Structural asymmetry in question/quantifier interactions

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Abstract

When universal quantifiers, such as *every* and *each*, interact with question words, this interaction gives rise to structural ambiguities. In this paper we show using an acceptability judgment task that even though the distributivity force of a universal quantifier affects the likelihood of its wide scope reading, pair-list answers still remain less available in questions with object quantifiers than in questions with subject quantifiers. We discuss how these findings fit into the existing analyses of quantifier scope in relation to quantifier semantics and discourse structure.

1 Introduction

Questions with universal quantifiers may be structurally ambiguous and allow multiple readings. The question in (1) can be understood as (1a) where there is a single assignment that every student completed, or as (1b), where there are pairings of students and their individual assignments. Finally, we could specify the pairings of students and assignments not extensively by listing them, but rather by naming a function. In this case – the hardest assignment (1c), which is presumably different for every student.

(1) Which assignment did every student complete?

a. The semantics assignment. *Single answer*

b. John completed the semantics assignment, Jane completed the syntax assignment, and Mary completed the phonology assignment. *Pair-list answer*

c. The hardest assignment. *Functional answer*[1]

May (1985) was one of the first to observe that the position of the quantifier determines the range of possible answers: pair-list answers (PLA) are lacking for questions with object quantifiers, such as (2).

(2) Which student completed every assignment?

[1] Functional answers are not the focus of this paper and will not be discussed further here.

a. Mary.
b. *John completed the semantics assignment, Jane completed the syntax assignment, and Mary completed the phonology assignment.

However, this structural restriction on PLA availability does not hold for all universal quantifiers equally. PLAs to questions with *each* (3) in object position freely allow pair-list readings, indicating that the wide scope of the quantifier is possible.

(3) Which student completed each assignment?
John completed the semantics assignment, Jane completed the syntax assignment, and Mary completed the phonology assignment.

In this paper, we show using experimental tools that the structural position of the quantifier in fact affects the accessibility of a PLA regardless of the lexical differences between universal quantifiers, such as *every* and *each*. The rest of the paper is structured as follows: we first review the theoretical background explaining the role of structure and quantifier semantics. We follow with the results of our acceptability judgment experiments. We conclude with a discussion of the subject-object asymmetry and speculate about the possible sources of this effect.

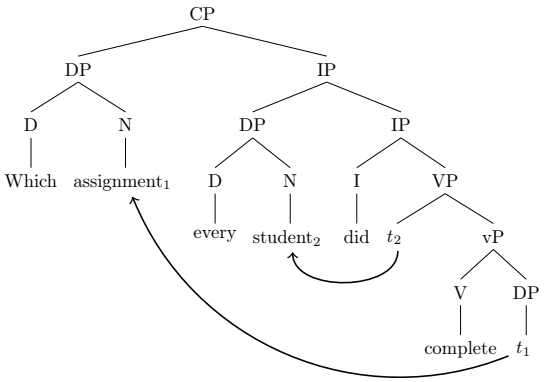
2 Theoretical background

2.1 Structural limits on the wide scope reading of quantifiers

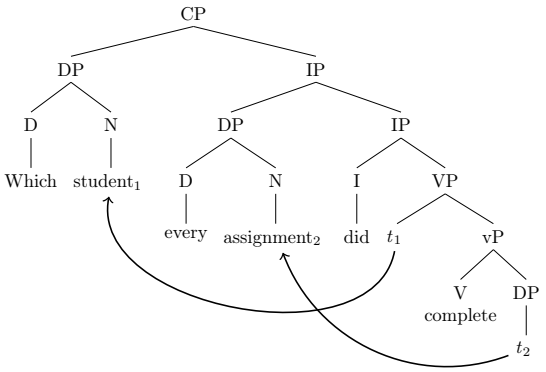
The observation that certain questions with object quantifiers lack pair-list readings led to the development of several analyses to account for this fact. We will first review the accounts that attribute the inability of object quantifiers to take wide scope over a *wh*-phrase to structural reasons.

