

Plural marking and d-linking in Spanish interrogatives

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Abstract

What is the semantic import of number morphology? This question has been traditionally addressed by focusing on singular and plural noun phrases. The present work brings interrogative phrases into the picture. We analyse Spanish bare interrogative ‘quién’ and its plural counterpart ‘quiénes’. Unlike *which*-questions in both English and Spanish, the behaviour of *quién*- and *quiénes*-interrogatives cannot be easily explained by most accounts of semantic number. In contrast, we argue that the distribution of these interrogatives in Spanish can be well accounted for by assuming that the plural ‘quiénes’ triggers a *strong plurality presupposition*, and can only be used in *d-linking* contexts, whereas ‘quién’ carries no specific requirement, as far as its semantics is concerned. As a result, our proposal shows that current approaches to number marking need to be refined in order to account for cross-linguistic and within-language variation.

1 Introduction

The question of the semantic import of overt number morphology is at issue in current semantics research (Link, 1983; Sauerland, 2003; Spector, 2007; de Swart and Farkas, 2010; Zweig, 2009; Grimm, 2013, among others). While most approaches have addressed this question by discussing number differences in declarative sentences, this paper analyses the semantics of singular and plural *wh*-interrogatives, which appear to be problematic for most accounts of both plural and question semantics.

Singular and plural *which*-interrogatives in English differ in what the speaker can expect to be a *complete true answer* to her question. A similar pattern is attested for Spanish *cuál/qué*-interrogatives.¹

- | | | | |
|-----|----|--|-------------------------|
| (1) | a. | Which client called? | ✓ John; ✗ John and Mary |
| | b. | Which clients called? | ✗ John; ✓ John and Mary |
| (2) | a. | ¿Cuál/Qué cliente llamó?
which.SG/what client called?
‘Which client called?’ | ✓ John; ✗ John and Mary |
| | b. | ¿Cuáles/Qué clientes llamaron?
which.PL/what clients called?
‘Which clients called?’ | ✗ John; ✓ John and Mary |

¹We will treat interrogatives headed by ‘cuál’ (‘which’) and by ‘qué’ (‘what’) in Spanish as equivalent to each other. As in English, they do contrast in their d-linking requirements.

Singular *wh*-questions trigger a *uniqueness* inference: questions such as (1a) and (2a) can only be uttered if the speaker believes exactly one client called (henceforth *exactly-one* contexts; Dayal, 1996). Conversely, uttering a plural interrogative such as (1b) or (2b) triggers the inference that the speaker believes that more than one client called (*plurality* or *anti-uniqueness* inference). These different inferences can be attributed to differences in number morphology, and are usually thought to arise with different strength (see section 2).

Interestingly, English *who*-interrogatives such as (3) do not trigger any specific inference about how many clients the speaker believes to have called: they have associated neither a *uniqueness* nor a *plurality* inference. Despite its singular morphology, these questions do not pattern with singular or with plural *which*-interrogatives.²

(3) Who called? ✓ John; ✓ John and Mary

The puzzling behaviour of *who*-interrogatives might be related to the fact that the quantifier ‘who’ lacks a plural counterpart in English (Chierchia, 1993; Hagstrom, 2003): ‘who’ can then be thought of as semantically underspecified for number, ranging over both atomic individuals and pluralities. The fact that ‘who’ triggers singular agreement with the verb could then be understood as default agreement.

Although the implementation of this idea might differ across accounts (see 2), one can easily notice that a specific prediction is made about languages that distinguish between singular and plural ‘who’: in these languages, the contrast attested for singular and plural *which*-interrogatives is expected to also arise for *who*-interrogatives. Specifically, singular *who*-interrogatives should trigger a uniqueness inference, whereas plural *who*-interrogatives should trigger a plurality inference. Spanish is one of such languages, making a morphological distinction between *who*_{SG} (‘quién’) and *who*_{PL} (‘quiénes’):

(4) a. ¿Quién llamó?
 who.SG called.SG?
 ‘Who called?’ ✓ John; ✓ John and Mary
 b. ¿Quiénes llamaron?
 who.PL called.PL?
 ‘Who called?’ ✗ John; ✓ John and Mary

As illustrated in (4a), singular *quién*-questions are compatible with both plural and singular answers. In other words, they appear to behave just like *who*-questions in English, suggesting that ‘quién’ is not semantically singular (no uniqueness inference). In contrast, the plural alternative in (4b) does trigger a plurality inference such that the speaker believes that more than one person called. This inference makes the question incompatible with singular answers. Importantly, other languages that also present a morphological distinction between singular and plural *who* give rise to the same inferential pattern as Spanish. As I will observe in section 4.3, this is also the case for Farsi and Hungarian *who*-interrogatives.

The Spanish data in (4) presents a challenge for a unified semantics of number morphology: even in presence of a plural alternative, singular morphology does not have the same semantic import across different *wh*-phrases (simple vs. complex *wh*-phrases), as revealed by the contrast between (1a)-(2a) and (4a). Most semantic accounts of number morphology consider singular and plural morphemes as alternatives to each other. Within these frameworks, the possibility of having more than one possible meaning for singular marking will cause a polysemic plural morphology as well.

²For instance, English ‘who’ can be combined with collective predicates (e.g. *Who gathered in the hallway?*), indicating that, despite triggering singular agreement, this interrogative quantifier is not semantically singular, as it has to be able to range over not only atoms but also over pluralities. Similar results hold for Spanish ‘quién’, which can also be combined with collective predicates.

The purpose of this paper is to provide an explanation for the distribution of *quién(es)*-interrogatives in Spanish. I will argue that the pattern illustrated in (4) can be derived directly from requirements of the plural ‘quién(es)’. In particular, our account builds on two main assumptions: (a) a strong semantics for the plural ‘quién(es)’, which triggers a *strong plurality* presupposition and can only be used in *d-linking* contexts; and (b) a weak semantics for the singular ‘quién’, which carries no specific requirement, and can be used whenever its plural alternative is not available. By relying on a strong account of plurality, my proposal challenges current theories of *weak* plural meaning and their cross-linguistic generality.

This article is organized as follows: I will start by presenting some background assumptions about number marking in interrogative sentences (Section 2). Then, Section 3 puts forward my characterization of Spanish *quién(es)*-interrogatives, which is based on cardinality (Section 3.1) and d-linking (Section 3.2) requirements. The complete account for the data is given in Section 4: I first explain the distribution of these interrogatives (Section 4.1), then point out some of the challenges that arise from my proposal (Section 4.2), and finish with a short note on how the puzzle extends to other languages (Section 4.3). Finally, Section 5 concludes and comments on open questions for further research.

2 Number marking in interrogative sentences

The English contrast illustrated in (1) can be well-accounted for by making two assumptions: (A) plural marking has weak semantic import (i.e. *weak account of plurality*, Link, 1983; Sauerland, 2003; Spector, 2007; Zweig, 2009); and (B) interrogatives presuppose the existence of a maximally informative true answer (Dayal, 1996).

Current approaches to plurality assume, following Link (1983), that the domain of individuals D_e is closed under sum (i.e. it contains atomic individuals as well as their sums). However, they do differ on how exactly plural and singular predicates draw their reference from the domain. *Weak accounts of plurality* (cf. A) assume that the meaning of plural morphology is strictly weaker than the one of singular: while singular predicates (e.g. ‘client’) range over atomic individuals, plural predicates (e.g. ‘clients’) range over both atoms and pluralities. Accounts might differ in how they derive this weak plural meaning (see Spector, 2007; Landman, 2000; Sauerland, 2003; Sauerland et al., 2005; Zweig, 2009 for different proposals). For the sake of simplicity, here we will follow the view proposed in Sauerland (2003). Note, however, that alternative implementations will not make any substantial difference to our proposal. On Sauerland’s view, the singular morpheme presupposes that the extension of the predicate to which it is applied only contains atomic individuals. In contrast, the plural morpheme has no semantic contribution (i.e. it is semantically vacuous).³

Assuming that the denotation of a question is the set of propositions that count as its possible answers (Hamblin, 1973), a singular question such as (1a) will only include in its denotation singular propositions of the form ‘ x called’, with x being an atomic individual. This is a direct consequence of the singular morphology in the predicate ‘client’. Plural questions will range over both singular and plural propositions. An illustration of the denotation of (1a) and (1b) is provided in (6). Following Heim and von Stechow’s (2018) reconstruction of Karttunen’s (1977) compositional semantics, we assume *wh*-words to be existential quantifiers and derive the question denotation by posting an abstract complementizer that acts as a “proto-question” operator.⁴ For simplicity, the requirements of

³Sauerland furthermore assumes the existence of a star-operator (*) that closes the predicate under sum formation (in the lines of Link, 1983): if the predicate is true of {a, b}, the star operator would make the predicate true of {a, b, a⊕ b}. This operator is compatible with the plural morpheme and incompatible with the singular.

