

# Accommodation and the Strongest Meaning Hypothesis\*

Clemens Mayr and Uli Sauerland

Zentrum für Allgemeine Sprachwissenschaft, Berlin, Germany  
mayr@zas.gwz-berlin.de, uli@alum.mit.edu

## Abstract

Quantifiers have been claimed to differ with respect to how they project presuppositions from their scope. Early work claimed that, while negative quantifiers project presuppositions universally, indefinites do so existentially. But the environment the quantifier occurs in matters as well (e.g. Fox [12]). This paper suggests a new account of presupposition projection from a quantifier scope. We propose that, despite appearances, presupposition projection from the scope of quantifiers is always universal following Heim [16]. Apparent deviations from universal projection, we explain by means of additional acontextual silent restriction of quantifiers. Specifically, the mechanism of intermediate accommodation can add the presupposition of a quantifier's scope to its restriction and thereby derive apparent existential projection. We propose furthermore that intermediate accommodation must be licensed by a version of the Strongest Meaning Hypothesis. Our account explains how the monotonicity properties of quantifiers and the environments they occur in determine their projection properties.

## 1 The puzzle of varying presuppositions in quantifier scopes

That presuppositions embedded in the scope of quantifiers are central to the problem of presupposition projection has been known since at least Karttunen [18] and Heim [16]. The general issue is as follows. For the non-quantificational (1), the presupposition trigger *both* arguably contributes the presupposition that John wrote two papers.

(1) John is proud of both of his papers.

But what about the quantificational (2)? Assuming that its LF is something like the one in (3), it becomes clear that things are not as straightforward as they were in (1). We cannot simply say that (2) presupposes that  $x$  wrote two papers, as  $x$  is a variable bound by a  $\lambda$ -operator and thus co-varying with the choice of boys *none* quantifies over.

(2) None of the ten boys is proud of both of his papers.

(3) None of the ten boys  $\lambda x[x$  is proud of both of  $x$ 's papers]

The standard reply to this question is that the presupposition of (2) is itself quantificational. But quantificational in which sense? To this one finds different answers in the literature. Heim's [16] theory of presupposition projection derives a universal projection pattern for all presuppositions in the scope of quantifiers.<sup>1</sup> That is, (2) is predicted to presuppose that everyone of the ten boys wrote two papers. Intuitively, this seems adequate. Moreover, Chemla [7] provides experimental

---

\*We thank the audiences at the FB IV workshop at ZAS, at the University of Siena, and at the ImPres 1 workshop at ZAS. Furthermore, we thank two anonymous reviewers for the Amsterdam Colloquium 2015. The first author's research was supported by DFG grant MA5872/1, and the second author's by DFG grant SA925/11 and by the Bundesministerium für Bildung und Forschung (BMBF, Grant Nr. 01UG1411).

<sup>1</sup>This result obtains independently of the dynamic system and the related notion of local context employed there. Schlenker's [24] static reconstruction of a system of presupposition projection using local contexts derives exactly the same result. Also see [23].

evidence for this.<sup>2</sup> His findings are also supported by Fox’s [12] observation that some speakers judge statements with negative quantifiers as incoherent if preceded by a sentence requiring that only some of the ten boys wrote two papers, as in (4) modeled on his example (4). The reason would be that the universal presupposition of the second sentence clashes with the assertion of the first one.

- (4) #Half of the ten boys wrote two papers. But none of the ten boys is proud of both of his papers.

Indefinites as in (5), however, seemingly do not lead to an inference that all of the ten boys wrote two papers. Under a quantificational analysis, however, Heim [16] would derive exactly that as its presupposition.<sup>3</sup>

- (5) One of the ten boys is proud of both of his papers.

In addition, to different quantifiers projecting presuppositions differently from their scopes, Fox [12] has produced evidence suggesting that the environment in which the quantifier occurs in also affects the possible presuppositional inferences. As a solution to this issue of varying presupposition projection patterns, he has pursued an account couched in a Strong Kleene semantics (see also [21, 2, 14, 15, 11] a.o.). Such a system shows more flexibility in the presuppositions that it assigns to quantificational sentences than competing theories do. In a nutshell, there the presupposition of a sentence corresponds to the statement of what it takes for the sentence to be either true or false – i.e., for it to have a truth-value that is not the third one. Thus, it derives a disjunctive presupposition for all of the examples above, where one disjunct corresponds to what it takes for the sentence in question to be true and the other disjunct corresponds to what it takes for it to be false. Therefore, since (2) is just the negation of (5), they are predicted to have the same disjunctive presupposition: *‘Either all of the ten boys wrote two papers or some boy wrote two papers and is proud of both of them’*.

