w if and only in all the worlds that are closest to w where Juan sends "Principles of C", he gets the grant. The proposition that results from considering the wider domain (D_2) is logically stronger than the proposition resulting from considering the singleton set (D_1). Now, suppose that speakers prefer to select the strongest meaning available for any given sentence. This would explain why they resist narrowing down the set of reject a sentence as false than assign it a weaker interpretation. Further research is needed to determine if this is indeed the case.

5.3.5 Wrapping-up.

Let us recap: Experiment 2 supports the analysis presented in section 3.2. As predicted by that proposal, we find that (i) in conditionals, exceptional scope readings are available for *un* but not for *algún*; (ii) in relative clauses, both *un* and *algún* can get exceptional scope readings. The alternative explanation that we considered in section 3.3 (the Complexity Hypothesis) does not seem to be on the right track: no main effect of embedding was found.

Furthermore, this experiment provides evidence for the hypothesis that we put forward to explain the difference between *algún* and *un* in relative clauses (the Domain Widening Hypothesis). The difference between *un* and *algún* was roughly the same in the relative clause items as in the no-subordination items (with *algún* being harder than *un* in both cases.) This is as predicted by the Domain Widening Hypothesis, according to which *algún* should be harder than *un* whenever these indefinites are in an upward entailing context.

6   Open Issues and Conclusion

Before concluding, we would like to point out an open issue for our analysis. Kratzer and Shimoyama distinguish between non-selective indefinites, which can associate with any operator (e.g., Japanese indeterminate pronouns) and selective indefinites, which impose restrictions in the type of operator they associate with. Both *un* and *algún* are selective, as illustrated by (68a) and (68b) below. The sentence in (68a) shows that neither indefinite can be interpreted under the direct scope of sentential negation. In the current framework, this means that the alternatives they introduce cannot be captured by the negation operator. The sentences in (68c-68d) show that neither *un* nor *algún* can get an interrogative reading —they cannot associate with the question operator.

(68)   a.   No leyó ningún   libro.
              pro not read NINGÚN book
              'She didn't read any book.'

        b.   No leyó algún   libro
              pro not read ALGÚN book
              There is some book he didn't read. / *He didn't read any book.

        c.   ¿Leyó un libro?
              pro read   UN book
              Did he read a book? / *What book did he read?

        d.   ¿Leyó algún   libro?
              pro read   ALGÚN book
              Did he read any book? / * What book did he read?

However, according to our analysis, *un* and *algún* are not completely selective either: we have assumed that the alternatives they introduce can combine with the

existential operator in (69a) (in relative clauses) and with the universal operator in (69b) (in conditionals).

(69) Where $\mathbb{A}$ is a set of propositions,
    a. $[\![\forall]\!]^{w,g}(\mathbb{A}) = \{\lambda w'.\forall p[p \in \mathbb{A} \rightarrow p(w')]\}$
    b. $[\![\exists]\!]^{w,g}(\mathbb{A}) = \{\lambda w'.\exists p \in \mathbb{A} \ \& \ p(w')\}$

This would mean that *un* and *algún* are partially selective Hamblin indefinites.[22] As we discussed in section 2, Kratzer and Shimoyama 2002 analyze the selectivity of Hamblin indefinites as morphological agreement. Casting the partial selectivity of *un* and *algún* in terms of agreement does not seem straightforward. We will have to leave this issue open.

Let us sum up. This paper brings into the arena new experimental data that should inform our theories of indefinites. The main empirical contribution is that indefinites may display different scope possibilities depending on the type of island: in conditionals, exceptional scope readings are impossible for *algún*, and possible (but hard) for *un*; in relative clauses, intermediate scope readings are available for both indefinites, but are harder for *algún*.

These results show that both the type of indefinite and the type of island may have an effect on the availability of exceptional scope readings. The contrast between different types of islands is challenging for most theories of scope, which predict any indefinite to have the same scopal properties across islands. We have presented an analysis of this puzzling data that makes crucial use of the Hamblin Semantics put forward in Kratzer and Shimoyama (2002).