⁴In order to achieve the correct composition, I will assume, following Heim and von Stechow, 2018, that the proto-question operator is generated together with another cover operator OP as its sister, generating the following LF: $[_{CP} OP \lambda p$ which client(s) $\lambda 1$ $[_{C'} 0$ $[_{C?} p$] t_1 called]]. Some authors have alternatively assumed that *wh*-expressions are not type $\langle et, t \rangle$ but a higher type (see Fox, 2012, and Heim and von Stechow, 2018 for discussion).

the singular morpheme are assumed to be inherited by the proposition.

- (5) a. $\llbracket \text{which client.SG} \rrbracket^w = \lambda F_{\langle e,t \rangle}. \exists x_e : [|x| = 1]. \text{client}(w)(x) \wedge F(w)(x)$
 b. $\llbracket \text{which clients.PL} \rrbracket^w = \lambda F_{\langle e,t \rangle}. \exists x_e. \text{client}(w)(x) \wedge F(w)(x)$
- (6) a. $\llbracket (1a) \rrbracket^w = \lambda p_{\langle s,t \rangle}. \exists x_e : [|x| = 1]. \text{client}(w)(x) \wedge p = \lambda w'. x \text{ called in } w'$

$$\llbracket (1a) \rrbracket^w = \left\{ \begin{array}{l} \lambda w'. m \text{ called in } w', \\ \lambda w'. b \text{ called in } w', \\ \lambda w'. j \text{ called in } w' \end{array} \right\}$$
- b. $\llbracket (1b) \rrbracket^w = \lambda p_{\langle s,t \rangle}. \exists x_e. \text{client}(w)(x) \wedge p = \lambda w'. x \text{ called in } w'$

$$\llbracket (1b) \rrbracket^w = \left\{ \begin{array}{l} \lambda w'. m \text{ called in } w', \\ \lambda w'. b \text{ called in } w', \\ \lambda w'. j \text{ called in } w', \\ \lambda w'. j \oplus m \text{ called in } w', \\ \lambda w'. j \oplus b \text{ called in } w', \\ \lambda w'. b \oplus m \text{ called in } w', \\ \lambda w'. j \oplus m \oplus b \text{ called in } w' \end{array} \right\}$$

By the assumption in (B), the set of *true* answers to a question should contain a member that entails all the other members. This member will be the *maximally informative* true answer to the question. Following Dayal (1996), the requirement in (B) can be captured in terms of the answerhood operator defined in (7): a question Q is felicitous only if in all worlds w compatible with common knowledge, $\text{ANS}(w)(Q)$ is defined.

$$(7) \quad \text{ANS}(w)(Q) = \left[\begin{array}{l} \exists p \in Q. p(w) \\ \forall p' \in Q [p'(w) \rightarrow p' \subseteq p] \end{array} \right]. \iota p \in Q. p(w) \wedge \forall p' \in Q [p'(w) \rightarrow p \subseteq p']$$

In words: $\text{ANS}(w)(Q)$ is the maximally informative answer to Q in w , if there is one, and is undefined otherwise.

- (8) a. $\text{ANS}(w)(6a)$ is defined iff:
 (i) $\exists p \in (6a)$ s.t. $p(w)$, and
 (ii) $\forall p' \in (6a)$, if $p'(w)$ then $p' \subseteq p$
 Exactly one ‘singular’ proposition in (6a) is true (cf. $\neg \exists p' \in (6a): p' \subseteq p$).
- b. $\text{ANS}(w)(6b)$ is defined iff:
 (i) $\exists p \in (6b)$ s.t. $p(w)$, and
 (ii) $\forall p' \in (6b)$, if $p'(w)$ then $p' \subseteq p$
 One or more than one proposition in (6b) is true (cf. $\exists p' \in (6b): p' \subseteq p$).

When the ANS operator is plugged into the LFs in (6), the corresponding LFs will have the felicitous conditions in (8). Since singular questions can only have such a maximally informative answer if the set of true propositions is a singleton (‘ x called’ does not entail ‘ y called’ unless $x = y$), the uniqueness inference is directly captured by the presuppositions of the ANS operator—as a *uniqueness presupposition*. In the case of plural, the set of true propositions can contain more than one member (‘ $x \oplus y$ called’ entails ‘ x called’ and ‘ y called’). However, once we assume that plural questions have in their denotation both plural and singular propositions (cf. (6b)), nothing prevent us from uttering a plural interrogative in a context where a (maximally informative) *singular* answer is expected. This is not a welcome result since, as we have observed, plural questions tend to require a plurality named in their answer (i.e. the aforementioned *plurality inference*).

By analogy with the case of nominal expressions, the plurality inference associated with plural

interrogatives can be thought to arise as an *implicated presupposition* (Heim, 1991; Sauerland, 2008), product of the competition between singular and plural alternatives. The basic reasoning goes as follows: In every scenario where two sentences are contextually equivalent (9a), a pragmatic principle such as *Maximize presupposition!* can apply, demanding the item with stronger presuppositions.

- (9) a. Two sentences F and F' are *contextually equivalent* in context c iff in every world w of c where $F(w)$ and $F'(w)$ are defined, $F(w)$ and $F'(w)$ have the same truth value.
- b. MAXIMIZE PRESUPPOSITION!
If F and F' are contextually equivalent in c and the presuppositions of F are stronger than those of F' , then one must use F and not F' .

The notion of contextual equivalence has to be slightly modified to be applied to interrogative sentences: two interrogatives will be *contextually equivalent* in one context if they have the same maximally informative answer in every world compatible with the context; namely, if ANS returns the same exhaustive true answer.⁵ For concreteness, we will then consider ANS to be incorporated into the LF of matrix questions. Whenever it is presupposed that exactly one person went to the party, the two interrogatives in (1) are contextually equivalent, and the speaker should use the alternative carrying stronger presuppositions; namely, the singular.

Given that using the plural interrogative is only appropriate in contexts where it is not common knowledge that there is a unique singular answer, these questions trigger the inference that the uniqueness presupposition is not satisfied: (1b) is then felicitous whenever its singular counterpart (1a) is not. As a result, plural interrogatives such as (1b) are predicted to have the implicated presupposition that it is *not* common knowledge that exactly one person called. That is to say, *it is possible*, according to common knowledge, that more than one person have called.

In the same way as with implicated presuppositions for declarative sentences, whenever the speaker is considered to be reliable and knowledgeable, the logic of the epistemic-step for presuppositions (or anti-presuppositions) developed in Chemla (2008) can be applied, and the inference can be strengthened into a *strong* implicated presupposition, such as “it’s common knowledge that more than one person called” (i.e. it is common knowledge that it is not the case that exactly one person called).⁶ Strikingly, the plurality inference for plural *which*-interrogatives is typically an implicated presupposition of this second class (a strong one): when the speaker utters the question, it seems to imply that the complete answer is a plural answer.

It is worth noticing that the distribution of singular and plural forms under a weak account of plurality crucially depends on the asymmetry in presuppositional strength between the two items: the plurality inference for the plural arises as long as the singular has stronger presuppositions; otherwise, a principle such as *Maximize Presupposition!* could not be applied.

To conclude this section, we would like to briefly explore how a weak account of plurality could deal with English *who*-interrogatives. The absence of a uniqueness inference for these questions indicates that, despite triggering singular agreement, the simpler *wh*-element ‘who’ is semantically plural or underspecified (see Dayal, 1996). In (10), ‘who’ is assumed to quantify over the domain of (human) individuals D_e , and interrogatives such as (3) should denote a set containing both plural and singular propositions, just like the plural question in (6b). The human requirement is encoded here as a presupposition. The main difference between plural and ‘neutral’ interrogatives would be that only

⁵Two interrogative sentences F and F' are *contextually equivalent* in context c iff in every world w of c where $\text{ANS}(w)(F)$ and $\text{ANS}(w)(F')$ are defined, $\text{ANS}(w)(F)$ and $\text{ANS}(w)(F')$ return the same maximally informative answer.

⁶In the case of questions, there is of course an inference that the speaker does not know the answer to the question. So for the reliability assumption to hold, it has to be the case the hearer believes that the speaker, at the same time, knows whether one or more than one people called, but does not know who exactly called. It is not clear that this line of reasoning is sufficient to explain why, out of the blue, a plural *wh*-question suggests that the answer involves a true plurality, but we will not pursue this question here.

the former has an alternative with stronger presuppositions, and, as a result, no plurality inference is predicted for *who*-interrogatives.

$$(10) \quad \llbracket \text{who} \rrbracket^w = \lambda F_{(e,t)}. \exists x_e : [x \in \llbracket \text{human} \rrbracket^w]. F(w)(x)$$

This is hard to integrate with the semantics proposed by Sauerland for number morphology: while ‘who’ phrases appear to receive singular marking, the singular morpheme seems to have the same semantic import as the plural one (i.e. it is vacuous).

