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Universal Quantifier PPIs

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Abstract

Why have Positive Polarity Items (PPIs) that are universal quantifiers only been attested in the domain of modal auxiliaries (cf. Homer t.a., Iatridou & Zeijlstra 2010, 2013) and never in the domain of quantifiers over individuals? No PPI meaning *everybody* or *everything* has ever been reported. In this paper, I argue that universal quantifier PPIs actually do exist, both in the domain of quantifiers over individuals and in the domain of quantifiers over possible worlds, as, I argue, is predicted by the Kadmon & Landman (1993) – Krifka (1995) – Chierchia (2006, 2013) approach to NPI-hood. However, since the covert exhaustifier that according to Chierchia (2006, 2013) is induced by these PPIs (and responsible for their PPI-hood) can act as an intervener between the PPI and its anti-licenser, it is concluded in this paper that a universal quantifier PPIs may scope below it and thus appear in disguise; their PPI-like behaviour only becomes visible once they morpho-syntactically precede their anti-licenser. Another conclusion of this paper is that Dutch *iedereen* (‚everybody'), opposite to English *everybody*, is actually a PPI.

1 Introduction

Following recent lines of thinking (Kadmon & Landman 1993, Krifka 1995 and Chiercha , 2013), Negative Polarity Items (NPIs) are only fine in Downward Entailing contexts, since outside such contexts their semantics would give rise to a contradiction. According to Chierchia's (2006, 2013) implementation, this is due to the fact that NPIs are equipped with a feature [σ] that ensures (i) obligatory introduction of domain alternatives and (ii) that the proposition that this NPI is part of must be covertly exhaustified. To see this, take (1).

(1) *I read any book

For Chierchia, the underlying syntax of (1) is (2).

(2) [EXH$_{[\sigma]}$ [I read [any book]$_{[\sigma]}$]]

Suppose that the domain quantification is the set of books {a,b,c}. Then [[I read any book]] denotes ∃x.[x∈{a,b,c} & read(I, x)]. Domain alternatives of [[I read any book]] are then, for instance, ∃x.[x∈{a,b} & read(I, x)] or ∃x.[x∈{c} & read(I, x)]. Now, if (1) is obligatorily exhaustified, as in (2), all stronger domain alternatives, like the ones above, are false. But if that is the case, then [[(2)]] has the denotation in (3), which forms a logical contradiction and rules out the sentence. Since in Downward Entailing (DE) contexts logical entailments relations are reversed, all stronger alternatives become weaker, and therefore no contradiction arises.

(3) $\exists x.[x \in \{a,b,c\}$ & read(I, x)] & $\neg\exists x.[x \in \{a,b,c\}$ & read(I, x)]

But no language in the world seems to have a word meaning *all*, *everybody* or *everything* that is a PPI. Within the domain of quantifiers over individuals, most PPIs are actually existential quantifiers (e.g. English *some*), never universal quantifiers. This would suggest that for some unknown reason the approach by Kadmon & Landman, Krifka and Chiercha would not extend to universals.

However, in the domain of modals, universal quantifier PPIs are indeed attested. As has been pointed out by Israel (1996), Iatridou & Zeijlstra (2010, 2013) and Homer (t.a.) universal modals that take wide scope with respect to negation, like English *must*, *should* or *ought to*, are indeed PPIs. That they are PPIs ensure that these modals outscope negation.

(4) She must not leave $\Box > \neg$

(5) She should not leave $\Box > \neg$

(6) She ought not to leave $\Box > \neg$

The fact that these modals precede negation at the surface does not guarantee their scopal behaviour with respect to negation; other modals, e.g. deontic can or may, scope under negation, even though they surface in a higher position.