This presupposition is indeed weaker than the one predicted by Heim [16] and thus at first glance looks more promising in light of the contrast noted. Notice, however, that the second disjunct of this presupposition is equivalent to the assertive component of (5). Fox notes that this fact causes a potential issue. Assuming with Stalnaker [28] that presuppositions of sentences are requirements which must be met by the context, and that moreover the assertion of a sentence should not be entailed by the context in order for it to be informative, it follows that no context can entail the second disjunct of the predicted presupposition for (5) if it is to be asserted. Rather the first disjunct should be entailed because only this one allows the assertive component to be informative. But then one again derives an existential inference for positive indefinites, contrary to our conclusion from above.<sup>4</sup> For (2) no such issue arises. Given its assertion, the context should entail the first disjunct of its predicted presupposition, namely that every boy wrote two papers. A context entailing the second disjunct would be incompatible with the assertion of (2).

Summarizing, a more flexible system of presupposition projection making use of Strong Kleene semantics such as Fox’s [12] one is not fully satisfying to account for the contrast discussed above. Less flexible systems, however, are also not completely adequate. Heim’s [16] universal projection pattern, on the other hand, is needed for at least negative quantifiers. On the other hand, something like Beaver’s [3] weaker existential projection pattern is necessary for

<sup>2</sup>At this point, we haven’t been able to consider the data presented by Zehr et al. [31].

<sup>3</sup>Heim [16] being aware that this prediction might be problematic therefore assumes that the indefinite in (5) is not quantificational at all thereby avoiding the unwelcome result.

<sup>4</sup>Fox [12] shows that there are indeed situations where this universal inference might be adequate. But the issue that this inference appears too strong in many cases, and in particular in (5), remains as far as we can see.

positive indefinites it seems. It is not clear how one general system for presupposition projection can derive both kinds of projection patterns in a principled way, though.

The present paper proposes the following solution to the puzzle. Despite appearances, presupposition projection from the scope of quantifiers is uniform. In particular, following Heim [16] and Schlenker [24] it is always universal. We argue that apparent deviations from this universal projection pattern are due to differences in accommodation. Specifically, weaker existential inferences arise if the quantifier is acontextually restricted by accommodating the presupposition from its scope – so called intermediate accommodation (see [29] but cf. [3] for an opposing view). The choice between such a restriction and a vacuous restriction leading to a universal inference is negotiated by a weak version of the Strongest Meaning Hypothesis. We show that such a system does not only account for the data reviewed above but makes further welcome predictions: first, it correctly accounts for the presuppositional inferences licensed by other quantificational determiners. Second, it accounts for why projection patterns seemingly switch in entailment-reversing contexts.

## 2 The proposal

### 2.1 Accommodation and the Strongest Meaning Hypothesis

Given a sentence  $S$  with quantifier  $Q$  in it, we assume with Heim [16] that  $Q$  projects presuppositions universally from its scope. Contrary to Heim we include indefinites in the category of  $Q$  as existential quantifiers. Now, such a sentence  $S$  with a presupposition trigger in the scope of  $Q$  is in principle multiply ambiguous – that is,  $S$  is ambiguous with regards to the restriction of  $Q$ . And more specifically,  $S$  is ambiguous between interpretations  $S_U$  and  $S_D$ , where  $U$  is a vacuous restrictor on  $Q$  – with  $U$  standing for ‘Universe’ – and  $D$  is the non-empty restrictor on  $Q$  arising from accommodation of the presupposition in the scope of  $Q$ . In other words,  $S$  is ambiguous between (6a) and (6b), where  $R$  is the overt restrictor of  $Q$  and  $R'_P$  its scope with presupposition  $P$ .  $U$  and  $D$  are given in boldface in the following to differentiate them from  $R$ .

