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**Is the 'Arbitrary Interpretation' a Semantic Epiphenomenon?\***

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Much syntactic research on Romance, and, specifically, on Spanish, has been devoted within the GB framework to examining the properties of a class of pronominal elements involving the so-called 'arbitrary reference'.<sup>1</sup> Here is a sample of such constructions:

- (1) a. *PRO* bailar es aburrido  
PRO to dance is boring  
'Dancing is boring.'
- b. En ese departamento *pro* trabajas como un esclavo  
In this department pro work:2S like a slave  
'In this department you (gen.) work like a slave.'
- c. *Pro* llaman a la puerta  
pro knock:3PL to the door  
'Somebody is knocking at the door.'
- d. En Oviedo se presume de no saber nada  
In Oviedo SE boast:3S of not to know nothing  
'In Oviedo people boast of knowing nothing.'

However, except for Chierchia 1984 for the so-called *PRO*<sub>arb</sub> and Chierchia 1995b for impersonal *si* constructions in Italian, no explicit truth conditional accounts have been offered for such readings. Hence, there is no precise semantic definition of what 'arbitrary reference' means. The goal of this paper is twofold: first, to offer such an account for Spanish; second, to argue that such an enterprise can be easily entertained if couched within a situation-based semantics as that presented in Kratzer 1989.

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<sup>1</sup>I am very grateful to Barbara Partee for more help, observations and encouragement than I could acknowledge here. Thanks to Paula Menéndez-Benito for useful comments, specially on section 6. Thanks also to the participants in the Fall 99 Seminar on Quantification taught at UMass by Barbara Partee. Despite my best intentions, the present paper is still an underdeveloped version of some issues presented there. As usually, all mistakes, misunderstandings and obscurities are mine.

<sup>1</sup> See, among others, Suñer 1983, Jaeggli 1986, Otero 1986, Hernanz 1988, Caselles 1993 is an excellent survey of the empirical properties of these constructions. See also Jónsson 1992 for Icelandic.

Specifically, it is shown that the constructions licensing such 'arbitrary' readings are empirically distinct and that the so-called 'arbitrary interpretation' can be considered a semantic epiphenomenon that involves the interpretation of different logical forms.<sup>2</sup> In brief, it will be argued that 'arbitrary interpretation' is actually an intuitive label describing the semantics of four different constructions: (i) plural indefinites, (ii) the interaction of adverbial quantification (henceforth *A-quantification* as in Partee 1995) and non-rigid indexicality, (iii) inherently vague pluralities and (iv) existentially quantified events underspecified for agents.

The overall organization of the paper runs as follows. Section 1 surveys the data claimed to convey 'arbitrary reference'. Section 2 extracts from them some empirical generalizations whose explanation is taken to constitute the minimal goal for a theory of 'arbitrary interpretation'; on its basis, it also offers a taxonomy of the constructions under discussion. Their formal semantics are sketched on sections 3-6.

## 1. The Data

The term 'arbitrary' has been successfully coined within the GB literature on Control structures. We have learnt from Williams (1980), Manzini (1983), Chomsky (1986) and others that PRO receives an 'arbitrary interpretation' whenever uncontrolled:

- (2) *PRO fumar es peligroso*  
 PRO to smoke is dangerous  
 'Smoking is dangerous.'

At least since Chierchia 1984, we have also learnt to think about (2) as involving a predication of properties. The predicate *to be dangerous* is predicated of the property *to smoke*. Without using second order predicates (of type  $\langle\langle e,t \rangle, t \rangle$ ) this is made possible by (i) proposing a nominalization device that takes a property like *to smoke* and yields an expression of type *e* that a regular  $\langle e,t \rangle$  type expression can apply to, and (ii) by committing oneself to the ontological weight of properties. Since one can follow Chierchia and think about this type of 'arbitrary reference' as involving second order predication, I will not go into this construction here and, right from the beginning, suggest to keep it apart for further research.<sup>3</sup>

<sup>2</sup> Since I will use an indirect method of interpretation, 'logical forms' will be intended to refer to the formulas of the intermediate intensional logic, rather than to the disambiguated representation of sentences we are used to within contemporary syntactic jargon. For this latter use, I will capitalize the same term and refer to the 'Logical Form' of a sentence.

<sup>3</sup> The quantificational variability effects of these constructions still deserves further attention. Compare (i) to (ii):

- (i) *Fumar es peligroso (generic)*  
 To smoke is dangerous  
 (ii) *Fumar fue peligroso (episodic)*  
 To smoke was dangerous

Whereas (ii) makes a claim about a restricted group of people and a single event, (i) have a quasi-universal flavor. Thanks to Barbara Partee for raising this issue.

On the basis of the 'arbitrary interpretation' of PRO, and trying to unify PRO and *pro* (à la Huang (1989) or Borer (1984)) Suñer (1983) suggested that not only PRO shows 'arbitrary reference' effects, *pro* [III,pl], as in (3), does too.<sup>4</sup> In this case, however, 'arbitrary' presumably has to be taken to mean 'indefinite', as shown by the gloss. Consequently, the interpretation of (3a) would be roughly equivalent to the interpretation of the formula in (3b), where  $\exists$  is a generalized quantifier (see also Jaeggli 1986). In section 6 I will explain why I take (3b) to be roughly equivalent to (3a) and show why (3b) is not still an appropriate enough logical form.

- (3) a. *Pro* preguntan por ti.  
       *pro* ask:3PL for you  
       'Somebody is asking for you.'  
 b.  $\exists x$  [person (x)] [ask-for-you (x)]

Although (3) is disambiguated by the gloss as having an episodic interpretation, it can also have a generic reading, the one forced in (4). In generic contexts as (4), *pro* has a quasi-universal reading (see Cinque 1988 for Italian). Consequently, (4) is understood as a claim about most people from this department:

- (4) En este departamento siempre *pro* preguntan por ti.  
 In this department always *pro* ask:3PL for you  
 'Everybody in this department asks for you.'

Hernanz (1988) has shown, contra Jaeggli (1986:44), that the 'arbitrary' readings are not exclusive to *pro* [III, pl]. Rather, they are also conveyed by *pro* [II,s], as shown in (5a). It is worth noting, however, that this interpretation is only possible in generic sentences. In episodic sentences as (5b), *pro* [II,s] has a regular indexical reading, picking up the addressee in the context of utterance.

- (5) a. (En ese departamento) *pro* trabajas como un esclavo.  
       In that department, *pro* work:2SGEN like a slave  
       '(In that department), you (gen.) work like a slave.'  
 b. (En ese departamento) *pro* trabajaste como un esclavo.  
       In that department, *pro* work:2SPASTE<sub>P</sub> like a slave.  
       '(In this department) you (add.) worked like a slave.'

Along these lines, Casielles (1993) widens the list of constructions involving 'arbitrary' readings, showing that *pro* [I,pl] patterns with [II,s] in that it has 'arbitrary readings' in generic sentences, but not in episodic ones. The same kind of

<sup>4</sup> Roman numbers indicate the person specifications of *pro*, 's' stands for singular and 'pl' for plural. 'Gen' to the generic use of otherwise indexical pronouns that pick up the speaker ('sp.') or addressee ('ad.') in the context of utterance. I am consciously implying that *pro* is not featureless, assuming with Heim (1982) that the lexical content of pronouns contribute a set of presuppositions. I will remain neutral about whether *pro* enters the numeration featureless and about the relation between this lexical content and Agr.

When illustrating *se*-sentences I ignore the claim that a null category, besides *se* should be syntactically projected (see Suñer 1983 and Chierchia 1995b).

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quantificational variability effects (henceforth QVE) can be obtained in examples containing *pro* [II,pl].

Finally, the 'arbitrary' readings are not specific to null pronouns. In particular, impersonal constructions with *se* have been characterized as conveying 'arbitrariness' and showing QVE. As (6) shows, they have a quasi-universal interpretation in generic sentences and a quasi-existential in episodic ones (see Cinque 1988 and Chierchia 1995b for Italian).

- (6) a. (En este departamento) se escriben pocos artículos.  
(En este department) SE write:3PL few papers  
'In this department, people write few papers.' (Generic/Quasi universal)
- b. (En este departamento) se escribieron pocos artículos.  
(In this department) SE write:3PL few papers.  
'In this department, some people wrote few papers.' (Episodic/Existential)

## 2. The Empirical Generalizations

Despite their being labeled as 'arbitrary', the constructions in section 1 are not semantically homogeneous: they rather behave differently with respect to, at least, (i) the QVE they show, (ii) the fact that some of them need some kind of restrictor to be interpreted as 'arbitrary', and (iii) the fact that their 'arbitrary' readings can be restricted only to certain types of subjects.

As for the QVE, note that in characterizing sentences all these pronominal units can have 'arbitrary readings', where 'arbitrary reading' amounts to quasi-universal quantification. (7a), for instance, can be *very roughly* paraphrased as 'for almost every *x*, if *x* is in this department, *x* works like a slave', (7b) as 'for almost every *x*, if *x* is from this country, *x* eats lobster' and (7c) as 'for almost every *x*, if *x* is from this department, *x* writes few papers'.

