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Predicative Possessives, Relational Nouns, and Floating Quantifiers

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Abstract

Green (1971) notes the apparent unacceptability of certain quantificational expressions as possessors of singular head nouns. We provide data from a range of English dialects to show that such constructions are not straightforwardly unacceptable, but there are a number of restrictions on their use. We build on Kayne's (1993; 1994) analysis of English possessives in conjunction with considerations on floating quantifiers to explain both the types of possessive that are permitted in the relevant dialects and their distribution, which is restricted to predicative position.

Keywords: Floating quantifiers, possessives, predication

1 Introduction

In a 1971 squib, Georgia Green makes the following observation (Green, 1971, p.601; numbering adjusted):

The noun phrases of (1):

- (1) a. One of my friends' mother
- b. All of their scarf

- c. Both of our scarf
- d. One of our scarf
- e. Both of my sisters' birthday [My sisters are twins]

which should be well formed paraphrases of (2):

- (2) a. The mother of one of my friends
- b. The scarf that belongs to all of them
- c. The scarf that belongs to both of us
- d. The scarf of one of us
- e. The Birthday of both of my sisters

are ungrammatical.

Green's intuition is correct for the examples in question in the way they are presented. It is not, however, *generally* correct in the sense that forms of the type she cites are grammatical for many speakers of English¹ in specific grammatical contexts. Consider the following example:

- (3) Norman is both of our friend(s)².

For speakers who find (3) grammatical, the possessive DP in predicative position does not receive the pragmatically somewhat implausible reading where the speaker and some other person(s) (*our*) have exactly two friends and these two friends happen to be the same person, (*Norman*). For concreteness and ease of reference, call this *meaning A*. This reading is not altogether impossible, but it is implausible and requires very specific contextual information to work.³

The most plausible and prominent reading (call it *meaning B*), the one we are interested in, conveys the information that one person (*Norman*) is a friend of both

the speaker and the other relevant person(s) (*our*). The kind of examples like (3) that form the core of this paper have not received any attention in the formal literature as far as we know.⁴ They are, however, extant in speech, informal writing and formal writing. A March 2016 headline in *The Guardian* newspaper reads:⁵

(4) Getting a fair deal for millennials is in all our interests.

(4) clearly does not mean that all the interests that a set of people have are served by whatever the subject describes. Rather it means that whatever the subject describes serves a particular interest which is an interest of each of the individuals quantified over by *all*. However, as Green's examples indicate, the same reading is not available when the QP is in argument position:

- (5) a. Both of our friends are here.
b. Both of our friends are coming.
c. *Both of our friend is coming.
d. Jim saw both of our friend(s).

The only available meaning for (5-a)-(5-b) is that the two individuals who are our friends are here/coming. (5-c) shows that singular agreement on *friend*, which could force *meaning B*, is completely impossible. It is possible in (5-d), however, which has the QP in object position. It is in this sense that Green's observation is not *generally* correct. We can therefore ask why such a contrast between argument and predicate positions should actually exist. Does the distinction between argument and predicate positions provide sufficient tools to explain it, and if so, how? Alternatively, is it the case that the restriction to predicate positions should itself be derived from independent properties of the construction?

To understand the differences between the grammatical and ungrammatical

cases we will first tackle the structure of the post-copular phrase in (3), and from that build the meaning compositionally for the examples in the same class as (3). This will also show us what is wrong with the examples of similar form that are *not* in the same class as (3). But before all that, we should characterize the class in which (3) belongs. This is the focus of section 2 where we present the core relevant data. The analysis is developed in section 3. More specifically, section 3.2 develops a syntactic analysis based on Kayne's (1993; 1994) analysis of English possessives, section 3.3 develops the semantic analysis, and section 3.4 deals with some residual issues, including the optional plural agreement on nominals by developing an analysis in parallel with cases of coordination, and the observed dialectal variation as a case of lexical variation.

2 The Core Data

Let us start by documenting in more detail the observation that this construction is only possible in predicative positions and never as an argument. Compare the examples in (6) with those in (7):

- (6) a. Sam is both of our friend(s).
- b. Mary is all of our mom(s).
- c. Archie is each of our son(s).

- (7) a. Both of our friends are in the room.
- b. All of our moms are gone.
- c. Each of our sons has a toy train.

The examples in (7) can only receive *meaning A* and the phrases *both of our friends*, *all of our moms*, *each of our sons* will always denote a set of individuals of cardi-

nality 2 (in the case of *both*) or more. It cannot receive a meaning where the phrase headed by *both* denotes a singleton set. However, these constructions do not seem to behave like standard copular constructions as they do not allow in any case the formation of the inverse copular (Moro, 1997).⁶

- (8) a. Both of our friends is/*are Sam.
 b. *All of our moms is/are Mary.
 c. *Each of our sons is/are Archie.

Furthermore, they also occur in small clauses:

- (9) a. I consider him both of our dad(s).
 b. ?I thought her both of our ally/allies.
 c. I called her both of our buddy/buddies.

As these constructions have a clearly possessive structure and are restricted to predicative positions, we will refer to them from now on as *Uniquely Predicational Possessives* (UPPs). Turning now to the internal structure of UPPs we will focus in turn on the nature of the determiners available in UPPs, the types of noun, the possessive pronoun and the plural inflection.

2.1 Quantificational determiners in UPPs

As shown in (10), universal quantificational determiners in UPPs give rise to *meaning B* whereas existential and intermediate quantifiers are generally unacceptable.

- (10) a. He is all of our friend(s).
 b. He is each of our friend(s).
 c. He is both of our friend(s).

- d. He is none of our friend(s).
- e. He is neither of our friend(s).
- f. ??/*He is some of our friend(s).
- g. *He is most of our friend(s).
- h. *He is many of our friend(s).
- i. *He is few of our friend(s).

Further examples using universal determiners are easy to find; the examples in (11) were found using Google on 10th March 2017:

- (11) a. I know, but he is both of our friends and it is driving a wedge between us.
- Unconfirmed dialect⁷
- b. Is this both of our decision?! US English⁸
- c. The Beatles' story is all of our stories. US English⁹
- d. It is all of our responsibility to help girls everywhere defy the odds.
- Canadian English¹⁰
- e. Drink driving is all of our responsibility. Australian English¹¹
- f. He is willing to not invite his friends so she will not come, since she is neither of our friends. Unconfirmed dialect¹²
- g. SV is neither of our friends lately Unconfirmed dialect¹³

The British National Corpus¹⁴ also yields the following examples:

- (12) a. Now that the eight year journey to *Passion* is complete it is all of our responsibility to get out there and get *Passion* into bookshops, onto

bookshelves and onto reading lists.