We have proposed that *un* and *algún* are Hamblin indefinites, which introduce sets of propositional alternatives into the semantic derivation. Furthermore, we

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[22] With adverbs of quantification, *un* shows quantificational variability effects, but *algún* has constant existential force, as illustrated below:

(i)   a. Un estudiante {siempre, normalmente, nunca} tiene dinero
       UN student   {always, usually,   never} has money
       'All, most, no students have money.'

   b. Algún   estudiante {siempre, normalmente, nunca} tiene dinero.
       ALGÚN student   {always, usually,   never} has money
       'Some student always, normally, never has money.'

This is still compatible with both items having existential force: in the analysis of adverbs of quantification entertained in von Fintel 1994 and von Fintel 1995, indefinites always have existential force in these contexts, even in cases like (ia) above.

have claimed that the two indefinites differ in the size of the set of alternatives that they introduce: *algún* is a domain widener, and *un* a domain shrinker.[23]

If-clauses introduce a universal propositional operator that stops alternative-expansion (Alonso-Ovalle, 2006). This will block exceptional scope readings unless the domain of alternatives introduced by the indefinites can be narrowed down to a singleton. *Algún* is a domain widener and, thus, it cannot have exceptional scope readings in the antecedent of conditionals. In contrast, exceptional scope readings are available for *un*, which can be a singleton indefinite (Schwarzschild, 2002). Our experimental results, however, indicate that these readings are hard for *un*. We have tentatively suggested that this might be explained by a general preference for strong meanings.

Relative clauses crucially differ from conditionals in that they do not block alternative expansion. This, combined with the hypothesis that Existential Closure is freely available up to interpretability, gives us the possibility of exceptional scope for both indefinites. *Algún* seems to be harder than *un* in this configuration. This was attributed to the fact that the domain widening induced by the former does not fulfill any role in an upward entailing context.

The results that we have presented raise the issue of whether there are other indefinites that might also be sensitive to different types of islands. We hope to be able to explore this possibility experimentally in future work. In the meantime, we hope that the generalizations that we have presented will help to define the full range of exceptional scope possibilities across languages, and that, therefore, they will contribute to the characterization of a semantic typology of natural language indefinites.

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[23]This fits well with the program presented in Matthewson (1999), which treats determiners, in general, as elements that perform operations on domains of quantification.

Acknowledgements

Appendix A: Alonso-Ovalle (2006) on Disjunctive Conditionals

To illustrate the analysis of disjunctive conditionals presented in Alonso-Ovalle (2006), we will consider the semantic composition of the counterfactual in (70).

(70) If we had had good weather this summer or the sun had grown cold, (then) we would have had a bumper crop.
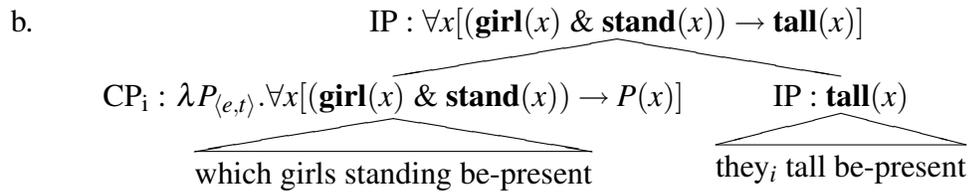
(A variation on an example in Nute 1975)

The analysis assumes that the domain of quantification of the modal in the consequent is determined by a propositional anaphor that is sometimes overtly realized as *then* (Iatridou, 1991b,a, 1994; von Fintel, 1994; Hegarty, 1996). The proposition expressed by the consequent of (70), for instance, is the proposition p that is true in a world w if and only if the closest worlds in the proposition picked up by *then* are all worlds where we have a bumper crop.[24]

---

[24]For the formal properties of the ordering of worlds that need to be assumed to state the truth-conditions of counterfactuals with the help of a class selection function, see Lewis 1973.