- $$(6) \quad \begin{array}{ll} \text{a.} & Qx[x \in R \cap \mathbf{U}][x \in R'_P] \quad (S_U) \\ \text{b.} & Qx[x \in R \cap \mathbf{D}][x \in R'_P] \quad (S_D) \end{array}$$

Given our assumption that presuppositions are generally projected universally from the scope of  $Q$ , the following holds:  $S_U$ , on the one hand, results in the strong universal presupposition (SUP) in (7a).  $S_D$ , on the other hand, results in the weak universal presupposition (WUP) in (7b). That is, SUP is an inference about all the individuals in  $R$  restricted by  $U$  – which amounts to all the individuals in  $R$  given that  $U$  is a vacuous restrictor – whereas WUP is a presupposition about all those individuals in  $R$  which are also in  $D$ . In case  $D$  does not include all the individuals that are in  $R$ ,  $S_D$  with its WUP leads to an inference that is weaker than the one arising from  $S_U$  with its SUP. Crucially, though the projection mechanism delivers the same result in both cases. Thus, strictly speaking it is not correct to refer to the WUP as an existential presupposition, at least not in the sense that, for instance, Beaver [3] uses the term.

- $$(7) \quad \begin{array}{ll} \text{a.} & \forall x[x \in R \cap \mathbf{U} \rightarrow x \in P] \equiv \forall x[x \in R \rightarrow x \in P] \quad (\text{SUP for } S_U) \\ \text{b.} & \forall x[x \in R \cap \mathbf{D} \rightarrow x \in P] \quad (\text{WUP for } S_D) \end{array}$$

Now, Dalrymple et al. [10] argued on the basis of ambiguity in reciprocal statements that out of the theoretically possible readings only the strongest reading compatible with the context and world-knowledge is available. They call this principle the Strongest Meaning Hypothesis. We make use of the weak version of the Strongest Meaning Hypothesis (wSMH) in (8). In

particular, according to wSMH reading  $S_D$  and with it WUP is only available if  $S_D$  itself is not tautologous and  $S_D$  is at least as strong as  $S_U$ .

- (8) *Weak version of the Strongest Meaning Hypothesis*  
 Given sentence  $S$  that is ambiguous between readings  $S_U$  and  $S_D$ , choose  $S_D$  only if  $S_D \neq \perp$ , and  $S_D$  either asymmetrically Strawson-entails  $S_U$  or  $S_D$  is Strawson-equivalent to  $S_U$ . Otherwise choose  $S_U$ .

Notice that the wSMH must use von Fintel's [30] notion of Strawson-entailment for comparing the strength of the two readings: given two propositions  $p$  and  $q$ ,  $p$  Strawson-entails  $q$  if and only if whenever  $p$  and the presupposition of  $q$  are true,  $q$  is true itself.<sup>5</sup> Given that  $S_U$  and  $S_D$  come with presuppositions, Strawson-entailment might hold even though classical entailment might not. Generally, Strawson-entailment is a weaker notion than classical entailment. Hence the name wSMH.

## 2.2 Application to universal and negative quantifiers and indefinites

Consider the contrast in (9) modeled on Fox's [12] example (3). While (9a) is acceptable as a continuation of the first sentence, (9b) is not.

- (9) Half of the ten boys wrote two papers. ...  
 a. Furthermore, one of the ten boys is proud of both of his papers.  
 b. #Furthermore, every one of the ten boys is proud of both of his papers.

The present proposal derives this contrast. Let us assume for simplicity that assertion and presupposition are conjoined at the scope level with the presuppositional component being underlined in the following representations. Then  $S_U$  and  $S_D$  are as in (10) for the sentences in (9), differing only in the quantifiers.  $B$  stands for the set containing the ten boys. Again  $U$  is the vacuous restrictor. Therefore  $B \cap U$  is just the set containing the ten boys.  $D$ , however, is non-vacuous. Since  $D$  is moreover required to accommodate the presupposition in the scope of the quantifier,  $D$  corresponds to the set of individuals who wrote two papers. Thus  $B \cap D$  is the set containing those individuals in  $B$  who wrote two papers. As a consequence,  $B \cap D \subseteq B \cap U$ .