3 Characterizing *quién* and *quiénes* interrogatives

3.1 Cardinality requirement

The distribution of *quién(es)*-interrogatives in Spanish is restricted by conditions on contexts: the possibility of using each of these interrogatives depends on the beliefs the speaker has about the complete answer to her question. The data in (11)- (12) illustrate, together with (4), such distribution.

- (11) *The speaker is pointing towards her clients, who are at the other side of the room.*
- Uno de ellos llamó ayer, pero no estoy segura (de) quién (#quiénes).
One of them called yesterday, but not am sure (of) who.SG (#who.PL)
‘One of them called yesterday, but I am not sure who’
 - Uno o dos de ellos llamaron ayer, pero no estoy segura (de) quién
One or two of them called yesterday, but not am sure (of) who.SG
(#quiénes).
(#who.PL)
‘One or two of them called yesterday, but I am not sure who.’
 - Varios de ellos llamaron ayer, pero no estoy segura (de) quiénes (#quién).
Several of them called yesterday, but not am sure (of) who.PL (#who.SG)
‘Several of them called yesterday, but I am not sure who.’
- (12) A: Mucha gente de la que invitamos ya llamó. B: ¿De verdad? ¿Quiénes
A: Many people of the that invited already called. B: For real? Who.PL
(??quién)?
(??who.SG)?
‘A: Many of the people we invited already called. B: Really? Who?’

Singular *quién*-interrogatives such as (4a) can be felicitously uttered in two alternative scenarios: whenever the speaker expects a singular answer (i.e. *exactly-one* contexts in (11a)) and whenever the speaker does not know whether one or more than one person called —e.g. (11b). We will call these contexts *ignorance scenarios* because the speaker is ignorant about the cardinality of the expected answer⁷. The fact that *quién*-interrogatives are available in ignorance scenarios is what makes them fully compatible with both plural and singular answers, as observed in (4).

The plural alternative with ‘quiénes’ is not available in either of these two contexts. *Quiénes*-interrogatives can only be felicitous as long as it is common knowledge that a plurality will be named in the complete answer (cf. plurality inference). Specifically, the common ground should contain the proposition “more than one person VP” to admit an interrogative of the form *¿quiénes VP?*⁸ In

⁷Note that, in principle, I am excluding contexts where the speaker is not sure whether an individual answer exists. In other words, in all the contexts above, the speaker is expecting at least one individual to be named in the answer to her question.

⁸We assume the notion of common ground proposed by Stalnaker (1978, p.74). A proposition is in the common ground if each interlocutor is “disposed to act as if he assumes or believes that the proposition is true, and as if he assumes or believes

(11c), the speaker asserts that more than one person called, introducing the proposition in the common ground, and asks for their identity. *Quién*-interrogatives are degraded in this context. As illustrated in (12), this contrast is partly independent of the morphological marking in the noun: even though the phrase ‘*mucha gente*’ triggers singular agreement in Spanish, it is semantically plural and therefore it seems to force the use of the plural ‘*quiénes*’.⁹

The availability of *quién*-interrogatives in ignorance contexts (e.g., (11b)) is well accounted for by an underspecified entry for ‘*quién*’, analogous to the one proposed for English ‘*who*’ in (10):

$$(13) \quad \llbracket \text{quien} \rrbracket^w = \lambda F_{(e,t)}. \exists x_e : [x \in \llbracket \text{human} \rrbracket^w]. F(w)(x)$$

Since ‘*quién*’ will range over the set of people—which we could consider equivalent to the domain of singular and plural individuals—, *quién*-interrogatives will include in their denotation both singular and plural propositions. No constraint would then be imposed to the context of utterance. For instance, in a scenario where the speaker is ignorant about answer cardinality, the ANS operator would be able to return both singular or plural propositions, depending on the world.

The question then is how to derive the plurality inference attested for *quiénes*-interrogatives. Depending on the specific account of number marking one adopts, such inference can be derived in one of two ways: as an implicated presupposition, product of the competition with a stronger alternative (cf. weak accounts of plurality described in Section 2), or as part of the literal meaning of the interrogative (i.e. *strong* accounts of plurality). In their simplest form, weak accounts of plurality predict singular *quién*-interrogatives to give rise to a uniqueness presupposition. The plurality inference attested for the plural should arise as an implicated presupposition. As observed, this first prediction is not borne out by the data: an underspecified entry for ‘*quién*’ is indeed required; therefore, there is at least one entry for ‘*quién*’ which is not capable of competing with a weak plural alternative.

Nonetheless, one might still conceive the possibility that ‘*quién*’ is actually ambiguous between a form that ranges only over atoms (‘*quién.SG*’), and one that is neutral to semantic number (‘*quién.∅*’). This ambiguity might emerge from the singular morpheme or be lexically based. In either case, the neutral form ‘*quién.∅*’ would be the one used in ignorance contexts (11b), whereas ‘*quién.SG*’, equivalent to ‘*which person*’ in English, would be used in *exactly-one* scenarios (11a). The plural ‘*quiénes*’ (‘*quién.PL*’) would have a weak semantics, equivalent to ‘*which people*’ in English, and the plurality inference would arise by the competition with ‘*quién.SG*’ in the relevant contexts. As long as this inference is an implicated presupposition, *quiénes*-interrogatives should be available whenever the singular alternative is not, namely in both *more-than-one* and ignorance scenarios.¹⁰ Hence, the distribution of ‘*quiénes*’ should be strictly equivalent to the one of all the other plural interrogatives involving complex *wh*-phrases, such as the ones headed by ‘*cuáles*’ or ‘*qué*’ in Spanish or by ‘*which*’ in English. In (11b), we already showed that *quiénes*-interrogatives are deviant in ignorance scenarios.¹¹ This pattern persists across different contexts, contrasting—crucially—with the behaviour of

that his audience assumes or believes that it is true as well”.

⁹Some speakers report unclear judgments regarding the unavailability of ‘*quién*’ in these cases, in particular in (12). While they all agree in that the alternative with ‘*quiénes*’ is preferred, they do not necessarily consider the sentence unacceptable. As we will note in Section 3.2, the use of ‘*quiénes*’ is constrained by both a plurality and a *d-linking* requirement. The fact that some speakers might find ‘*quién*’ acceptable in these scenarios is presumably grounded on a non-d-linked interpretation.

¹⁰I am tacitly assuming that plural ‘*quiénes*’ competes only with singular ‘*quién*’. As the editor suggests (p.c.), one could also imagine that the number neutral alternative ‘*quién.∅*’ also carries some sort of ignorance presupposition (e.g. the cardinality is unknown). If this were the case, ‘*quiénes*’ would compete with both number neutral and singular alternatives and it would be infelicitous in ignorance scenarios. Since there is no independent evidence for the existence of such ignorance presupposition, I will not discuss it further.

¹¹Arguably, the sluicing example provided in (11b) is also deviant when we replace ‘*quiénes*’ by ‘*which ones*’ in English or by ‘*cuáles*’ in Spanish (e.g. i). However, the singular alternatives in (ii) are even more degraded in both languages.

- a. (i) ? One or two of my clients called yesterday, but I am not sure which one.

plural complex questions in English and Spanish, as shown in (14) and (15).¹²

(14) *G is a 4-person game. The possible outcomes of which are: either one player wins or two players win.*

A: Qué hiciste ayer con tus amigos?

‘What did you do yesterday with your friends?’

B: Les enseñé a jugar G, y jugaron una partida.

‘I taught them how to play G, and they played a game.’

A:

a. ¿Quién ganó?

‘Who.SG won?’

b. # ¿Quiénes ganaron?

‘Who.PL won?’

c. ¿Cuáles de tus amigos ganaron?

‘Which.PL friends won?’

d. Which friends won?

(15) *Juan is expecting at least one of his friends to come with him to the party.*

a. Juan no sabe todavía quién de sus amigos va a ir a la fiesta.

Juan not know yet who.SG of his friends FUT PREP go to the party.

‘Juan doesn’t know yet who (among his friends) will go to the party.’

b. #/?? Juan no sabe todavía quiénes de sus amigos van a ir a la fiesta.

#/?? Juan not know yet who.PL of his friends FUT PREP go to the party.