(71)　Where MAX is a class selection function (a function that given a world w, a proposition p and an ordering of worlds $\leq$ returns a non-empty set of worlds that are the closest to w in which p is true),

$[\![\text{would (then}_{1_{\langle s,t\rangle}})(\text{we have a bumper crop)}]\!]^{g,\leq} =$
$\{\lambda w'.\forall w''[\text{MAX}_{\leq,w'}(g(1_{\langle s,t\rangle}))(w'') \rightarrow \textbf{good-crop}_{w''}(\textbf{we})]\}$

Conditionals are correlative constructions (Bhatt and Pancheva, 2006), and Alonso-Ovalle (2006) assumes that the semantic composition of conditionals mimics the semantic composition of correlatives. In the semantics for correlatives presented in Dayal 1996, the antecedent of a correlative is a generalized quantifier, which takes as an argument the property that results from abstracting over a pronoun in the main clause, as illustrated below with a plural correlative.

(72)　a. jo　　laRkiyaaN khaRii haiN ve lambii haiN
　　　　which girls　　standing be-PR they tall　be-PR
　　　　'Which girls are standing, they are tall.'　　　　(Dayal, 1996, 192)

　　b.　　　　　　　　　　　　　　　IP $: \forall x[(\textbf{girl}(x) \, \& \, \textbf{stand}(x)) \rightarrow \textbf{tall}(x)]$

CP$_i$ $: \lambda P_{\langle e,t\rangle}.\forall x[(\textbf{girl}(x) \, \& \, \textbf{stand}(x)) \rightarrow P(x)]$　　　　IP $: \textbf{tall}(x)$

which girls standing be-present　　　　　　　they$_i$ tall be-present

Once *then* is analyzed as a propositional anaphor, the consequent of a conditional can be analyzed as denoting a property of propositions, much as the consequent of a correlative denotes a property of individuals. Consider, for instance, the consequent of the counterfactual in (70). We will assume that (73) is its LF.

(73)　　　　　　　　　　　IP

　　　　$\oplus$　　　　　　　　　　$\otimes$

　　would　then$_{5_{\langle s,t\rangle}}$　we have had a bumper crop
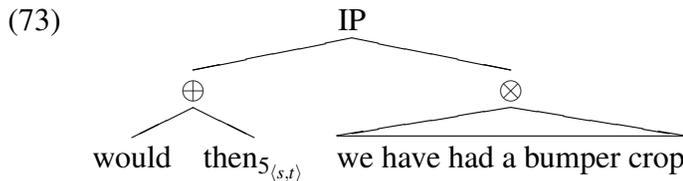
By abstracting over *then* in (73), we end up with (a set containing) a function from propositions to propositions that maps any proposition p into the proposition that is true in a world w if and only if the p-worlds that come closest to w are all worlds where we have a bumper crop.[25]

---

[25]We will assume that lambda abstraction is represented at LF by means of an index, as in Heim and Kratzer 1998.

(74)

$$\left[\!\!\left[\begin{array}{c} \odot \\ 5_{\langle s,t\rangle} \qquad\qquad \text{IP} \\ \oplus \qquad\qquad \otimes \\ \text{would}\quad \text{then}_{5_{\langle s,t\rangle}}\quad \text{we have had a bumper crop} \end{array}\right]\!\!\right]^{\leq,g} =$$

$$\{\lambda p_{\langle s,t\rangle}.q_{\langle s,t\rangle} \mid q \in [\![(73)]\!]^{\leq,g_{[p/5_{\langle s,t\rangle}]}}\}$$

We can now treat the *if*-clause in parallel to Dayal's analysis of correlatives. We can assume that it denotes a property of properties of propositions which holds of any property of propositions $P_{\langle\langle s,t\rangle,\langle s,t\rangle\rangle}$ if and only if $P_{\langle\langle s,t\rangle,\langle s,t\rangle\rangle}$ holds of every proposition in the set of propositional alternatives introduced by *or*.

(75)

$$\left[\!\!\left[\begin{array}{c} \text{CP} \\ \text{if} \qquad\qquad\qquad \otimes \\ \otimes \qquad\qquad \text{or} \qquad\qquad \otimes \\ \text{we had had good weather} \qquad \text{the sun had grown cold} \end{array}\right]\!\!\right]^{\leq,g}$$

$$= \left\{ \lambda f_{\langle\langle s,t\rangle,\langle s,t\rangle\rangle}.\lambda w.\forall p \left[p \in \left\{ \begin{array}{c} \lambda w.\textbf{good-weather}_w, \\ \lambda w.\textbf{grow-cold}_w(\mathbf{s}) \end{array} \right\} \to f(p)(w) \right] \right\}$$

The denotation of the whole conditional can be calculated by applying the denotation of the *if*-clause to the denotation of the consequent.