- (7) a. (En ese departamento) pro trabajas como un esclavo.  
In that department, pro work:2SGEN like a slave  
'In that department you (gen.) work as a slave.'
- b. (En este país) pro comemos langosta  
(In this country) pro eat:1PL lobster  
'In this country we eat lobster.'
- c. (En ese departamento) se escriben pocos artículos.  
(In that department) SE write:3pl few papers  
'In this department, people write few papers.'

Whereas this is true for all items in characterizing sentences, not all of them can have 'arbitrary' readings in episodic contexts. Rather, in those contexts some (namely *pro* [II,s],[I,pl],[II,pl] and some instances of [III,pl]) are only interpreted as regular indexicals. Thus, (8a) is a claim about whoever is the addressee in the context of utterance, and (8b) about whoever was the group of the speaker.

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- (8) a. *pro* comiste mucha langosta  
 pro eat:2SPAST a lot of lobster  
 'You ate a lot of lobster.'  
 b. *pro* comimos mucha langosta  
 pro eat:1PLPAST a lot of lobster  
 'You ate a lot of lobster.'

While these units behave as indexicals in episodic sentences, *pro* [III,pl] and *se* still have 'arbitrary meanings', which in both cases amount to indefiniteness:

- (9) a. *pro* arreglaron el teléfono  
 pro repair:3PLPAST the phone  
 'Somebody repaired the phone.'  
 b. *Se* comió mucha langosta en tu cumpleaños  
 SE eat:3SPAST a lot of lobster in your birthday  
 'Somebody ate a lot of lobster.'

Supporting 'arbitrary' interpretations in different contexts is not the only property that distinguishes different types of constructions: they are also characterized by different degrees of QVE in contexts of A-quantification. In this respect, while *se* mimics the behavior of regular indefinites, inheriting the quantificational force of an A-quantifier, constructions including *pro* do not. Their only variability concerns their being interpreted as regular indexicals in episodic sentences and conveying 'arbitrary' reference in generic contexts. (10) illustrates this point:

- (10) a. Si *se* es guapo, pocas veces *se* es listo  
 If SE is handsome, few times SE is intelligent  
 'Few people that are handsome are also intelligent.'  
 b. (En este departamento) pocas veces *pro* te sientes perdido.  
 In this department few times *pro* CL:2S feel:2S lost  
 \* 'Few people feel lost in this department.' / Ok: '(...) people rarely feel lost.'

Casielles (1993) points out a further area of divergence: the quasi-universal readings of these covert 'arbitrary' pronouns are dependent on the presence of some kind of overt restrictor that appears under the form of a pseudo-locative expression.<sup>5</sup> In its absence, as in (11a) (vs. (7a)), it is very difficult for them to obtain an 'arbitrary' reading. Since the same observation has been independently reported by Jónsson (1992) for the Icelandic generic pronoun *maður*, I will refer to this phenomenon as 'the Jónsson-Casielles' generalization'. It holds for constructions involving *pro*, but not for *se*-constructions, as (11c) shows.

- (11) a. *pro* trabajas como un esclavo  
 pro work:2S like a slave  
 ?? 'You (gen.) work like a slave.'  
 'You (add.) work like a slave.'

<sup>5</sup> See section 4 for a precise semantic characterization.

- b. En este departamento te tratan bien  
 In this department CL:2S treat well  
 'In this department they treat you (gen.) well.'
- c. Nunca se trabaja demasiado  
 Never SE work too much  
 'People never work too much.'

Finally, the constructions involving *pro* [III,pl] are singled out because, as previously pointed out by Belletti and Rizzi (1986) and others (Cinque (1988), Jaeggli (1986)), their 'arbitrary readings' in episodic sentences are restricted to non derived subjects, i.e. they appear with agent subjects of transitive and unergative verbs, but neither with subjects of passives (12a) nor of ergatives (12b). The rest of constructions are insensitive to this constraint.

- (12) a. *pro* están siendo golpeados  
*pro* are being beaten  
 \*'Somebody is being beaten.' / 'They are being beaten.'
- b. *pro* llegan cansados después de un viaje tan largo (Jaeggli, 1986)  
*pro* arrive:3PL tired after of a trip so long  
 \*'Somebody arrives tired after such a long trip.' / 'They arrive tired (...).'

Summarizing, according to what we have seen before, the constructions involving 'arbitrary reference' can be seen as belonging to three different types. Table 1 classifies the previous data on the basis of four properties: having an arbitrary (indefinite) interpretation in episodic sentences, needing an overt restrictor, restricting the 'arbitrary' readings to agent subjects and, finally, inheriting the quantificational force of overt A-quantifiers. I will take the explanation of these empirical generalizations, together with negative evidence (why, say, [III,s] does not license 'arbitrary readings') as the minimal goal for a theory of the so-called 'arbitrary reference'. The next sections are devoted to it.

Table 1. Empirical Generalizations

|                                 |                                | Indef. | Rest. | Agent | Q-force |
|---------------------------------|--------------------------------|--------|-------|-------|---------|
| I. The indefinite/generic type  | [III, pl]                      | +      | -     | +     | -       |
| II. <i>se</i> -type             | <i>se</i> -type                | +      | -     | -     | +       |
| III. The indexical/generic type | [II,s],[I,pl],[II,pl],[III,pl] | -      | +     | -     | -       |

### 3. The Indexical/Generic Type: Quantifying over Situations & Diagonalization

To begin with, I will first propose a formal treatment of *pro* [II,s] and postpone the analysis of the rest of elements of type III until section 4, where I will argue that they should be treated apart. Basically, I will present an analysis that derives the 'arbitrary' readings of *pro* [II,s] from its regular indexical value and show that this is indeed possible if we adopt an ontology based on situations rather than regular worlds (Kratzer 1989) and, consequently, a situation-based theory both for A-quantification and genericity (*à la* Von Stechow 1995).

### 3.1 Worlds and Contexts

The behavior of *pro* [II,s] in episodic sentences, picking up the addressee in the context of utterance, suggests a formal analysis along the classical kaplanian treatment of indexicality: we can follow the practice of Kaplan (1977) and assume that there are two sorts of dependence of truth on features of context: *context-dependence* and *index-dependence*. The former amounts to dependence with respect to the location of the utterance and the latter to dependence with respect to possible circumstances of evaluation of the sentence. In principle, both are so intimately related that they could be reduced to the same. As Lewis puts it: 'contingency is a kind of indexicality' (Lewis, 1980:25). For instance, one can model context dependency by relativizing interpretation to multiple coordinates of context, as in Lewis 1970. However, since deciding what to count as a feature of context is a difficult task (see Cresswell 1972), a different treatment of indexicality can be developed where one uses *both contexts and indices* (see Stalnaker 1978 and Kaplan 1977). This is possible if an additional stage of interpretation in addition to extensions and intensions is provided. First, interpretation is relativized to contexts, assigning each expression a function that determines for a given context an intensional value. Then intensions are assigned an extension in each index (see also Bennett 1978). Along these lines, it sounds reasonable to treat both *pro* [II,s] and the second person indexical *tú* as denoting (partial) functions from contexts to individuals, as in (13), where interpretations are relativized to a context (c) and a world (w).<sup>6</sup>

- (13) a.  $\text{Tr}(tú) = t\acute{u}$ ,  $\text{Tr}(pro[II,s]) = pro2$   
 b.  $[[t\acute{u}]]^{w,c} = [[pro2]]^{w,c} = \lambda x. \text{addressee}(x)(c)$

(13) predicts that a sentence containing either *tú* or *pro* [II,s] will express a function from contexts to propositions, what Stalnaker called a *propositional concept*. And this prediction is empirically borne out by episodic sentences (14a) and (14b), whose interpretation is shown equivalent in (14c).

- (14) a.  $\text{Tr}(pro[II,s] \text{ estás trabajando mucho}) = \text{work-a lot}(pro2)$   
           *pro*    *be:2S* *working*    *a lot*  
           'you (add.) are working a lot.'  
 b.  $\text{Tr}(t\acute{u} \text{ estás trabajando mucho}) = \text{work-a lot}(t\acute{u})$   
           *you* *be:2S* *working*    *a lot*  
           'you (add.) are working a lot.'  
 c.  $[[\text{work-a lot}(pro2)]]^{w,c} = [[\text{work-a lot}(t\acute{u})]]^{w,c} = 1$  in *w* iff the unique addressee in *c* is working a lot (undefined if there is no such unique addressee).

So far so good. Nonetheless, (14) cannot predict the behavior of *pro* [II,s] as a quasi-universally quantified pronoun in characterizing sentences. To show that this is the case, let us recall how generic sentences are treated within possible world semantics.

<sup>6</sup> The requirement that the functions indexicals denote be partial has been argued for by Bennett (1978).