‘Juan doesn’t know yet who (among his friends) will go to the party.’

c. Juan no sabe todavía cuáles de sus amigos van a ir a la fiesta.

Juan not know yet which.PL of his friends FUT PREP go to the party.

‘Juan doesn’t know yet which ones of his friends will go to the party.’

d. Juan doesn’t know yet which friends will go to the party.

Plural interrogatives headed by ‘which’ in English and by ‘cuáles’ or ‘qué’ in Spanish can be felicitously uttered in ignorance contexts, as observed in (14c)/(15c) and (14d)/(15d). This indicates that the *plurality inference* for these interrogatives is indeed an implicated presupposition: the relevant questions can be used as soon as the presupposition of their singular counterpart is not satisfied, including in an ignorance scenario. Instead, *quiénes*-interrogatives are still incompatible with this context (e.g., (14b)/(15b)), suggesting that the plurality inference for these questions is not an implicated presupposition.

A further contrast between *quiénes*-questions, on the one hand, and plural *which* and *cuáles/qué* questions, on the other, is obtained when these interrogatives are embedded under a universal quantificational adverb (e.g. ‘each day of the week’). Consider the scenario described in (16). This ‘mixed’ context ensures that every day there was *at least* one person the professor received. As predicted by different accounts of plurality (see Spector, 2007; Križ, 2015; Zweig, 2009 for a discussion of this kind of examples), sentences such as (16a) and (16b) can be considered true descriptions of such situation (i.e. the professor received one or more than one student each day of the week’). Instead,

(ii) #One or two of my clients called yesterday, but I am not sure which ones.

b. (i) ?Uno o dos de mis clientes llamaron ayer, pero no estoy segura (de) cuáles.

(ii) #Uno o dos de mis clientes llamaron ayer, pero no estoy segura (de) cuál.

¹²The contrasts reported below between simple and complex plural interrogatives are not systematically shared by all the informants (but by most of them). A controlled study with a bigger sample of responses might help elucidate the source of this variability.

COMMON GROUND		
<i>Exactly one person VP</i>	<i>At least one person VP</i>	<i>More than one person VP</i>
which/what person VP? (EN) cuál/qué persona VP? (SP)	which/what people VP? (EN) cuáles/qué personas VP? (SP)	
	who VP? (EN)	
quién VP? (SP)		quiénes VP? (SP)

Table 1: Distribution of interrogatives depending on the contexts where they can appear. Shaded cells indicate the alternatives that carry stronger presuppositions.

quiénes-interrogatives are perceived as deviant by Spanish native speakers.

- (16) *The professor received one student every day and at least one day he received multiple students.*
- The professor knows which students came to his office each day of the week.
 - El profesor sabe qué estudiantes/cuáles de sus estudiantes vinieron a su oficina cada día de la semana.
The professor knows what students/which.PL of his students came to his office each day of the week.
'The professor knows which students came to his office each day of the week.'
 - ?? El profesor sabe quiénes de sus estudiantes vinieron a su oficina cada día de la semana.
?? The professor knows who.PL of his students came to his office each day of the week.
the week.
'The professor knows who of his students came to his office each day of the week.'

Note that this contrast cannot be explained by relying on relevance or contextual differences (Križ, 2015): for each of the three sentences in (16) it is equally irrelevant whether one or more than one student was received by the professor.

The examples presented in (11)-(16) (see illustration in Table 1) suggest that *quién* and *quiénes* interrogatives cannot be explained with the same tools we used to account for questions involving complex *wh*-phrases (i.e. *which* and *cuál* interrogatives). Namely, they cannot be explained in terms of weak account of plurality.

Rather, the properties of these questions can be nicely integrated within a *strong plural semantics* (in the lines of Chierchia, 1998), such that the plural 'quiénes' carries a *more-than-one* requirement as part of its literal meaning. A weak plural meaning, however, is still required in order to explain the behaviour of the different plural interrogatives in both Spanish and English. Should one then adopt an *ambiguity-based* approach to number marking (de Swart and Farkas, 2010; Grimm, 2013; Martí, 2018), where plural morphology is ambiguous between a strong and a weak meaning? As I will discuss in more detail in Section 4.2, these accounts crucially rely on positing an unambiguous singular marking, and thus make inaccurate predictions for singular *quién*-interrogatives.

$$(17) \quad \llbracket \text{quiénes} \rrbracket^w = \lambda F_{\langle e,t \rangle}. \exists x_e : \left[\begin{array}{l} x \in \llbracket \text{human} \rrbracket^w \\ |x| > 1 \end{array} \right]. F(w)(x)$$

For the moment, a lexical entry such as (17) ensures that the denotation of *quiénes*-interrogatives includes plural propositions, making them only compatible with *more-than-one* contexts. This is encoded as a presupposition of the existential quantifier. In this respect, *quiénes*-interrogatives are

the mirror image of singular questions headed by ‘cuál’ and ‘which’: while the latter presuppose that the complete answer involves an atomic individual, the former presuppose that the complete answer involves a non-atomic individual.

In a recent proposal, Elliott et al. (2018) have aimed at unifying the data provided in a previous version of the present paper with a standard weak account of plurality. In a nutshell, Elliott et al. take bare singular *wh*-expressions (e.g. ‘who’, ‘quién’) to have a type flexible denotation such that they can range either over individuals or over higher-order semantic objects (i.e. quantifiers). The lack of uniqueness presupposition for *quién*-interrogatives is directly derived from making ‘quién’ range over generalized quantifiers. This movement alone, however, does not account for the different inferential pattern of bare and complex *plural* interrogatives in ignorance contexts (e.g. (14)). Thus, Elliott et al. assume that the implicated presupposition associated to plural marking (i.e. it is not common knowledge that exactly one person VP) is obligatorily strengthened for these interrogatives, always leading to a *strong* plurality inference (i.e. it is common knowledge that more than one person VP). In other words, the epistemic step à la Chemla (2008) would always be applied (see Section 2).¹³

As far as I can see, however, this account does not straightforwardly explain why the plurality inference is not obligatorily derived for other plural interrogatives, such as *which* and *cuáles/qué* questions and, more generally, for other noun phrases (see discussion above). Presumably, this obligatoriness is specific to ‘quiénes’ —or, more generally, to simple *wh*-words. If this is indeed the case, the account in Elliott et al. (2018) would rely on a lexical stipulation.¹⁴ I will leave at the moment the possibility raised by Elliott et al. open, referring the reader to the relevant paper.

3.2 D-linking requirement

We have proposed that *quiénes*-interrogatives impose a *more-than-one* requirement into the common ground. While satisfying this requirement is a necessary condition to license a *quiénes*-interrogative, it is not a sufficient one. Additionally, the plural ‘quiénes’ seems to require a *discourse-linked* context, where the domain of individuals over which the quantifier ranges is either contextually salient or has been previously introduced into the discourse by an indefinite noun phrase or whatever element could license anaphora (Pesetsky, 1987; Comorovski, 2013).

Consider the context in (18). This scenario ensures that the speaker believes that more than one person is in the house, but differs from previous examples in that the individuals contained in the set of people are not contextually salient or discourse-given. *Quiénes*-interrogatives are not licensed in these cases, and only the alternative with ‘quién’ can be uttered (18a). A similar pattern is attested with plural indefinites in (18b); (Alonso-Ovalle and Menéndez-Benito, 2011; Etxeberria and Giannakidou, 2010).¹⁵ As expected, the contrast is reversed if an antecedent for the *wh*-phrase has been previously introduced in the discourse (18c).¹⁶

¹³The authors actually cash out this idea by assuming obligatory local exhaustification (following Magri, 2009, see Elliott et al., 2018, p.21).

¹⁴Additional shortcomings of this proposal are discussed in Alonso-Ovalle and Rouillard (2018).

¹⁵An anonymous reviewer points out that the contrast in (18a) is likely to have a different source from the one in (18b). Indeed, the singular ‘algún’ is an ignorance indefinite, whereas the plural ‘algunos’ is not, explaining why only the former is acceptable in this type of scenarios. In contrast, ‘quién’ does not introduce ignorance —at least not in the same sense. The connection between plurality and knowledge (“anti-ignorance”), however, might be worth exploring.

¹⁶‘Quién’ and ‘quiénes’ also differ in their ability to appear in interrogatives without existential import. As *who*-interrogatives in English (Krifka, 2011), singular *quién*-interrogatives can appear both in *there*-insertion contexts (e.g. i) and in scenarios where the speaker puts in doubt the existence of propositions in the set of true answers (e.g. rhetorical questions in (ii); Aguero Bautista, 2001). *Quiénes*-interrogatives are deviant in these contexts.

- (i) ¿Quién (# quiénes) hay en la fiesta?
Who.SG (# who.PL) was at the party?