Text ARW 250

- b. There has been some very unfortunate suicides [...] which is all our responsibility.

Text KGR 697

- c. But clearly some way must be found to prevent the open house that is all our concern to safeguard the amenity and character of the county.

Text KM7 14

Although in some cases (see (12-b)-(12-c)) the preposition *of* appears to be optional, the [D [of. . .]] construction must be possible with the relevant Q-Det in order for the UPP to be at all possible. Thus (13), with the intended meaning that Jim is a friend of every one of us, is ungrammatical:

- (13) *Jim is every of our friend(s).

As can be observed, the set of quantifiers that are acceptable in UPPs includes the three quantifiers that *float* in English, *all*, *both*, *each*, an observation which will turn out to be crucial in the analysis. But for now let us turn to the nouns that can appear in UPPs.

2.2 The Nouns

The set of nouns that allow this construction is rather restricted. What one might call the core set of relational nouns like *friend*, *mother*, *father* and other kinship terms are the paradigmatic cases:

- (14) a. He is both of our friend(s).
b. I am both of your son!¹⁵
c. They are both of our parent(s). (2 parents, 2+ children)
d. He is both of our dad(s).

- e. She is both of our great-grandmother(s).

Beyond kinship, UPPs can be found with other relational nouns expressing part-whole and even more abstract relations (with some degradation in judgments as the relations become more abstract). The following list of examples is based on Barker's (1995) discussion of part/whole relations:¹⁶

- (15) a. This is both of our nose(s).
- b. These are both [of these cakes']/their ingredients.
- c. This is all of [these stories']/their ending(s).
- d. This is both of their shape(s).
- e. The Rhine is both of [these countries'/France and Germany's]/their border(s).
- f. The 38th parallel is both of [the Koreas']/their border(s).
- g. Ahab is both of [these ships'/crews']/their captain(s).
- h. Murielle is both of [these students']/their penpal(s).
- i. This is both/all/each of our biography/biographies.

On the other hand, absolute/non-relational nouns give consistently bad results:

- (16) a. *Rex is both of our dog(s).
- b. *The pink fleece is both of our sweater(s).
- c. *The Skoda is both of our car(s).
- d. *The Toshiba laptop on the right is both of our computer(s).

An apparent exception to this is the example of the more abstract kind of relational nouns that involve a representation of an individual. To clarify, a noun like *birthday* is relational because its use entails the existence of an individual whose it is the *birthday*. The same goes for *mother*, *friend* and so on.¹⁷ Now if we turn to some-

thing like *statue*, *picture* or *photo* then we can make the equivalent argument that a statue entails the existence of the individual it represents.¹⁸ These nouns, and by extension nouns like *paper* or *book*, can also be thought of as relational in the sense that they entail the existence of an individual who is the author of the book or paper. This is pretty much the argument in Barker (1995). A critique of this argument is found in Adger (2013). Interestingly though, Adger’s critique is based almost entirely on examples of the representation type.¹⁹ Nonetheless, the following examples appear to be fine:

- (17) a. This is both of our paper(s).
 b. The statue in the garden is both of our sculpture(s).
 c. The picture on the stairs is both of our photo(s).

Crucially, in examples (17-b) and (17-c), the subject (*statue*, *picture*) can only be interpreted as belonging to or being created by the possessors; it is not possible, or at the very least extremely difficult outside very specific pragmatic contexts, to interpret them as *representing* the possessors:

- (18) The sculpture in the garden is both of our statue(s) . . .
 a. . . . we worked on it together.
 b. . . . #we sat for it at the same time.

The significance of these facts is that they suggest that these nouns can be construed as relational in the relevant sense with the proviso that what seems to be prominent is not the individual that is represented but the individual that is the thematic *creator*.

Somewhere in between these categories falls a group of nouns consisting of nouns like *teacher*.²⁰

- (19) a. ?She was both of our teacher(s).
 b. ?She was both of our doctor(s).
 c. ?She was both of our therapist(s).

These can be thought of as more or less inherently relational, although not in as straightforward a manner as the previous ones, given that, for example, one can be a teacher but an unemployed one (i.e. a teacher of no students). As Partee and Borschev (2003, p.82) have observed ‘... *teacher*, unlike *father*, is lexically supplied with equally salient and closely related relational and non-relational readings, so that one would not have to suppress the relational reading by shifting in order to interpret *teacher* [...] non-rationally.’

It is instructive to compare them with similar deverbal nouns that produce consistently bad results:

- (20) a. *He was both of our cleaner(s).
 b. *He was both of our bank manager(s).
 c. *He was both of our bicycle-repairman/men.

Another class of derived nominals, namely those that according to Grimshaw (1990) and subsequent literature are supposed to have their own argument structure (inherited from the verb from which they derive) are permitted in UPPs, with some interpretive subtleties:

- (21) a. This is both of our announcement(s) to the commission.
 b. This is both of our examination(s) (of the patient).
 c. This is both of our condemnation(s) (of the invasion).
 d. This is both of our claim(s) (to the presidency of Burundi).
 e. I consider this both of our examination(s).

With these nouns, judgments are somewhat more subtle because there is a plurality of events leading to a meaning that can be construed in ways to render them irrelevant. The important generalization from our point of view is that for those nouns that obligatorily take arguments, the “subject” or agent, in fact *the highest*, argument can be possessivized in this construction. Crucially, lower arguments cannot. This fact will become important later on.

Finally, the noun in these constructions can be in the singular or plural, but some speakers strongly prefer for it to appear in the plural with relational nouns. The fact that relational nouns are in the plural for these speakers does not have an interpretive effect that is immediately clear. With event nominals, on the other hand, it seems to signal the plurality of the events. Given the patterns observed so far it is clear that there are some important questions that require further scrutiny. In the next section we develop the syntax of these sentences.

3 Analysis

3.1 Initial Assumptions

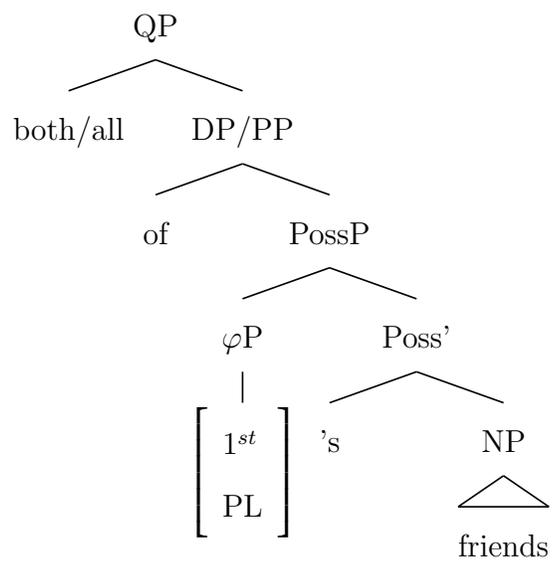
Before we turn to the main part of the analysis we need to spell out two assumptions that we will be making. The first and rather uncontroversial one regards the structure of the phrases that we are analyzing when they are in argument position:

(22) Both of our friends came.