- (10) a.  $Qx[x \in B \cap \mathbf{U}]$  [ $x$  wrote two papers and is proud of both of his papers] ( $S_U$ )  
 b.  $Qx[x \in B \cap \mathbf{D}]$  [ $x$  wrote two papers and is proud of both of his papers] ( $S_D$ )

Now, which of the readings in (10) does the wSMH choose for the sentences in (9)? Note that while *every* is Strawson-antitone on its restrictor, *one* is Strawson-isotone on its restrictor. In other words, the restrictor of *every* is an entailment-reversing environment, but the one of *one* is not.<sup>6</sup> Thus *every* allows inferences from sets to subsets in its restrictor. Therefore  $S_U$  asymmetrically Strawson-entails  $S_D$  for (9b), which can be shown by the paraphrases for  $S_U$  and  $S_D$  in (11). As a consequence of this, wSMH selects  $S_U$ , and a SUP inference is predicted for (9b): each of the ten boys wrote two papers. This clashes with the requirement of the preceding sentence. The result is deviance.

<sup>5</sup>More formally,  $p \in D_{(s,t)}$  Strawson-entails  $q \in D_{(s,t)}$  iff in all worlds  $w$  such that  $p(w) = 1$  and  $q(w) \neq \#$ ,  $q(w) = 1$ .

<sup>6</sup>We use the lattice theoretic terms *isotone* and *antitone* of Birkhoff [4] rather than the terms  $\pm$ *affective* or *up-/downward entailing*, but with the same meaning. I.e. Given  $f \in D_{(\sigma,\tau)}$  and  $x, y \in D_\sigma$  such that  $x$  Strawson-entails  $y$ ,  $f$  is Strawson-isotone iff  $f(x)$  Strawson-entails  $f(y)$ , and  $f$  is Strawson-antitone iff  $f(y)$  Strawson-entails  $f(x)$ .

- (11) Everyone of  $B \cap \mathbf{U}$  wrote 2 papers and is proud of both of his papers.  $(S_U)$   
 $\Rightarrow_S$   
 Everyone of  $B \cap \mathbf{D}$  wrote 2 papers and is proud of both of his papers.  $(S_D)$

*One*, on the other hand, only allows inferences from sets to their supersets in its restrictor. Hence,  $S_D$  Strawson-entails  $S_U$  for (9a), and in fact, the readings are Strawson-equivalent. Again, this can be clearly seen by the paraphrases in (12). Consequently,  $S_D$  is selected by wSMH. That is, we predict the WUP inference that one of the ten boys wrote two papers for (9a), which makes it a coherent continuation of the preceding sentence.

- (12) One of  $B \cap \mathbf{D}$  wrote 2 papers and is proud of both of his papers.  $(S_D)$   
 $\Leftrightarrow_S$   
 One of  $B \cap \mathbf{U}$  wrote 2 papers and is proud of both of his papers.  $(S_U)$

Finally, the degraded status of (13), repeated from (4) above, is also expected. Negative quantifiers like other negative expressions are Strawson-antitone, and in particular, they are Strawson-antitone on their restrictor. (14) gives the paraphrases for the  $S_U$  and  $S_D$  readings. Crucially, these correspond to universal statements with negation at the scope level – where negation, of course, does not affect the presuppositional component. As can be seen there is asymmetric Strawson-entailment from  $S_U$  to  $S_D$ . This means that we predict that  $S_U$  is selected by wSMH for the second sentence in (13) in parallel to the case with the universal quantifier. From this the SUP inference that each of the ten boys wrote two papers follows, which accounts for the deviance of (13).

- (13) #Half of the ten boys wrote two papers. But none of the ten boys is proud of both of his papers.  
 (14) Each of  $B \cap \mathbf{U}$  wrote 2 papers and isn't proud of both of his papers.  $(S_U)$   
 $\Rightarrow_S$   
 Each of  $B \cap \mathbf{D}$  wrote two papers and isn't proud of both of his papers.  $(S_D)$

### 3 Predictions and extension to other quantifiers

#### 3.1 Embedded Projectors

By default the wSMH applies at the sentence level (e.g. [26]). A prediction of this is that the projection properties of quantifiers can change when embedded in an antitone environment such as the antecedent of a conditional or under the predicate *doubt*. It appears that this prediction – with related data already discussed by Fox [12] from a different theoretical perspective – is correct, as the following examples illustrate. We have shown that (15a) is acceptable in the context of the preceding sentence due to its WUP inference. We now, add to this that (15b) and (15c) are somewhat degraded relative to (15a) when uttered in that same context. We submit that this is due to the antitone property of the antecedent of the conditional and *doubt* leading to the selection of  $S_U$  by wSMH and thereby a conflicting SUP inference. (16) shows the reverse behavior for negative quantifiers, which on their own trigger a problematic SUP inference but when themselves embedded in an antitone environment can trigger an unproblematic WUP inference. In the following, we indicate whether  $S_U$  or  $S_D$  is chosen by wSMH for a given example by notating the respective restrictor as a subscript on the quantifier.