(76) $[\![(70)]\!]^{\leq,g} = [\![(75)]\!]^{\leq,g}([\![(74)]\!]^{\leq,g})$

The universal quantifier conveys that the property of propositions denoted by the consequent is true of all propositions in the set denoted by the antecedent: for the counterfactual in (70) to be true, it has to be the case that the closest worlds where we have a good summer are all worlds where we have a bumper crop, and that the closest worlds where the sun grows cold are too, thus capturing the intuition that the counterfactual is false in the actual world.

Appendix B: Existential Closure and Relative Clauses

We present the computation of the wide and narrow scope interpretations of the sentence in (77).

(77)   Juan leyó todos los trabajos que le   había entregado algún
          Juan read all   the papers   that TO-HIM had   given   ALGÚN
          estudiante suyo.
          student   of his
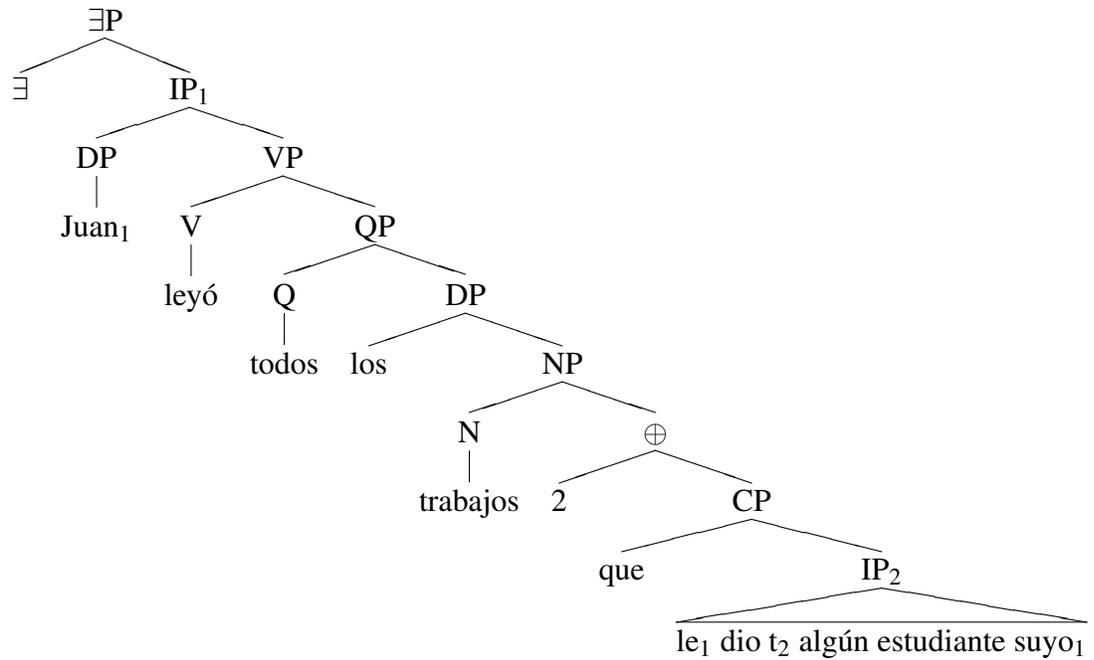   'Juan read all the papers that a student of his had given to him.'