(23) I gave a book to all of our friends.

The relevant structure is as follows:

(24)



Second, as is observable in the tree above, we take it that possessive determiners like *my, your, his, her* and so on are not inserted in D position as such but instead are the morphological spell-out of a φ P and the possessive morpheme (cf. Hudson (2003)). One way to understand this process is as a case of *Morphological Merger*, originally proposed by Marantz (1984) and generalized in Marantz (1988) as follows:

(25) **Morphological Merger**

At any level of syntactic analysis (D-structure, S-structure, phonological structure), a relation between X and Y may be replaced by (expressed by) the affixation of the lexical head of X to the lexical head of Y.

Under the conception of Morphological Merger in (25), the case of (24) represents the expression of the Spec-Head relation between the φ P and the possessive head ('s) by affixing the φ° onto the possessive head.²¹

If this is so, it is to be expected that the morphological spellout of this relation may vary across dialects. English dialects provide evidence for precisely this variation. In South and West Yorkshire dialects the most common form of the first-person plural possessive is *us*:

(26) We all take us cars to work nowadays.

This suggests a phonetic simplification of *us*'s. The rule can also have different outputs, in North Eastern (Newcastle/Northumberland) dialects for example it can also produce *wor*, as in (27), or in Shetland dialects *wir*, as in the political campaign group "Wir Shetland" (E Jamieson, p.c.).

(27) **Wor** Thomas'll be fourteen on Christmas Day, and **wor** little Steven, that's the seventh; he'll be ten.²²

UPPs containing these dialect forms are also grammatical in the relevant dialects; note that in the North Eastern dialect, the -s on *wors* is actually obligatory:

- (28) a. John is both us friends. West Yorkshire dialect
 b. John is both of wors friend. North Eastern dialect
 c. John is both o' wir friends. Shetland dialect

Moreover, other examples demonstrate that the possessive morpheme is present:²³

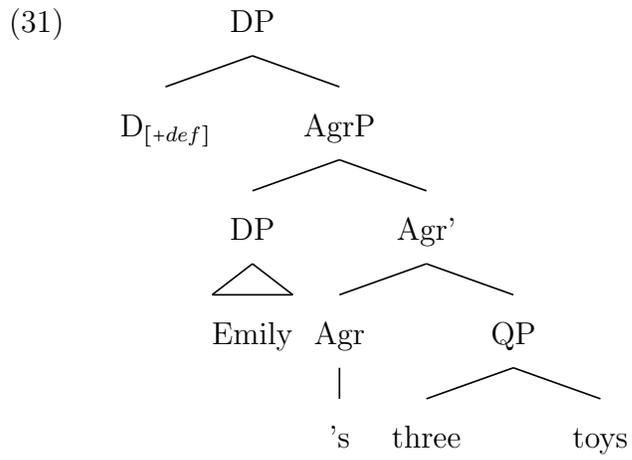
- (29) a. Yep, booze is none of these women's friend. Unconfirmed dialect²⁴
 b. Twitter is none of these people's friend. Unconfirmed dialect²⁵
 c. She is all of our children's biggest fans! US English²⁶
 d. Dr. Michele is both of our children's pediatrician. Canadian English²⁷

This variation is clearly a low-level one affecting spellout rules rather than the syntactic structure, which seems to remain constant across these different dialects. As a result, it seems that the best way to capture it is at the level of the mapping of syntactic structure to morphophonological structure.

3.2 The syntax of possessives

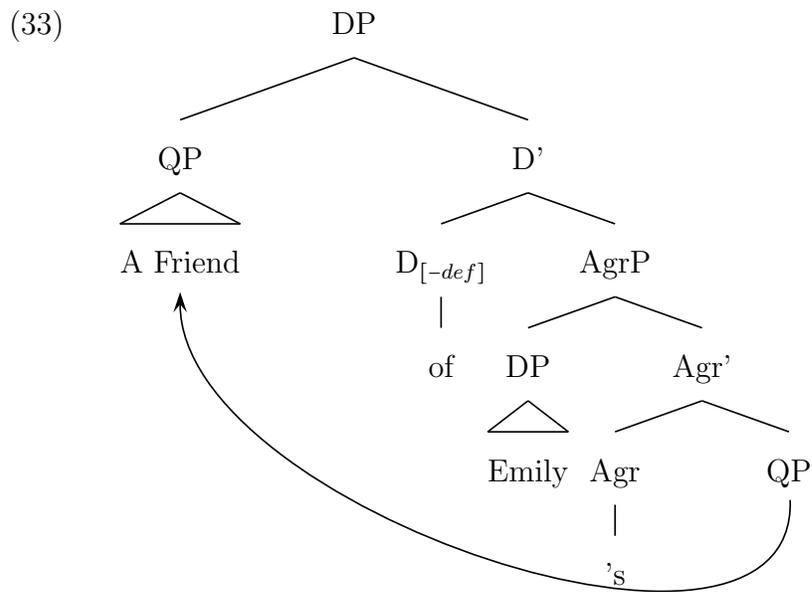
The main question that arises with UPPs is whether the surface order is derived or base generated. While we cannot review all the extensive literature on possessives here, an important and influential proposal regarding the syntax of double and Saxon genitives is due to Kayne's (1993; 1994) extension to English of Szabolcsi's (1981; 1983) analysis of Hungarian possessive constructions. The proposal is rather well known so we will only present the part of it most relevant to our concerns in schematic form. Kayne's structure for (30) is (31):

(30) Emily's three toys



When D is indefinite, however, it is not able to assign case, so *of* is inserted and at the same time the QP raises to [Spec DP]. The result is that for a sentence with a double genitive as in (32), the proposed structure is (33):

(32) A Friend of Emily's

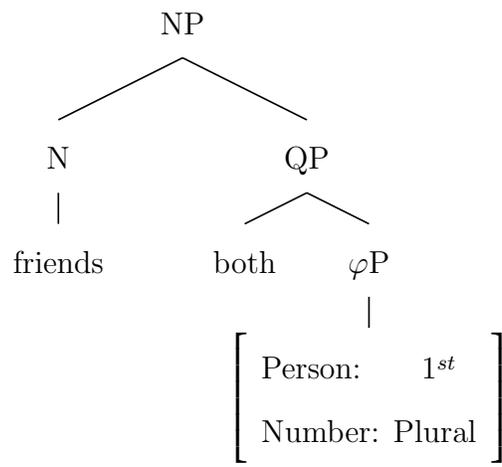


Turning again to UPPs, we first suggest that, given their uniquely predicative nature, they involve an indefinite D. Note also that they are not equatives, which would give us *meaning A*. We will therefore assume that the (derived) predicative phrase *both of our friends* involves an indefinite D. We are also mindful of the virtual semantic equivalence of (34) and (35), which is not a double genitive:

- (34) a. John is both of our friend(s).
 b. Bob is both our son(s).
 c. This is both of our paper(s).
 d. 3 is both of their divisor(s). [12 and 15]
- (35) a. John is a friend of both of us.
 b. Bob is a son of both of us.
 c. This is a paper by both of us.
 d. 3 is a a divisor of both of them.²⁸

Bearing these facts in mind, we propose that (34) starts life in a way that looks very much (but not completely) like (35).²⁹ We thus take the QP [_{QP} Both us]³⁰ in (35) to first-merge with the noun *friends* and saturate its first argument.³¹ The representation at this stage of the derivation will be (36):

(36)

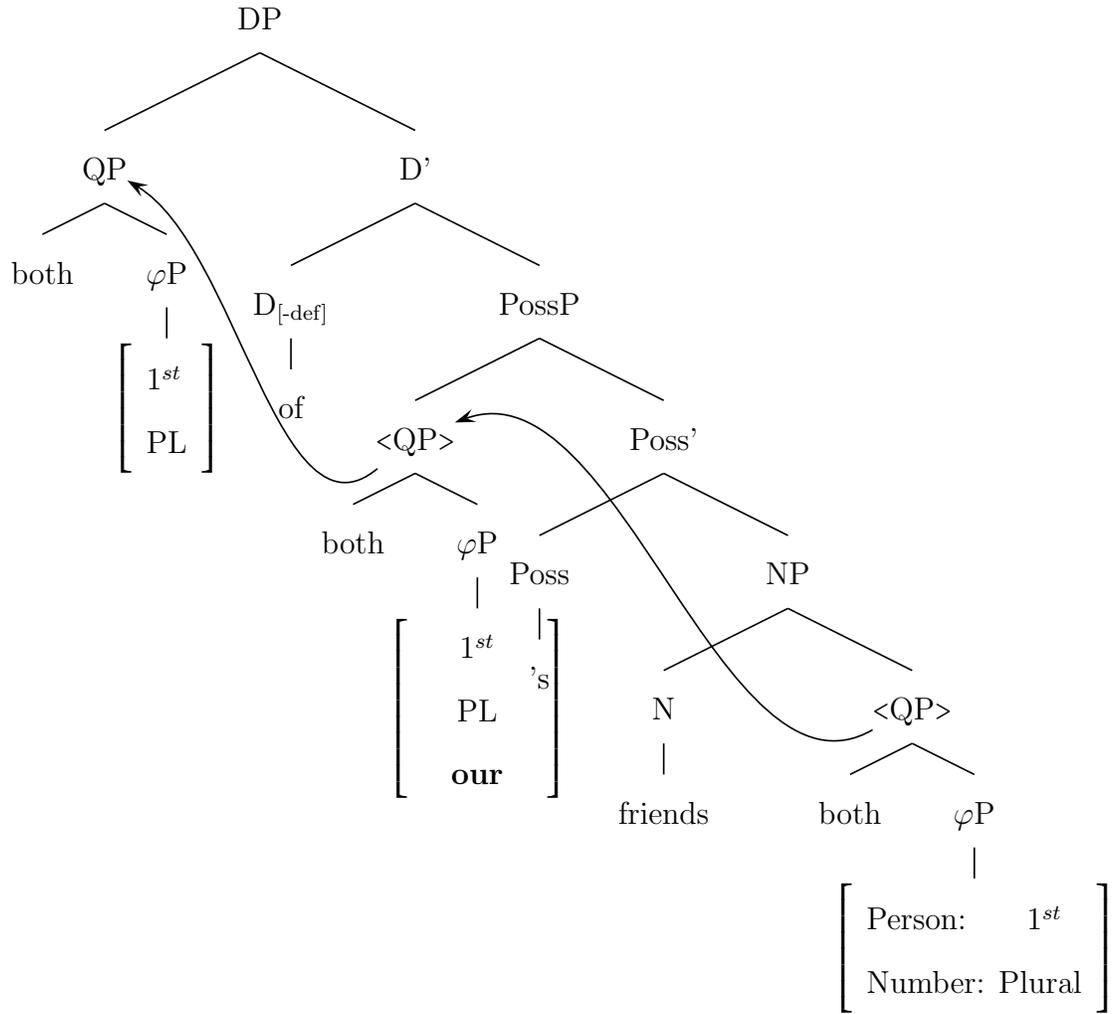


The next step in the derivation involves merging the possessive morpheme 's. Kayne places it in the head of AgrP; we will also put it in the same position though rename Agr as Poss. Following the introduction of 's the QP raises to [Spec PossP], presumably as a reflection of the fact that 's, as a clitic, requires a host. Finally, the indefinite D-layer is merged, *of* is inserted in D⁰ and the QP moves to [Spec DP]. Interestingly, the resulting chain is pronounced in parts. The head of the QP *both* is pronounced at the head of the chain whereas its complement, φ P is spelled out morphologically in the intermediate position as the possessive pronoun *our* after Morphological Merger of φ° with the possessive morpheme 's. Pronouncing the whole QP at the head of the chain would produce either (37-a) or (37-b) both of which are ungrammatical: (37):

- (37) a. *Both us of 's friend(s)
 b. *Both our of friend(s)

We suggest that this pronunciation in parts is forced by the fact that the D position must be filled by *of* and its presence breaks the required adjacency between the φ P and the possessive morpheme. Thus the final structure looks like (38):

(38)



This is a plausible structure for the cases at hand and it is not far from Kayne’s existing proposal. As it stands, however, it only goes part of the way to explaining the restriction of UPPs to predicative positions. The part that it achieves is that the DP is an indefinite one which can be used in predicative position. However, it does not explain why UPPs *cannot* appear as arguments; indefinite DPs are, of course, perfectly good arguments. To see why this is, we need to turn to the semantics of the construction. In the next section we will develop the compositional derivation of the meaning of these sentences showing that (a) they can only be predicates and (b) the structure proposed provides the best basis for capturing the meaning and the restrictions that we find.