- (15) Five of the ten boys wrote two papers. ...  
 a. One<sub>D</sub> of the ten boys is proud of both of his papers.

- b. #If one<sub>U</sub> of the ten boys is proud of both of his papers, he will submit them.
  - c. #I doubt that any<sub>U</sub> of the ten boys is proud of both of his papers.
- (16) Five of the ten boys wrote two papers. ...
- a. #None<sub>U</sub> of the ten boys is proud of both of his papers.
  - b. If none<sub>D</sub> of the ten boys is proud of both of his papers, no one will submit one.
  - c. I doubt that none<sub>U</sub> of the ten boys is proud of both of his papers.

We add to this that while entailment reversal can trigger a reversal in the reading selected by wSMH and while this indeed might be the preferred option, this need not happen. In particular, Sauerland [22] argues that the Strongest Meaning Hypothesis can apply locally. So, if the wSMH applies at the level of the antecedent of the conditional in the (b)- and (c)-examples above, the antitone property is immaterial and the same prediction as in the (a)-examples is made.

### 3.2 Modified Numerals

Chemla [7] shows experimentally that modified numerals like *more than n NP*, *exactly n NP*, and *fewer than n NP* all behave more similarly to indefinites than they do to universal or negative quantifiers with regards to the presuppositional inferences they allow for. Let us therefore consider the predictions of the present proposal for modified numerals.

*More than n NP* is Strawson-isotone on its restrictor. Therefore generally  $S_D$  rather than  $S_U$  is the preferred option by wSMH. But which  $D$  does it choose? In the case of (17), for instance, no  $D$  with a cardinality lower than four can be selected by wSMH. The reason for this is that the wSMH does not take into account contradictions, and restricting the set of ten boys to a set with fewer than four boys in it contradicts the semantic contribution of *more than three*. Thus a  $D$  with a cardinality of at least four is chosen by the wSMH. As the paraphrase of the resulting  $S_D$  of (17) in (18) shows, this indeed Strawson-entails the  $S_U$  reading and is in fact Strawson-equivalent to it. The result is a WUP inference for (17) saying everyone in a group of at least four boys out of the ten boys wrote two papers.

- (17) More than three<sub>D</sub> of the ten boys are proud of both of their papers.
- (18) More than 3 of  $B \cap \mathbf{D}$  wrote 2 papers and are proud of both of their papers. ( $S_D$ )  
 $\Leftrightarrow_S$   
 More than 3 of  $B \cap \mathbf{U}$  wrote 2 papers and are proud of both of their papers. ( $S_U$ )

The remarks about *more than three NP* in (17) carry over to the non-monotonic *exactly three NP* in (19): its  $S_D$  is Strawson-equivalent to its  $S_U$  as their paraphrases in (20) make apparent. Once again wSMH selects  $S_D$  and we get a WUP inference for (19). This time it says that everyone out of a group of exactly three boys out of the ten boys wrote two papers.

- (19) Exactly three<sub>D</sub> of the ten boys are proud of both of their papers.
- (20) Exactly 3 of  $B \cap \mathbf{D}$  wrote 2 papers and are proud of both of their papers. ( $S_D$ )  
 $\Leftrightarrow_S$   
 Exactly 3 of  $B \cap \mathbf{U}$  wrote 2 papers and are proud of both of their papers. ( $S_U$ )

While our predictions for *more than three NP* and *exactly three NP* align with Chemla's [7] experimental findings, this is not straightforwardly the case for *fewer than three NP*. The latter is Strawson-antitone on its restrictor. As the paraphrases of  $S_U$  and  $S_D$  in (22) for the sentence in (21) show, a situation parallel to the one with negative indefinites obtains. wSMH is predicted to select  $S_U$ . That is, a SUP inference that each of the ten boys wrote two papers is derived.