We have assumed that Existential Closure is freely available up to interpretability. There are two possible sites for the Existential Closure operator in the sentence in (77): above the relative clause boundary, as in the LF in (78), and at the topmost IP level, as in the LF in (79).[26]
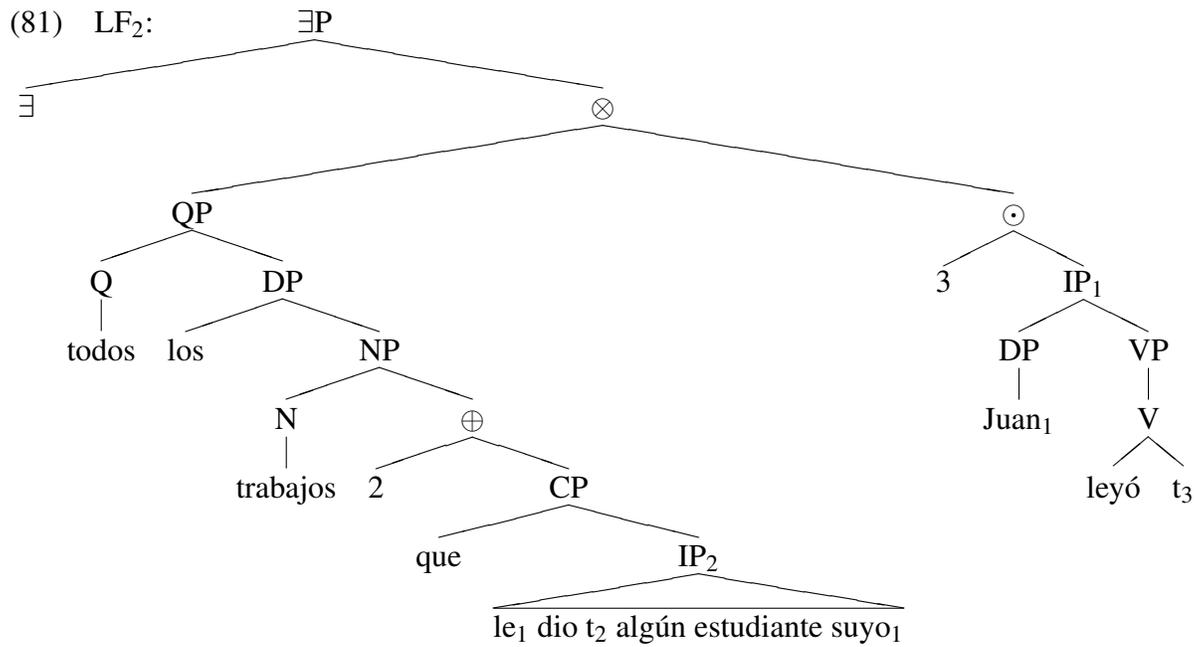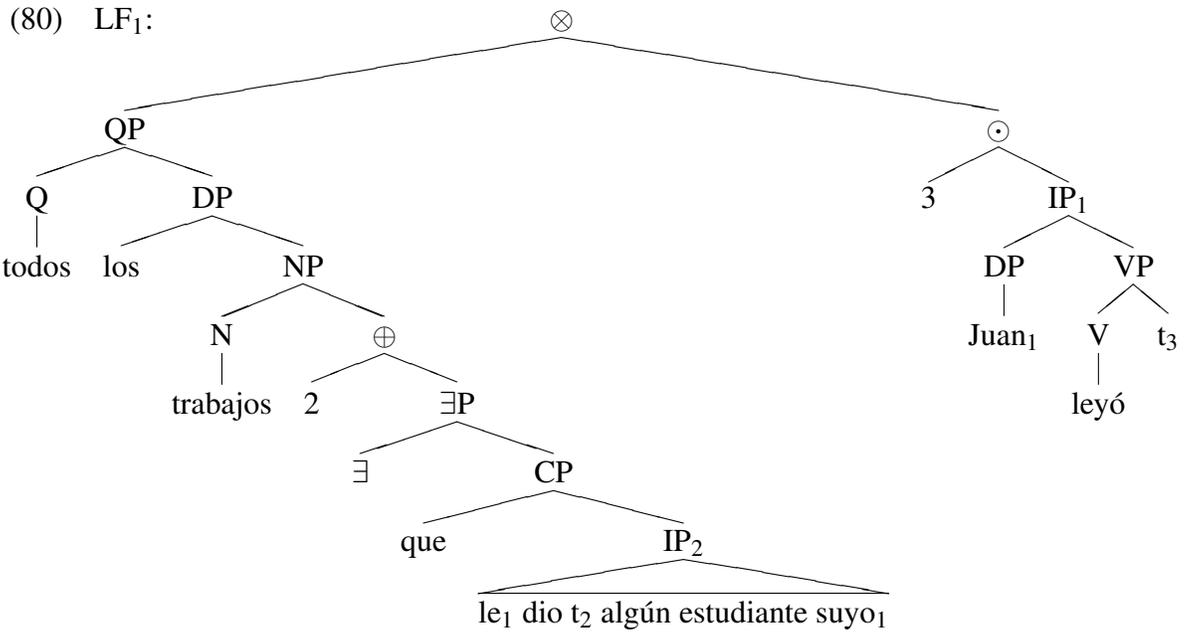
(78)   LF$_1$:
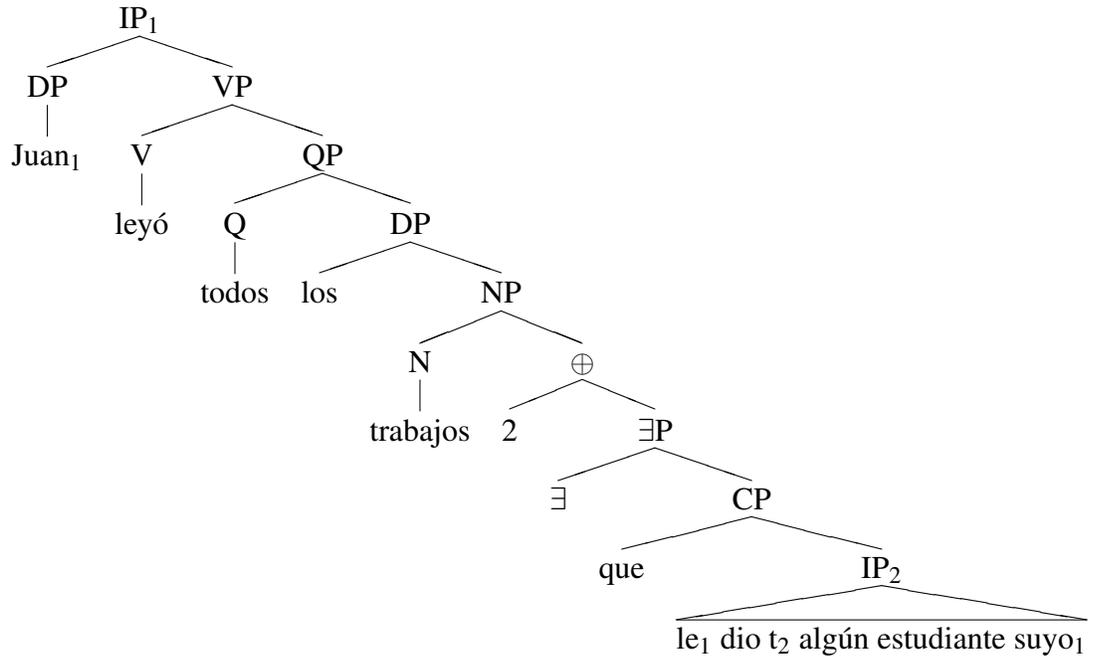
[26]As in Heim and Kratzer 1998, we assume that relative pronouns introduce an index into the representation, which is interpreted as a lambda abstractor.

