What's not to like

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1 Introduction

The interpretation of sentences in which negation appears above certain verbs like 'think' and 'want' is typically stronger than expected. Such sentences generally license an inference not just that the individual in question fails to have a positive attitude, but also that they have the corresponding negative attitude (Horn 1978 among many others). For instance, a sentence like (1-a) is generally interpreted in the same way as (1-b):

(1) a. James doesn't think that Marie will be hired.

b. $\rightsquigarrow$ James thinks that Marie will not be hired.

The traditional name for this phenomenon is 'neg-raising'.[1] Neg-raising readings are generally the most prominent, but not the only, available reading; thus e.g. (1-a) could be followed by 'He doesn't think that she will not be hired either; he just doesn't know whether she will be', in which case (1-a) will clearly not be interpreted in the same way as (1-b). If we combine a standard Hintikkan semantics for neg-raising predicates like 'think' with a classical treatment of negation, we only predict that a sentence like (1-a) will have an agnostic reading, and do not account for its stronger reading on which it licenses the inference to (1-b). Accounting for neg-raising is an enduring challenge at the intersection of semantics, syntax, and pragmatics.

As is well-known, neg-raising is not possible with all attitude predicates. For instance, 'is certain' interacts with negation in the way we would expect from a classical point of

view: (2-a) has only an agnostic reading, not a neg-raised reading.

(2) a. James is not certain that Marie will be hired.

b. $\not\rightarrow$James is certain that Marie will not be hired.

Another crucial feature of neg-raising predicates is that, when negated, they generally license strong Negative Polarity Items (NPIs), like 'until tomorrow' or 'in years/days'. By contrast, non-neg-raising predicates do not license strong NPIs (Lakoff 1969 among others):

(3) a. James doesn't think that Marie has been here in years.

b. *James isn't certain that Marie has been here in years.

Traditional theories of strong NPIs and neg-raising are formulated to predict a tight connection between the two phenomenon. In particular, most approaches predict that neg-raised predicates always license strong NPIs.

More recently, however, Gajewski (2011) and Chierchia (2013) have proposed a theory of strong NPIs on which, at least in principle, they may fail to be licensed by neg-raising constructions. The gist of the idea is that strong NPIs, like all NPIs, are licensed only in downward monotonic environments. However, the calculation of monotonicity properties for the former, but not the latter, is sensitive to non-truth-conditional components of meaning like presupposition and scalar implicature. Going back to the contrast in (3), the reason why (5-a) but not (3-b) licenses strong NPIs is because the latter gives rise to a positive implicature (viz. that John leaves it open that Marie has been here in recent years) which disrupts the downward monotonicity of the context in which 'in years' appears. This means that in this theory the alignment between neg-raised predicates and strong NPI licensing is only indirect: neg-raised predicates generally license strong NPIs because they do not give rise to non-truth conditional meanings which would disrupt monotonicity, whereas non-neg-raisers typically do give rise to such non-truth-conditional meanings. But nothing

in this approach excludes the possibility of there being a predicate which is neg-raising but gives rise to a presupposition or implicature which disrupts strong NPI licensing. In fact, given that non-truth conditional meanings are pervasive in natural language, one might indeed expect there to be such a class of predicates, given this approach.

In this squib, we show that there is indeed a class of predicates which give rise to neg-raising inferences but do not license strong NPIs: namely, factive emotives like 'appreciate', 'be glad', 'be happy', and 'like'. This is a striking fact which we believe provides support for the Gajewski-Chierchia theory of NPI-licensing, together with a semantic approach to neg-raising.