Within this framework, characterizing sentences are essentially thought of as modal statements whose modal relation is necessity and whose modal base and ordering source restrict the worlds being quantified over to prototypical worlds, in order to derive their quasi-universal force:<sup>7</sup>

- (15)  $[[\text{Gn}_{x_1, \dots, x_n} [\phi] [\psi]]]^{E, w, c, B_w, \leq_w} = 1$  iff for every  $x_1 \dots x_n$  and every  $w' \in B_w$  such that  $[[\phi]]^{E, w} = 1$ , there is a  $w'' \in B_w$  such that  $w'' \leq_w w'$ , and for every  $w''' \leq_w w''$ ,  $[[\exists y_1 \dots y_n \psi]]^{E, w''} = 1$  (where  $y_n$  is the  $n$ -th free variable (if any) in  $\psi$  that is not already free in  $\phi$ )<sup>8</sup>

Now consider (16a), the generic counterpart of (14). (16c) and (16d) are the translations of (16a) and (16b) respectively. According to the proposed semantics, both (16c) and (16d) end up having the same truth conditions: as shown in (16e), both formulas claim that (a counterpart of) the addressee in  $c$  in every prototypical world is such that in every world that is most normal with respect to the prototypical ordering source, the (counterpart of) the addressee in  $c$  works a lot in that world.<sup>9</sup>

- (16) a. En este departamento *pro* trabajas mucho  
 b. En este departamento tú trabajas mucho  
 c.  $\text{Gn}_x$  [pro2] [work-a-lot-in-this-department (pro2)]  
 d.  $\text{Gn}_x$  [tú] [work-a-lot-in-this-department (tú)]  
 e.  $[[\text{Gn}_x$  [tú] [work-a-lot-in-this-department (tú)]]]^{w, c} = [[\text{Gn}\_x [pro2] [work-a-lot-in-this-department (pro2)]]]^{w, c} = 1 iff for every  $w'$  that is such that (a counterpart of the) addressee in  $c$  exists in  $w'$ , there is a  $w''$  such that  $w''$  is more normal than  $w'$ , and for every  $w'''$  that is more normal than  $w''$ , (a counterpart of) the addressee in  $c$  works a lot

Whereas this is accurate enough for (16b), it fails to capture the truth conditions of (16a): for (16a) is neither a claim about the addressee in  $c$  nor about its counterparts in the prototypical worlds: it can still be true even if it is false that the addressee in  $c$  (or his/her counterparts) work a lot in every prototypical world.

<sup>7</sup> I assume the widespread kratzerian treatment of modality (Kratzer 1991) under which modal statements amount to quantification over possible worlds, as in classical modal logic (see Kripke 1959, 1963). Unlike it, however, the type of quantification they express is highly context-sensitive: it depends on three parameters: a *modal relation* (that distinguishes necessity as universal quantification, from possibility as existential quantification), a *modal base* (that determines the set of worlds being quantified over) and a *ordering source* (that places possible worlds in an order of relative closeness to an ideal world, maybe the actual one). I am not claiming that the modal analysis of genericity should be essentially correct, just that it is quite a natural option within the possible world framework we are using so far. For relevant discussion about alternative analysis, see Krifka *et al.* 1995. On generics as involving necessity, see Krifka *et al.* 1995, but cf. Wilkinson 1990 for a different perspective.

<sup>8</sup> Interpretations are relativized to modal bases ( $B_w$ ) and ordering sources ( $\leq_w$ ) (see Krifka *et al.* 1995:52). I will just assume that  $B_w$  restricts the quantification to prototypical worlds (see Jónsson 1992).

<sup>9</sup> I will remain neutral to whether the set of individuals in the model is world-dependent and tentatively incorporate Lewis' counterpart theory (see Lewis 1968, 1986). For sake of simplicity, [tú] and [pro2] require a counterpart of the addressee/speaker in  $c$  in the set of prototypical worlds being quantified over

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Intuitively, what is wrong with the semantics proposed for *pro* [II,s] is that it assumes it to be a rigid designator, and, although we want to keep the fact that *pro* [II,s] behaves as a regular indexical in episodic sentences, we still want to explicitly express that it might pick up different individuals in different circumstances of evaluation in generic ones. Specifically, we want to derive the fact that a generic sentence containing *pro* [II,s] expresses the *diagonal proposition*: a proposition whose circumstances of evaluation and context coincide (Stalnaker 1978).

Amending the proposed semantics by claiming that, unlike *tú*, *pro* [II,s] is not a rigid designator, as in (17), does not suffice.

- (17)  $[[\text{pro2}]]^{w,c} = \lambda x. \text{addressee}(x)(w)$

Crucially enough, the properties of worlds impose quite interesting obstacles for such an enterprise. Notice that (17) will run into the embarrassing problem of claiming uniqueness for addressees in worlds. (18) illustrates the interpretation that our revised semantics assigns to (16c): it claims that there is a unique addressee in the prototypical worlds we are quantifying over. Nevertheless, how could we claim that there is a unique individual that is the addressee in a world? In principle, worlds are states of affairs that do contain more than one addressee. It seems that there are few worlds with a unique addressee in them. And if that is the case, contrary to evidence, (16c) will almost never be true.<sup>10</sup>

- (18)  $[[\text{Gn}_{x,w}[\text{pro2}][\text{work-a-lot-in-this-department}(\text{pro2})]]]^{w,c} = 1$  iff for every  $w'$  that is such that a unique addressee in  $w'$  exists, there is a  $w''$  such that  $w''$  is more normal than  $w'$ , and for every  $w'''$  that is more normal than  $w''$ , the unique addressee in  $w'$  works a lot in  $w'''$ .

The problem is even worse, because (16a) is not even making a claim about possible *addressees*. Rather, it makes a claim just about *possible individuals*. It does not claim that it is a prototypical property of a possible addressee that it works a lot in this department. Intuitively, it claims that if a person works in this department, he/she works a lot. Now, if we do not make a claim about addressees, how can we be sure that in episodic sentences *pro* [II,s] picks up the unique addressee in  $c$ ?

Finally, until now I have only commented mainly on generic statements and suggested that, since modality is involved, 'arbitrary' reference might be connected with the fact that *pro* [II,s] can pick up a (possibly) different individual in each circumstance of evaluation. We have also seen in (10b) that *pro* [II,s] does not pick up the addressee in A-quantified sentences either. Now, unless we want to claim that *every single* case of A-quantification involves modality, we cannot see how to directly integrate these two environments.<sup>11</sup>

<sup>10</sup> Using contextual features to restrict the choice ('the unique addressee now' ...) will not suffice: Creswell (1972) has claimed very difficult to include as a parameter every single shifting feature from context.

<sup>11</sup> An analysis in terms of unselective binding will not suffice: *pro* [II,s] does not behave as a free variable.

To put it in a nutshell, we need to let *pro* [II,s] pick up a possible individual in each possible circumstance of evaluation. Yet, if worlds are the circumstances of evaluation, it is not immediately obvious how to do it safely and, furthermore, how to unify non rigid designation with the regular indexical behavior attested in episodic contexts.

### 3.2 Situations and Contexts

Employing circumstances of evaluation smaller than worlds would be a natural solution for the problem. *Pro* would pick up a unique individual in each circumstance. On its turn, each such circumstance could play a role similar to the one played by context in possible worlds semantics and, provided that it is small enough, still be consistent with uniqueness when used as a circumstance of evaluation. Intuitively, in those circumstances that could be described as contexts of utterance, *pro* [II,s] would most naturally pick up the addressee. When sentences are evaluated with respect to other circumstances, however, this need not be the case, which seems promising for the semantics of *pro* [II,s] if we can defend that both A-quantification and genericity involve circumstances of evaluation other than the context of utterance.

In this section, I will show how using situations as both circumstances of evaluation and contexts can maintain the intuition that *pro* [II,s] is not a rigid designator. Specifically, by adopting a kratzerian situation-based ontology I will propose unifying contexts and circumstances of evaluation and show how widespread assumptions about a situation-based semantics for A-quantification and genericity can solve most of the previous problems.

Precisely, the semantic program presented by Kratzer (1989, 1990) uses parts of worlds that can be of the kind needed.<sup>12</sup> She adopts an ontology based on a set *S* of possible situations, which includes the set *D* of possible individuals. A partial ordering  $\leq$  on *S* satisfies a maximality condition: for all  $s \in S$  there is a unique  $s' \in S$  such that  $s \leq s'$  and for all  $s'' \in S$ : if  $s' \leq s''$ , then  $s'' = s'$ . This ontology assures that each world is the supremum of a complete join semilattice, whose parts are situations.<sup>13</sup> Besides that, propositions are sets of situations: the set of those situations in which the proposition holds (where a proposition holds in a situation  $s$  iff  $s \in p$ ). Consequently, the domain of propositions is  $\wp(S)$ .

By adopting this ontology we can make two crucial moves. First, since propositions in this model are sets of situations, the role played by the context and by the circumstances of evaluation can be unified by using a distinguished situation: the utterance situation ( $s_0$ ). Hence, indexicality will be equivalent to contingency with respect

<sup>12</sup> Barwise and Perry's situation semantics was also designed in part to capture the similarities between situations of evaluation and situations of utterance (see Barwise and Perry 1993). We do not explore here the possibility of using that framework for our purposes. For an excellent comparison between both versions of situation semantics, see Portner 1992.