(7) She cannot leave $\neg > \Diamond$

(8) She may not leave $\neg > \Diamond$

That it is the PPI-hood of modals like *must*, *should* and *ought to* that is responsible for the scopal differences between (4)-(6) as oppose to (7)-(8) is well established in Iatridou & Zeijlstra (2010, 2013) and Homer (t.a.) and I refer the reader to those articles for concrete evidence for the PPI status of such universal modals.

The existence of such universal PPI modals thus forms evidence in favour of the approach that takes polarity effects to result from logical contradictions: the predicted elements are indeed attested. But it gives rise to a new question as well: why have universal quantifier PPIs only been attested in the domain of modal auxiliaries and never in the domain of quantifiers over individuals? It is this question that I address in this paper.

2 Modal Universal PPIs

Iatridou & Zeijlstra (2013) briefly point out to what extent current approaches to NPI- and PPI-hood (Kadmon & Landman 1993, Krifka 1995, Postal 2000, Szabolcsi 2004, Chierchia 2006, 2013) may apply to account for the PPI-hood of these universal quantifier modals. They do, however, not provide any account themselves (though see Iatridou & Zeijlstra 2013: endnote xliii for a sketch). Rather they state in general terms that the reason why certain existentials/indefinites may be prone to become NPIs should extend to universals being prone to becoming PPIs.

To see this, take (9), which has the semantics in (10):

(9) (according to the law,) John must leave

(10) $\forall$w[the law is satisfied in w $\rightarrow$ John leaves in w]

Now, assume that *must* carries a feature [σ] too that obligatorily introduces domain alternatives in its first argument and requires it to be checked against a higher, c-commanding covert exhaustifier. This treatment of *must* is fully analogous to the treatment of NPIs, such as *any*, by Chierchia (2006, 2013). Then, the syntax of (9) is as in (11):

(11) $[\text{EXH}_{[\sigma]}\ [\text{John must}_{[\sigma]}\ \text{leave}]]$

Now, think of a model where the only relevant worlds are w1, w2 and w3. Saying that each of w1, w2 and w3 is a world where John leaves provides a stronger statement than saying that John only leaves in a subdomain of these worlds, for instance in w1 and w2 only. Therefore, exhaustifying the *must*-clause in a positive context has no semantic effect. The semantics of (11) is still the one in (10).

However, once *must* is put under negation, things change dramatically:

(12) John must not leave.

Now the question arises as to which takes widest scope, the modal or negation. Let us start with the case where the modal scopes under negation, and moreover, both scope under the required exhaustifier:

(13) EXH > NEG > MUST

Interpreting (12) with the scopal order of (13) has as result that the set {w1, w2, w3} is not a subset of the set of worlds where John leaves, since the universal quantifier of word variables is under the scope of negation. At the same time, all domain alternative expressions of this assertion are stronger: for instance, saying that {w1, w2} is not a subset of the set of worlds where John leaves makes a stronger statement than the original assertion. Therefore, the proposition that {w1, w2} is not a subset of the set of worlds where John leaves must be negated, which in turn entails that w1 and w2 are worlds where John leaves. Since the same mechanism applies to all subdomains of {w1, w2, w3}, including {w1}, {w2} and {w3}, interpreting the modal under the scope of negation with the strengthening operator applying above it yields a contradiction.

This contradiction disappears once the modal takes scope above negation again, since expressions of the form "must (not (p))" are stronger than their alternatives and will therefore not be contradicted by negated stronger alternatives. Hence, by applying the [σ] feature mechanism to a universal modal quantifier, this quantifier becomes a PPI in exactly the same way as existentials/indefinites become NPIs when equipped with such a feature. At first sight, this opens up a way to account for the PPI-hood of those universal modals that generally outscope negation. However, if this feature [σ] can be applied to universal modal quantifiers (i.e. universal quantifiers over possible worlds), the question immediately arises as to why it cannot be applied to other universal quantifiers, such as quantifiers over individuals. After all, nothing in the above analysis hinges on the fact that these quantifiers bind possible worlds, so by the same logic a universal quantifier (*all*, *everybody* or *everything*) that carries a feature [σ] should be able to be a PPI.