2 Gajewski and Chierchia on strong NPIs

We begin by briefly rehearsing Gajewski (2011), Chierchia (2013)'s theory of strong NPIs, which is based on the idea that strong NPIs are sensitive to non-truth conditional meanings. In brief, the idea is that both weak and strong NPIs are licensed only in downward entailing environments; but that while we can ignore presuppositions and implicatures in calculating monotonicity properties relevant for the licensing of weak NPIs, we cannot do so when calculating monotonicity properties relevant to the licensing of strong NPIs. To illustrate, consider the contrast between (4) and (5), which shows that a strong NPI like 'until tomorrow' can appear in the scope of negation like in (4), but cannot appear felicitously in downward entailing contexts like the restrictor of a universal quantifier in (5).

(4) Mary won't leave **until tomorrow**.

(5) *Every student who will leave **until tomorrow** will miss the class.

On the present approach, the relevant difference between (4) and (5) is that the latter has a presupposition that the intersection of the domain of quantification and the restrictor

clause is non-empty; if this presupposition is taken into account in calculating monotonicity properties, the restrictor of the quantifier in (5) is no longer downward entailing. since ⌜Something is p and everything which is p is q⌝ does not entail ⌜Something is (p and r) and everything which is (p and r) is q⌝.

3 Neg-raising and strong NPIs

Let us turn now to neg-raising. Consider again the contrast in (3), repeated here:

(3) a. James doesn't think that Marie has been here in years.

b. *James isn't certain that Marie has been here in years.

Given Gajewski-Chierchia's approach, what explains the fact that strong NPIs are licensed in the scope of the attitude predicate in (5-a) but not in (3-b) is a difference between their not-at-issue contents (implicatures or presuppositions). (6) generally gives rise to the implicature in (6-a) but not the neg-raising inference in (6-b), while (7) does not give rise to the corresponding implicature in (7-a), and instead gives rise to the neg-raising inference in (7-b) (cf. Romoli 2013).

(6) John isn't certain that Mary was here.

a. $\rightsquigarrow$ John leaves open that Mary was here.

b. $\not\rightsquigarrow$ John is certain that Mary wasn't here.

(7) John doesn't think that Mary was here.

a. $\not\rightsquigarrow$ John leaves open that Mary was here.

b. $\rightsquigarrow$ John doesn't leave open that Mary was here.

In Gajewski-Chierchia's theory, the question of whether strong NPIs are licensed in the scope of the attitude predicates in (6) and (7) is the question of whether those attitude

predicates, together with their scalar implicatures and presuppositions, create downward entailing environments. It is easy to see that the possibility inference of 'certain' disrupts the downward entailingness of its scope, for essentially the same reason as in the case of universal quantification. Abstractly, in the case of 'not certain' we have an environment with the form $\ulcorner \neg \Box_j(\_\_) \wedge \Diamond_j(\_\_) \urcorner$ (conjoining at-issue content and the openness implicature which projects through the negation), whereas in the case of 'doesn't think' we have instead an environment with the form $\ulcorner \neg \Box_j(\_\_) \wedge \Box_j(\neg \_\_) \urcorner$ (conjoining at-issue content with the neg-raising inference). __ is a downward entailing environment in the latter, since $\ulcorner \neg \Box_j(p) \wedge \Box_j(\neg p) \urcorner$ entails $\ulcorner \neg \Box_j(p \wedge q) \wedge \Box_j(\neg(p \wedge q)) \urcorner$, but not in the former, since $\ulcorner \neg \Box_j(p) \wedge \Diamond_j(p) \urcorner$ does not entail $\ulcorner \neg \Box_j(p \wedge q) \wedge \Diamond_j(p \wedge q) \urcorner$.

Note that in this system, strong NPI licensing does not follow directly from the fact that a predicate has a neg-raising inference. The connection is rather more general and more indirect: in particular, while the neg-raising inference of neg-raising predicates leaves the downward entailingness of the environment intact, the existential inference typical of non-neg-raising predicates disrupts it, so that only the former license strong NPIs in their complements.