May (1985) attributes the inability of object quantifiers to scope over a *wh*-phrase to a violation of constraints on movement. In May's view, the inverse scope of a quantifier phrase and a *wh*-phrase is possible if they can form a special $\sum$-sequence. Members of the $\sum$-sequence are governed by the same maximal projection. If such a formation is possible, members of the sequence can freely interact and scope over each other giving rise either to a single answer or to a PLA. While subject quantifiers can raise to a position close enough to the *wh*-phrase (4) to form a $\sum$-sequence, the movement path of an object quantifier must cross the movement path of a subject *wh*-phrase (5) to join with the *wh*-phrase.

(4)



(5)



This path crossing in (5) then violates the Path Containment Condition (PCC) proposed by Pesetsky (1982) who argues that multiple movement paths must embed rather than cross. What we have in the end is the inability of an object quantifier phrase and a *wh*-phrase to form an appropriate $\sum$-sequence that could license an inverse scope reading of the quantifier phrase. Hence, there can be no PLAs for questions, such as (2). May's structural account of the subject-object asymmetry in the availability of PLAs is related to other subject-object asymmetries known as Comp-trace effects (Pesetsky (1982), among others). The view that Comp-trace effects result only from characteristic structural asymmetry has been questioned in works starting with Déprez (1991) and Déprez (1994).

Aoun & Li (1993) developed an alternative proposal that explains the inability of questions with object quantifiers to give rise to PLAs. Relying on evidence from Chinese and Spanish, as well as English, the authors argue against the PCC-based analysis of May, and propose a new analysis that relies on the Minimal Binding Requirement (MBR) (6) and the newly defined Scope Principle (7) (Aoun & Li, 1993:11).

(6) *The Minimal Binding Requirement (MBR)*
Variables must be bound by the most local potential antecedent (A'-binder).

(7) *The Scope Principle*
A quantifier A may have scope over a quantifier B iff A c-commands a member of the chain containing B.

In (8) the QP *everyone* is the most local binder for x_i – this satisfies the MBR. At the same time, the QP *everyone* does not qualify as a potential binder for the subject-*wh* trace x_j, since assignment of the index of *everyone* would result in a Principle C violation. There is no other potential intervening antecedent between *what* and the object trace x_j – the variable is then properly bound and the MBR is satisfied.

(8) What did everyone buy (for Max)? (Aoun & Li, 1993:58)
a. [what$_i$ [$_{\text{IP}}$ *everyone*$_i$ [$_{\text{IP}}$ [$_{\text{NP}}$ x_i] [$_{\text{I}'}$ [$_{\text{VP}_1}$ t_i [$_{\text{VP}_2}$ [buy x_j]]]]]]

According to the Scope Principle (7), both scopal readings are possible. Since *what* c-commands *everyone* and its variable, *what* has scope over the QP – a necessary configuration for a single answer (e.g. *Everyone bought coffee for Max*). For a PLA, we need a configuration where *everyone* c-commands the variable x_j within VP_2. We have this configuration for (8), so *everyone* can take scope over *what* and a pair-list reading is possible, making the question in (8) ambiguous.

Let us now see how the principles defined in (6) and (7) account for the lack of a PLA to a question with an object quantifier, such as (9) (Aoun & Li, 1993:61-62). Aoun & Li show that the quantifier *everything* can adjoin either to VP_2 (9a) or VP_1 (9b).

(9) Who bought everything?
a. [who$_i$ [x_i [$_{\text{VP}_1}$ t$_i$ [$_{\text{VP}_2}$ everything$_j$ [$_{\text{VP}_2}$ V x_j]]]]
b. [who$_i$ [x_i [$_{\text{VP}_1}$ everything$_j$ [$_{\text{VP}_1}$ t$_i$ [$_{\text{VP}_2}$ V x_j]]]]

The Scope Principle (7) predicts that the question in (9) should be ambiguous as well, since *everything* c-commands the object-*wh*-trace x_j. However, according to Aoun & Li (1993), the question in (9) is in fact non-ambiguous and only allows a configuration where *who* takes scope over *everything*. Hence, the authors stipulate that only the operators and intermediate traces (elements in A'-positions and not in θ-positions) are relevant for the determination of relative scope. Since the trace t_i in (9) does not count for the determination of scope, the only available configuration is one in which *who* takes scope over *everything*. The wide scope reading of *everything* is lacking. Hence, a PLA is ruled out for questions, such as (9) with the quantifier in object position.

