C. Positive Polarity

1. Positive Polarity Items: Intro

A final phenomenon that needs to be addressed concerns Positive Polarity Items (PPIs). While English any-terms require some DE licensing context, PPIs, by contrast, are known to be illicit in negative contexts.

At least four different types of PPIs have been discussed in the literature. The first type is represented by the English some-series and their counterparts in other languages (Jespersen 1917; Baker 1970; Progovac 1994; Van der Wouden 1994; Giannakidou 1997, 2011; Haspelmath 1997; Szabolcsi 2004; amongst many others). The second class consists of high-scale elements, such as rather (cf. Krifka 1995; Israel 1996, 2011). The third class of PPIs contains speaker-oriented adverbs, and has been thoroughly discussed by Nilsen (2003), Ernst (2009), and Giannakidou & Mari (2018). The final class of PPIs concerns deontic modals which obligatorily outscope negation, such as English must (cf. Israel 1996, 2011; Iatridou & Zeijlstra 2010, 2013; and Homer 2015). For an overview of all types of PPIs, the reader is referred to Van der Wouden (1994) and Israel (2011).

Each type is exemplified in (1). Note, though, that, contrary to most NPIs, PPIs in negative sentences do not always render a sentence ill-formed, but rather disambiguate it. Therefore, in (1)a and d, the sentences are not ruled out, but rather the readings with the PPI taking scope under the negation are excluded.

(1) a. John didn't see somebody
*'John saw nobody'
√'There is somebody John didn't see'
b. I am (*not) rather ill
c. They (*don't) possibly like spinach
d. Mary mustn't leave (vs. Mary needn't leave)
*'Mary doesn't have to leave'
√'It's obligatory that Mary doesn't leave'

2. Explaining PPI-hood

The construction of PPIs has received disproportionately less attention than the construction of NPIs. And unlike in the domain of NPIs, most of the action here seems to take place in the syntactic approach. In this context, we will concentrate on Szabolcsi 2004.

As for the semantic approach, although PPI-hood should be derivable under the scalarity perspective to PIs, very few such proposals have been made. The only real example is Krifka (1995), which we will also look at.

2.1 The syntactic approach

Szabolcsi 2004 extends Postal's view on NPI-hood to PPI-hood. Recall that according to Postal, NPIs are lexical items associated with negations (negative features in den

Dikken's implementation of Postal). Szabolcsi's conjecture is that if lexical items can be associated with negations, nothing prevents a certain lexical item from being associated with two negations. It is exactly such items (with two negations) that we end up identifying as PPIs, according to Szabolcsi. For her then, NPIs have one, and PPIs two negative features. A PPI like somebody has the following representation:

(16) $\lambda P \neg\neg \exists x[person(x) \& P(x)]$

In regular positive contexts $\neg\neg\exists$ can be realized as some. However, why can't some appear in negative contexts as well? In other words, what explains the positive polarity of PPIs?

For Szabolcsi, this is because the two negative features are "dormant". Dormancy is the state in which the two negative features cancel each other out. However, when the PPI finds itself under a DE operator, something goes wrong. The DE operator activates and licenses (i.e. absorbs) one of the negative features of the PPI. Since now the first negative feature has been absorbed, the second negative feature is no longer in a dormant stage, as the first feature no longer cancels it out.

So under a DE operator, the PPI is left with an unlicensed negative feature, which is why it is ruled out. In fact, the [DE-Op > PPI] complex is ruled out for exactly the same reason for which an unlicensed NPI is ruled out; both have a negative feature on the PI item that needs to be licensed. This means that Szabolcsi makes the prediction that if the [DE-Op > PPI] complex is placed under the scope of another DE operator that licenses NPIs, then the sentence should be fine again. In other words, she predicts that while (17a) is bad, (17b) should be good:

(17) a. *[DE-Op > PPI]
b. DE-Op > [DE-Op > PPI]

In truth, these are exactly the facts pointed out by Baker (1970), as reported on in Szabolcsi (2004). Sometimes the phenomenon is called "double licensing" (because the PPI is bad under just one operator, but becomes good under two of them.)

(18)	a.	I am surprised that John didn't call someone.	surprise > not > some
	b.	I regret that John didn't call someone	regret > not > some
	c.	If we don't call someone, we are doomed	if [not > some]
	d.	Every boy who didn't call someone	every [not > some]
	e.	Only John didn't call someone.	only > not > some
	f.	Few boys didn't call someone.	few > not > some
	g.	Few boys thought that you didn't call someone.	few > not > some

In short, the reason that a PPI is ungrammatical under a single DE operator is not that there is an abstract prohibition against PPIs being in the scope of such operators (as also evidenced by the fact that they can appear in such scope when the operator is

extraclausal). The reason that a PPI under a clausemate DE operator is bad is because the [DE-Op > PPI] complex contains what essentially is an unlicensed NPI.

Szabolcsi's account for how to construct PPIs inherits some of the problems of the Postal account of NPI construction. Why would the distribution of negations/negative features not be random across categories of words but instead be found in so much higher concentration in classes of scalar elements? And the fact is that, just like NPIs, PPIs also have been argued to tend to be endpoints of scales (Krifka 1995, Israel 1996).[1]

2.2 The semantic approach

From within the semantic approach, only Krifka (1995) has made some suggestions about how to construct PPIs.

Krifka argues that elements that (contextually) denote some maximum value on a scale, like tons of , survive only in positive contexts for reasons similar to the ones that explain why NPIs survive only in negative contexts.