To see this, take the imaginary word *pevery* that would be semantically identical to English *every* apart from being equipped with a feature [σ]. A negative sentence containing *pevery*, like (14), would have the syntax as in (15) and therefore the denotation as in (16), a clear contradiction.

(14) I did not read pevery book

(15) $[\text{EXH}_{[\sigma]}\ [\text{I did not read [pevery book]}_{[\sigma]}]]$

(16) $\neg\forall x.[x\in\{a,b,c\} \rightarrow \text{read}(I, x)]\ \&\ \neg\neg\forall x.[x\in\{a,b,c\} \rightarrow \text{read}(I, x)]$

But, as of yet, such non-modal universal quantifiers PPIs have not been attested.

3 Non-modal Universal PPIs

3.1 Proposal

In this section I argue that the reason why only universal PPIs have been attested among quantifiers over possible worlds and not among quantifiers over individuals lies in their syntactic differences rather than in their semantic differences, in particular in their syntactic position in the sentence. More concretely, I argue that both universal modals and universal quantifiers over individuals with a feature [σ] can actually be attested, but that the syntactic properties of universal quantifiers over individuals with such a feature may obscure their diagnostic PPI properties. To see, this, take again the scopal ordering of a universal quantifier with a feature [σ], negation and the covert exhaustifier that gives rise to the logical contradiction, the ordering in (17):

(17) $^{\#}$… EXH > NEG > $\forall_{[\sigma]}$

If negation intervenes between the exhaustifier and the universal, a contraction arises. But nothing guarantees that a universal quantifier with a feature [σ] (henceforward $\forall_{[\sigma]}$) has its exhaustifier scope higher than the negation: the feature [σ] only requires that the exhaustifier c-commands the $\forall_{[\sigma]}$ and therefore has scope over it, but does not require that it has immediate scope. An alternative underlying syntactic configuration for such a universal quantifier, *pevery*, carrying a feature [σ] would be (18).

(18) [NOT [EXH$_{[\sigma]}$ [I read [pevery book]$_{[\sigma]}$]]]

But (18) does not give rise to a logical contradiction. In (18) the proposition *I read pevery book*, denoting $\forall x.[x \in \{a,b,c\} \rightarrow read(I, x)]$, would be exhaustified (a vacuous operation, since it is already stronger than any of its alternatives) *before* it gets negated. The denotation of (18) is then just simply (19). The exhaustifier acts as an intervener.

(19) $\neg \forall x.[x \in \{a,b,c\} \rightarrow read(I, x)]$

Consequently, a universal PPI (or to be more precise: a universal quantifier that obligatorily introduces domain alternatives and that must be exhaustified) is fine in a negative / downward entailing context as long as the exhaustifier is in between the negation or any other downward entailing operator and the universal quantifier itself. Universal quantifier PPIs may thus appear under negation without being ungrammatical and therefore be unrecognizable as such.

3.2 Universal quantifiers and self-intervention effects

How do we know then if such universal quantifier PPIs that bind individuals exist in the first place. And why is it that we do find clear modal universal PPIs? Since the recognisability of universal PPIs depends on the possibility of an intervening EXH, these questions arises as to exactly when EXH can intervene. Since, EXH is a covert operator whose present depends on an overt marker of it, the element carrying the uninterpretable feature [σ] that must be checked against the interpretable [σ] feature on EXH, this question depends on when and where such covert operators may be posited in general. Zeijlstra (2012) has argued for a number of different phenomena that covert operators must be included in a position c-commanding the highest overt marker(s) of an abstract operator. If this is correct, then the only restriction on the position of EXH in a sentence containing a universal quantifier carrying uninterpretable [σ] ($\forall_{[\sigma]}$ henceforward), is that it c-commands the surface realization of $\forall_{[\sigma]}$. This entails that the only orders where $\forall_{[\sigma]}$ may not appear under the scope of negation are exactly those cases where either $\forall_{[\sigma]}$ precedes negation or where it forms a morpho-syntactic unit with it; in both cases it is not possible for EXH to c-command $\forall_{[\sigma]}$ while still be under the scope of negation.