3.3 The semantics of UPPs

3.3.1 Background: the Partee-Barker view of the semantics of possessives

A distinction that has played a decisive role in the analysis of possessives is that between relational and sortal/absolute/non-relational ones (Strawson, 1959; Alexiadou et al., 2007).³² This distinction was already introduced in section 2.2. Intuitively speaking, a relational noun,³³ say *mother*, describes a type of individual (to wit, the female of some species, who has had offspring) and entails the existence of another individual (the offspring). In other words, one can’t be a mother without being someone’s mother. On the other hand, absolute nouns simply denote the sets of relevant individuals; *lightbulb* for example denotes the set of lightbulbs and neither entails nor implicates in any sense the existence of any other individual. Based on this general observation, Barker (1995) proposed that relational nouns such as *mother* should be represented as 2-place predicates (39):

$$(39) \quad [[mother]] = \lambda x \lambda y [mother(x, y)]$$

In contrast a noun like *lightbulb* would have the representation of a 1-place predicate (40):

$$(40) \quad [[lightbulb]] = \lambda x [lightbulb(x)]$$

Löbner (1985) has observed, however, that given a plausible enough relation, any, or almost any, noun can behave as relational. Nonetheless, Barker's (1995) proposal of the 2-place predicate representation in (39) should in fact be reserved only for those nouns that *lexically* have the relational property, i.e. those which entail the existence of an entity to which the individual referred to stands in the relation denoted by the noun. Chief amongst this class of nouns are kinship terms, body-part terms, terms denoting a part-whole relation and so on. Thus, according to this view, at least one class of underived nominals are argument-taking nouns and behave semantically, and one assumes also syntactically, as transitive predicates.

Now, Partee (1983/1997), Barker (1995), and Vikner and Jensen (2002) have pursued (with differences) a general approach to the semantics of possessives that takes relational nouns to inherently provide the relevant relation $[R]$ and the possessor argument to be the realization of one of the arguments of the relation.³⁴ In the case of absolute nouns, Barker (1995, p.54) assumes that there is 'a second lexical interpretation for the possessive determiner that takes a predicate of valence 1 and returns a predicate of valence 2 by introducing the extrinsic possession relation π .' He gives the following definitions:

$$(41) \quad \begin{array}{ll} \text{a.} & [[\emptyset_{[poss]}]] = \lambda R[R] \\ \text{b.} & [[\emptyset_{[poss]}]] = \lambda P \lambda x \lambda y [\pi(x, y) \wedge P(y)] \end{array} \quad \text{Barker (1995, p.54)}$$

Along similar lines, Partee (1983/1997) and Partee and Borschev (2001, 2012) suggest that in the absence of an argument position, i.e. in the case of absolute nouns, ‘the construction provides a “free **R**” (Partee and Borschev, 2001, p.95), a variable of type $\langle e, \langle e, t \rangle \rangle$. Postnominal genitives are one illustration:

- (42) a. *of John’s* = $\lambda P \lambda x [P(x) \wedge R_i(\textit{John})(x)]$
 b. *team of John’s* = $\lambda x [\textit{team}(x) \wedge R_i(\textit{John})(x)]$

Sometimes the “free **R**” can be supplied overtly by some element. This is the case with adjectives like *favorite* (Partee, 1983/1997, p.464):

- (43) a. John’s favorite movie
 b. A favorite movie of John’s

In the examples in (43) it is not the noun *movie* that provides the relevant relation but rather, the \bar{N} *favorite movie*. With respect to UPPs, the following contrast is particularly telling:

- (44) a. **The Shining* is both of our movie(s)
 b. *The Shining* is both of our favorite movie(s)

This contrast is particularly important as it shows that UPPs are inextricably connected with relational nouns but that a freely available type-shifting operation, like for instance Barker’s π , will not be sufficient, arguing strongly that relational nouns must be taken as such in the lexicon. With this much background let us turn to the compositional derivation of the predicative possessives that we focus on here.

3.3.2 The compositional derivation

For the purposes of illustration we will use the sentence whose structure we mapped in section 3.2, repeated here with focus on the post-copular DP:

(45) John is [_{DP} both of our friends]

The crucial element here is *both*, which combines with a plural pronoun (φ P) and yields something that merges with the noun *friend*. The effect is that of a distributive operator. We can thus propose the following lexical entry for *both* where the cardinality requirement is treated as a presupposition:

(46) $[[\textit{Both}]] = \lambda X : |X| = 2 \lambda R \lambda y [\forall x, x \in X \rightarrow R(x, y)]$

It goes without saying that this is not the only lexical entry for *both*, which has also the standard determiner entry. It is, however, also not entirely *ad hoc*. A meaning like (46) is related to proposals regarding the syntax and semantics of floating quantifiers dating back to Dowty and Brodie (1984) and Link (1983, 1987) who, taking the distributional similarity between adverbs and floating quantifiers as key, propose that floating quantifiers have meanings of VP modifiers which after combining with a VP argument yield, in the case of *both* and *each*, a distributive predicate, whereas in the case of *all* a predicate that still can display ambiguities.³⁵

Note that accepting our lexical entry for *both* in (46) in no way entails that we should also accept an adverbial analysis of floating quantifiers in general.

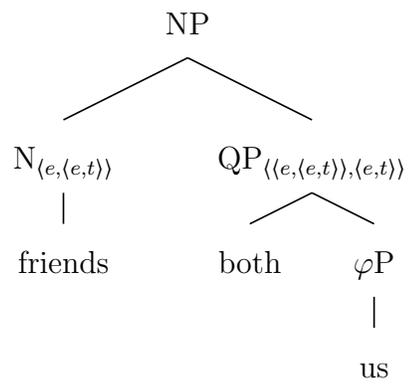
The basic difference between (46) and the adverbial semantics given to other floating quantifiers is that in the case of (46), the arguments of *both* are a plural nominal and a relation rather than a plural nominal and a one place predicate.

With this in mind, let us now turn to the rest of the derivation. Combining *both* with φ P which, for clarity we will represent as *us* gives:

$$(47) \quad \lambda X \lambda R \lambda y [\forall x, x \in X : |X| = 2 \rightarrow R(x, y)] ([[us]]) = \\ \lambda R \lambda y [\forall x, x \in us : |us| = 2 \rightarrow R(x, y)]$$

The resulting constituent is of type $\langle\langle e, \langle e, t \rangle \rangle, \langle e, t \rangle\rangle$ and combines with the relational noun, which we have taken to be precisely of type $\langle e, \langle e, t \rangle \rangle$, giving (48):

(48)