- (21) Fewer than three<sub>D</sub> of the ten boys are proud of both of their papers.
- (22) For each group of 3 of  $B \cap \mathbf{U}$  each wrote 2 papers and isn't proud of both. ( $S_U$ )  
 $\Rightarrow_S$   
 For each group of 3 of  $B \cap \mathbf{D}$  each wrote 2 papers and isn't proud of both. ( $S_D$ )

However, Chemla [7] shows an SUP inference to be inadequate for sentences like (21). Rather a weaker inference is observed. Now, Krifka [20] and Gajewski [13] independently argued that modified numerals like *fewer than n NP* can have an existential scalar implicature. That is, (21) is claimed to standardly lead to a strengthened interpretation as in (23). But since (23) is a non-monotonic environment, this affects which reading the wSMH selects. Parallel to *exactly three NP* above,  $S_U$  and  $S_D$  become Strawson-equivalent. Therefore wSMH selects  $S_D$ , and we are after all able to correctly predict a WUP inference for (21) according to which everyone of some group with one or two boys wrote two papers.

- (23) 'Fewer than three of the ten boys are proud of both of their papers, but some of the ten boys are proud of both of their papers.'

### 3.3 Only

Note that (19) above contrasts sharply with the minimally differing (24) with *only three* instead of *exactly three*. (19), on the one hand, licenses the WUP inference saying that each boy out of a group of exactly three boys out of the ten boys wrote two papers. (24), on the other hand, seemingly licenses the stronger inference that all of the ten boys wrote two papers. This is somewhat surprising given that (24) seemingly entails that exactly three of the ten boys are proud of both of their papers.

- (24) Only three<sub>U</sub> of the 10 boys are proud of both of their papers.

Note, however, that under Horn's [17] semantics for *only* its literal meaning consists of both a presuppositional and an assertive component. This view has become standard, and we therefore adopt it. Furthermore for concreteness and simplicity let us assume with Buring and Hartmann [5] that *only* in (24) is a sentential operator as in (25). Nothing hinges on this, though.

- (25) only [three of the ten boys are proud of both of their papers]

For present purposes it then suffices to assume that *only* in (24) contributes the presupposition that the prejacent is true and asserts that every alternative with a cardinal higher than *three* is false.<sup>7</sup> This derives for  $S_U$  and  $S_D$  the presuppositional and assertive components in (26). Now, recall that the wSMH makes use of Strawson-entailment rather than classical entailment. Thus when checking whether  $S_U$  Strawson-entails  $S_D$ , the presupposition of the latter is assumed to be true.<sup>8</sup> As a consequence, strictly speaking only the assertive components of  $S_U$  and  $S_D$  matter for the wSMH. And since *only* is Strawson-antitone in its assertive component as the asymmetric entailment relation in (26) shows, wSMH selects  $S_U$ . This means the present account predicts a SUP inference for (24) saying that all of the ten boys wrote two papers.

- (26) 3 of  $B \cap \mathbf{U}$  wrote 2 papers and are proud of both. (prsp.  $S_U$ )  
 For each group of 4 of  $B \cap \mathbf{U}$  each wrote 2 papers and isn't proud of both. (asrt.  $S_U$ )  
 $\Rightarrow_S$   
 3 of  $B \cap \mathbf{D}$  wrote 2 papers and are proud of both. (prsp.  $S_D$ )  
 For each group of 4 of  $B \cap \mathbf{D}$  each wrote 2 papers and isn't proud of both. (asrt.  $S_D$ )

<sup>7</sup>All of this is rather uncontroversial. For discussion on how the compositional semantics of *only* is to derive these inferences, we refer the reader to Coppock and Beaver [9] and references therein.

<sup>8</sup>In fact, the presuppositional components of  $S_U$  and  $S_D$  are Strawson-equivalent.

The fact that the present system accounts for the contrast in presuppositional inferences between *exactly n NP* and *only n NP* is strong evidence in its favor.<sup>9</sup>

### 3.4 Proportional quantifiers

Consider next the proportional quantifier *most of the NP*. In contrast to non-monotonic *exactly three NP*, it appears to lead to a presuppositional inference for (27) that all of the ten boys wrote two papers.

(27) Most<sub>U</sub> of the ten boys are proud of both of their papers.

