**Number Inflection, Spanish Bare Interrogatives, and Higher-Order Quantification.**

Luis Alonso-Ovalle (McGill) & Vincent Rouillard (MIT)

**1. Introduction.** Some languages inflect *who* for number: e.g. Spanish has *quién* (who.SG) and *quiénes* (who.PL). Assuming [Di]'s *ANS* operator, [Md] argues that *quién(es)* challenge [Sl05]'s theory of number, where the plural is weak (semantically vacuous) and the singular strong (presupposes atomicity). [Md] takes *quiénes* to be a strong plural (ranges over non-atoms only) and *quién* a weak singular (ranges also over atoms). We show that this fails to capture the behavior of *quién(es)* with collective predicates and argue, extending [Et], that both range over generalized quantifiers (GQs) (conjunctions and disjunctions [Xg]). We also conclude, contra [Et], that having *quién* range over GQs while being a strong singular is insufficient and that the data are best described if *quién* is a weak singular and *quiénes* a strong plural, extending [Md].

**2. Context.** The singular *which*-question in (1a) disallows ‘plural’ answers (1c). To capture this, [Di] proposes an *ANS* operator that takes a question *Q*<sub>x</sub> and presupposes that *Q* has a maximally-informative true answer (2); if [ student.SG]<sup>w</sup> contains only atoms [Sl05], the *Hamblin set* (HS) for (1a) will contain logically independent propositions (1d). Given *ANS*, this predicts a *Uniqueness Presupposition* (UP) for (1). (1) a. Which student left? b. Al. c. #Al and Bob. d. {that a left, that b left, that a=b left}

(2) *[ANS]<sup>w</sup> = λp.∃p∈Q[p(w)=1 & ∃p′∈Q[p′(w)=1 → p′ ⊆ p]]p∈Q[p(w)=1 & ∃p′∈Q[p′(w)=1 → p′ ⊆ p]]*  
This contrasts with the *Anti-Uniqueness Inference* (AUI) of plural *which*-questions (3a). With weak plurals [Sl05], the propositions in (3a)'s HS in (3d) are related by entailment (with distributive predicates) and *ANS*’s presupposition can be met if more than one of them is true, accounting for (3c). The AUI is derived via *Maximize Presupposition*! (MP; [Hm], [Sl08]); uttering (3a) triggers the inference that (1a)'s UP is not common ground. This inference is strengthened to convey that the UP is false [Cl], deriving the AUI.

(3) a. Which students left? b. Al. c. #Al and Bob. d. {that a left, that b left, that a=b left}


**2.2. The Puzzle.** [Md] observes that *quién*, like *who* but unlike *which student*, allows for both ‘singular’ and ‘plural’ answers (4), whereas plural *quiénes*, like *which student*, only allows for plural answers (5). Given *ANS*, (4c) is unexpected if singular *quién* ranges only over atoms. Furthermore, if *quién* ranges over atoms and non-atoms, and *quiénes* does too, the two items are equivalent and (5b) is not accounted for.

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**3. Weak Quién / Strong Quiénes.** [Md] concludes that *quién* is a weak singular (ranging over (non-)atoms) and *quiénes* a strong plural (ranging only over non-atoms) ((6), assuming the question composition in [Et].)

(6) a. *quién*<sup>w</sup> = λf.HUMAN<sub>x</sub>(x) & f(x))  b. *quiénes*<sup>w</sup> = λf.HUMAN<sub>x</sub>(x) & f(x) & |x| > 1

Under this view, the HS of (1a) is (3d), which allows *ANS* to be defined if both Al and Bob called.

**4. A Challenge for 3.** Allowing *quién* to range both over atoms and non-atoms, as in (6a), does not capture the lack of uniqueness of *quién* in the general case. To see why, consider collective predicates such as *formar un círculo* (‘form a circle’), with which *quién* can combine (7a). In parallel with its behavior with distributive predicates, *quién* tolerates both unique and non-unique answers with collective predicates; both (7b/b') and (7c/c') can answer (7a), but (7c/c') does not entail that only one circle was formed. Yet, as [Xg] notes, *ANS* predicts a UP in cases like (7a). This is so because the HS for (7a) will contain propositions of the form ‘that x formed a circle’ (where x is a non-atomic entity) which, like those in (3d), are logically independent (this is so even if these predicates are lexically closed under sum; if a<sub>b</sub>c<sub>d</sub>e<sub>f</sub>g<sub>h</sub> is in the extension of *FORM-A-CIRCLE<sub>x</sub> it does not follow that both a<sub>b</sub>c<sub>d</sub>e<sub>f</sub>g<sub>h</sub> and e<sub>f</sub>g<sub>h</sub> form a circle.)


**5. Higher Order Quién.** To capture the non-uniqueess of *quién* in both (4a) and (7a) in a unified way while keeping *ANS*, the HSs of both (4a) and (7a) must contain propositions related by entailment. One way to achieve this is to resort to higher order quantification [S07, S08]. This is what [Et] propose, claiming that *quién* can (optionally) quantify over generalized quantifiers, as in (9). In (10), *quién* takes the property of GQs in (11). Assuming (departing slightly from [Et] for illustration) that the GQs that *quién* ranges over in...
(9) are all of the form $\lambda f_{e\ominus,p} \forall x \in X[f(x)]$ for any non-empty $X \subseteq D_e$ [cf. Xg], the HS of (3a) boils down to (12) ($D_e = \{a, b, a \ominus b\}$) and does not yield uniqueness with ANS (cf. [Et] regarding semantic composition).