This applies to both types of modals in (20) and (21). In (20) negation is below the modal (and therefore already under its scope) and the modal is in turn c-commanded and outscoped by EXH. In (21) the negative marker is attached to the modal. Since EXH cannot intervene between negation or be inserted below the modal, it must be in a position c-commanding both of them. However, this would already give rise to a contradiction, since the scopal order would then be EXH>NEG>$\forall_{[\sigma]}$, yielding a contradiction. The only way to rescue this sentence is then to first have the modal undergo QR (along the lines of Iatridou & Zeijlstra 2013) and then have it c-commanded by EXH. In both (20)-(21) the scopal order can only be EXH > $\forall_{[\sigma]}$ > NEG, which gives rise to the PPI-effect.

(20) John mustn't leave

(21) Juan no-debe ir
Juan neg-must go
'Juan mustn't go'

By contrast, if a modal would appear (sufficiently lower) than negation, it is predicted that EXH might intervene between the negation and the modal. This is indeed the case. In a language like Dutch in main clauses a modal must precede negation (due the verb second property of the language), but in subordinate clauses the verb remains in situ and follows the negation. The prediction that this analysis makes is that modals that must take scope over negation in main clauses (due to their [σ] feature), should be able to take scope both below and above negation in a subordinate clause. In a subordinate clause EXH can either be posited in between negation and the modal, or above negation. In the former case, the modal may scope under negation; in the later case, it may not and must raise across the negation. This prediction is indeed born out, as the data in (22)-(25) show.

(22)*Jan moet niet vertrekken, maar het mag wel
Jan must neg leave, but it may prt
'John mustn't leave, but it is allowed'

(23)Jan moet niet vertrekken, omdat het verboden is
Jan must neg leave, because it forbidden is
'John mustn't leave, because it is forbidden'

(24)Ik weet dat Jan niet moet vertrekken, maar dat het wel mag
I know that Jan neg must leave, but that it prt may
'I know that John doesn't have to leave, but that it is allowed'

(25)Ik weet dat Jan niet moet vertrekken, omdat het verboden is
I know that Jan neg must leave, because it forbidden is
'I know that John mustn't leave, because it is forbidden'

Applying this to universal quantifiers over individuals, it is entailed that those quantifiers that follow negation, can also be under the scope of negation or any other proper anti-licenser, since EXH is able to intervene. On the basis of those cases one cannot even tell whether the universal quantifier carries a feature [σ] or not.

Only on the basis of examples where a morphologically independent negation precedes a universal quantifier one cannot tell whether a universal quantifier like *everybody* is a PPI or not by investigating its scopal behavior when it precedes negation. In that case the surface scope order would be EXH > $\forall_{([\sigma])}$> NEG. Under such a configuration, the universal quantifier that is equipped with a feature [σ] cannot reconstruct below negation (as this would give rise to a logical contradiction), but a universal quantifier that is lacking [σ], would be able to reconstruct below negation. Interestingly, variation between universal quantifiers that may and that may not reconstruct under negation when preceding it at surface structure, has indeed been attested (and never been properly explained). In the remainder of this paper I show that the only distinction between such quantifiers is the presence or the absence of a feature [σ] on ∀.

4 ∀ reconstruction

Following this line of reasoning, we can actually establish that English *everybody* is not a PPI, but that Dutch *iedereen* ('everybody') is a PPI, a novel observation to the best of my knowledge. In English (and most other languages), for almost all speakers a universal quantifier that precedes negation may reconstruct under negation. This shows that English everybody cannot carry a feature [σ].