<sup>13</sup> Given  $D \subseteq S$  and  $\leq$ , considering possible alternatives of an actual individual requires some version of the counterpart theory as advocated by Lewis (1968, 1986).

to  $s_0$ .<sup>14</sup> Second, by adopting a situation-based ontology, we can defend coherently that A-quantification and genericity amount to quantification over situations (Berman 1987, von Fintel 1995). And I will show that independently motivated properties of a situation-based account for A-quantification provide insightful details about the semantics of *pro* [I, s].<sup>15</sup>

The basic idea of a situation based framework for A-quantification is that A-quantifiers denote relations between two sets of situations: an A-quantified sentence with an operator  $\delta$  applied to a pair of propositions  $\langle p, q \rangle$  would be true in a situation  $s$  iff  $\delta$ -many of the  $p$ -situations are also  $q$ -situations (Von Fintel, 1995). Several constraints have to be imposed onto this picture. First, because of the mereological structure of the domain, counting situations is a difficult task. Accordingly, if we want to individuate situations to compare the cardinality of two propositions we have to use minimal situations (see Berman 1987, Heim 1990), where:

- (19) For any set of situations  $S$ , the set of minimal situations in  $S$ ,  
 $\min(S) = \{s \in S : \forall s' \in S (s' \leq s \rightarrow s' = s)\}$

Nevertheless, minimal  $p$ -situations do not stand much of a chance of being  $q$ -situations as well, since they just contain what they need to be  $p$ -situations and nothing else. Consequently, it has been pointed out that situations in the restrictor have to be minimal, but extendable to situations in the nuclear scope (Von Fintel, 1995:6):

- (20)  $[[\delta p q]]^s = \{s' : [[\delta]] ([[p]]), (\{s' : \exists s'' (s' \leq s'' \ \& \ s'' \in [[q]])\})\}$

This does not suffice yet, for we are quantifying over  $p$ -situations in any possible world, and that makes the proposition non-contingent. In order to avoid that, we need to restrict situations in the restrictor to the evaluation world. If we still want to maintain the intensional character of some A-quantifiers (*usually, traditionally*), we can restrict situations in the restrictor to accessible  $p$ -situations and exploit this property to capture the idea that generic statements amount to universal quantification over prototypical situations. This allows us to fill the gap between A-quantification and genericity that we encountered before. In (21)  $f(s)$  is a function from evaluation situations to sets of accessible situations that plays a role very similar to Kripke's accessibility relations or Kratzer's conversational backgrounds. Its identity is largely contextually determined.

- (21)  $[[\delta p q]]^s = \{s' : [[\delta]] (\min (f(s) \cap [[p]]), \{s' : \exists s'' (s' \leq s'' \ \& \ s'' \in [[q]])\})\}$

Finally, the behavior of *pro* [I, s] coincides with the  $e$ -type strategy (Heim 1990) in that they both need situations in the restrictor to be accessible from situations in the nuclear scope. To capture this constraint, I will use Von Fintel's notion of a reference

<sup>14</sup> On the claim that context is a type of event see Link (1987 : 255). Kratzer 1990 does not treat sentences as functions from contexts to propositions for ease of exposition, but Portner (1992) relativizes interpretations to the situation of utterance.

<sup>15</sup> Single variable analysis of A-quantification (against unselective binding) are not unheard of. See Berman (1987). Lewis (1975) himself considered the possibility. Partee (1984), and De Swart (1991) use quantification over events. Here I follow very closely Von Fintel (1995).

situation ( $s'/r$ ) that is passed along as a parameter of interpretation. In order to account properly for the QVE, conservativity has been built into the semantics of A-quantification to be sure that situations in the nuclear scope do not contain other parts more than the minimal situations in the restrictor (von Stechow, 1995:29).

$$(22) \quad [[[\delta \text{ p q}]]^s = \{s: [[\delta]] (\min (f(s) \cap [[p]]), \{s': \exists s'' (s' \leq s'' \& s'' \in \{s''': s''' \in ([[p]] \cap [[q]]^{s'/r})\})\})\}}]$$

We can now, on the basis of (22), revise the semantics for *pro* [II,s] as in (23).

$$(23) \quad \begin{array}{l} \text{a. } [[[\text{t}\acute{u}]]^{s_0}]^{s_0} = \text{speaker} (s_0) \\ \text{b. } [[[\text{pro2}]]^{s_0}]^{s_0} = g (f (s)) \\ \text{Where } f \text{ is a free variable ranging over } \{g \in D_e^{Ds} : g \neq \text{speaker} (s_0)\}^{16} \end{array}$$

(23a) is practically a notational variant of the previously proposed denotation. As for (23b), it denotes an individual concept, any function from situations to an individual, except for *speaker* ( $s_0$ ). The domain of these functions includes  $s_0$ . Consequently, one possible value for  $f$  when applied to  $s_0$  is *addressee in*  $s_0$ . In fact, when **pro2** is interpreted with respect to  $s_0$ , it is only a question of saliency that it is interpreted as *addressee in*  $s_0$ . However, **pro2** need not be interpreted with respect to  $s_0$ . It can be interpreted with respect to other situations, which can pragmatically restrict the range of  $f$ . That is the case in contexts of both A-quantification and genericity.

By adopting (23) we can in fact derive most of the properties of *pro* [II,s] without stipulation and avoiding the problems of a possible world approach. First, the relation between the 'pure indexical' value of *pro* [II,s] and its 'arbitrary reading' can be made explicit: both are indexical uses in some sense. The former picks up its value from  $s_0$  and the latter from every other kind of situation. In contexts of A-quantification and genericity, 'arbitrary' means that the indexical can pick up its value from more than one situation: all those that are being quantified over.<sup>17</sup> Uniqueness is derived from the independently motivated requirement of minimality for situations in the restrictor. Diagonalization is also perfectly captured: a proposition in the nuclear scope of an A-quantified formula (including generic statements) would be interpreted with respect to a reference situation in the restrictor and, given the proposed semantics for **pro2**, this would be the situation where it picks up an individual.

<sup>16</sup> This does not preclude that the *reference* of **pro2** can end up being the speaker in  $s_0$ . In generic silent thoughts of the type of 'You never know what the weather will be like around here', *you* would pick up an individual in a prototypical situation of here, and this can be the speaker in  $s_0$ . Alternatively, **pro2** can pick up an addressee without an  $s_0$  mediating. Imagine a situation where somebody is driving and the car in front of him is making strange turns. If you consider this situation, then a silent thought as 'What are you doing?' is perfectly natural, although the *you* here is not picking up an individual in an utterance situation, because there is no such situation. Thanks to Barbara Partee for bringing these examples to my attention. In (23),  $s$  stands for the type of situations for ease of exposition.

<sup>17</sup> The domain of quantification can be formed by prototypical utterance situations, as in the following examples due to Barbara Partee: 'Here you are always expected to agree without questions' or 'Here you can't say no.'

Let us see how the semantics work. First, consider (24a): a (past) episodic sentence. (24b) will be true in  $s$  iff there is a  $s'$  whose running time is previous to the running time of  $s_0$  and to the running time of  $s$  such that  $s'$  is a situation of a salient individual in  $s_0$  working a lot. In this kind of use, *pro*  $[[I, s]]$  is roughly equivalent to its overt counterpart *tú*.<sup>18</sup>

- (24) a.  $Tr$  (Trabajaste mucho) = PAST (work-a-lot (pro2))  
 'You (add.) worked a lot.' From (24a) by means of  $\lambda$ -conversion:  
 b.  $[[[\lambda s \exists s'' (\text{time}(s'') < \text{time}(s_0) \ \& \ \text{time}(s'') < \text{time}(s) \ \& \ (\text{work-a-lot}(\text{pro2})(s''))]]]^{s_0} = \{s: \text{there is an } s' \text{ previous to } s_0 \text{ and to } s \ \& \ g(f(s_0)) \text{ works a lot in } s'\}$

Let us now see how the semantics works for sentences involving A-quantification and genericity. In what follows, I assume that genericity can be derived from A-quantified schemas just by letting the accessibility relation among situations pick up those prototypical situations of a kind given by the restrictor. This is the role of the constant *proto* in the translation.<sup>19</sup>

- (25) a. En ese departamento trabajas como un esclavo  
 In that department work:2s like a slave  
 b. LF: Gn [ en ese departamento ] [ pro  $[[I, s]]$  trabajas como un esclavo ]  
 c. Gn ( in-that-department (s) & proto (s) ) ( work-like-a-slave (pro2) (s) )  
 d.  $[[[Gn (\text{in-that-department}(s) \ \& \ \text{proto}(s)) (\text{work-like-slave}(\text{pro2})(s))]]]^{s_0} = \min(\text{proto}(s) \cap \{s: \text{in-that-dpt}'(s)\}) \subseteq \{s': \exists s'' (s' \leq s'' \ \& \ s'' \in \{s''': s'' \in (\text{proto}(s) \cap \{s: \text{in-that-dpt}'(s)\}) \cap [[\text{work-like-a-slave}'(\text{pro2})]]^{s''''/r}\})\}$   
 (Where  $s'''' \in \{s: \min(\text{proto}(s) \cap \{s: \text{in-that-dpt}'(s)\})\}$ )

(25d) illustrates the semantics of genericity modeled after the properties of A-quantification previously discussed. According to it, (25) expresses a true proposition with respect to a situation  $s$  iff all minimal prototypical situations of this department  $s'$  are extendable to prototypical situations of this department  $s''$  in which a person in  $s'$  works a lot. So it amounts to claiming that if you take a person from a minimal prototypical situation of this department, there is a bigger situation that contains it where this person is working a lot. And this is accurate enough to capture our 'arbitrary readings': (25a) does not make a claim about an addressee, it just claims that whoever is in a prototypical situation of this department is working in a lot in a situation that contains it.