Even though *most of the NP* is Strawson non-monotone, the wSMH does not allow for restriction by *D*. This is due to its proportionality. As (28) shows, the *S<sub>U</sub>* reading asymmetrically entails the *S<sub>D</sub>* reading. We thereby predict an SUP inference for (28) according to which all of the ten boys smoke.

(28) Most of  $B \cap \mathbf{U}$  wrote 2 papers and are proud of both of their papers. (*S<sub>U</sub>*)

$\Rightarrow_s$

Most of  $B \cap \mathbf{D}$  wrote 2 papers and are proud of both of their papers. (*S<sub>D</sub>*)

Notice that if *D* did not accommodate the presupposition in the scope of *most of the NP* but denoted a simple subset of *U*, there would not be any entailment between *S<sub>U</sub>* and *S<sub>D</sub>*. As a consequence, an *S<sub>D</sub>* reading would be possible for (28). But this could lead to an unwanted inference that, for instance, most of a group of four boys out of the ten are proud of both of their papers. By accommodation we avoid this problematic prediction.<sup>10</sup>

### 3.5 Anaphoric Triggers

Charlow [6] argues so-called strong presupposition trigger like *also* trigger a universal presuppositional inference even from the scope of indefinites. He cites the infelicity of the sequence in (29) as evidence for this claim. That is, the second sentence in (29) is said to lead to the inference that all of the hundred boys smoked something other than Marlboro in the past, which is incompatible with the preceding sentences.

(29) Just half of these 100 boys smoked in the past. They have all smoked Nelson.

#Unfortunately, some<sub>U</sub> of these 100 boys have also smoked Marlboro.

Now it is well-known that strong triggers do not easily allow for accommodation. Chemla and Schlenker [8] give the example in (30), to substantiate this point (also see [25, 1, 19]): if the presupposition of the strong trigger *too* – that the speaker gave a black eye to someone other than Susie – could be locally accommodated under *but*, Bill’s reply should be felicitous. The fact that it is not suggests that *too* does not allow local accommodation.

(30) Teacher: Johnny claims that you gave him a black eye. Is this true?

Bill: I don’t know, but #if I give Susie a black eye too, they’ll be twins.

Now, recall that in the present system restriction by *D* always involves accommodation of the presupposition in the scope of the quantifier. But if accommodation of the presupposition of *also* in (29) is not allowed, for the reasons just discussed, then the *S<sub>U</sub>* reading with the universal SUP that all of the hundred boys have smoked something other than Marlboro in the past is predicted. Thus we predict the infelicity of (29).

<sup>9</sup>Spector and Sudo [27] presumably also derive the correct result for *only n NP*. It is currently not clear to us, however, what their predictions for *exactly n NP* are.

<sup>10</sup>We thank Yasutada Sudo (p.c.) for raising this issue.



## 4 Conclusion

We showed that the wSMH viewed as a restriction on when presuppositions can be accommodated in the restrictors of quantifiers predicts the core data of presupposition projection from the scopes of quantifiers. While this solution is formally similar to the one pursued by Fox [12] in that they both make presupposition projection dependent on both the quantifier and the overall linguistic context, our account seems preferable for two reasons: first, it has fewer difficulties with indefinites than Fox’s, and second it has wider empirical coverage.