4 'Like'-verbs

Abstractly speaking, however, nothing in the Gajewski-Chierchia approach excludes the existence of a neg-raising predicate which doesn't license strong NPIs. In this section, we'll argue that some emotive factives have just this behavior. In particular, consider emotive factives like 'like', 'be glad', 'be happy', 'appreciate', and so on, with propositional complements. Unlike most factive attitude predicates, these are neg-raising predicates: that is, the typical interpretation of a sentence like (8) is *not* one on which Fred is indifferent about Marie being hired, but rather one on which Fred is unhappy about Marie being hired (Horn 1989: p. 341):[2]

(8) Fred {doesn't like/doesn't appreciate/isn't happy/isn't glad} that Marie was hired.

Just as for other neg-raising predicates, an indifference reading of (8) is possible; it can be brought out by following up (8) with something like 'He doesn't dislike that she was hired yesterday either; he is indifferent about it'. But this reading is certainly not the most prominent interpretation: on the most prominent interpretation, (8) is rather felt to express that Fred dislikes that Marie was hired.

Crucially, however, these predicates do not license strong NPIs when negated, unlike the standard neg-raising predicates discussed above, as witnessed by the contrast between (9-a) versus (9-b) and (9-c):[3]

(9) a. *Fred doesn't like that Marie has seen her mother in years.
b. Fred likes that Marie hasn't seen her mother in years.
c. Fred doesn't think that Marie has seen her mother in years.

At first glance, then, these emotive factives – call them *'like'-verbs* as a shorthand – seem to witness exactly the theoretical possibility that Gajewski-Chierchia's account makes available: namely, neg-raising predicates which do not license strong NPIs.

5 Motivating the inference

Before exploring Gajewski-Chierchia's predictions about our data in more detail, we will do more to motivate our claim that 'like'-verbs should be classed as neg-raisers. Motivating this involves two steps. The first is to argue that an *indifference* reading of negated 'like'-verbs is available – in other words, that 'not like' does not *logically* entail 'dislike'. This can be brought out, again, by the coherence of sequences like 'Fred doesn't like that Marie was hired. He doesn't dislike it either: he's completely indifferent', as well as similar sequences like 'Fred doesn't like that Marie was hired. In fact, he positively dislikes it', 'Fred isn't

happy that Marie was hired. He's not unhappy about it either. He really has no opinion at all', and so on. To bring out the coherence of these, compare them to sequences with binary predicates, like 'I'm thinking of a certain natural number. It's not even. It's not odd either.' or 'It's not even. In fact, I would even say it's odd'. Such sentences are plainly incoherent, by contrast with our target ones. These contrasts suggest that 'not like' does not logically entail 'dislike'. Of course, as we discuss presently, the inference from the former to the latter is very natural, and so it can require some effort to hear the coherence of these sentences; but the crucial point for our purposes simply is that there *is* a clearly coherent reading reading of these sentences, and thus that 'not like' does not logically entail 'dislike'.

The second part of motivating our claim is the observation that a strengthened, non-indifference reading of 'not like' is very natural – even if not logically entailed. In other words, as a default, sentences like (10-a) are generally interpreted as equivalent to (10-b):

(10) a. Fred doesn't like that Marie was hired yesterday.

b. Fred dislikes that Marie was hired yesterday.

This claim is very intuitive, and does not obviously require further motivation. However, given that the truth-conditions of (10-b) are intuitively stronger than the literal meaning of (10-a), (10-a) is always compatible with a situation in which (10-b) is true, so caution is required before concluding that (10-a) really licenses the inference to (10-b), as opposed to merely being compatible with it (see Gajewski 2005, Meyer & Sauerland 2009 for related discussion). The licensing of strong NPIs is often used as a diagnostic reinforcing the existence of neg-raising. However, in this case we cannot use that diagnostic, since we are precisely calling into question whether neg-raising predicates always license strong NPIs. A different argument that the inference from (10-a) to (10-b) is robust is the following, building on Chierchia et al. 2012. Consider a sentence like (11), which embeds (10-a) in the first disjunct.