<sup>18</sup> PAST is an abbreviation for  $\lambda p \lambda s \exists s'' (\text{time}(s'') < \text{time}(s_0) \ \& \ \text{time}(s'') < (s) \ \& \ p(s''))$  (Where  $[[\text{time}(s)]]^t = \{t: s' \text{ is running at } t\}$ ).  $\text{time}(s)$  is akin to the function presented by Kratzer (1998) or Johnson (1995) (see the temporal trace function in Krifka 1989 and the running time function in Laersohn 1990). '<' is a dyadic constant satisfied by pairs of temporal intervals  $\langle t_1, t_2 \rangle$  if  $t_1$  is previous to  $t_2$ .

<sup>19</sup> I assume for ease of exposition that semantic partition takes place at LF by means of whatever rules of construal and ignore whether it can be reduced to a pragmatic process as in von Stechow (1995). (25b) is a syntactic partition of (25a), responsible for including the locative into the restrictor. (25c) is the translation of (25b), assuming the neodavidsonian claim that locatives express properties of situations (given that eventualities can be interpreted as minimal situations, see Portner 1992). In am here inconsistent with section 6, where I assume with Kratzer (1996) that the situation/eventuality argument is syntactically projected in the natural language.

If the semantics of **pro**<sub>2</sub> were according to what we have proposed, we expected several facts concerning the distribution of the 'arbitrary readings' to follow. First, we expect 'arbitrary readings' to appear also in counterfactuals. And (26) shows that this is indeed the case.

- (26) a. Si tú estuvieras viviendo en Italia, (tú) comprarías mucha ropa  
 If you be:PASTSUBJ2S living in Italy, you would buy lots of clothes  
 'If you (ad.) lived in Italy, you (ad.) would buy lots of clothes.'  
 b. Si *pro* estuvieras viviendo en Italia, *pro* comprarías mucha ropa  
 If *pro* be:PASTSUBJ2S living in Italy, *pro* would buy lots of clothes  
 'If you (gen.) lived in Italy, you (gen.) would buy lots of clothes.'

Second, we know from any run-of-the-mill analysis of i-level predicates that they lack a free situation variable. Either they lack any situation variable whatsoever (as in Kratzer 1995) or they lexically incorporate an aspectual operator that binds it (as in Chierchia 1995a). Consequently, if the so called 'arbitrary reference' involves quantification over situations, we expect that sentences with i-level predicates cannot have such an interpretation, and this prediction is borne out by (27):

- (27) a. Eres médico en este hospital  
*pro* are doctor in this hospital  
 \* 'you (gen.) are a doctor in this hospital.' / Ok: 'you ... (ad.)'  
 b. En este país eres sordo  
 In this country are deaf  
 \* 'In this country, you (gen.) are deaf.' / Ok: 'you ... (ad.)'

To summarize, according to our analysis, this kind of arbitrariness amounts to non-rigid indexicality in A-quantified environments. In the next section I will show that plural *pro* cannot be treated along these lines and propose that the arbitrariness of plural *pro* is due to the inherent vagueness of plural definites.

#### 4. Plural *pro*

Since plural *pro* shows the same alternations between indexical values in episodic sentences and 'generic' values in characterizing sentences, trying to extend the semantics that we have proposed for **pro**<sub>2</sub> seems reasonable. In order to do so, I will slightly modify the previous ontology by adopting a linkean perspective on plurality that assumes the existence of plural individuals of type *e* in the model (henceforth *pluralities*) (Link 1983). Essentially, following Chierchia (1995), I will make use of a model whose universe is sortally distributed. It includes  $D^*$  as a subset of  $D$  (the set of *concrete* individuals<sup>20</sup>), which on its turn is a subset of  $S$  (the set of situations). The members of  $D^*$  are groups of humans and they all are of type *e*. Finally, I will also include an algebra  $\langle I, < \rangle$ , where  $I$  is the set of instants and  $<$  a linear order on it (*earlier than*).<sup>21</sup>

<sup>20</sup> Concrete individuals are the atoms in  $S$  that are not merely situations. I borrow the term from Portner 1992.

<sup>21</sup> I am not interested now in the properties of  $<$ . It will just suffice for our purposes to consider that is a linear order, i.e. that the relation *earlier than* is a transitive, asymmetric and connected relation.

$$(28) \quad M = \langle *D, D, S, W, \leq, I, <, [[]] \rangle$$

As before, *pro* gets translated as a logical constant of the  $\Pi$ , but now in the metalanguage I make use of plural variables ( $x_{pl}$ ) ranging over  $D^*$ . I also use  $\lambda$ -talk for functions in the metalanguage.

- (29) a.  $\text{Tr}(\text{pro} [I, pl]) = \text{group-of}(\text{pro1})$  type e  
 b.  $\text{Tr}(\text{pro} [II, pl]) = \text{group-of}(\text{pro2})$  type e  
 c.  $\text{Tr}(\text{pro} [III, pl]) = \text{anti-group-of}(\text{pro1})$  type e  
 d.  $[[\text{group-of}]]^s = \lambda x_e [ \iota y_{pl}. x \leq y_{pl} \text{ in } s \ \& \ R(x, y) ]$  type  $\langle e, e \rangle$   
 e.  $[[\text{pro1}]]^s = \iota x. \text{speaker}(x) (s_0)$  type e  
 f.  $[[\text{anti-group-of}]]^s = \lambda x_e [ \iota y_{pl}. \sim (x \leq y_{pl} \text{ in } s) \ \& \ R(x, y) ]$  type e<sup>22</sup>

The analysis predicts that the group itself is not a rigid designator, but the speaker or the addressee is, an accurate property for the semantics of *we*, as pointed out by Bennet (1978:36) and Partee (1989). Nevertheless, (30) shows that the semantics we have developed does not work. According with it, (30a), a generic statement in which plural *pro* has an 'arbitrary reading', will be true in a situation  $s$  iff every minimal prototypical situation in this country is extendable to a situation where the group in that situation that includes the speaker in  $s_0$  eats lobster. Thus, our semantics predict (30a) to be false in case the group that eats lobster never includes the speaker in  $s_0$ . And that is not the case: for (30a) is a claim about the people from this country and it will still be true if the speaker in  $s_0$  does not eat lobster at all.<sup>23</sup>

- (30) a. En este país *pro* (generalmente) comemos langosta  
 In this country *pro* (generally) eat:1PL lobster  
 'In this country we eat lobster.' ('We, people in this country, eat lobster.')
- b.  $[[\text{Gn}(\text{in-this-country}(s))(\text{eat-lobster}(\text{in pro1}))]]^{s_0} =$   
 $\min(\text{proto}(s) \cap \{s: \text{in-this-country}'(s)\}) \subseteq \{s': \exists s'' (s' \leq s'' \ \& \ s'' \in \{s''': s''' \in$   
 $([[\text{eat-lobster}(\text{group-of}(\text{pro1}))]]^{s''''/r} \cap \text{proto}(s) \cap \{s: \text{in-this-}$   
 $\text{country}'(s)\})\}$   
 (Where  $s'''' \in \{s: \min(\text{proto}(s) \cap \{s: \text{in-this-country}'(s)\})\}$ )

Throughout the rest of the paper, I will assume that the extension of expressions of type  $\langle e, t \rangle$  is a subset of  $D$ , meaning that they include both atomic individuals and pluralities. This is in order to define the satisfaction conditions for  $n$ -place predicates when applied to pluralities.

<sup>22</sup> The denotations above are obtained compositionally as in Kratzer 1997, which discusses the inclusive and exclusive readings of the impersonal German pronoun *man* by using the logical constants **in** and **ex**, approximately equivalent to **group-of** and **anti-group-of** respectively. For an overt morphological realization of **in**, consider Japanese *-tachi* (see Kawasaki 1989).  $R$  ranges over relations between singular individuals and the pluralities they belong to. It assures uniqueness relative to saliency, a strategy used in Kawasaki 1989. An alternative strategy:  $[[\text{anti-group-of}]]^s = \lambda x_e [ \iota y_{pl}. \sim (x \leq y_{pl} \text{ in } s) \ \& \ C(x) ]$ , where  $C(x) = 1$  iff  $x$  is salient enough. At this stage, I have no empirical argument for choosing among any of these approaches.

<sup>23</sup> Obviously under the assumption that, as it stands, our semantics require to **eat** to express distributive predications, i.e.  $[[\text{we eat}]]^s = 1$  iff  $\forall x \in [[\text{we}]]^s : x \in [[\text{eat}]]^s$  which seems to be the case in general.