- (18) *Mary and John arrive at their apartment, where there is supposed to be no one. They hear two people whispering inside. Mary asks:*
- a. ¿Quién (#quiénes) está ahí?
Who.SG (#who.PL) is there?
'Who is in there?'
 - b. Algún ladrón (#algunos ladrones) debe haber entrado.
Some.SG thief (#some.PL thieves) must have entered.
'Some thief must have broken-in'
 - c. Dos personas están hablando en el dormitorio, pero no sé quiénes (#quién)
Two people are talking in the bedroom, but not know who.PL (#who.SG)
son.
are.
'Two people are talking in the bedroom, but I don't know who they are.'

Another piece of evidence indicating the need of an additional *d-linking* requirement comes from the possibility of combining the singular 'quién' with collective and reciprocal predicates in (19a) and (19b). Collective and reciprocal predicates can *only* be predicated of pluralities; therefore, the speaker is *by default* opinionated about the cardinality of the expected answer. Given that *quiénes*-interrogatives have stronger presuppositions than their singular alternative (cf. (17)), questions such as (19a) should be blocked. Nonetheless, informal reports suggest that *quién*-interrogatives are actually preferred whenever one forces a *non-d-linked* context. This is the case, for example, when the question in (19b) is uttered in a context where the speaker does not know any of the attendees to the party.

A similar pattern arises when quantificational adverbs quantify over the embedded question (Quantificational Variability Effects, Berman, 1991). The sentence in (19c) triggers the inference that multiple people called and for most of them, Mary knows that they called. The embedded interrogative 'quién llamó' ('who_{SG} called') needs to have a plural maximal answer in order to allow such reading.

- (19) a. ¿Quién se juntó ayer a la noche?
Who.SG REFL gathered yesterday at the night?
'Who gathered last night?'
- b. ¿Quién se conoce entre sí en la fiesta?
Who.SG REFL know between them at the party?
'Who knows each other at the party?'
- c. María sabe mayormente quién llamó.
María knows mostly who.SG called
'Mary mostly knows who called'

The examples above suggest that the plural 'quiénes' can only range over a discourse or contextually salient set: 'quiénes' is always understood as 'quiénes out of the salient set of people'.¹⁷ This

'Who was there at the party?'

- (ii) *Mary's parents decided not to let her go out on Friday's night. Very upset, Mary says to them:*

¿Quién (#quiénes) se creen que son?
Who.SG (# who.PL) REFL believe that are?
'Who do you think you are?'

The availability of appearing in *there*-insertion contexts has been traditionally used to place DPs in the (in)definiteness scale (Heim, 1987). In (16), 'quién' proves to be better than 'quiénes' in this context, suggesting that the later is a stronger DP than the former. It's natural to think that there is a relation between *d-linking*, on the one hand, and definiteness and existential import, on the other. While establishing such connection might potentially help capturing all these contrasts with an unique account, I will not explore this connection here.

¹⁷One might be tempted to treat the interrogative 'quiénes' as a definite description (e.g. *the*(λx *people*(x))), in the same way it has been proposed for *which*-phrases in English (Rullmann and Beck, 1998; Novel and Romero, 2010) The *d-linking*

property, described as *d-linking*, has been used to account for the syntactic behaviour of interrogative sentences (e.g. *which*-interrogatives in English; Pesetsky, 1987, 2000). However, it has not been formally defined in the semantics literature, being alternatively assimilated to specificity or definiteness. For the purposes of this paper, I will define *d-linking* as follows:

- (20) (i) An interrogative phrase is *d-linked* in a context *c* if its restrictor *P* is understood to denote a contextually salient set of individuals that are *P* and that can be referred to by a pronoun or by the definite description ‘The Ps’. In such a case, the interrogative phrase can be paraphrased by a partitive *wh*-phrase of the form ‘Which of the *Ps*’.¹⁸
(ii) An interrogative phrase has a *d-linking requirement* if it cannot be felicitously used in a context *c* unless it is d-linked in *c*.

In scenarios such as (18), neither the pronoun ‘they’ nor the definite description ‘the thieves’ are licensed, indicating that the context does not provide a ‘contextually salient’ set of thieves in the sense of (20)i. In other words, although there might be a sense in which *there is* a salient set of two people whispering inside the apartment (as suggested by an anonymous reviewer), the interrogative cannot be d-linked in (18).

- (21) (cf. context in (18))
a. #Ellos deben ser ladrones.
‘They must be thieves’
b. #Los ladrones nos están robando.
‘The thieves must have broken in’
c. # ¿Cuáles de los ladrones entraron?
‘Which of the thieves have broken in?’

Some interrogative elements have a d-linking requirement: they can only be uttered in a context where they are d-linked. Others, instead, are underspecified for d-linking, and they can appear in any context. *Wh*-words such as ‘which’ and ‘quiénes’ seem to belong to the first group, whereas English ‘who’ and ‘quién’ belong to the second. Interestingly, some of these interrogative elements can optionally take as restrictors overt partitives that contain pronouns or definite descriptions. Whenever they do, we can assume that the utterance context provides a contextual reference for the overt partitive, and therefore the context is d-linked for the restrictor. This is the case for ‘quién’ and ‘quiénes’: they can both take overt partitives (e.g. (22)).

- (22) a. ¿Quién de tus amigos llamó ayer?
who.SG of your friends called yesterday?
‘Which one of your friends called yesterday?’
b. ¿Quiénes de tus amigos llamaron ayer?
who.PL of your friends called yesterday?
‘Which ones of your friends called yesterday?’

We can thus predict that whenever the *wh*-element takes a partitive and the cardinality requirement is met (i.e. *more-than-one* contexts), only the alternative with ‘quiénes’ will be licensed.¹⁹ This is

requirement would then be captured by the standard familiarity constraint for definite phrases (i.e. the reference of the definite has to be “familiar” to the audience, Heim, 1983). We will leave this possibility open for future research.

¹⁸The notion of “contextually salient individual” here does not in fact cover cases where, informally speaking, a ‘discourse-referent’ (to use DRT terminology, Heim, 1983; Kamp et al., 2011) is ‘introduced’ by indefinites in preceding discourse, allowing for subsequent pronouns to pick up that referent. While contexts that license pronouns also license ‘quiénes’, a full formalization of the notion of ‘contextually salient individual’ would need to rely on a dynamic semantics framework, but that goes beyond the scope of this paper.

¹⁹ For inherently d-linked words, having an overt partitive can however make a slight difference. For example, ‘which’ is

indeed the case:

- (23) a. * ¿Quién de tus amigos se juntó ayer?
* who.SG of your friends REFL gathered yesterday?
'Which one of your friends gathered yesterday?'
b. ¿Quiénes de tus amigos se juntaron ayer?
who.PL of your friends REFL gathered yesterday?
'Which ones of your friends gathered yesterday?'
c. * María sabe mayormente quién de sus amigos llamó.
* María knows mostly who.SG of her friends called.
'Mary mostly knows which one of her friends called.'
d. María sabe en su mayoría quiénes de sus amigos llamaron.
María knows in its majority who.PL of her friends called.
'Mary mostly knows which ones of her friends called.'

Lastly, let me briefly note that the contrasts between 'quién' and 'quiénes' discussed in Section 3.1 are also expected to become sharper whenever it is guaranteed that the interrogative is d-linked in the context; namely, whenever the *wh*-word takes an overt partitive. This is indeed the case for, for example, the contrast between (a) and (b) in (14) —'quién' of your friends vs. 'quiénes' of your friends.

4 Account

4.1 Deriving the distribution of *quién(es)* interrogatives

The use conditions of *quién* and *quiénes*-interrogatives can be summarized as follows (see also Table 2 for a complete paradigm):

- (24) A sentence of the form *¿quiénes VP?* can be felicitously uttered in *c* iff:
- a. **cardinality requirement**
the question presupposes that its complete answer involves a non-atomic individual.
 - b. ***d-linking* requirement**
the question presupposes its complete answer will be drawn from a 'contextually salient' (or previously introduced) set of individuals.

Otherwise, the alternative *¿quién VP?* should be used.

The plural 'quiénes' is constrained by the conjunction of (a) and (b): As long as one of the two requirement is not fulfilled in the common ground, the alternative with 'quién' will be the only available option. *Quién*-interrogatives are therefore underspecified, and their use conditions are disjunctive: they can be used either when the plurality requirement is not met or when the context is not d-linked.

one of the few *wh*-words in English that is inherently d-linked *and* can take an overt partitive as a complement. While both *which*-interrogatives below can only be felicitously uttered if the context provides a salient set of books —from where the speaker is asking for a choice—, the contextual requirements seem to be stronger for (ii) than for (i).