(26) Everybody didn't leave $\forall>\neg;\neg>\forall$

However, for most speakers of Dutch (and several Northern German varieties), this reconstructed reading is not available (cf. Zeijlstra 2004, Abels & Marti 2011). This observation has never received a satisfactory explanation, but directly follows once universal quantifiers in Dutch are taken to be PPIs.

(27) Iedereen vertrok niet (Everybody left not) $\forall>\neg;*\neg>\forall$
Everybody left not
'Nobody left'

If *iedereen* is a PPI, it must be c-commanded by EXH at surface structure and reconstructing it below negation would result in the contradictory reading EXH>NEG>$\forall_{[\sigma]}$, thus providing a simple solution for this hitherto unsolved problem. Moreover, if *iedereen* is a PPI the prediction that Chierchia's analysis makes with respect to universal quantifiers, namely that universal quantifiers equipped with a feature [σ] should also be attested (since nothing principled rules them out, is also confirmed.

However, how can we independently investigate whether Dutch *iedereen* is indeed a PPI? As pointed out by Szabolcsi (2004), PPI-hood can be diagnosed in four different ways. First, PPIs should be fine under metalinguistic negation. This is indeed the case for Dutch *iedereen*, which may take scope under metalinguistic negation:

(28) Speaker A: Iedereen moet de kamer uit
Everybody must the room out
'Everybody must leave the room'
Speaker B: Nee, onzin. Iedereen moet niet de kamer uit; alleen Jan en Piet
No, nonsense. Everybody must neg the room out; only Jan and Piet
'No, nonsense. Everybody mustn't leave the room, only John and Piet must'

Also, PPIs can take scope under clause-external negation. Again this applies to *iedereen* as well.

(29) Ik zeg niet dat iedereen moet vertrekken; alleen Jan moet vertrekken
I say not that everybody must leave; only Jan must leave
'I'm not saying that everybody must leave; only John must leave'

Third, PPIs can scope under negation if a proper intervener scopes between the PPI and its anti-licenser. In a way, we already saw that this is the case for those PPIs that appear under the surface scope of negation (since EXH then acts as an intervener), but more examples of intervention effects can be attested. Example (30) can be true in a situation where when serious family matters are discussed Jan and Piet always leave the room, but the rest doesn't, a reading that requires the universal quantifier to scope below negation.

(30) Iedereen gaat niet altijd de kamer uit, alleen Jan en Piet
Everybody goes neg always the room out, only Jan and Piet
'Everybody doesn't always leave the room, only Jan and Piet do'

Finally, Szabolcsi (2004), following Baker (1970), shows that PPIs can be rescued again under two anti-licensers (with the highest one being a non-anti-additive anti-licenser). Again, this is the case for Dutch *iedereen*. Take (31). The most salient reading of this sentence is the one where the speaker is surprised that some people left (i.e. that not everybody stayed). Again this reading is only possible if *iedereen* is allowed to reconstruct under negation.

(31) Het verbaast me dat iedereen niet blijft
It surprises me that everybody neg stays
'It surprises ma that everybody doesn't stay'

So, Dutch *iedereen*, when preceding negation, exhibits all the diagnostics of PPI-hood, thus allowing us to safely conclude that it is indeed a PPI in the classical sense. The fact that it may appear under the scope of surface negation when negation precedes it, simply follows because this PPI introduces an exhaustifier, which in turn may acts as an intervener between the PPI and its anti-licenser.

5 Conclusions

To conclude, universal quantifier PPIs do exist, both in the domain of quantifiers over individuals and in the domain of quantifiers over possible worlds, as is predicted by the Kadmon&Landman-Krifka-Chierchia approach to NPI-hood. However, since the exhaustifier that is induced by these PPIs can act as an intervener between the PPI and its anti-licenser, universal quantifier PPIs often appear in disguise. Their PPI-like behaviour only becomes visible once they morpho-syntactically precede their anti-licenser.

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