(11) Either Fred doesn't like that Marie was hired yesterday or he doesn't care.

If the first disjunct had only a weak indifference reading, then the second disjunct would entail the first. Then we would expect (11) to be a violation of Hurford's constraint (Hurford 1974), and to strike us as being as infelicitous as (12):

(12) #Either John is in France or he is in Paris.

The fact that (11) is felicitous thus suggests that (10-a) indeed does have a reading on which it communicates something more than indifference, and instead communicates what (10-b) does.

6 Universal inferences and partial cyclicity

Even if 'like'-verbs give rise to surprisingly strong readings, some might still resist counting them as neg-raisers. In particular, those who take the licensing of strong NPIs to be diagnostic of neg-raising could argue that 'like'-verbs are not neg-raisers; as we will see below, anyone who goes in for a syntactic approach to neg-raising must likewise argue that these are not neg-raisers. They might instead point out that when these predicates take nominal complements they give rise to an inference sometimes called 'inferences to the antonym'. That is, a sentence like (13-a) gives rise to the inference in (13-b).

(13) a. John doesn't like apples.

b. $\rightsquigarrow$ John dislikes apples.

One might argue that the sentential cases above are not cases of neg-raising after all, and instead should be treated as inferences to the antonym (Krifka 2007; see also Heim 2008, Ruytenbeek et al. 2017). We are sympathetic to this response, but we would take it in a different direction: it looks plausible to us that we might give a unified account of neg-raising *in general* and of the phenomenon in (13). Part of the motivation for this is

general considerations of theoretical simplicity. Part comes from the fact that, as we will see presently, the Gajewski-Chierchia approach already predicts the lack of strong NPI licensing under negated 'like'-verbs in the context of a semantic approach to neg-raising, which can be naturally extended to cases like (13). Here we will make another point, which is that inferences to the antonym, and 'like'-verbs, share some characteristic patterns with neg-raising: all three give rise to universal inferences under negative quantifiers (as in (14) and (15)) and (partial) cyclicity (as in (17) and (18)), just like the classical neg-raisers in (16) and (19).[4]

(14) a. Nobody likes apples.
b. ⇝ Everybody doesn't like apples.

(15) a. Nobody likes that Marie was hired.
b. ⇝ Everybody dislikes that Marie was hired.

(16) a. Nobody thinks that Marie was hired.
b. ⇝ Everybody thinks that Marie wasn't hired.

(17) a. I don't think that John likes apples.
b. ⇝ I think that John dislikes apples.

(18) a. I don't think that John likes that Marie was hired.
b. ⇝ I think that John dislikes that Marie was hired.

(19) a. I don't think that John thinks that Marie was hired.
b. ⇝ I think that John thinks that Marie wasn't hired.

These parallelisms are, of course, only suggestive; but they provide some evidence that what we have here is a unified phenomenon.

7 Gajewski-Chierchia on 'like'-verbs

We show now that the Gajewski-Chierchia approach to strong NPI licensing neatly predicts that neg-raised 'like'-verbs do not license strong NPIs. The reason for this is that 'like'-verbs are factive: they presuppose the truth of their complement. For instance, (20) presupposes that Marie was hired; we can confirm this by embedding (20) in standard projection environments and seeing that this inference projects.

(20) John likes that Marie was hired.

And this factivity presupposition disrupts the downward monotonicity of the environment in which the strong NPI appears. If we ignore the presupposition of 'likes', then ⌜Fred doesn't like that p⌝ is downward entailing in its scope.[5] But once we take into account the presupposition of 'like' in calculating monotonicity we do not have a downward entailing environment, and strong NPIs are predicted not to be licensed. Schematically, if we think about likes_f as a presuppositionless necessity operator corresponding to 'F likes' – essentially, 'has a pro-attitude towards' – then __ is downward entailing in (21-a) but not (21-b):