(9) $[\text{quién}] = \lambda P_{e\ominus,t,p} \exists Q[P(Q)]$

(10) LF: $\lambda p \ [\text{quién} [\text{[?}_p \ [\lambda w \ [t_1, \ldots, t_n] \ [\lambda_1 [SG t_1, t_n] \ [\lambda w]]]]]]$

(11) $\lambda Q_{e\ominus,t,p} = \lambda w, Q(\lambda x: ATM x). Called(x))$

(12) $\{a$ called, $b$ called, $a$ called and $b$ called$\}$

To derive the AUI of quiénes, which is assumed to range over individuals, [Et] resort to postulating a form of quién that also quantifies over individuals, conveys uniqueness, and competes via MP with quiénes.

6. Challenges for 5. Appealing to higher order quantification can overcome the challenge in 4 (see [Xg]’s for which questions), but [Et]’s implementation fails to do so because, in order to stick to [SI05], they assume that SG is interpreted over the trace of quién, as in (10) (presupposing atomicity of $g(t_{1, e} \ominus s))$, which predicts incompatibility with collective predicates (as [Et] note). A version of 5 where SG does not require atomicity (or is not interpreted) does overcome the challenge in 4 (as the HS of (7a) will contain the propositions in (13), which are related by entailment), but it brings back the issue of the competition between quién and quiénes: the evidence that [S07, S08] presents for higher order quantification argues for a higher order quiénes as much as it does for a higher order quién (e.g. (14a) does not convey that the speaker is ignorant about who she has to talk to, suggesting that con quiénes can range over a narrow scope disjunction), yet quiénes still conveys an AUI in cases where it is arguably higher order (as (14c) shows).

(13) $\{\ldots$ that $a \ominus b \ominus c \ominus d$ f. a circle, that $e \ominus f \ominus g \ominus h$ f. a circle, that $a \ominus b \ominus c \ominus d$ f. a circle and $e \ominus f \ominus g \ominus h$ f. a circle $\ldots\}$$

(14) a. ¿Con quiénes tienes que hablar? b. Con Ana y Bea o con Carlos y David. c. # con A. o con Carlos with who.PL have-to.2s talk with A and B or with C and D with A or with C

7. Higher Order Quién(es), Strong plural, Weak singular. To meet the challenges in 6 and 4, we propose to treat both quién and quiénes as uniformly conveying higher-order quantification. We follow [Xg] in assuming that the relevant quantifiers are generalized conjunctions and disjunctions and assume that singular quién is weak, in that it ranges over GQs of the form $\lambda f_{e\ominus,p} \forall x \in X[f(x)]$ and $\lambda f_{e\ominus,p} \exists x \in X[f(x)]$ for any non-empty $X \subseteq D_e$ (where $D_e$ is assumed to contain both atomic and non-atomic individuals), and that plural quiénes is strong in that it ranges over GQs of the same form, but where $X$ is any non-empty subset of $D_e$ containing only non-atomic individuals (we also take predicates to be closed under sum.)

This analysis, like [Md]’s predicts a competition between quién and quiénes with distributive predicates (4-5). The HS of (5) contains only ‘plural’ answers (e.g. ‘that a $\ominus$ called’), in which case ANS is predicted to trigger the Plurality Presupposition (PP) that at least one plural answer is true. The HS for (4) will on the other hand contain both ‘plural’ and ‘singular’ answers (e.g. ‘that a called’), triggering the weaker presupposition that at least one singular or plural answer is true. The inference that (5)’s PP is not common ground is predicted given MP. Hence, in cases where the context makes it clear that the PP is common ground, questions with quién are predicted to be deviant. This prediction seems borne out in examples such as (15), where the local context [Sg] of the second conjunct entails that a plurality of students called.

(15) Varias amigas llamaron pero no me acuerdo quiénes (?? quién).

Several friends called but not REF1 remember who.PL (?? who.SG). ([Md])

No competition between quién and quiénes is predicted with collective predicates. Only plural answers in (7a)’s HS can be true, since, given the predicate, the singular answers are undefined. ANS is therefore predicted to generate for (7a) a presupposition equivalent to that of its plural counterpart. Quién and quiénes are as such predicted to be interchangeable with collective predicates, which is consistent with the facts.

8. Conclusion. Open Issues. [Md]’s account of simplex wh-quantifiers in Spanish is insufficient to describe their behavior with collective predicates. We propose a conciliatory approach: while [Et]’s proposal that such items can quantify over GQs does not succeed in preserving [SI05]’s theory of number, it can be successfully used to extend [Md]’s claim for strong plurals and weak singulars.

With [Md], we predict inferences from quién to be strengthened to convey anti-plurality when the questioner is well informed on the truth of plural answers [Cl]. Quién is compatible with common grounds entailing singularity, and initial evidence suggests that using quién in contexts where the questioner is well-informed suggests singularity. However, this requires further confirmation. Like [Md], we leave open why inferences from which students seem stronger than those from quién.