- (i) Which book did you read?
- (ii) Which of the books did you read?

This might suggest that the d-linking requirement as defined in (20) is actually too strong. However, since the goal of (20) is to ensure that the context is d-linked, I will keep this proposal for the time being.

I will first account for this distribution by presenting a non-compositional semantics for ‘quién’ and ‘quiénes’, where these are treated as unbreakable morphemes. That is, I assume for now that the cardinality and d-linking requirements emerge specifically for ‘quiénes’ as part of its lexical meaning. However, given that the requirements in (24) are only imposed to the plural alternative, it is natural to infer that they are somehow related with the semantics of plural morphology. This intuition is assessed in the next subsection. There, I explore the challenges of deriving the meaning of ‘quién’ and ‘quiénes’ from a single lexical entry (‘quién’) plus independent mechanisms for number marking and d-linking.

	COMMON GROUND		
	<i>Exactly one person VP</i>	<i>At least one person VP</i>	<i>More than one person VP</i>
Interrogative is d-linked in the context	which person <i>VP?</i> (EN) cuál/qué persona <i>VP?</i> (SP)		which people <i>VP?</i> (EN) cuáles/qué personas <i>VP?</i> (SP)
		quién <i>VP?</i> (SP)	quiénes <i>VP?</i> (SP)
Interrogative is not d-linked in the context	what person <i>VP?</i> (EN) qué persona <i>VP?</i> (SP)		what people <i>VP?</i> (EN) qué personas <i>VP?</i> (SP)
		who <i>VP?</i> (EN) quién <i>VP?</i> (SP)	

Table 2: Final Distribution of interrogatives depending on the contexts where they can appear. Interrogatives are either d-linked or non-d-linked in the context based on the definition in (20).

Let me now inspect a first, non-compositional account by working on the examples in (4). The cardinality requirement is cashed out in (25b) as an anti-singleton presupposition: the domain of quantification of ‘quiénes’ is restricted to plural individuals. Since providing a formal definition of d-linking exceeds the scope of this paper, an intuitive way to express the requirement in (24b) would be simply assuming that ‘quiénes’ includes a pronominal element, represented by an index i , whose reference is determined by the assignment function g in a given context.

There are alternative ways of integrating this pronominal element into the meaning of the quantifier. A first, ultimately unsatisfactory solution would be treating this pronominal element as the restrictor of the interrogative quantifier: x is a subpart (\preceq) of the plurality denoted by $g(i)$. An appropriate context for the use of ‘quiénes _{i} ’ would then be one that provides a specific assignment function for the index i (i.e. *appropriateness condition*). Moreover, ‘quiénes _{i} ’ would trigger the presupposition that the value assigned to i by the assignment function is contained in the set of humans, which contains atoms as well as pluralities. This presupposition is cashed out as a definiteness condition in (25b), given Kratzer and Heim’s notational conventions.

$$(25) \quad \begin{array}{l} \text{a. } \llbracket \text{quién} \rrbracket^{w,g} = \lambda F_{(e,f)}. \exists x_e : [x \in \llbracket \text{human} \rrbracket^w] . F(w)(x) \\ \text{b. } \llbracket \text{quiénes}_i \rrbracket^{w,g} = \lambda F_{(e,f)}. \exists x_e : \left[\begin{array}{l} |x| > 1 \\ g(i) \in \llbracket \text{human} \rrbracket^w \end{array} \right] . x \preceq g(i) \wedge F(w)(x) \end{array}$$

The entry in (25b) accurately captures the d-linking requirement as defined in (20): the existential quantifier would range over the referents introduced by this anaphor, making ‘quiénes _{i} ’ equivalent to ‘which of them’, modulo the cardinality requirement.

There is, however, a problem with this proposal²⁰: the entries in (25) fail to have the same at-issue content, and therefore they cannot be presuppositional alternatives of each other. That is: by adding a further restriction in the assertive content, the interrogative quantifier ‘quiénes’ is treated as a complex *wh*-word, more similar to ‘which’ than to ‘quién’. In order to better encode the impact of the context on the interpretation of the quantifier, I make two substantial changes in the lexical entries.

First, I follow Von Stechow (1994) in proposing that the quantificational domain is contextually restricted. Having a contextual restriction for *wh*-words is desirable, independently of the d-linking requirement: it’s, for instance, unlikely that when someone utters a *quién*-interrogative, she intends to ask about every human in the universe; rather, the question is probably about who among a restricted set of humans. As sketched in (26), both ‘quién’ and ‘quiénes’ are then hypothesised to be interpreted relative to a contextually supplied set, which is provided by the assignment function g given a context C . This contextual restrictor is presupposed to be a subset of the set of humans.

$$(26) \quad \text{a.} \quad \llbracket \text{quién}_C \rrbracket^{w,g} = \lambda F_{\langle e,t \rangle}. \exists x_e : [g(C) \subseteq \llbracket \text{human} \rrbracket^w] . x \in g(C) \wedge F(w)(x)$$

$$\text{b.} \quad \llbracket \text{quiénes}_{C,i} \rrbracket^{w,g} = \lambda F_{\langle e,t \rangle}. \exists x_e : \left[\begin{array}{l} g(C) \subseteq \llbracket \text{human} \rrbracket^w \\ \oplus g(C) = g(i) \\ |x| > 1 \end{array} \right] . x \in g(C) \wedge F(w)(x)^{21}$$

To encode the d-linking requirement, one needs to model the intuition that ‘quién’ and ‘quiénes’ differ on the nature of their contextual restriction: ‘quiénes’ ranges not over *any* contextually restricted domain, but rather over a particularly salient one (see Büring, 2011; Von Stechow, 2013 for a similar approach to pronouns and definite descriptions). In (26b), ‘quiénes’ is interpreted relative to two different indexes, C and i . It carries the presupposition that the restrictor assigned by $g(C)$ is equivalent to the value given by a second assignment $g(i)$, which crucially corresponds to the most salient (plural) entity in the sequence g . While this proposal is only a sketch of a complete solution, it does capture the idea that ‘quiénes’ has a stronger context sensitivity than its singular alternative.

For the sake of the example, I assume the d-linking requirement is met in the utterance context (i.e. the interrogative phrase is d-linked in the context): the utterance context provides a ‘contextually salient set of individuals’, which in our example are Mary, John and Bill. Adopting the lexical entries in (26), the interrogatives in (4a) and (4b) will have the denotations in (28) and (29). Note that the LFs in (28a) and (29a) are derived by means of Heim & von Stechow’s (2018) take on Karttunen (1977) semantics, as I have done before.²²

$$(27) \quad \llbracket \text{human} \rrbracket^w = \{m, j, b, m \oplus j, m \oplus b, j \oplus b, m \oplus j \oplus b\}$$

$$(28) \quad \text{a.} \quad \llbracket (4a) \rrbracket^{w,g} = \lambda p_{\langle s,t \rangle}. \exists x_e : [g(C) \subseteq \llbracket \text{human} \rrbracket^w] . x \in g(C) \wedge p = \lambda w'. x \text{ called in } w'$$

²⁰I thank an anonymous reviewer and Maribel Romero for pointing out this issue.

²¹For a given set A , $\oplus A = x$ iff for all $y \in A$, $y \preceq x$. Applying the \oplus operator to $g(C)$ serves to ensure that the equivalence is established between objects of the same type.

²²In (29a), the plurality condition of ‘quiénes’ is assumed to end up in the presuppositional content of the interrogative. One could alternatively assume, following Chemla (2009), that this condition starts off as a presupposition of the *wh*-word but, during the compositional process, ends up in the at-issue content of the interrogative. I thank Maribel Romero for this suggestion. Either way, once the ANS operator is plugged into the LFs, the two interrogatives will be contextually equivalent, as applying the answerhood operator will return in both cases the same maximal true answer for all worlds compatible with the context. Given the definition in (9b), if the two LFs are contextually equivalent, a principle like Maximize Presupposition! will apply.

$$\begin{array}{l}
\text{b. } \left\{ \begin{array}{l} \lambda w'. m \text{ called in } w', \\ \lambda w'. b \text{ called in } w', \\ \lambda w'. j \text{ called in } w', \\ \lambda w'. j \oplus m \text{ called in } w', \\ \lambda w'. j \oplus b \text{ called in } w', \\ \lambda w'. b \oplus m \text{ called in } w', \\ \lambda w'. j \oplus m \oplus b \text{ called in } w' \end{array} \right\} \\
(29) \quad \text{a. } \llbracket (4b) \rrbracket^{w,g} = \lambda p_{\langle s,t \rangle} . \exists x_e : \left[\begin{array}{l} g(C) \subseteq \llbracket \text{human} \rrbracket^w \\ \oplus g(C) = g(i) \\ |x| > 1 \end{array} \right] . x \in g(C) \wedge p = \lambda w'. x \text{ called in } w' \\
\text{b. } \left\{ \begin{array}{l} \lambda w'. j \oplus m \text{ called in } w', \\ \lambda w'. j \oplus b \text{ called in } w', \\ \lambda w'. b \oplus m \text{ called in } w', \\ \lambda w'. j \oplus m \oplus b \text{ called in } w' \end{array} \right\}
\end{array}$$

After applying the ANS operator to (28) and (29), the two corresponding LFs will have different presuppositional strength: as illustrated in (30), the set of worlds where (29) is defined is included in set the worlds where (28) is defined. In every context where it is common ground that exactly one person went to the party, (29a) will yield to a presupposition failure, leading to the attested oddness (e.g. (11a)). Conversely, if it is common ground that more than one person (out of a salient set of people) went to the party, the two interrogatives will be contextually equivalent, and a principle such as *Maximize Presupposition!* will then select (29a), since this is the LF carrying a stronger presupposition.