Chierchia (1993) also challenges May's analysis proposing a different mechanism to account for the absense of pair-list readings for questions with object quantifiers. Chierchia uses constraints on pronominal binding to explain why

an object quantifier cannot take wide scope over the *wh-phrase*. *Wh*-phrases, he argues, are associated with two traces: a functional trace and an argument trace. The functional trace is bound by the *wh*-phrase that appears in Spec CP. The argument trace, co-indexed with an NP, acts like a pronominal element, and may be bound by the quantifier. If the binding is possible, the question has a pair-list reading. In (10a), for example, the binding allows extracting the information about the domain of a function which, in turn, provides pairings of people and those who love them (10b).

(10) a. Who does everyone love?
b. Mary loves John, and Sue loves Peter.

While binding is possible for questions with subject quantifiers, and thus a PLA is available, object quantifiers trying to bind the pronominal trace give rise to a Weak Crossover (WCO) effect – a general constraint on pronominal binding. WCO emerges when the movement an element, here the *wh*-term, crosses over a pronominal trace, like in (11).

(11) Who$_i$ does his$_i$ mother love t_i?
His$_i$ mother loves every boy$_i$.

In questions, the quantifier fails to bind the pronominal trace left by *wh*-movement, like in (12). Thus, no PLA is possible for such questions.

(12) Who$_i$ t_i^j loves everyone$_j$?

Agüero-Bautista (2001) develops yet another account to capture the same subject-object asymmetry in the availability of PLAs. He appeals to the notion of reconstruction and argues that reconstruction of a *wh*-phrase below the quantifier is necessary for an inverse scope reading to obtain. While subject quantifiers can always scope over some reconstructed position of an object question, object quantifiers, which only rise as high as the vP domain, will only be able to scope over the lowest position of a reconstructed subject *wh*, i.e. its original θ-position. Agüero-Bautista further specifies that only non-presuppositional *wh*-phrases, such as *who* but not *which NP* can reconstruct into their θ-position inside the vP. Hence, he predicts that PLAs are possible for questions with *who* interacting with an object *everything/everyone*, but not for *which*.

In sum, while the analyses differ in the precise mechanisms they use to explain the inability of questions with object quantifiers to give rise to a PLA, they all appeal to a difference in structural position to predict that PLAs should be ruled out with a quantifier in object position. Yet these accounts start to diverge in their predictions once we pay attention to the type of the quantifier involved. For May (1985) and Chierchia (1993) both universal quantifiers, *every* and *each* are predicted to pattern alike since both are assumed to obey constraints on movement (PCC) and pronominal binding (WCO) in the same way. Agüero-Bautista (2001) goes further by proposing that different quantifiers can raise to different structural positions depending on the force of their distributivity, and consequently can have different scopal behavior. In the next section, the

relations between quantifier scope and distributivity is discussed, with a focus on how distributivity ultimately affects the availability of a PLA.

2.2 Quantifier distributivity and scope

Beghelli (1997) proposed that the distributive properties of universal quantifiers can affect their syntactic behavior. To be more precise, he argues that strongly distributive quantifiers such as *each* are able to override the structural restrictions on QR proposed in earlier structural accounts, and take wide scope even when they occur in object position. This analysis is crucially different from May's structure-only account reviewed above, as it suggests that the semantic properties of quantifiers have the potential to affect and even cancel out structural constraints.

There are several syntactic environments where the differences between *every* and *each* in their ability to take inverse scope can be observed. One of them concerns the interaction with negation. In (13) both scopal readings are available: the first corresponds to the inverse scope (13a) and the second to the surface scope (13b).

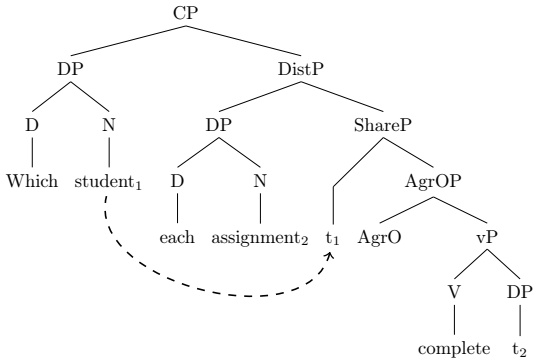
(13) Every horse didn't jump over the fence. (Musolino, 1998)
   a. It is not the case that every horse jumped over the fence ('some reading').
   b. For every horse it is true that it did not jump over the fence ('none reading').

