

Complement Anaphora and Negative Polarity Items

Based on German data, I will point to a so far unnoticed relationship between the possibility of providing an antecedent for a complement anaphor and the licensing of a strict negative polarity item (NPI). I will provide a lexical decomposition analysis.

Some quantified NPs can serve as antecedent for a pronoun which refers to the intersection of the restriction and the complement of the scope (the *complement set*), rather than to the intersection of the restriction and the scope of the quantifier (the *reference set*) (Sanford et al. 1994). Such pronouns are called *complement anaphora* (CA). CAs occur with monotone decreasing antecedents (*none of the N*, *few N*), but there are exceptions: For instance *not all N* does not license CAs.

(1) Keiner der/ *Nicht alle/ Wenige Studenten kam(en) zum Seminar. Sie gingen in die Kneipe.
None of the/ Not all/ Few students attended the class. They went to the pub.

Only *none of the N* licenses strict NPIs such as *auch nur irgendwas* (anything at all).

(2) Keiner der/ *Nicht alle/ *Wenige Studenten wollen auch nur irgendwas lernen.
None of the/ *Not all/ *Few students want to learn anything at all.

If, however, the sentences in (2) are continued with a CA in the following sentence, the pattern changes. While *not all N* is still impossible, the NPI is fine in the scope of *few N* in this context.

(3) Keiner der/ *Nicht alle/ Wenige Studenten will auch nur irgendwas lernen. Sie wissen schon alles.
None of the/ *Not all/ Few students wants to learn anything at all. They already know everything.

(van der Wouden 1995) has observed the same licensing pattern for strict NPIs in neg raising constructions. (I give corresponding German examples to his Dutch cases).

(4) Wenige/ *Nicht alle Studenten glauben, dass sie auch nur irgendwas lernen müssen.
Few students/ *Not all students think that they have to learn anything at all.

What is not noted by van der Wouden is that the NPI licensing goes hand in hand with establishing a potential antecedent for a CA: The *few*-variant of (4) can be continued with a CA (5-a), but not with a pronoun referring to the student who actually feel the necessity of studying (5-b).

(5) a. Sie halten sich für Genies. (They consider themselves geniuses.)
b. * Sie halten den Stoff für sehr schwer. (They find the material very hard.)

The data show that there is a clear relation between NPI licensing and CA licensing: If a quantified NP can establish an antecedent for a CA, it can also license a strict NPI.

Previous Approaches The NPI/CA data are problematic for existing approaches of either NPI licensing or CA licensing. (van der Wouden 1995) shows that the contrast between *few* and *not all* in (4) is unexpected under an entailment-based approach to NPI licensing, given that both are monotone decreasing and *not all* is even anti-additive. Pragmatic accounts of NPI licensing such as (Krifka 1995) can differentiate between *few* and *not all*. They would have to argue that in certain contexts, *few N* can serve to mark an extreme point on a scale, whereas *not all N* can never do so. Nonetheless it is not clear how a relation to the CA data can be established.

We can also approach the problem from the CA side. (Kibble 1998) analyzes CAs as e-type pronouns. Some quantifiers introduce both a reference and a complement set, either of which can be used as the antecedent of the pronoun. This means, however, that the semantics of the clause containing the antecedent is the same no matter how it continues. Consequently, the fact that the NPI licensing potential varies depending on the continuation is not captured. (Nouwen 2003) rejects an e-type pronoun approach to CAs. He uses ranked constraints to determine whether a reference or a complement set can be inferred and used as antecedent to a pronoun. However, there is no direct way to link these constraints to a theory of NPI licensing in a way that would allow us to distinguish two cases for *few*.

Analysis I will show that the data follow immediately under a representational approach which allows for underspecification. The analysis can be seen as a variant of (Kibble 1998) capturing the two potential antecedent sets for the pronouns in terms of semantic underspecification. The analysis is compatible with frameworks of combinatorial semantics such as Underspecified DRT

or Lexical Resource Semantics (Richter and Sailer 2004), extended with a dynamic semantic representation language such as a version of Dynamic Predicate Logic (DPL), which I will use here. I make the simplifying assumption that a strict NPI is licensed if it is in the scope of a negation in the semantic representation of its clause, where at most existential quantifiers may intervene between the negation and the NPI.

In Underspecified Semantics every word in a sentence contributes a list of subexpressions of the overall semantic representation. In addition, the relative embedding of some of these subexpressions can be determined either lexically or by the syntactic structure. Scope ambiguity arises whenever the relative embedding of two subexpressions is not determined within the structure. In (6) the semantic contributions of *few* and *not all* are sketched. α stands for the semantic contribution of N, β for that of the VP; γ is the partially underspecified scope of the negation.

- (6) a. *few N VP*: $\langle \mathbf{many} x (\dots \alpha \dots) (\dots \beta \dots), \neg \gamma \rangle$, where β is in the scope of \neg .
 b. *not all N VP*: $\langle \mathbf{all} x (\dots \alpha \dots) (\dots \beta \dots), \neg \gamma \rangle$, where \mathbf{all} is in the scope of \neg .

In (6), $\mathbf{many} x (\phi)(\psi)$ is an abbreviation for something like $\exists X (\forall x (x \in X \rightarrow (\phi \wedge \psi)) \wedge |X| \geq |\{\lambda x. \phi\}| * \mathbf{n})$, where \mathbf{n} is the percentage which must satisfy the condition to count as *many*. Analogously, $\mathbf{all} x (\phi)(\psi)$ stands for $\exists X (\forall x (x \in X \rightarrow (\phi \wedge \psi)) \wedge |X| = |\{\lambda x. \phi\}|)$. The quantifier whose dynamics will allow for binding the variable introduced by a following pronoun is $\exists X (\dots)$.

In (6-b) the negation has wide scope. Consequently, a strict NPI which is part of the VP, and, thus, part of β (which is part of ψ) is not possible: there will always be a universal quantifier ($\forall x$) intervening between the NPI semantics and the negation. Furthermore, $\exists X$ is in its scope and the possibility of binding a pronoun variable is excluded.

In the case of *few*, the scope of the negation is only partially fixed. If it only takes scope over β , a strict NPI is possible within the VP semantics. In addition, the dynamic effect of $\exists X$ is not blocked either. The set X , then, consists of those x which are in the denotation of N and in the complement of the VP, i.e. X is the antecedent for a complement anaphor.

If the wide scope option for the negation is chosen, similar to *not all*, the entire expression is in the scope of the negation. Thus, $\forall x$ blocks the licensing of a strict NPI. In addition, dynamic binding into a following sentence is excluded. The possibility of having a pronoun which refers to the intersection of the restriction and the scope, i.e., to the reference set, then, follows from the general, partially pragmatic, principles of pronoun reference explored in (Nouwen 2003). Pragmatics will also have to tell us that the wide scope reading of the negation is normally preferred, unless there is a particular contexts, such as a neg raising construction or a CA continuation.

Conclusion I have provided new data for both the study of complement anaphora and the study of polarity items. The sketched analysis attempts to provide a unified account for these phenomena. If this theory is correct, there is no need to stipulate that in certain circumstances, a complement set can be introduced as a discourse referent. Instead, such a discourse referent, where appropriate, will follow from the position of the negation in the decomposed logical form of an expression.

References

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