The alternative I want to propose is that arbitrariness amounts here to the context-sensitiveness of pluralities. I want to suggest that plural *pro* denotes maximal pluralities, where maximality is defined with respect to situations.<sup>24</sup> Specifically, I will suggest that the actual denotation of *pro* [I,pl] is the unique (contextually salient) maximal individual  $x_{pl}$  in the situation of evaluation such that  $x$  includes the speaker in  $s_0$  (31a).

Some technicalities: I use **max** and **in** in (31a) as abbreviations of the IL expressions in (31b) and (31c). In order to relativize maximality to situations, I make use of the logical constant  $\leq$  that expresses a part-of relation relative to circumstances of reference (31d). An interesting question is that the result of applying plural *pro* to a property has to be a collective predication, a predication of the whole group that does not entail the set of predications of each of the individual members that are part of the group. Still, I will not mark collectivity in the denotation, keeping distributivity as the marked phenomenon. This captures the fact that (30a) can still be true if, say, the speaker does not eat a lobster.<sup>25</sup>

- (31) a.  $\text{Tr}(\text{pro} [I,pl]) = \text{max}(\text{in}(\text{speaker}(s_0)))$  type  $e$   
 b.  $\text{max} = \lambda Q_{\langle e,t \rangle} \lambda z_{pl} [Q(z_{pl}) \ \& \ \forall y_{pl} [z_{pl} \leq y_{pl} \rightarrow z_{pl} = y_{pl}]]$  type  $\langle \langle e,t \rangle, e \rangle$   
 c.  $\text{in} = \lambda x \lambda y_{pl} [x \leq y_{pl}]$  type  $\langle e, \langle e,t \rangle \rangle$   
 d.  $[[x_{pl} \leq y_{pl}]]^{s,s} = 1$  iff  $g(x_{pl})$  is part of  $g(y_{pl})$  in  $s$

(32) illustrates the interpretation that our semantics gives for (30a). (32) will be true in a situation  $s$  iff all minimal prototypical situations of this country are extendable to situations in which the maximal group in  $s$  that includes the speaker in  $s_0$  'collectively' eats lobster. Since a prototypical situation of this country is quite a big one, given context-sensitiveness of maximality and collectiveness we obtain the desired 'arbitrary' effects. (32) is a claim about the whole group of people from this country as defined in a prototypical situation of this country, but not necessarily about each of its members.

- (32)  $\min(\text{proto}(s) \cap \{s : s \in [[\text{in-this-country}(s)]]\}) \subseteq \{s' : \exists s'' (s' \leq s'' \ \& \ s'' \in ([[\text{eat-lobster}(\text{max}(\text{in}(\text{pro1}))]])^{s''} \cap \text{proto}(s) \cap \{s \in [[\text{in-this-country}(s)]]\})\}$   
 (Where  $s'' \in \{s : \min(\text{proto}(s) \cap \{s : s \in [[\text{in-this-country}(s)]]\})\}$ )

We can now begin to understand the role of the locative expressions that, according to the Caselles- Johnson's generalization, license 'arbitrary' readings. In cases involving **pro2** we have seen that they characterize the types of situation being quantified over and provide suitable restrictors. This explains why, when uttered out-of-the-blue, these sentences do not have 'arbitrary' interpretations: nor do they have generic readings. If there is a suitable restrictor then generic quantification is possible and, consequently, 'arbitrary' readings are licensed.

<sup>24</sup> The fact that maximality is context sensitive is pointed out by Jacobson's (1995) analysis of English free relatives.

<sup>25</sup> The contrast I have in mind is Link's idea to distinguish between predications of a plural entity as a whole and predications of each member of a plural entity, the second being translated by using the 'partake' operator.

Now consider what happens with pluralities. In cases involving the pluralities under discussion, these expressions are responsible for characterizing the types of situations with respect to which maximality is defined. Notice that all examples involving 'arbitrary' reference restrict the situations of evaluation to big chunks of worlds in which maximality is defined. Otherwise the 'arbitrary' reading is not obtained.

Consider for instance (33a). (33b) captures what should be its generic reading. Under the intended reading, (33a) would be true in  $s$  in case every minimal prototypical situation of my room  $s'$  can be extended to a situation  $s''$  where the maximal group in  $s'$  containing the speaker in  $s_0$  eats lobster in  $s''$ . However, since prototypical situations of my room are not big enough, the plurality is not big enough and it is not difficult to identify its members. Its 'arbitrary' reading is ruled out as pragmatically odd, the members of the maximal plurality being easily identified. (33a) could only have 'arbitrary' readings in those (pragmatically odd) scenarios in which a prototypical situation of my room can include big groups, whose members need not be identified.<sup>26</sup>

- (33) a. En mi habitación *pro* comemos langosta  
 In my room pro eat:1PL lobster  
 'In my room we eat lobster.'
- b.  $\min(\text{proto}(s) \cap \{s : s \in [[\text{in-my-room}]]\}) \subseteq \{s' : \exists s'' (s' \leq s'' \& s'' \in ([[\text{eat-lobster}(\text{max}(\text{in}(\text{pro1}))]])^{s'/r} \cap \text{proto}(s) \cap \{s \in [[\text{in-my-room}']]])\}$

If you use an adverbially quantified version of (33), then its most natural generic reading is one in which the locative directly modifies the property of situations expressed by the VP. It will assert that  $\delta$ -many minimal situations of a contextually specified kind are extendable to situations in which the maximal group containing the speaker in  $s_0$  eats lobster in the room of the speaker in  $s_0$ . As a consequence, there is no 'arbitrary' reading.

- (34)  $\delta^* < \min(C(s), \{s' : \exists s'' (s' \leq s'' \in [[\text{eat-lobster-in-my-room}'(\text{max}(\text{in}(\text{pro1}))]])^{s'/r}\})$

We still have a problem, though. Recall the contrast between generic and episodic statements: in generic statements plural *pro* license 'arbitrary readings', whereas in episodic sentences, it behaves as a regular definite. In the last section we have seen how to capture this behavior with **pro2**, but it does not seem intuitively obvious how to capture it here, under the current assumptions.

First, consider the contrast between (35a) and (35b). (35a) is the kind of example we have been working with: it is a (past) episodic sentence and apparently has no 'arbitrary readings'. It is not a claim about all Spaniards, it is a claim about a definite group of people including the speaker. Interestingly enough, under the interpretation about a contextually restricted group of people, the locative does not express a property

<sup>26</sup> There is an interesting regularity having to do with the informational status of these locatives, whose details I will leave for further research. Whenever they are not focused, as expected, they are material mapped to the restrictor that characterize the situation of evaluation and, consequently, define maximality. On this respect, recall the davidsonian analysis of locatives as expressing properties of events. But they can still be new information: in that case they still express properties of situations and are interpreted as VP-modifiers, as I will show below.

of the situation of evaluation, but rather modifies the property of situations expressed by the VP, and so, it is more natural if it does not project in the left periphery, as in (35b).

- (35) a. En España ayer comimos langosta  
 In Spain yesterday pro eat:1PL lobster  
 'In Spain, we ate lobster yesterday.'  
 b. Ayer comimos langosta en España  
 'Yesterday we ate lobster in Spain.'

Under current assumptions, however, we predict (35a) to have 'arbitrary' readings, provided that the locative characterizes quite large situations. I would like to claim that the absence of an 'arbitrary reading' for sentences like (35a), that reading in which *pro* is equivalent to Spaniards as a collective, is rather a pragmatic factor. It is quite odd to think about a single event in which all Spaniards ate lobster. But it is not impossible in other cases, as (36) illustrates.

- (36) En España ayer celebramos el día del trabajo  
 In Spain yesterday pro celebrate:1PL the day of the work  
 'In Spain we celebrated Labour Day yesterday.'

Now, if 'arbitrary' means just 'maximal' in collective predications, we expect the arbitrary readings of plural *pro* to be insensitive to quantification over situations, in contrast to the attested behavior of *pro*<sub>2</sub>. Recall that the 'arbitrary' readings of *pro*<sub>2</sub> were dependent on quantification over situations, and so became impossible with *i*-level predicates. (37) shows that 'arbitrary' interpretations of plural *pro* become possible in these contexts, provided that there are overt restrictors characterizing situations that are big enough.

- (37) a. En Japón hablamos japonés  
 In Japan pro speak:1PL japanese  
 'We, Japanese, speak Japanese.'  
 b. En este país somos morenos  
 In this country be:1PL dark-haired  
 'We, in this country, are dark-haired.'

Notice also that our semantics predicts that, under the 'generic-collective' readings, the speaker has to be included in the group we are dealing with. This explains contrasts of the following type, where the first group has to include the addressee and the second the speaker.<sup>27</sup>

<sup>27</sup> This gives us a clue about how to solve the problem of the so-called 'concordantia ad sensum'. Agr will determine whether the speaker is included in plurality or not. Thus in (i) the speaker has to be necessarily a man, but not in (ii).