## References

- [1] Dorit Abusch. Lexical alternatives as a source of pragmatic presupposition. In Brendan Jackson, editor, *Proceedings of SALT XII*, pages 1–19, Cornell University, Ithaca, NY, 2002. CLC Publications.
- [2] David Beaver and Emiel Krahmer. A partial account of presupposition projection. *Journal of Logic, Language and Information*, 10:147–182, 2001.
- [3] David I. Beaver. *Presupposition and Assertion in Dynamic Semantics*. CSLI Publications, Stanford University, 2001.
- [4] Garrett Birkhoff. *Lattice Theory*. American Mathematical Soc., 1940.
- [5] Daniel Büring and Katharina Hartmann. The syntax and semantics of focus-sensitive particles in German. *Natural Language and Linguistic Theory*, 19:229–281, 2001.
- [6] Simon Charlow. “Strong” predicative presuppositional objects. In *Proceedings of ESSLLI*, 2009.
- [7] Emmanuel Chemla. Presuppositions of quantified sentences: experimental data. *Natural Language Semantics*, 17(4):299–340, 2009.
- [8] Emmanuel Chemla and Philippe Schlenker. Incremental vs symmetric accounts of presupposition projection: an experimental approach. *Natural Language Semantics*, 20(2):177–226, 2012.
- [9] Elizabeth Coppock and David Beaver. Principles of the exclusive muddle. *Journal of Semantics*, 31:371–432, 2014.
- [10] Mary Dalrymple, Makoto Kanazawa, Yookyung Kim, Sam Mchombo, and Stanley Peters. Reciprocal expressions and the concept of reciprocity. *Linguistics and Philosophy*, 21:159–210, 1998.
- [11] Danny Fox. Two short notes on Schlenker’s theory of presupposition projection. *Theoretical Linguistics*, 34:237–252, 2008.
- [12] Danny Fox. Presupposition projection from quantificational sentences: trivalence, local accommodation, and presupposition strengthening. In Ivano Caponigro and Carlo Cecchetto, editors, *From Grammar to Meaning: The Spontaneous Logicality of Language*, pages 201–232. Cambridge University Press, Cambridge, 2013.
- [13] Jon R. Gajewski. Licensing strong NPIs. *Natural Language Semantics*, 19(2):109–148, 2011.

- [14] Benjamin George. Predicting presupposition projection: some alternatives in the Strong Kleene tradition. ms. UCLA, 2008.
- [15] Benjamin George. A new case for an old logic: reviving Strong Kleene approaches to presupposition projection. ms. UCLA, 2010.
- [16] Irene Heim. On the projection problem for presuppositions. In Daniel P. Flickinger, editor, *Proceedings of WCCFL 2*, pages 114–125, Stanford University, Stanford, California, 1983. CSLI Publications.
- [17] Laurence R. Horn. A presuppositional analysis of *only* and *even*. In *Papers from the 5th annual meeting of the Chicago Linguistics Society*, pages 98–108, Chicago, 1969. Chicago Linguistics Society.
- [18] Lauri Karttunen. Some observations on factivity. *Papers in Linguistics*, 4(1):55–69, 1971.
- [19] Nathan Klinedinst. Totally hardcore semantic presuppositions. In A. Capone, F. L. Piparo, and M. Carapezza, editors, *Perspectives on Pragmatics and Philosophy*. Springer, 2012.
- [20] Manfred Krifka. At least some determiners aren’t determiners. In K. Turner, editor, *The semantics/pragmatics interface from different points of view*, pages 257–291. Elsevier Science B.V., Amsterdam, 1999.
- [21] Stanley Peters. A truth-conditional formulation of Karttunen’s account of presupposition. *Synthese*, 40:301–316, 1979.
- [22] Uli Sauerland. Where does the Strongest Meaning Hypothesis apply? *Snippets*, 25:13–14, 2012.
- [23] Philippe Schlenker. Be articulate! A pragmatic theory of presupposition projection. *Theoretical Linguistics*, 34:157–212, 2008.
- [24] Philippe Schlenker. Local contexts. *Semantics and Pragmatics*, 2:1–78, 2009.
- [25] Mandy Simons. On the conversational basis of some presuppositions. In Rachel Hastings, Brendan Jackson, and Zsófia Zvolenszky, editors, *Proceedings of SALT XI*, pages 431–448, Cornell University, Ithaca, NY, 2001. CLC Publications.
- [26] Benjamin Spector. Global positive polarity items and obligatory exhaustification. ms. Institut Jean Nicod, 2013.
- [27] Benjamin Spector and Yasutada Sudo. Presupposed ignorance and exhaustification: How scalar implicatures and presuppositions interact. ms. Institut Jean Nicod, CNRS-ENS-EHESS University College London, 2014.
- [28] Robert C. Stalnaker. Assertion. *Syntax and Semantics*, 9, 1978.
- [29] Rob van der Sandt. Presupposition projection as anaphora resolution. *Journal of Semantics*, 9:333–377, 1992.
- [30] Kai von Stechow. NPI licensing, Strawson entailment, and context dependency. *Journal of Semantics*, 16:97–148, 1999.
- [31] Jérémy Zehr, Cory Bill, Lyn Tieu, Jacopo Romoli, and Florian Schwarz. Experimental evidence for existential presupposition projection from *none*. In *Amsterdam Colloquium 2015*, 2015.