However, the pattern is different for *each*: only the surface scope (14b) is available and the inverse scope (14a) is not possible for (14). Beghelli & Stowell (1997) argue that *each* occupies a position higher than negation (NegP), so the inverse scope 'some reading' (14a) where negation takes scope over the quantifier phrase {negation » each} is unavailable.

(14) Each horse didn't jump over the fence.
   a. *It is not the case that each horse jumped over the fence. 'some reading'
   b. For each horse it is true that it did not jump over the fence. 'none reading'

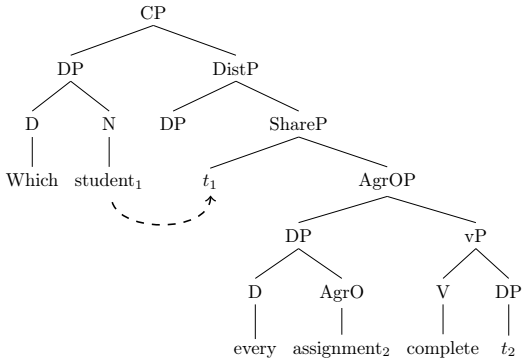
Beghelli & Stowell propose a hierarchy of syntactic positions where DistP – a position where strong distributive quantifiers raise – dominates ShareP – a projection where subjects get agreement. Let us now see what predictions this hierarchy makes for questions with object quantifiers. In (15) *each* is able to take scope over the reconstructed subject *wh*-phrase. Hence, a PLA is possble for (15).

(15) Which student completed each assignment?



In contrast, for Beghelli & Stowell (1997) the quantifier *every* cannot raise as high as *each* from an object position. Its highest possible landing site then is the AgrOP - a site for object agreement. As a consequence, the subject *wh*-phrase has no place to reconstruct below the quantifier , as in (16), and a PLA is not possible for (16).

(16) Which student completed every assignment?



In Beghelli's terms, the quantifier *each* is strongly distributive: it exhibits its ability to target the DistP as a raising cite in any syntactic environment. On the other hand, *every* needs special syntactic circumstances (being bound by existential closure) to raise as high, and hence it is pseudo-distributive. In that scence, we talk about the distributivity force of a quantifier. Tunstall (1998) formulates the difference between the two quantifiers by establishing requirements on the event structure that these quantifiers have. She proposes that *each* has a stricter requirement on the event distributivity structure – the differentiation requriement: the events must be differentiated on some dimension, such as time or space, for example.

Additional evidence for the role of distributivity force of quantifiers in determining the possibility of inverse scope comes from experimental studies. Brasoveanu & Dotlačil (2015) tested the ability of *each* and *every* to give rise to an inverse scope reading in declarative sentences. Using a binary choice and a self-paced reading tasks, the authors show that the quantifiers have distinct sco-

pal behavior. They found that *each* increases the probability of inverse scope by approximately 17% in a binary choice task. In a self-paced reading experiment, Brasoveanu & Dotlačil found that greater processing difficulty is associated with the inverse scope reading of the quantifier *every* as compared to *each* when a resultative predicate was present. The authors suggest that this behavior of *each* follows from its differentiation requirement (Tunstall, 1998).

Taken together, the theoretical proposals of Beghelli (1997) and Tunstall (1998), as well as the experimental evidence presented in Brasoveanu & Dotlačil (2015) confirm that *each* has a higher ability to give rise to an inverse scope reading. In terms of *wh*-questions with quantifiers, we expect questions with *each* to allow PLAs more easily than questions with *every* regardless of the syntactic position of the quantifier.

2.3 Summary

Accounts that rely purely on structural factors, such as May (1985), Aoun & Li (1993), and to some extent Chierchia (1993), differ from proposals that take into consideration the semantics of quantifiers (Beghelli, 1997) or *wh*-phrases Agüero-Bautista (2001) in the predictions they make for PLA availability. In this paper we directly tested the predictions of these two families of accounts using experimental tools. We studied the acceptability of PLAs in different conditions with the following questions in mind:

1. Do questions with subject quantifiers allow PLA more readily than questions with object quantifiers regardless of the quantifier type?