- (i) Los hombres creemos que es un problema demasiado difícil  
 Men believe:2PL that is a problem too difficult  
 'We men believe that it is too difficult a problem.'  
 (ii) Los hombres creen que es un problema demasiado difícil  
 Men believe:3PL that is a problem too difficult  
 'Men believe that it is too difficult a problem.'

- (38) a. En Japón *pro* coméis bien  
 In Japan *pro* eat:2PL well  
 'In Japan you (Japanese) eat well.'  
 b. En Japón *pro* comemos bien  
 In Japan *pro* eat:1PL well  
 'In Japan we (Japanese) eat well.'

To sum up, in this section we have shown that plural *pro* cannot be characterized as a non-rigid indexical, as in the case of **pro2**. Instead, it is more accurate to think about plural *pro* in terms of denoting maximal pluralities, where maximality is defined according to the circumstance of evaluation. We have also explained the role of the locative expressions that license such 'arbitrary' readings: along the lines of a classical davidsonian analysis, they express properties of situations. When they characterize a situation as a large enough one, maximality yields large individuals, whose atoms are not easily identified. This, in conjunction with the fact that all 'arbitrary' sentences are instances of collective predication defines this type of 'arbitrariness'. Consequently, type-III is split into two types: type-III proper, including just **pro2** and type-IV, including plural *pros*. In the next section, I will deal with type II.

##### 5. The Indefinite/Generic Type: Plural Indefinites and Existential Disclosure

Of the three types of 'arbitrary reference', this is the only one for which an explicit semantics has been provided. Although there might be several problems arising from it, I will not discuss them here. Instead, I will present the basics of the analysis argued for in Chierchia 1995b for Italian in order to contrast it with the remainder types of 'arbitrary reference'.

Basically, Chierchia (1995) proposes that *se*-constructions denote plural indefinites. Recall that *se*-constructions have 'arbitrary interpretations' in episodic contexts, do not need overt restrictors, and inherit the quantificational force of overt A-quantifiers. All these properties can be easily explained if we think of impersonal *se*-constructions as plural human indefinites and we adopt some dynamic version that allows for quantifiers to extend their scope beyond the sentence (see Groenendijk and Stokhof 1991). Under this analysis, *se* is treated as a polymorphic operator of type  $\langle a, t \rangle$ , where  $a$  ranges over  $\{e, \langle \langle e, t \rangle, t \rangle\}$ .

- (39) a.  $T(\overline{s}) = SI$   
 b.  $[[SI]] = \lambda P \exists x_{arb} [P(x_{arb})]$  if  $P$  is of type  $\langle e, t \rangle$  (limited to extensional cases)  
 c.  $[[SI]] = \lambda P \exists x_{arb} [P(\lambda Q. [Q(x_{arb})])]$  if  $P$  is of type  $\langle \langle \langle e, t \rangle, t \rangle, t \rangle$

This means that *se* applies to a property  $P$  and yields a formula containing existential quantification over pluralities of which  $P$  is predicated. In a regular episodic sentence, this amounts to a plural indefinite reading. Thus, (40) would be true in a situation  $s$  iff there is at least one group of people that ate well in a situation previous to  $s$ . Here 'arbitrary' equals plural indefiniteness.

- (40) a. Ayer aquí se comió bien  
 yesterday here SE ate:3S well  
 'Yesterday, some people ate well here.'  
 b.  $\exists x_{pl}$  eat ( $x_{pl}$ ) (disregarding temporal content)

Now, in cases where **Gn** or an adverb of quantification obtains, a dynamic framework *à la* Chierchia would propose that  $\exists$  be wiped out by means of an operation of 'Existential Disclosure' (see Dekker 1993). For ease of exposition, let us assume that A-quantifiers are unselective binders. In generic sentences, as (41) the result is the expected quasi-universal interpretation. In sentences where overt a-quantifiers obtains as in (42), then the indefinite inherits the quantificational force of the overt operator, as expected.

- (41) a. En este país se come langosta  
 In this country SE eat lobster  
 'In this country, people eat lobster.'  
 b. **Gn<sub>x,s</sub>** [this country (s) ( $x_{pl}$ ) & C(s) ( $x_{pl}$ )] [ ( $x_{pl}$ ) eats lobster]
- (42) a. Si se es guapo, nunca se es inteligente  
 If SE is handsome, never SE is intelligent  
 b.  $\sim\exists x_{pl}$  [handsome( $x_{pl}$ )] [intelligent( $x_{pl}$ )]

Although I will not go into that here, it is necessary to unify Chierchia's analysis with a situation-based view of A-quantification in order to be consistent with the previous sections. This would imply considering *se* as a russellian indefinite evaluated over minimal situations, along the lines of von Stechow (1995). Even though developing such an analysis is an important task, I will just assume that the basic lines of Chierchia's analysis are correct and can be translated into a situation-based model for A-quantification. Meanwhile, I will go on deriving the properties of the last type of 'arbitrary reference'.

## 6. Type I and Underspecified Events

In previous discussion we have talked about the examples of *pro<sub>arb</sub>* in Suñer 1983, those in which *pro* [III,pl] behaves as a singular indefinite in episodic sentences (as in (3)), as different from those of the indexical/generic type (see (8a) and (9a)). Recall that the indefiniteness of *pro* [III,pl] is restricted to regular subjects of transitives and unergative verbs, since in regular passives or ergative constructions there is no possible 'arbitrary' reading. And this is quite a puzzle: how could it be that a lexical item that is normally a regular plural definite apparently behaves just in certain cases as an singular indefinite?

In this section I will argue against the indefinite analysis of *pro* [III,pl] and propose an alternative analysis. Essentially, I will propose that the sentences under discussion just make reference to plain events, underspecified for their agents and that, as a consequence, their interpretation will *imply* the interpretation of an equivalent sentence with a singular indefinite, although their logical forms do not involve any kind of indefinite at all.

Before proposing this analysis, let us examine what would be the consequences of assuming that *pro* [III,pl] can actually be a singular indefinite in those cases where 'arbitrary readings' obtain, as suggested in previous literature (see Jaeggli 1986).

Even if we disregard now that it is not immediately obvious why the indefinite interpretation for *pro* [III,pl] is only available for regular subjects, there are two big problems with this analysis. They both concern the anaphoric and scopal properties of *pro* [III,pl]. First, consider the contrast between (43a) and (43b). If *pro* [III,pl] were a regular indefinite, we would expect it not to be anaphorically related to another indefinite intersententially. After all, the indefiniteness of indefinites amounts to introducing a new discourse referent (see Heim 1982). However, contrary to our expectations, (43b) shows that this is indeed possible, in spite of (43c), the logical form that would correspond to it if *pro* [III,pl] were a real indefinite.

- (43) a. A teacher<sub>i</sub> arrived yesterday. A teacher<sub>i</sub> is nice.  
 b. *pro*<sub>i</sub> llaman a la puerta. *pro*<sub>i</sub> piden ayuda  
 pro knock:3PL to the door pro ask-for:3PL help  
 'Somebody is (/They are) knocking at the door. He is (/They are) asking for help'.  
 c.  $\exists x$  knock-the-door(x) &  $\exists y$  ask-for-help (y)

Second, consider (44). All the sentences under (44) show that a regular indefinite can have both narrow and wide scope with respect to other operators in the sentence: negation in (44a), universals (44b) or modal operators (44c).<sup>28</sup>

- (44) a. No es el caso que haya venido alguien de tu familia  
 Not is the case that have come:SUBJ somebody of your family  
 'It is not the case that somebody from your family has come.'  
 (Both  $\neg \exists$  and  $\exists \neg$ )  
 b. Una niña saludó a cada presidente  
 a girl greet:PAST3S each president  
 'A girl greeted each president.'  
 (Both  $\forall \exists$  and  $\exists \forall$ )  
 c. Es posible que venga alguien de tu familia  
 It is possible that come:SUBJ somebody of your family  
 'Somebody from your family may come.'  
 (Both  $\diamond \exists$  and  $\exists \diamond$ )

Accordingly, if *pro* [III,pl] were a regular singular indefinite, it should obey the scopal properties exemplified by the previous examples. However, contrary to our expectations, the sentences under (45) show that *pro* [III,pl] can only have narrow scope systematically.

<sup>28</sup>However, I do not want to commit myself to the equivalence between wide-scope indefinites and existential quantification. On this topic, see Kratzer (1998).

- (45) a. No llaman a la puerta  
No knock:3PL to the door  
'They are not knocking at the door.'  
( $\neg\exists / * \exists \neg$ )
- b. *Pro* están llamando a cada puerta.  
'They are knocking at each door.'  
( $\forall\exists / * \exists \forall$ )
- c. *Pro* es posible que estén llamando a la puerta  
It is possible that be: SUBJ knocking at the door  
'Maybe they are knocking at the door.'  
( $\diamond\exists / * \exists \diamond$ )

The peculiar anaphoric and scopal properties of *pro* [III,pl] suggest that an analysis in terms of its indefinite nature would have to overcome quite important difficulties: namely, it would have to explain (i) why it consistently behaves anaphorically as a definite, (ii) why it yields only narrow scope readings and, finally, (iii) how and why the indefinite reading is restricted to subjects of regular transitive or unergative verbs.