We now face an incarnation of the familiar problem of quantifiers in object position and we need to ask ourselves whether these structures are interpreted in situ or require movement. The syntax that we proposed in section 3.2 crucially involves movement, namely first to [Spec AgrP] and subsequently to [Spec DP]. It would not, therefore, be unreasonable to assimilate these movements or perhaps part thereof, to a QR-like operation. This is a question of composition rather than scope and it is QR's type-mismatch repairing function that we draw upon. Alternatively, we could pursue an in situ interpretation yielding pretty much the same results.³⁶ Beyond the theoretical arguments in favor of or against the existence of QR, empirical support for either position is somewhat difficult to come by. One argument that can potentially be taken to favour the in situ approach is the behavior of nouns that can, at least at some level, plausibly be taken as 3-place relations. Although underived 3-place relational nominals are limited, *letter* and *threat* seem to fit the bill. A movement approach to the interpretation might lead us to expect sentences like (49)-(50) on the relevant reading, i.e. the reading where *this* is the threat/letter whose originator/author is Bill and we are the recipients, to be grammatical, contrary to fact:

(49) *This is both of our Bill's letter(s)

(50) *This is both of our Bill's threat(s)

Derived nominals show the same pattern. Consider these contrasts:

(51) a. This is both of our examination(s) of the patient

b. *This is both of the patient's examination(s) by us

(52) a. This is both of our announcement(s) of the results to the commission

b. *This is both of the results' announcement(s) to the commission by us

As the issue is not crucial for what follows we will take this argument as at least suggestive and pursue the in situ strategy for the interpretation. As a result, the combination has the following result (53):

$$(53) \quad \begin{aligned} &[[\text{Both-Us}]]([\text{Friends}]) = \\ &\lambda R \lambda y [\forall x, x \in us : |us| = 2 \rightarrow R(x, y)](\mathbf{friends}') = \lambda y [\forall x, x \in us : |us| = 2 \rightarrow \\ &\quad \mathit{friends}(x, y)] \end{aligned}$$

The last line in (53) expresses the property of being someone who is, separately, a friend of both individuals making up the group *us*. The next step in the derivation involves the introduction of the possessive morpheme, which was defined in (41-a), and yields (54):

$$(54) \quad \begin{aligned} &[[\text{'s}]]([\text{NP}]) = \\ &\lambda R [R](\lambda y [\forall x, x \in us : |us| = 2 \rightarrow \mathit{friends}(x, y)]) = \lambda y [\forall x, x \in us : |us| = 2 \rightarrow \\ &\quad \mathit{friends}(x, y)] \end{aligned}$$

Assuming that *of* insertion takes place for independent reasons (following Kayne's proposal) and that *of* is indeed semantically transparent, the rest of the derivation has no relevance to the compositional derivation of the DP which ends up with the denotation above, i.e. a one-place predicate that can combine with the subject. For completeness, assuming a syntax for copular sentences roughly similar to the one proposed by Moro (1997), the rest of the derivation will involve building a small clause with John as the subject which will raise to [Spec TP] following merging of T and insertion of *be* in T, with the meaning in (55):

$$(55) \quad \begin{aligned} &[[\text{DP}]]([\text{John}]) = \\ &\lambda y [\forall x, x \in us : |us| = 2 \rightarrow \mathit{friends}(x, y)]([\text{John}]) = \forall x, x \in us : |us| = 2 \rightarrow \\ &\quad \mathit{friends}(x, \text{John}) \end{aligned}$$

Of course, (55) is exactly the meaning of the sentence *John is both of our friends*. The derivation that we presented now allows us to partly answer Green's question. Let us reconsider her examples in (2) repeated here in (56):

- (56)
- a. One of my friends' mother
 - b. All of their scarf
 - c. Both of our scarf
 - d. One of our scarf
 - e. Both of my sisters' birthday [My sisters are twins]

First off, as we have shown, these phrases will not be able to appear as argumental DPs. In predicative position (56-b) and (56-c) will also be ungrammatical as they do not contain a clearly relational noun. In (56-a) and (56-d), the numeral *one* is not part of the set of determiner-like elements which have a *floating* use and the corresponding meaning. Finally, (56-e) is indeed grammatical for some English speakers in predicative position (57) as our analysis predicts:

- (57) 25th March is both of my sisters' birthday(s).

3.4 Some residual issues

3.4.1 Predicate nominal agreement

In the previous sections we have proposed an analysis of the syntax and semantics of UPPs. A particular issue that we have not addressed so far is that of the plural inflection on the predicate nominal. As we noted already the plural is not obligatory, but its presence is puzzling as, in general, agreement in predicate nominals is with the sentential subject:

(58) John is our friend(*s).

Ideally we should be able to account both for the possibility of the plural and its optionality. So the question of the origin of the plural -s in UPPs arises at this point. Plural agreement in predicate nominals is found when the subject is formally plural, coordinated, a collective noun (optionally in some dialects) and, with symmetric predicates when there is an underlying coordination with *with*. For the last case, Kayne (1994) suggests that the starting structure involves something along the following lines (using *Conj* for the category of *with* in these cases:

(59) $[_{TP} DP_1 [_{T} BE-SG [_{SC} N-PL [_{ConjP} [_{tDP_1} [_{Conj} with [DP_2]]]]]]]$

This structure is licensed when the nominal predicate is symmetric (friends, siblings, school/band-mates etc). It is different from a structure that involves coordination with *and* in that the first conjunct cannot be Case-licensed *in situ* but must raise to [Spec TP] licensing singular agreement on the auxiliary and yielding the word order in (60):

(60) John is friends with Mary.

If this analysis is correct³⁷ it shows that the sentential subject is not the only source of agreement of the predicate nominal. It can either agree immediately with the constituent it is merged with, as in (60) where agreement in number is between the N and the *ConjP*, or alternatively, agreement in number can be “delayed” until [Spec TP] is filled and valuation proceeds in the usual way. We assume that coordinated DPs are independently plural.³⁸ Note that there is no independent process of *delayed valuation* or similar. Rather, the idea is that in cases where no locality boundaries exist and in this case there is no phase boundary, both patterns would be possible. This is supported by the fact that all agreement patterns are found:

- (61) a. Brian is my brother. [AUX: SG, PN: SG]
 b. Jonni is schoolmates with Neil. [AUX: SG, PN: PL]
 c. Bobby and Margaret are spouses. [AUX: PL, PN: PL]
 d. My viewers really feel like they are my friend.³⁹ [AUX: PL, PN: SG]

Given these patterns and the assumptions above, the appearance of the plural *-s* in UPPs can be understood as agreement between the predicate nominal and its complement (QP) and its absence, when allowed as a case of delayed valuation of the number feature on the predicate nominal.

Thus from a strictly syntactic point of view both patterns are allowed and easily derivable. The reasons that may lead a speaker to choose one over the other are not yet well understood, though we can get a further glimpse of what is part of the difference between the case with the plural and the one without by taking further the comparison of UPPs and the *friends with* construction in terms of their interpretation. In considering the difference between (60) and (62):

- (62) John is a friend of Mary.