(79) LF$_2$:

$\exists$P
├ $\exists$
└ IP$_1$
  ├ DP
  │ └ Juan$_1$
  └ VP
    ├ V
    │ └ leyó
    └ QP
      ├ Q
      │ └ todos
      └ DP
        ├ los
        └ NP
          ├ N
          │ └ trabajos
          └ $\oplus$
            ├ 2
            └ CP
              ├ que
              └ IP$_2$
                └ le$_1$ dio t$_2$ algún estudiante suyo$_1$

Both LFs contain a quantifier in object position. We assume that, to prevent a type mismatch, the quantifier raises, leaving a trace of type *e* in object position. We also assume that this movement operation introduces an index (interpreted as a lambda abstractor) right below the position where the moved element lands (Heim and Kratzer, 1998).

(80) LF$_1$:

⊗
QP
Q — todos
DP
los
NP
N — trabajos
2
⊕
∃P
∃
CP
que
IP$_2$
le$_1$ dio t$_2$ algún estudiante suyo$_1$
⊙
3
IP$_1$
DP — Juan$_1$
VP
V — leyó
t$_3$

(81) LF$_2$:

∃P
∃
⊗
QP
Q — todos
DP
los
NP
N — trabajos
2
⊕
CP
que
IP$_2$
le$_1$ dio t$_2$ algún estudiante suyo$_1$
⊙
3
IP$_1$
DP — Juan$_1$
VP
V — leyó
t$_3$

For the sake of illustration, we will assume that the quantifier *todos* is a run-of-the mill universal and that the definite determiner (*los*) is semantically invisible:[27]

---

[27]Alternatively, we could assume that the set of individuals is closed under sum formation, that the definite determiner denotes the maximal sum of individuals satisfying the property that the NP

(82) $[\![\text{todos}]\!]^{w,g} = \{\lambda P_{\langle e,st \rangle}.\lambda Q_{\langle e,st \rangle}.\lambda w'.\forall x[P(x)(w') \rightarrow Q(x)(w')]\}$

In (80), the NP provides the first argument of *todos*, and the node labelled '⊙' the second. To interpret the node labelled '⊙' we will make use of the Predicate Abstraction rule in Kratzer and Shimoyama 2002:

(83) If α is a branching node whose daughters are an index i and β, where $[\![\beta]\!]^{w,g} \in D_\sigma$, then $[\![\alpha]\!]^{w,g} = \{f | f \in D_{\langle e,\sigma \rangle} \ \& \ \forall a[f(a) \in [\![\beta]\!]^{w,g_{[a/i]}}]\}$

The denotation of the node labelled '⊙' is the singleton containing the function of type $\langle e,st \rangle$ that yields, for any individual a, the proposition that is true in a world w if and only if Juan read a in w.

(84) $[\![\odot]\!]^{w,g} = \{\lambda x.\lambda w'.\mathbf{read}_{w'}(\mathbf{Juan})(x)\}$

Let us consider now the denotation of the NP. Suppose that Juan only has two students: Marta and Pedro. The indefinite phrase *algún estudiante suyo* will denote the set in (85a) — assuming that the pronoun *suyo* is correferential with *Juan*. Combining the set in (85a) with the other elements in IP$_2$ by pointwise functional application, we get the set of propositional alternatives in (85b) below.

(85)   a. $[\![\text{algún estudiante of his}_1]\!]^{w,g} = \{\text{Marta, Pedro}\}$

   b. $\left\{ \begin{array}{l} \lambda w'.\mathbf{gave}_{w'}(\mathbf{Marta})(x)(\mathbf{Juan}), \\ \lambda w'.\mathbf{gave}_{w'}(\mathbf{Pedro})(x)(\mathbf{Juan}) \end{array} \right\}$

We assume that *que* is semantically vacuous. The denotation of the node ∃P is the singleton containing the proposition that is true if at least one of the propositions in the set in (85b) is true.

(86) $[\![\exists P]\!]^{w,g} = \{\lambda w'.\exists p \in (85b) \ \& \ p(w')\}$

The node labelled '⊕' in LF$_1$ denotes the set containing that function f of type $\langle e,st \rangle$ that maps any individual a into the proposition that is true in a world w if and only if at least one of the propositions in (85b) is true in w, when $x = a$, i.e. the proposition that is true in a world w if and only if at least one student in {Marta, Pedro} gave a to John in w.

(87) $[\![\oplus]\!]^{w,g} = \{f \in D_{\langle e,st \rangle} | \forall a[f(a) \in [\![\exists P]\!]^{w,g_{[a/2]}}]\}$

---

denotes, and that *todos* ranges over all parts of that sum, as in (i) below:

(i) $[\![\text{todos}]\!]^{w,g} = \{\lambda x_e.\lambda Q_{\langle e,st \rangle}.\lambda w'.\forall y[y \in x \rightarrow Q(y)(w')]\}$

We can now compute the denotation of the NP by combining the denotation of the N node in (88) with the denotation of (87) via Predicate Modification. We get the set in (89), which contains the function of type $\langle e, st \rangle$ that is true of an individual *a* in a world *w* if *a* is a paper and at least one student in {Pedro, Marta} gave *a* to Juan.