2. Does the quantifier type affect the availability of PLA?

3. Can the quantifier type supersede differences due to quantifier position? In other words, does the subject-object asymmetry affect only questions with *every* but not with *each*?

Let us quickly review the predictions. If the distributivity force of quantifiers affects their scopal behavior, we expect that participants should find PLAs more acceptable in questions with *each* than in questions with *every*. Concerning the role of quantifier position in the acceptability of PLAs, the picture is more complex. If both quantifiers obey the same structural restrictions, as some earlier accounts suggested (May, 1985; Aoun & Li, 1989), a higher acceptability level for questions with subject quantifiers as compared to object quantifiers should be observed. However, if the quantifier semantics also matters, we should see an effect of quantifier position with *every* but not with *each* (Beghelli, 1997; Agüero-Bautista, 2001).

3 Experimental data

We testded the acceptability of PLAs as a response to questions with quantifiers using a Likert-scale to assess the relative weight of structure and quantifier

semantics. In a 2x2x2 design we manipulated quantifier position in questions (subject or object quantifier), the type of the quantifier used (*every* vs. *each*), and the type of answer (a single answer vs. a PLA). Structural and semantic accounts make different predictions regarding the acceptability of PLAs. If all universal quantifiers obey the structural constraints on movement (either in May's (1985) or Chierchia's (1993) perspective), we expect to see a lower acceptability for PLAs to questions with object quantifiers than to questions with subject quantifiers accross the board. However, the semantic accounts (Beghelli, 1997) entail that PLAs should be possible and acceptable for questions with *each* regardless of the quantifier position, while questions with *every* should show the subject-object asymmetry, and only allow PLAs when *every* is in subject position.

3.1 Method

Materials and procedure. Participants were randomly assigned to one of the four randomized item-lists. The experiment started with the presentation of three practice questions. The main test lasted approximately 15-20 minutes. Participants could take as long as they wanted to give their answers, but they were not allowed to return to a previous question and change their responses. Each trial consisted of a question and an answer to that question. The task was to determine whether that answer was a possible answer to the relevant question on a $1-7$ scale (where 1 was 'definitely no' and 7 'definitely yes', other values not labeled). A sample question is given in (17).

(17) Which driver took everybody home last night?
Tom took Ms. Franko, Bob took Ms. Dombovski, and Jack took Mr. Perkins.

Participants rated 32 critical items (8 conditions, 4 items per condition) and 60 control/filler statements, which included answers to questions with *wh*-words only (18), quantifiers only (19), questions with clearly acceptable (20) or unacceptable answers (21), questions allowing PLAs (22), as well as questions with pragmatically odd answers (23).

(18) Which countries share a border with the US?
Canada and Mexico.

(19) Did each doctor get a license?
No, only 2 of them did.

(20) Which animal in this zoo is the tallest one?
The giraffe.

(21) Did you read every book on the list?
Yes, I read 3 out of 8.

(22) Who bought what?
Mary bought the cheese, Sue bought the milk, and Jim bought the

potatoes.

(23) Which girls ate the cake?
Mary did.

The experiments were run using the Survey Monkey software (SurveyMonkey.com, LLC).

Participants. 29 undergraduate students, all native speakers of English, participated in this experiment. They received course credit for their participation.