- (30) a. ANS(w)(28b) is defined iff:
(i) $\exists p \in (28b)$ s.t. $p(w)$, and
(ii) $\forall p' \in (28b)$, if $p'(w)$ then $p' \subseteq p$
One or more than one proposition in (28b) is true.
- b. ANS(w)(29b) is defined iff:
(i) $\exists p \in (29b)$ s.t. $p(w)$, and
(ii) $\forall p' \in (29b)$, if $p'(w)$ then $p' \subseteq p$
One or more than one ‘plural’ proposition in (29b) is true.

When a *quién*-interrogative is uttered in a context where the d-linking requirement is met, one should infer that it’s not presupposed that the question has a plural answer, or the alternative with ‘quiénes’ should have been used. Questions such as (4a) therefore trigger an ignorance inference: according to what is common knowledge, it is possible that one or more than one person has called. This explains why *quién*-interrogatives are compatible with *ignorance* scenarios.

However, if the speaker can be considered to be reliable and knowledgeable, following the logic of the epistemic step for implicated presuppositions or anti-presuppositions, an ‘exactly-one’ inference (cf. *strengthened* implicated presupposition) will be derived. One would then be in a position to infer that, according to what is common ground, exactly one person has called.²³

²³At this point, it’s worth noticing that the difference in presuppositional strength illustrated in (30) is weaker than the one attested for *which*-interrogatives in (8): unlike the uniqueness presupposition, the plurality presupposition still allows for more than one proposition to be true. Similarly, implicated presuppositions are also weaker for *quién*-interrogatives than for plural *which/cuál*-questions. As observed, in most contexts, *which*-interrogatives such as (1b) trigger a quite strong plurality inference (i.e. it is common ground that more than one client called). Instead, singular *quién*-questions tend to convey complete ignorance, compatible with a standard implicated presupposition (i.e. it is possible, according to common

Finally, whenever the d-linking requirement is not fulfilled in the common ground (i.e. there is no reference for the plural anaphora in the context), *quiénes*-interrogatives are predicted to yield to a presupposition failure. The denotation of the question will be empty, and the existential presupposition of the ANS operator will not be satisfied in the common ground. *Quién*-interrogatives will then be the only available alternative. Note that the two interrogatives can only be contextually equivalent if and only if the context both allows the interrogative to be d-linked and involves more than one person who VP (9a). In contexts where the d-linking requirement is not met, *Maximise Presupposition!* can never be applied, so *qué*-questions will not trigger any inference regarding the cardinality of the expected answer (cf. no implicated presupposition). This explains the distribution attested in examples such as (18) and (19).

4.2 Breaking down ‘quién’ and ‘quiénes’

A fully compositional account of *quién(es)*-interrogatives would require to derive the contrast between ‘quién’ and ‘quiénes’ from the semantics of number morphology together with a d-linking mechanism, rather than from the lexical meaning of the *wh*-words. A natural course of action towards this end would be to mirror the weak account of plurality proposed in Sauerland (2003), and assume that plural morphology introduces an *anti-singleton* presupposition, whereas singular marking is vacuous —i.e. an identity function without presupposition:

- (31) a. $\llbracket \text{SG} \rrbracket = \lambda x_e. x$
 b. $\llbracket \text{PL} \rrbracket = \lambda x_e : |x| > 1. x$

(32) $\llbracket \text{quién}_C \rrbracket^{w,g} = \lambda F_{\langle e,t \rangle}. \exists x_e : [g(C) \subseteq \llbracket \text{human} \rrbracket^w] . x \in g(C) \wedge F(w)(x)$

When combined with a *wh*-expression such as (32), repeated from (26a), the features in (31) would be enough to derive a contrast between ‘quién’ and ‘quiénes’ with regards to their cardinality requirements.²⁴ In the light of a broader set of data, however, the *strong plural/weak singular* semantics proposed in (31) turns out to be faulty, or at least insufficient. As observed, singular *which* and *cuál/qué*-interrogatives do trigger a uniqueness presupposition (e.g. (1a)/(2a)), whereas their plural alternatives are compatible with ignorance contexts, where one or more than one individual is expected to be named in the complete answer (e.g. (15)). As a result, the meaning of these complex *wh*-expressions is still best accounted for in terms of a weak semantics for plural morphology, where the *singular* feature carries the stronger meaning:

- (33) a. $\llbracket \text{SG}' \rrbracket = \lambda x_e : |x| = 1. x$
 b. $\llbracket \text{PL}' \rrbracket = \lambda x_e. x$

Taken together, these data suggest that a compositional approach to number marking in *wh*-expressions cannot rely on a unified semantics for singular and plural morphemes (cf. Sauerland, 2003; Sauerland et al., 2005, but see Elliott et al., 2018). Instead, one might need to posit an ambiguity at the level of number features, such that both singular and plural marking would have different semantics depending on the quantifier with which they are combined. That is, we would have an alternation between PL and PL', and between SG and SG'. Crucially, this sort of proposal is different from the one made by ambiguity-based approaches to plurality (de Swart and Farkas, 2010; Grimm, 2013; Martí, 2018). First, all these accounts posit an ambiguity uniquely for plural, but not for sin-

knowledge, that only one person have had called).

²⁴Given that number features in (31) compose with type *e* expressions, they cannot be applied directly to the *wh*-word, which is type $\langle e, t \rangle$. Instead, they would combine with the type *e* trace left behind after *wh*-movement (Fox, 2012; Sauerland, 2003, 1998).

gular morphology. More importantly, the choice between alternative meanings for plural marking is assumed to be settled as a function of the context—in combination with some pragmatic principle such as the Strongest Meaning Hypothesis—and *not* as a function of the expression they modify. In other words, none of these approaches predicts plural morphology to give rise to different truth conditions in exactly the same context (e.g. sentences in (15)).

What are then the dynamics behind number marking? A conceivable hypothesis is that number morphology has different semantic import depending on whether it applies to single-word quantifiers (i.e. often denominated indefinite pronouns or generalized quantifiers) or to determiners in complex *wh*-phrases. Specifically, traditional approaches could account for number marking applied to determiners, whereas single-word quantifiers would follow a strong plural/weak singular pattern. An analysis in these lines would explain the difference between ‘quién’/‘quiénes’ and ‘cuál’/‘qué’-phrases in Spanish (and in English). Indeed, a contrast between these two different kinds of quantifiers is also attested in the declarative domain, where some singular single-word quantifiers seem to have a weak semantics, making them compatible with a collective predicate (p.c. Benjamin Spector). An illustration of such behaviour is shown in (34) and (35) for different quantifiers in English. The same pattern is attested in Spanish.

- (34) a. Everyone gathered
b. *Every student gathered

- (35) a. Nobody gathered
b. *No student gathered

Note that, if the ideas sketched above are on track, every single-word quantifier that can receive both plural and singular marking is predicted to have the same distribution as ‘quién’ and ‘quiénes’ in Spanish.

There are, however, various counterexamples to this generalization. A first notable exception is the distribution of English ‘someone’. Like the singular determiner ‘some’, ‘someone’ is unable to appear as the subject of a collective predicate (e.g. **Someone gathered*), suggesting that it is not a weak singular despite being a single-word quantifier. Additionally, some plural determiners might also impose *strong* plural requirements, even independently of having a strong singular as their alternative. This seems to be the case for the existential determiner ‘unos’ (*ones*) in Spanish, which directly competes with the singular indefinite ‘un’ (*a*) (see Martí, 2008; Alonso-Ovalle and Menéndez-Benito, 2011 for the relevant examples). Finally, a generalization of this sort is not able to capture all cross-linguistic variation. For instance, English indefinites are taken to have a standard strong singular/weak plural semantics; instead, in Brazilian Portuguese bare singulars are often thought to be number neutral, whereas plural indefinites seem to convey proper plurality (Ferreira, 2010; Martí, 2008).²⁵ Overall, the lack of a principle explaining the distribution of number features makes the compositional account of *quién(es)*-interrogatives analogous to the non-compositional one, as it fails to generalize away from these specific quantifiers.