(21) a. $\neg \mathsf{likes}_f(\_\_)$

b. $\neg \mathsf{likes}_f(\_\_) \wedge \_\_$

This is because for any necessity operator '$\Box$', $\ulcorner \neg \Box p \urcorner$ entails $\ulcorner \neg \Box (p \wedge q) \urcorner$, but $\ulcorner \neg \Box (p) \wedge p \urcorner$ does not entail $\ulcorner \neg \Box (p \wedge q) \wedge (p \wedge q) \urcorner$. More intuitively, 'Fred doesn't like that Marie was hired yesterday' intuitively does not entail 'Fred doesn't like that (Marie was hired yesterday and Jane was hired yesterday)', since the latter presupposes something that the former doesn't, namely that Jane was hired yesterday.

So, if we take into account presuppositions in calculating the monotonicity properties relevant to the licensing of strong NPIs, the scope of 'doesn't like' is not downward entailing.

Thus, if we follow Gajewski and Chierchia, we predict that strong NPIs are not licensed in the scope of negated 'like'-verbs. This makes them unlike standard neg-raising predicates like 'think', which are not factive, and thus do not have a presupposition which blocks downward monotonicity in a parallel way.

By contrast, since presuppositions are not taken into account in calculating weak NPIs, Gajewski-Chierchia predict that weak NPIs will still be licensed by negated 'like'-verbs, which seems correct to us: (22-a) seems substantially better than (22-b) (though perhaps not perfect; intuitions here seem somewhat unclear):

(22) a. John doesn't like that Marie ever went to Paris.

b. *John doesn't like that Marie has been to Paris in weeks.

Taken together, these facts are, we think, a striking point in favor of Gajewski-Chierchia's theory. That theory opens up a theoretical possibility (one not to our knowledge heretofore discussed), namely that we could have neg-raising predicates which are do not license strong NPIs, provided those neg-raising predicates have presuppositions or implicatures which prevent their scope from being downward entailing. This possibility seems indeed to be realized by 'like'-verbs.

8 Syntactic neg-raising

This is all to the good for Gajewski and Chierchia's theory of strong NPIs. We haven't yet said anything about how to actually account for the neg-raising inferences of negated 'like'-verbs. In the rest of the paper, we will turn to this topic. We will show that it is not clear how to provide a unified account for the cases above within a syntactic approach to neg-raising; while a semantic approach (Gajewski 2007, Romoli 2013) also faces challenges, but can be more readily extended to provide such an account.

The syntactic approach to neg-raising originated in Fillmore 1963 and Horn 1971 and

was recently taken up and revived by Collins & Postal (2014, 2017). The basic idea is that a sentence like (23-a), on its neg-raising reading, has at some level of syntactic representation a negation actually present in the embedded clause, as in (23-b), and that this level of syntactic representation feeds into semantic interpretation. This negation then moves out and appears in the main clause.[6]

(23) a. James doesn't think that Marie will be hired.

b. James NEG thinks that [Marie will ⟨NEG⟩ be hired]

The non-neg-raising readings are those where the negation is interpreted in the same place it appears in surface form. The syntactic approach is generally linked to a theory on which strong NPIs require a local licensor; the silent low negation acts as this licensor for neg-raising readings (Linebarger 1987 among others; see Gajewski 2005, 2007, Romoli 2013 for critical discussion).[7]

This approach cannot be extended to account for the neg-raising behavior of 'like'-verbs. The first problem is that this kind of approach does not, as far as we can tell, have the resources to explain why negated 'like'-verbs do not license strong NPIs. The second problem is much more basic, and is one of truth-conditional adequacy. On this approach, superficially high-negation neg-raising sentences are predicted to be *semantically equivalent* (on their default readings) to their low-negation counterparts. If we were to extend this approach to 'like'-verbs, then a sentence like (24-a) is predicted to have a syntactic level of representation like (24-b) where negation is interpreted in its lower position. Thus (24-a) (on its neg-raising interpretation) and (24-c) are predicted to be *semantically equivalent*:

(24) a. Fred doesn't like that Marie was hired yesterday.

b. Fred NEG likes that [Marie was ⟨NEG⟩ hired yesterday]

c. Fred likes that Marie was not hired yesterday.