Huddleston and Pullum (2002, p.344) write that ‘The *friends with* construction focuses on the relationship, while the *friend of* construction gives a descriptive property of the predicand.’ This intuition is further confirmed by the following contrast:

- (63) a. Lucy is a friend of the director.
 b. Lucy is the director’s friend.
 c. Lucy is friends with the director.

There is a reading that (63-a)-(63-c) share, namely the reading that simply asserts that Lucy and the director are friends. However, they differ in the following ways. First, (63-a)-(63-b) can be truthfully asserted in contexts where Lucy and the direc-

tor have no personal knowledge of each other; in other words, in cases where what is meant is that Lucy has the director's best interests in mind. Second, a continuation along the lines of *but it is not reciprocated* may follow (63-a)-(63-b), meaning that the director is not a friend of Lucy's in the sense suggested. Neither of these assertions hold of (63-c); thus, it is impossible to assert (63-c) in cases where Lucy is only acting in a friendly way towards the director without being friends and knowing each other. Equally, (64) is semantically anomalous in all contexts:

(64) */# The director is friends with Lucy but Lucy is not her friend.

The pattern follows naturally from the idea that using the plural emphasizes the plurality of relations rather than simply asserting a predication. In other words, *s* in dialects that optionally allow it as a matter of emphasis and information structure. A plural predicate nominal emphasizes the plurality of relations. A singular predicate nominal does not.⁴⁰ Given the truth-conditional equivalence of (65), it follows that information-structural considerations are more likely to dictate the choice.

- (65) a. John is both of our friend.
b. John is both of our friends.

3.4.2 A note on variation

As we showed above, while UPPs are found frequently in many dialects, the variation patterns across, rather than within, geographically-defined dialect boundaries. For example, there exist speakers of "American English" that do accept UPPs and those who do not, a pattern replicated in a range of British dialects. Clearly, more work is needed in order to establish which dialects have it and which do not. How-

ever, from the perspective of interest in this paper, it is equally clear that there is nothing in the syntactic mechanisms that we made use of that can be reasonably supposed to be subject to variation.⁴¹ The variation observed can be accounted for, however, in lexical terms and more specifically on whether a particular dialect/speaker have in their lexicon the definition of the quantificational determiner exemplified with *both* in (46), repeated here:

$$(66) \quad [[\textit{Both}]] = \lambda X : |X| = 2 \lambda R \lambda y [\forall x, x \in X \rightarrow R(x, y)]$$

The crucial aspect of this definition is that the quantifier ranges over relations rather than individuals. Thus, if a dialect/speaker has (66), the otherwise existing morphosyntactic apparatus can be marshalled to generate sentences like UPPs. Although this analysis is in a sense more germane to movement-based analyses of floating quantifiers (at least in the syntax) it is in fact silent with respect to the general analysis of floating quantifiers. Our proposal makes space for dialects that have floating quantifiers but no UPPs *even* under the so-called *adverbial* analysis of floating quantifiers (Dowty and Brodie, 1984; Bobaljik, 1995; Brisson, 1998, 2000). The reason for this is that semantically, the floating quantifier combines with a VP, hence a one-place predicate. Thus, it will again come down to the available lexical meanings. There is a second dimension to the variation, this time concerning dialects that do allow UPPs. The variation regards the presence or absence of the plural inflection on the predicate nominal. There appear to be three types of dialect:

- (67)
- a. Plural *-s* is optional.
 - b. Plural *-s* is obligatory.
 - c. Plural *-s* is impossible.

In the previous section we accounted for dialect (67-a) in a way that makes a UPP with the plural interpretively equivalent to the *A is Ns with B* construction whereas a UPP without the plural is equivalent to the *A is N of B* construction. Dialect (67-b) maps UPPs to the meaning of the former construction only (focusing on the plurality of relations) whereas dialect (67-c) to the latter. The reasons for this are not clear to us at this point and we leave it for future work.

Notes

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¹The constructions of interest have been found in British, American, Canadian and Australian Englishes and, in informal grammaticality judgment tasks, are accepted by many speakers of British and American Englishes. Acceptance of the construction does not seem to be geographically circumscribed. Beyond English, similar constructions are found in German in the same contexts (Josef Bayer, p.c.; Uli Sauerland, p.c.), also in Danish (Sten Vikner, p.c.), and certain varieties of French:

(68) Er ist unser beider Freund
 He is our.GEN both.GEN friend
 “He is both of our friend(s).”

(69) Ich habe dann seinen besten Freund, unser beider Freund, dort getroffen.
 I have then his best friend, our.GEN both.GEN friend, there met

“I then met his best friend, both of our friends, there.”

From <https://www.urbia.de/archiv/forum/th-1130328.html>, 4th July 2017

(70) Det vil være til vores begges fordel
It will be to our both's advantage.SG
“It will be to both of our advantage.”

(71) Parce que c'est tous notre passion, tout simplement.
Because that it.is all.PL our passion all simply
“Because it is, very simply, all of our passion.”

From <http://www.rigged-poker.info/content/poker-en-ligne-est-il-rigged>, 20
July 2017

(72) La mort c'est tous notre lot
The FEM.SG death it is all.PL our lot
“Death is all of our lots.” *La chanson de Milly*, M. Briant

Although the crosslinguistic distribution of these structures is well beyond the scope of this paper it is worth noting that these constructions are not simply a quirk of English dialects.

²The -s on the head noun is obligatory for some speakers, optional for others and banned for yet another group of speakers. We will discuss this in section 3.4.

³ Here is an example of such a context: Shaun and Marie have made a rather unpopular proposal for a policy change affecting their department. Their proposal is going to be discussed at the relevant faculty committee. As far as Shaun and Marie know, the only people who support their proposal are the chair of their department (Sue) and the Dean of the faculty. Shaun knows but Marie does not, that Sue has just been appointed Dean. At the beginning of the meeting, as Sue comes into the room, Marie whispers conspiratorially to Shaun *Here comes one of our friends*, whereupon Shaun remarks: *Oh, you haven't heard then, Sue is both of our friends*, perhaps with focal stress on *both*.

⁴A reviewer points out that there have been sporadic mentions of the construction (*You are both of our children*, *John is both of our friends*) on internet fora including Reddit and English Stack Exchange at <http://napoleonchingon.tumblr.com/post/143980844027/aquestionforgermanspeakers>, https://www.reddit.com/r/linguistics/comments/4iakbq/usage_of_both_as_in_john_is_both_of_our_friends/, <http://english.stackexchange.com/questions/297493/yourebothofuschildyourebothofourch>

and <http://ell.stackexchange.com/questions/77691/isbothofourchildvalid>, all accessed 7th July 2017.