(19) a. They have tons of money
b. *They don't have tons of money

Assuming that tons of X is a maximum value on some scale (in other words, there are no even higher values; we can think of tons of money as being the maximal amount of money a person can have), then (19a) is a stronger proposition than any of its alternatives. Therefore, no alternative proposition needs to be negated under Scal.Assert.

This is not the case, however, once negation is brought into the sentence, as in (19b). The reason is that there are stronger alternatives to (19b). Assuming that there is some threshold that needs to be satisfied for tons of to be applicable, any negated sentence containing an expression below that threshold will be stronger than (19b) (e.g. "They don't have $400", "They don't have $300", etc.). This means that Scal.Assert will yield a contradiction: since Scal.Assert says that no such proposition can be true, it turns out that for all possible amounts x of money, even the highest amounts, it is not true that they don't have that amount. So they must have a very high amount of money, but that is in sheer contradiction with (19b).

Interestingly, the item that most people think of as the prototypical PPI, English some does not come out as a PPI for Krifka at all. PIs are end-of scale items

[1] Even though this is not a problem for Szabolcsi, of course, there would be a problem for the extension of Szabolcsi's account into terms of Chomsky 1995, along the lines of den Dikken's extension of Postal. The reason is simple: if the negations that are part of PIs are uninterpretable features, it is hard to imagine how two uninterpretable negative features would cancel each other out.

and PPIs are high-end of scale items for Krifka, and some clearly does not fall in this category. Krifka realizes this and attributes the wide-scope wrt negation property of some in (20a) to the result of a conventionalized implicature. In short, (20a) is strictly speaking taken to be ambiguous between a wide and a narrow-scope reading. However, its alternative (20b) only yields a narrow-scope reading due to the NPI property of anybody. (20a) then, as a result of general pragmatic principles, is taken to infer the wide-scope reading only. Krifka argues that this effect may nowadays even have fossilized, so that the ambiguity can be hardly retrieved anymore.

(20) a. John didn't see somebody
b. John didn't see anybody

However, it should be noted that fossilization does not explain why somebody (nowadays) cannot scope under negation; it is a diachronic account, not a synchronic account. It remains an open question as to how it is (lexically) encoded that some may not scope under negation. Moreover, as we saw before in the discussion of Szabolcsi (2004), PPIs such as some may sometimes surface and be interpreted in the same positions as NPIs, which is unexpected under the fossilization view.

It must be noted that the result of not treating some as a regular PPI on a par with tons of and rather is somewhat unsatisfactory. Both some and these high-scale PPIs behave remarkably similar in the Baker/Szabolcsi contexts: they cannot appear under negation except when the negation is clause-external, when they appear under two negations or when some element intervenes between the negation and the PPI. If some and rather/tons of are treated alike, these correspondences in their distribution naturally follow, but under Krifka's account, they remain unexplained.

In addition to the issues for Krifka's approach raised by items like some, there are some further questions to consider. For one, Krifka postulates a strong relation between high-end scalar items and PPIs. One might be tempted to expect, therefore, that universal quantifiers like every should be PPIs, which they are not. For Krifka it looks like a one-way implication: all PPIs are high-end items; not all high-end items have to necessarily be PPIs. In other words, being high-end is a necessary but not sufficient condition for PPI-hood. But this means, then, that we do not yet have a predictive understanding of which items will become PPIs -- unless, of course, it turns out to be that it is a truly random selection from within the class of high-end items.

Finally, we should point out that there at least appears to be an asymmetry between NPIs and PPIs that remains unaccounted for. There are NPIs that cluster truly at the end of their scales (e.g. any, lift a finger). On the other hand, PPIs, while being high-end, like tons of and rather, do not appear to be truly end-of-scale items.

2.3 Possibly bridging the two approaches?

Finally, the question arises as to how PPI-hood can be derived under Chierchia's mixed approach. Although Chierchia does not discuss the construction of PPIs himself, his extension of Krifka's approach to NPIs can be duplicated in the domain of PPIs also. It might go something like this: a PPI, like tons of, would carry a [+σ] feature,

thus requiring the presence of an exhaustification operator. In a non-negative sentence this would be fine, just as uttering "John has tons of money" would be fine under Scale.Assert for Krifka, as it is the strongest proposition among its scalar counterparts.

However, when putting the PPI under negation, exhaustification of "John doesn't have tons of money" yields a contradiction again. Take (21):

(21) EXHAUST[+σ] They don't have {tons of}[+σ] money

When EXHAUST[+σ] is applied to they don't have tons of money, it says that any stronger alternative proposition is false. As the result, (21) says that any proposition of the form "they don't have x amount of money" for some particular amount x is false; but then it contradicts the statement "they don't have the maximal possible amount of money".

For this extension of Chierchia to PPIs to work, however, the EXHAUST operator should apply higher than negation, as in (22):

(22) EXHAUST[+σ] > NEGATION > PPI

If, instead, we have the scopal order in (23), the PPI is expected to be fine in the scope of negation:

(23) NEGATION > EXHAUST[+σ] > PPI

While (23) may be the representation of a PPI under extra-clausal negation, the question is how to prevent this order from appearing within one and the same clause. One possible answer is that the EXHAUST operator is an IP-level operator, which would automatically preclude (23) from arising within one clause, since we do not permit negation to raise. But Chierchia does not give any structural restrictions on the placement of the operator. So, a question that arises in this context is what determines exactly the locus of the abstract strengthening operator in the syntactic structure.