But this is plainly wrong: (24-a) is not equivalent to (24-c) on any reading. The problem at a theoretical level is that 'like'-verbs presuppose the truth of their complement; so if negation is in the embedded clause for the purposes of semantic interpretation, we would expect the presupposition of (24-a) to include that negation: i.e. to presuppose that Marie was *not* hired yesterday.

A syntactic approach to neg-raising thus cannot be extended to account for the behavior of 'like'-verbs. Defenders of the syntactic approach can, of course, maintain that, superficial similarities aside, the behavior of negated 'like'-verbs should not be assimilated to neg-raising. We cannot say anything to rule out this option definitively. A unified approach should, however, be preferred if possible, both for general theoretical reasons and due to the similarities brought out above. And as we will see presently, a semantic approach to neg-raising, coupled with the Gajewski-Chierchia theory of strong NPIs, provides just such an option.

9 Semantic neg-raising

The semantic approach to neg-raising treats it as arising from an excluded middle inference of neg-raising predicates. This inference can be derived either as a presupposition (Bartsch 1973, Heim 2000, Gajewski 2005, 2007, Homer 2015) or scalar implicature (Romoli 2013, Bervoets 2014).[8] The idea is that a sentence like 'James thinks that Marie will be hired', schematized as $\ulcorner \mathbf{think}_j(p) \urcorner$, gives rise to the excluded middle, or opinionatedness, inference (presupposition/implicature) in $\ulcorner \mathbf{think}_j(p) \vee \mathbf{think}_j(\neg p) \urcorner$ (which we can paraphrase 'James has an opinion as to whether Marie will be hired'). The positive case is not interesting, because the excluded middle is entailed by the assertion. However, when we negate this sentence and assume that the negation is interpreted *in situ* above the attitude verb, then, assuming this excluded middle inference projects through negation, from $\ulcorner \neg \mathbf{think}_j \urcorner$ and

$\ulcorner$**think**$_j(p) \vee$ **think**$_j(\neg p)\urcorner$ we can conclude $\ulcorner$**think**$_j(\neg p)\urcorner$. On these views, the excluded middle inference will project through negation as a default, but can also fail to project, accounting for the availability of non-neg-raising readings (agnostic readings). If we couple this approach with the Gajewski-Chierchia theory of strong NPIs (as Romoli (2013) suggests), this approach predicts that strong NPIs are licensed under most neg-raised predicates, but not under 'like'-verbs, for the reasons we have already seen.[9]

The semantic approach to neg-raising can be extended to 'like'-verbs, but requires some tweaks. This has to do with the presuppositional nature of 'like'-verbs (we'll focus on 'like', but everything we say here generalizes). Suppose that 'like' licenses an excluded middle inference of the kind semantic approaches posit for neg-raising predicates. Then, schematically, $\ulcorner$**likes**$_f(p)\urcorner$ will license the inference to $\ulcorner$**likes**$_f(p) \vee$ **likes**$_f(\neg p)\urcorner$. The problem is that, as we have seen, 'likes' presupposes the truth of its complement. On standard theories of presupposition projection, (24-b) will then presuppose $\ulcorner p \wedge \neg p\urcorner$, leading to incoherence.[10] In other words, the excluded middle inference which is meant to do the heavy lifting in semantic theories of neg-raising will be incoherent when the predicate in question presupposes its complement.

There are, however, ways around this problem. One way is to assume that the excluded middle inference of (23) should not be formulated as above, but as (25):

(25) **likes**$_f(p) \vee$ **dislikes**$_f(p)$

It is easy to see that once we combine $\ulcorner\neg$**likes**$_f(p)\urcorner$ with (25), we correctly predicted the neg-raising inference $\ulcorner$**dislike**$_f(p)\urcorner$, without any problematic incoherent presuppositions. In other words, on its most prominent reading, 'Fred doesn't like that Marie was hired yesterday' will be interpreted like 'Fred dislikes that Marie was hired yesterday.'