⁵From <http://www.theguardian.com/world/2016/mar/18/getting-a-fair-deal-for-millennials-is-in-all-our-interests>, 20th March 2017.

⁶(8-a) is irrelevantly grammatical under *meaning A* in a context like the one given in footnote 3.

⁷From <http://whisper.sh/whisper/05338d3e20e737cffa20cbd1aa2da22eb3aea2/I-know-but-he-is-both-of-our-friends-and-it-is-driving-a-wedge-between>

⁸From <https://community.babycenter.com/post/a62862370/is-this-both-of-our-decision>

⁹From <http://www.washingtonpost.com/wp-dyn/content/article/2005/11/06/AR2005110600458\textunderscorepf.html>

¹⁰From <http://www.huffingtonpost.ca/caroline-riseboro2/how-to-show-girls-that-we\textunderscoreb\textunderscore12105120.html>

¹¹From <http://www.northerndailyleader.com.au/story/4383707/drink-driving-is-all-of-our-responsibility/>

¹²From <http://boards.weddingbee.com/topic/invite-friend-but-not-girlfriend/>

¹³From <http://www.fanforum.com/f182/michelle-danny-thread-5-all-fireflies-whispered-your-name-love-love-62817399/index18.html>

¹⁴Examples of usage taken from the British National Corpus (BNC) were obtained under the terms of the BNC End User Licence. Copyright in the individual texts cited resides with the original IPR holders. For information and licensing conditions relating to the BNC, please see the web site at <http://www.natcorp.ox.ac.uk>. The alphanumeric sequence following the example indicates the text that the example is taken from (the first three characters) and the line number.

¹⁵Attested in the speech of the first author's son.

¹⁶Some examples may appear degraded merely because they are somewhat implausible, (15-a) for instance would usually be seen as somewhat incongruous as it might point to either an impossibility or a case of conjoined twins joined at the nose. But it can also be understood as part of a backstage conversation between two clowns.

¹⁷See also section 3.3.1.

¹⁸Abstract art perhaps excepted. A further trap that must be avoided is the idea that somehow the individual represented say by the Mona Lisa is an actually existing individual. The issue is, of course, largely philosophical and has no direct bearing on the analytical questions.

¹⁹Judgments here are less clear cut, see for example the contrasts in (43) and (44).

²⁰See (29-d) for an attested example using the noun *pediatrician*.

²¹As Embick and Noyer (2001) discuss, affixation may involve rebracketing under adjacency defined in (73):

$$(73) \quad [[(X)+Y] Z] \rightarrow [(X) + [Y + Z]]$$

The conditions for rebracketing are also fulfilled in our cases.

²²The examples from the South/West Yorkshire and North Eastern dialects are from Beal (2004).

²³Thanks to an anonymous reviewer for alerting us to such examples and for providing examples (29-a) and (29-b).

²⁴From <http://www.allaboutthetea.com/2015/08/12/real-housewives-of-new-york-recap-s7e19/>, 21st July 2017

²⁵From http://www.celebitchy.com/167945/leann_rimes_in_a_white_cutout_dress_improving_healthier_or_still_a_mess/, 21st July 2017

²⁶From <https://www.childcarenetwork.com/Florida-Gulf%20Breeze-FL-150/teachers>, 21st July 2017

²⁷From <https://www.ratemds.com/doctor-ratings/1213604/Dr-Michelle-Feierstein-Winnipeg-MB.html>, 21 July 2017

²⁸Thanks to an anonymous reviewer for this example.

²⁹This also foregrounds our analysis of the -s on relational nouns not as a genitive, but as a form of the plural.

³⁰We assume that the complement of *both* is the set of φ -features [1st, PL]. We return to this immediately.

³¹We use the neutral term *first* argument rather than *internal* to avoid potential confusion.

³²These three terms mean roughly the same thing. They will be used interchangeably in the rest of this paper.

³³We are setting aside for now all consideration of derived nominals.

³⁴This is the type of possession that Barker (1995) calls *lexical* possession.

³⁵To be more specific, the definition for *both* given by Dowty and Brodie (1984) can be reconstructed (in their formalism) as follows:

$$(74) \quad \llbracket both \rrbracket (\llbracket VP_{PL} \rrbracket) = \{\wp \in D_{NP_{PL}} \mid \{X \in D_{\overline{VP}_{PL}} \mid \cup\{Y \in D_{NP_{PL}} \mid Y \in \cup\wp\} \subseteq X\} \in \llbracket VP_{PL} \rrbracket\} \wedge \\ |\cup(\cap\wp)| = 2$$

What this definition expresses is that a floating quantifier restricts the domain of a function, in this case a VP, which is taken to be a function from generalized quantifiers to truth values. The addition of a floating quantifier restricts the mapping to a subset of the original class of quantifiers. In the case of *both* that would be the class of quantifiers that satisfy the cardinality condition. For further detailed discussion, see Hoeksema (1996). Similarly, Link (1983, 1987) proposed that floating quantifiers such as *all*, *both* and *each* also have a different meaning whereby they compose with a VP argument and yield a distributive predicate that combines with a DP. Link's definition for floating *all* is given in (75):

$$(75) \quad \llbracket all \rrbracket = \lambda P \lambda x \forall y [y \bullet \Pi x \rightarrow P(y)]$$

We will assume now that this type of meaning is available for floating quantifiers but also for *none* and *neither* as far as UPPs are concerned. The reason why *none* and *neither* do not float is unclear, as unclear in fact as the reason why only universal quantifiers float in English.

³⁶The issue is hard to decide and ultimately perhaps of no significant consequence insofar as the main issues are concerned.

³⁷Technical implementation aside; there are various ways to generate this pattern but they are not directly relevant to present purposes.

³⁸How they end up being formally plural is immaterial here.

³⁹From http://www.huffingtonpost.com/paige-mckenzie-/the-lonely-youtuber_b_4946063.html, 20th July 2017.

⁴⁰A reviewer asks why the plurality of relations in (58), repeated in (76), does not license plural on the predicate nominal:

$$(76) \quad \text{John is our friend}(*s).$$

The answer to this is that simply there is no source for the plural agreement on the predicate nominal. In these cases the φP will be merged directly in the specifier of *poss*^o rather than as a sister to the noun. There is still of course a plurality of relations that the singular *friend* can still denote. This is reminiscent of Winter's (2001) distinction between set predicates and atom predicates. In his the-

ory, as in a way here too, relational nouns like *friend* end up with the same denotation in the singular and in the plural. It is a type fitting principle (or rather the lack thereof) that is responsible for the fact that *friend* and *friends* do not end up with exactly the same analysis.

⁴¹We thank an anonymous reviewer for pressing us on this point.

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