(88) $[\![\text{papers}]\!]^{w,g} = \{\lambda x.\lambda w'.\mathbf{paper}_{w'}(x)\}$

(89) $[\![\text{NP}]\!]^{w,g} = \left\{ \quad \lambda x.\lambda w'.\mathbf{paper}_{w'}(x) \ \& \ \left(\begin{array}{c} \mathbf{gave}_{w'}(\mathbf{marta})(x)(\mathbf{juan}), \\ \vee \\ \mathbf{gave}_{w'}(\mathbf{pedro})(x)(\mathbf{juan}), \end{array} \right) \quad \right\}$

The topmost IP denotes, therefore, the singleton containing the proposition that is true in *w* if and only if Juan read all of the papers that at least one individual in {Pedro, Marta} had given him. We get a narrow scope reading for the existential.

Consider now LF₂, in (81) above. The denotation of the node labelled '⊙' is as before. The denotation of the NP node is not, because we do not have an Existential Closure operator now, and the alternatives introduced by the indefinite grow to the top. The denotation of the nodel labelled '⊕' is now a set containing two functions of type $\langle e, st \rangle$, as illustrated below:

(90) $[\![\oplus]\!]^{w,g} = \left\{ \begin{array}{c} \lambda x.\lambda w'.\mathbf{gave}_{w'}(\mathbf{Pedro})(x)(\mathbf{Juan}), \\ \lambda x.\lambda w'.\mathbf{gave}_{w'}(\mathbf{Marta})(x)(\mathbf{Juan}) \end{array} \right\}$

To compute the meaning of the NP, we apply Predicate Modification pointwise. We get again a set containing two functions of type $\langle e, st \rangle$: the function that is true of any *x* in a world *w* if and only if *x* is a paper that Pedro gave to Juan, and the function that is true of any *x* in a world *w* if and only if *x* is a paper that Marta gave to Juan. Combining this set with the quantifier by pointwise Functional Application, we get the set of functions of type $\langle \langle e, st \rangle, st \rangle$ below:

(91) $[\![\text{QP}]\!]^{w,g} =$
$\left\{ \begin{array}{c} \lambda Q_{\langle e,st \rangle}\lambda w'.\forall x[\mathbf{paper}_{w'}(x) \ \& \ \mathbf{gave}_{w'}(\mathbf{Pedro})(x)(\mathbf{J}) \rightarrow Q(x)(w')], \\ \lambda Q_{\langle e,st \rangle}\lambda w'.\forall x[\mathbf{paper}_{w'}(x) \ \& \ \mathbf{gave}_{w'}(\mathbf{Marta})(x)(\mathbf{J}) \rightarrow Q(x)(w')] \end{array} \right\}$

Applying these functions pointwise to the node labelled '⊙' gives us a set containing two propositions: the proposition that Juan read every paper that Pedro gave to him, and the proposition that Juan read every paper that Marta gave to him. Existential Closure applies to this set of propositions and returns the (singleton containing) the proposition that is true in a world *w* if and only if there is at least

one student *x* in the set {Pedro, Marta} such that Juan read all papers that *x* gave to him. We get a wide scope reading.

We leave to the reader to verify that if we have a quantifier in subject position and we move it past the site of Existential Closure in LF$_2$, we derive the required intermediate readings.

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| | % of 'yes' answers | |
Subject	Condition A: algún	Condition B: un
1	0	20
2	0	60
3	0	0
4	20	20
5	0	20
6	0	20
7	20	0
8	20	20
9	0	20
10	20	0
11	0	0
12	0	20
13	40	20
14	20	0
15	0	20
16	20	20
17	0	0
18	40	0
19	0	40
20	60	40
21	0	0
22	0	0
23	0	20
24	20	0
25	0	0
26	80	40
27	40	20
28	20	20
29	0	0
30	60	0
31	20	40
32	0	0
33	0	0
34	40	20
35	0	60
36	20	20
37	0	0
38	20	20
39	0	60
40	0	0
41	0	0
42	0	0
43	0	60
44	20	0
45	0	0
46	40	0

Figure 1: Subject data. Experiment 1A