One challenge for this approach is what to do for verbs which do not lexicalize a negative version – including other factive neg-raisers, like 'appreciate', as well as non-

factive neg-raisers like 'want' or 'think'. This is a tricky issue; one way to address this challenge, suggested to us by an anonymous reviewer, is the following. To begin with, note that the predicates we focused on above are gradable, as evidenced by contrasts like the following:

(26) a. John very much likes that Marie was hired.
b. *John very much thinks that Marie was hired.

(27) a. John appreciates that Sue arrived more than he appreciates that Alan did.
b. *John thinks that Sue arrived more than he thinks that Alan did.

Standard theories of gradable predicates involve predication over degrees; in the positive case, a silent morpheme POS binds the degree variable (von Stechow 1984, Heim 2000, Kennedy & McNally 2005, von Stechow 2005, Heim 2008 *inter alia*). If we go this way, we can associate a homogeneity presupposition with POS, even when no antonym is lexicalized. In other words, focusing on *like*, let us assume that *like* has a degree semantics as in (28):

(28) $[\![\text{like}]\!] = \lambda d_{\delta}.\lambda p_{st}.\lambda x_{e}.[\text{LIKE}(x,p) > d]$

A positive sentence like *John likes that Marie was hired* then will have the LF 'POS[λd[John d likes [that Mary is here]]]'. Loosely following von Stechow, we assume that the scale associated with a gradable predicate P is divided into three parts: a positive interval P^{+}, a negative one P^{-}, and a neutral band P^{N}. Given these assumptions, what POS is saying is that all degrees are above the neutral band of the predicate. We can build on this idea to attach a homogeneity presupposition to POS $-$ namely, that all degrees in the neutral band satisfy $P_{\langle d,t\rangle}$ or that none do $-$ as follows.

(29) $[\![\text{pos}]\!] = \lambda P_{\langle d,t\rangle} : \forall d \in P^{N}[P(d)] \vee \forall d \in P^{N}[\neg P(d)]\ .\ \forall d \in P^{N}[P(d)]$

This would capture the neg-raising effects of verbs like *like* in the way suggested above:

not like will say that not all degrees in the neutral range are such that *x* likes *p* more than that degree; given the excluded middle presupposition, it will follow that *no* degrees in the neutral range have that property, and thus that *x* dislikes that *p*. Importantly, however, now the presupposition is introduced by POS and is therefore independent from whether a particular verb lexicalises its antonym. This approach seems promising to us;[11] note *inter alia* that this approach readily generalises in principle to the cases with nominal complement mentioned above in (13), thereby promising a unified account of classical neg-raising cases and 'like'-verbs, with sentential or nominal complements.

10 Conclusion

The Gajewski-Chierchia theory of strong NPI licensing predicts that, while neg-raising predicates will typically license strong NPIs, there will be exceptions to this rule if the negated predicate has implicatures or presuppositions which block downward monotonicity. 'Like'-verbs have exactly this property, and, as predicted, do not license strong NPIs. This striking fact provides support for the Gajewski-Chierchia theory and for an accompanying semantic approach to neg-raising.

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Notes

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[1] 'Neg-raising' suggests a syntactic analysis, but we will follow the recent literature in using this as a name for the phenomenon without suggesting a particular analysis of it. Strong NPI licensing is sometimes treated as definitive of neg-raising, but we will assume the more traditional and simpler definition: neg-raising is simply the phenomenon of certain predicates licensing unexpectedly strong inferences when negated: 'the collapsing (*Zusammenfall*) of the distinction between contrary and contradictory readings of negation' (Horn 1989). Relatedly, Kiparsky & Kiparsky (1971: p.19) claim that neg-raising and factivity are incompatible. But they do so because they assume a syntactic approach to neg-raising − which, as we discuss below, is indeed incompatible with treating 'like'-verbs as neg-raisers. We think, by contrast, that adopting a relatively broad definition of the phenomenon in question makes it possible to investigate it without prejudging the question of

whether neg-raised attitude verbs can always be paraphrased with a low scope negation, and whether they always license strong NPIs.