Before concluding, let me briefly discuss the challenges of a compositional account of d-linking. An independent d-linking mechanism would allow deriving ‘quién_{C,i}’ from ‘quién_C’ in (32). As encoded in (26), applying this d-linking mechanism would result in introducing the presupposition that the quantifier ranges over the most salient element(s) in the context, equivalent to $g(i)$. This compositional approach, while intuitively correct, would present a similar shortcoming as the one established above for number marking, namely being quantifier-dependent. Put differently, the distribution of the d-linking mechanism still needs to be determined by the quantifier to which it applies (i.e. lexically encoded), as it is sometimes required (e.g. ‘quiénes’; ‘which’), sometimes optional (e.g. ‘quién’) and sometimes incompatible (e.g. ‘what’).

²⁵I would like to thank an anonymous reviewer for suggesting these references.

A final note should be made about the unexpected link between d-linking and cardinality. Many *wh*-expressions can be d-linked without carrying a strong plurality requirement, indicating that d-linking is independent of number (e.g. *which*-phrases). However, one could still imagine that it's the *strong* plural feature that triggers a d-linking requirement when it applies to certain quantifiers. It might be, for instance, that strong plural morphology can only be applied to d-linked quantifiers. This would explain why the requirements in (24) arise together and uniquely for 'quiénes'. Indeed, an homologous connection has been attested for plural epistemic indefinites in Spanish (Alonso-Ovalle and Menéndez-Benito, 2011), as illustrated in (18). Nevertheless, in order to properly understand the nature of this relation, one would need to enlarge the cross-linguistic evidence and assess whether all *wh*-expressions that carry a strong plurality requirement are also d-linked. Consequently, the existence of this connection remains purely speculative for the moment.

4.3 A note on cross-linguistic generality

The basic puzzle arising in Spanish generalizes, at least partially, to some other languages that inflect simple *wh*-words. This is the case of colloquial Farsi and Hungarian, which also distinguish morphologically between singular and plural *who* ('ki'/'ki-a' and 'ki'/'ki-k' respectively).

To begin with, singular *who*-interrogatives in Farsi and Hungarian (henceforth, *ki*-interrogatives) pattern with English *who*- and Spanish *quién*- questions in that they are a priori compatible with singular and plural answers, suggesting that in both languages the *wh*-word 'ki' is not semantically singular.²⁶ A closer look into the distribution of these interrogatives suggests that singular *ki*-interrogatives can be felicitously uttered in both *exactly-one* and *ignorance* scenarios, whereas the plural alternative seem to require a *more-than-one* context. The examples in (36)–(38) illustrate this behaviour, which once again patterns with Spanish.

(36) *John tells me that he called one friend to ask where the movie theater is.*

- | | | | |
|----|------------|----------------------|-----------|
| a. | Be ki | zang zadi? | FARSI |
| | | did who.SG you call? | |
| b. | ??Be ki-a | zang zadi? | |
| | | did who.PL you call? | |
| | | 'Who did you call?' | |
| | | | |
| c. | Kit | hívtál fel? | HUNGARIAN |
| | who.SG.ACC | called PTCL? | |
| d. | ??Kiket | hívtál fel? | |
| | who.PL.ACC | called PTCL? | |
| | | 'Who did you call?' | |

(37) *John tells me that he called several friends to ask where the movie theater is.*

- | | | | |
|----|---------|----------------------|-------|
| a. | ??Be ki | zang zadi? | FARSI |
| | | did who.SG you call? | |
| b. | Be ki-a | zang zadi? | |
| | | did who.PL you call? | |
| | | 'Who did you call?' | |

²⁶All the judgments were provided by the same two informants (Amir Anvari and Flóra Doñati). The examples were slightly modified from the ones in (11) to obtain more natural Farsi/Hungarian translations.

- c. ??Kit hívtál fel? HUNGARIAN
 who.SG.ACC called PTCL?’
- d. Kiket hívtál fel?
 who.PL.ACC called PTCL?’
- (38) Context in (14): *B’s friends have played the game G, and either one or more than one of them won. A asks:*
- a. Ki (??ki-a) bord? FARSI
 who.SG (??who.PL) won.SG?
 ‘Who won?’
- b. Kudum dustaat (# kudum doostet) bordan?
 which friends.PL (# which friend.SG) won.PL?
 ‘Which friend(s) won?’
- c. Ki (??kik) nyert? HUNGARIAN
 who.SG (??who.PL) won.3SG
 ‘Who won?’
- d. Melyik barátod (Melyik barátaid) nyertek?
 which friend.PL-yours (??which friend.SG-yours) won.3PL?
 ‘Which friend(s) of yours won?’

Importantly, both Farsi and Hungarian also display a contrast between interrogatives involving simple and complex *wh*-phrases: the equivalents to plural *which*-interrogatives in both languages can be appropriately used in ignorance contexts —see (38b) and (38d)—, whereas plural *ki-a*- and *ki-k*-questions in (38a) and (38c) cannot, revealing that the inferences associated to each interrogative are of different nature.

Before concluding, a cautionary note is in order. The similarity between Spanish, Farsi and Hungarian in simple interrogatives seems to hold specifically for the semantic import of number marking —i.e., cardinality requirement. Further research is needed in order to assess whether something akin to a *d-linking* requirement is also at play for plural *ki-a*-questions in Farsi and Hungarian. Preliminary judgments, however, suggest that Farsi might behave like Spanish with respect to the impossibility of using the plural alternative in contexts such as (18), whereas Hungarian seems to allow both options.

- (39) Context in (18).
- a. Ki tu khunas? FARSI
 who.SG in apartment?
- b. ??Kia tu khunan?
 who.PL in apartment?
 ‘Who is in there?’
- c. Ki van ott? HUNGARIAN
 who.SG be.3SG there?
- d. Kik vannak ott?
 who.PL be.3PL there?
 ‘Who is in there?’

Overall, the facts presented in this section constitute a first approximation to the cross-linguistic dimension of the problem addressed in this paper. While it is not my goal to draw specific conclusions about the behaviour of Farsi and Hungarian interrogatives, nor to draw a strong cross-linguistic generalization, one could easily note that an approach analogous to the one proposed for Spanish—modulo the *d-linking* requirement— could in principle also account for Farsi and Hungarian data. Further re-

search should aim at gathering a more representative typological sample to assess whether this pattern exemplifies an actual typological tendency.

5 Conclusions and issues for further research

The account provided in this article contributes to the current research on number semantics by bringing interrogative quantifiers into the picture. I have addressed the contrast between *quién* and *quiénes*-interrogatives in Spanish, claiming that plural morphology has a *strong* semantic import into the quantifier meaning, whereas singular marking is semantically vacuous (i.e. *strong plural/weak singular* semantics). I have then argued that the distribution of the two interrogatives arises from the existence of two requirements (cardinality and d-linking) which might be both linked to plural morphology.

In its novelty, the data presented here also raises a number of questions. One aspect that requires further investigation is the cross-linguistic generality of the patterns illustrated in this paper. By looking at a more typological representative sample—including other languages that, like Spanish, Farsi and Hungarian, also inflect simple *wh*-words—one might be able to assess how tight is the connection between bare interrogatives and a strong plural/weak singular semantics. Similarly, the relation between d-linking, plurality and *wh*-words needs to be articulated further in order to understand which aspects influence the semantics of number marking. Future research will hopefully address these issues.

To conclude, the analysis proposed here reveals that current approaches to number marking need to be made more sophisticated to account for both cross-linguistic and within-language variation. Indeed, while the behaviour of ‘quién’ and ‘quiénes’ is well explained by a strong plural/weak singular semantics, the meaning of complex *wh*-phrases in different languages is still best accounted for in terms of a weak semantics for plural morphology (i.e. *strong singular/weak plural* semantics). In this sense, my account, while tentative, serves to provide a first approximation to the complexity and scope of the problem, reinforcing the need for a "mixed" approach to number semantics, which might rely on lexical stipulations to account for the complete range of data.²⁷

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²⁷Indeed, an approach similar to mine in what respect to number semantics has been recently adopted by Alonso-Ovalle and Rouillard (2018) to account for the behaviour of Spanish bare interrogatives involving collective predicates.

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