In the absence of such explanations, I am going to posit alternatively (i) that the logical forms licensing 'arbitrary readings' of type I do not contain *pro* [III,pl] at all, (ii) that the attested indefiniteness is due to an implication of such logical forms and (iii) that they can be easily derived from syntactical representations if some motivated properties of the projection of external arguments defended in Kratzer 1996 are taken into account.

First, I would like to suggest that looking at the way we interpret external arguments could give us a clue about the properties of this phenomenon. As a minimal background for this question, consider, for instance, the claims made in Kratzer 1996. According to her, along the lines of the neodavidsonian view of argument selection, external arguments are not arguments of their verb. Rather, they are arguments of events. Specifically, Kratzer suggests that they are syntactically introduced by a functional head (VoiceP) that gets interpreted as a dyadic predicate, satisfied by pairs of individuals and events if the individual fulfills the description of the predicate with respect to the event.

Now, assume that VPs express properties of events. If we want to rely on some version of type-driven interpretation, in order to be sure that both the VP and Voice express a property of *the same* event, it is necessary to introduce an interpretation principle, a variety of a regular predicate conjunction principle that Kratzer dubs 'Event Identification'. The whole process is illustrated in (46), where *s* is the type of the *eventualities* and *e* is a variable ranging over individuals. Let us underline that Event Identification, as defined in Kratzer 1996 is defined iff the two predicates that are being conjoined have compatible aktionsarten, in order to avoid having agents of states or holders of activities, and the such.<sup>29</sup>

<sup>29</sup> I assume that eventualities can be identify with the minimal situations that exemplify a proposition, as in Kratzer 1990, 1998 and Portner 1992. Intuitively, an eventuality that exemplifies or supports a proposition is a situation in which the proposition is true and is small enough so as not to contain anything irrelevant to its truth:

- (46) a. Peter bought the house  
 b. [<sub>VoiceP</sub> Peter [<sub>Voice agent</sub> [<sub>VP</sub> buy the house]]]  
 c. [[Agent]] =  $\lambda x \lambda e$ [agent (x) (e)], [[VP]] =  $\lambda e$  [buy (x) (the house) (e)]  
 d. Event Identification:  $f \in D_{\langle e, \langle s, t \rangle \rangle}, g \in D_{\langle s, t \rangle} \rightarrow h \in D_{\langle e, \langle s, t \rangle \rangle}$  such that  $\lambda x \lambda e$ [f(x)(e) & g(e)]

Now, the hypothesis I would like to suggest for the *pro* [III,pl] sentences is that they translate into the intermediate language as existentially quantified events, with no claim whatsoever about their agents. Under this view, (47a) would be translated into (47b), which would be true in a situation *s* iff there is an event of knocking at the door.

- (47) a. Llaman a la puerta  
 'They are knocking at the door.'  
 b.  $\exists e$  knock-at-the-door(e)

(47b) can be compositionally obtained if we define an operation on LF that optionally deletes Voice when headed by 'agent'. I will dub it 'Drop Voice'. As an illustration, consider (48). (48b) is the LF corresponding to (48a). I have assumed that Case marking has taken place by that level and that objects end-up being reconstructed in a VP-internal position after having checked accusative. (42b) is the result of applying 'Drop Voice' to (42a). By means of this operation, we obtain an input for the translation function that can yield as a result the logical form in (48c).<sup>30</sup> Notice that the temporal-aspectual heads above VoiceP are responsible for existentially closing the properties of events denoted by the VP.

- (48) a. They repaired the phone.

(i) For each  $s \in S$  and any  $p \in \wp(S)$ ,  $s$  is an eventuality that exemplifies  $p$  iff for all  $s'$  such that  $s' \leq s$ , there is an  $s''$  such that  $s' \leq s'' \leq s$ , and  $s''$  is a minimal situation in which  $p$  is true.

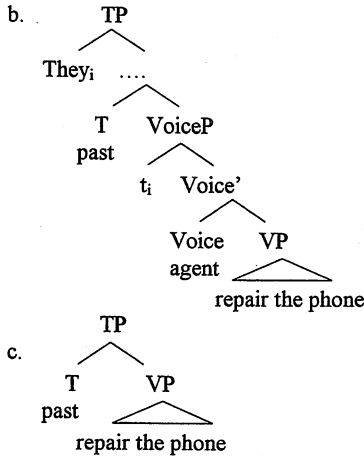
In order to map propositions into eventualities that exemplify them, Kratzer 1999 makes use of an operator  $\downarrow$  in the intermediate typed language :

(ii)  $[[\downarrow p]] = \{s: s \text{ exemplifies } p\}$

Given all this, the event-talk used in the discussion above can be translated into situation-talk just with some caveats I am not discussing here.

<sup>30</sup>One could have alternatively obtained the same effects by letting 'Drop Voice' be the effect of an optional rule of translation. I will remain here neutral on this question. I will also remain neutral with respect to the derivational history of such structures. In principle, it is conceivable that VoiceP does not project at all in any stage. If that were the case, we would directly obtain structures of the kind of (42c). I will let this question open and I think of it is a very theory-laden one, since empirical motivation for deciding among possible alternatives would come from properties within the syntactic component as Case marking, &c.





d.  $\text{Tr (48b)} = \exists s (\text{time (s)} < \text{time (s}_0) \ \& \ \text{repair-the-phone (s)})$

Notice that, if it turns out to be the case that ‘Drop Voice’ is defined only when VoiceP is headed by ‘agent’, then we would obtain the desired effects: neither subjects of passives nor those of ergative verbs and in general ‘derived’ subjects license ‘arbitrary readings’ (see also Goodall 1999).

An interesting argument for reinforcing this hypothesis comes from the behavior of a set of adverbial complements that have been shown to be ‘thematically dependent’ (see Wyner 1998). Specifically, consider what happens in this type of construction with adverbs like *de mala gana* (‘reluctantly’). Since they have been claimed to be dependent on the existence of an agent, we expect indefinite-like *pro* [III,pl] constructions to lack arbitrary readings when these adverbs are present, since we have proposed that the ‘arbitrary’ interpretation lacks specification of agents. And this prediction is empirically borne out by sentences like (49), which lack such ‘arbitrary readings’.

- (49) *Pro llaman a la puerta de mala gana*<sup>31</sup>  
 Pro knock:3PL to the door reluctantly  
 ‘They (definite) are reluctantly knocking at the door.’

Furthermore, the same blocking effect is obtained with other types of rationale/volitional complements, as illustrated in (50).

- (50) a. *Pro llaman a la puerta para sorprenderme*  
 pro knock at the door to surprise me  
 ‘they (def.) knock the door to give me a surprise.’

<sup>31</sup> Watch Out! *De mala gana* has two possible readings: one of which is clearly a VP-modifier. When it has a VP-modifier meaning, as expected, ‘arbitrary readings’ are possible.

b. *Pro* están arreglando el teléfono para cobrar el seguro.

They are repairing the phone to collect the insurance

Finally, it can be easily seen how to derive the indefinite flavor of this constructions: I would like to claim that their indefinite interpretation is actually obtained as a semantic implication, which can be represented by means of meaning postulates of the form of (51a) or, quite generally (51b).

- (51) a.  $\Box \forall e[\text{knock}'(e) \rightarrow \exists x[\text{agent}'(x,e)]]$   
 b.  $\Box \forall e[\text{activity}'(e) \rightarrow \exists x[\text{agent}'(x,e)]]$

## 7. Conclusions

I hope to have shown convincingly that 'arbitrary' reference is not a unique semantic phenomenon, but rather an epiphenomenon. What has been intuitively called 'arbitrary' amounts to the interpretation of four different logical forms: non rigid indexicals in quantified formulas, maximal pluralities (where maximality is relative to the circumstances of evaluation), plural indefinites and events underspecified for agents.

We can easily derive the properties of 'arbitrary' constructions of type-I from the analysis provided above. Since 'arbitrary' here means 'underspecified for agents', it can easily be seen why 'arbitrariness' is restricted to agents, why we do not need restrictors and why there are no real QVE effects. The indefinite-like interpretation is captured as a lexical implication.

As for type II, we have shown that a treatment *à la* Chierchia (1995) directly derives all the listed properties. First of all, 'arbitrary' here means 'indefinite'. Consequently, there is no need for overt 'restrictors' of the kind needed for types III and IV. The quasi-universal reading appears in generic statements as a result of existential disclosure. Being indefinites, we have the expected QVE. Insensitivity to the Hurtado-Jaeggli generalization is expected.

As for type-III, we have seen that 'arbitrary' amounts to non rigid indexicality. Consequently, there is no indefinite-like behavior with A-quantifiers. We have also explained the role of the locative-like phrases of this sentences: they characterize the domain being quantified over. Insensitivity to the Jaeggli-Cinque's generalization is also expected.

Finally, the fourth type of 'arbitrary reference' amounts to the vagueness of maximal pluralities. In this case the overt locatives characterize the situations with respect to which maximality is defined and we have seen that 'arbitrariness' is dependent on situations large enough.

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