[2]Horn writes: ‘ ‘I don’t like it that he was reelected’ can convey (by litotes) a strong negative reaction to his re-election (= I dislike it...), but it cannot convey satisfaction with his defeat.’

[3]Thanks to Chris Collins and Paul Postal (p.c.) for first bringing this point to our attention.

[4]See Gajewski 2007, Romoli 2013 among others for discussion of these cases with classical neg-raising predicates. Thanks to an anonymous reviewer for suggesting these data to us.

[5]We assume an upward entailing semantics for ‘like’ which would make its negation downward entailing. See von Fintel 1999 for discussion of an upward entailing semantics for ‘be glad’, which can be extended to ‘like’, ‘appreciate’, and their kin. On the other hand, if we adopt a non-upward entailing semantics for this attitude predicates, then this could provide an independent explanation of why their negations will not license strong NPIs, though it would not explain the licensing of weak NPIs under ‘not like’ in the present theory; see Rothschild 2006 and Chemla et al. 2011 for discussion of NPI licensing in non-monotonic contexts.

[6]Collins & Postal 2017 differs in some details, but the differences are not relevant for our purposes.

[7]Arguments for the syntactic approach also come from apparent island effects. See Collins & Postal 2014, 2017 for further discussion; for some arguments against the syntactic approach see Romoli 2013 and Zeijlstra 2018.

[8] Recent work (see especially Križ 2015) identifies this kind of inference as one out of many homogeneity effects attached to a wide range of phenomena. Some of that work suggests that the inference is neither a presupposition nor scalar implicature, but rather some other kind of inference. This question does not have a direct bearing on our main points here; we will assume it is a presupposition, but other assumptions are consistent with our basic points.

[9]Note that adding an excluded middle inference does *not* block downward monotonicity properties, since $\ulcorner \neg \mathbf{think}_j(p) \wedge (\mathbf{think}_j(p) \vee \mathbf{think}_j(\neg p)) \urcorner$ entails $\ulcorner \neg \mathbf{think}_j(p \wedge q) \wedge (\mathbf{think}_j(p \wedge q) \vee \mathbf{think}_j(\neg(p \wedge q))) \urcorner$, assuming a standard quantificational semantics for ‘think’.

[10]There is some controversy about how presuppositions project out of disjunction. On one approach (e.g. Geurts 1999), a disjunction presupposes everything which either disjunct presupposes; then obviously $\ulcorner \mathbf{likes}_f(p) \vee \mathbf{likes}_f(\neg p) \urcorner$ will presuppose $\ulcorner p \wedge \neg p \urcorner$. On a different approach (e.g. Groenendijk et al. 1996), a disjunction $\ulcorner p \vee q \urcorner$ presupposes the presuppositions of p, together with $\ulcorner \neg p \supset r \urcorner$, where r is the conjunction of the presuppositions of q. On this approach, $\ulcorner \mathbf{likes}_f(p) \vee \mathbf{likes}_f(\neg p) \urcorner$ presupposes $\ulcorner p \wedge (\neg \mathbf{likes}_f(p) \supset \neg p) \urcorner$. Together with the asserted content of $\ulcorner \neg \mathbf{likes}_f(p) \urcorner$, this will again entail $\ulcorner p \wedge \neg p \urcorner$.

What's not to like

[11]One potential challenge here is that this approach only works for gradable predicates; if we found a non-gradable predicate without a lexicalized antonym, that would be a challenge.