3.2 Results and discussion

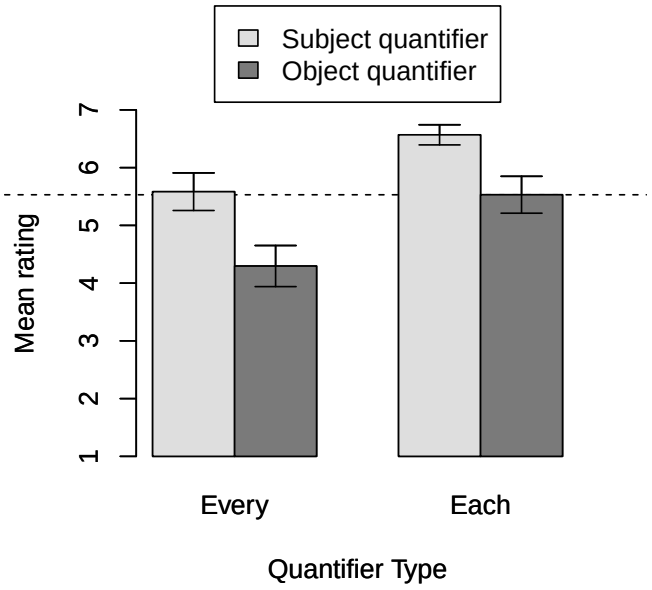
We fitted cumulative link mixed models to compare the acceptability ratings for PLAs in different conditions. Our dependent measure was a rating on a 7-point scale, indicating how acceptable the subjects found a given answer. The fixed effects included quantifier position and quantifier type. We built in the maximal random effect structure that still converged (as per Barr et al. (2013)). In our case these were random intercepts for subjects and items, as well as random slopes for subjects and quantifier position and quantifier type. The analysis revealed that overall, PLAs to questions with *each* were more acceptable than those to questions with *every* ($\beta = -1.385, SE = 0.334, p < 0.01$), confirming the predictions of Beghelli (1997), Tunstall (1998), and the experimental findings of Brasoveanu & Dotlačil (2015) (Figure 1).

We observed an unexpected result with respect to the structural factor: it is significant for both quantifiers ($\beta = 2.699, SE = 0.769, p < 0.01$), and the interaction between quantifier type and quantifier position is insignificant ($\beta = -0.78, SE = 0.867, p = 0.368$). We can directly compare the magnitude of the asymmetry for the two quantifiers using a Bayesian t-test. It returns a Bayes Factor of 5 in favor of a hypothesis that the difference between the ratings for PLAs to questions with subject vs. object quantifiers is the same for *every* and *each*. A Bayes Factor of 5 corresponds to substantial evidence on Jeffreys (1961) scale, suggesting that structure plays a similar role in determining PLA availability for the two quantifiers types studied here.

Let us now consider what these facts mean. Figure 1 reveals that there is an asymmetry with the quantifier *every*, as all the theoretical accounts predict. PLAs to questions with subject quantifier *every* are more acceptable than PLAs to questions with object-*every*. Second, overall PLAs to questions with *each* are more easily accessible than PLAs to questions with *every*, as suggested by the analyses taking into account the distributive force of a quantifier (Beghelli, 1997; Tunstall, 1998).

We also see in Figure 1 that PLAs to questions with object-*each* are less acceptable than PLAs to questions with subject-*each*. While such an asymmetry has several straightforward explanations when the quantifier is *every*, things are a lot more complicated for *each*. We cannot argue that PLAs to questions with object-*each* are ruled out due to a violation of some structural constraint. Otherwise, we would be forced to argue that such PLAs are not acceptable,

Figure 1: Acceptability ratings for PLAs depending on quantifier position and quantifier type



and pair-list readings of questions with object-*each* unavailable. Both of these claims are problematic, since a) we observe a rather high average rating for PLAs to questions with object-*each*, and b) PLAs to questions with *subject-every* fall in the same category: the mean rating for PLAs to questions with object-*each* is 5.53 and subject-*every* – 5.58 on a 7-point scale. In other words, if we declare anything below the 5.53 line as being ungrammatical, we would have to assume that the PLAs to questions with *every* are unavailable altogether regardless of the quantifier position. This is clearly wrong: both the naïve speakers' judgments and the theoretical predictions converge here: questions with at least subject-*every* can have pair-list readings and are indeed ambiguous between allowing a single or a pair-list answer. A question then arises: what is driving this difference between subjects and objects, if it is not a violation of a grammatical constraint?

In order to account for the subject-object asymmetry effect with *each*, we need an analysis that would 1) predict that PLAs to questions with object quantifiers are less acceptable than PLAs to questions with subject quantifiers; 2) would not completely rule out the possibility of a pair-list reading for a question with an object quantifier, since PLAs to questions with object-*each* are acceptable.

4 Nature of the subject-object asymmetry in scopal interactions

The diverging scopal behavior of different universal quantifiers has long been known. However, it has remained unclear to what extent quantifier semantics can override structural considerations on the availability of PLAs. We tested the ability of *each* and *every* to give rise to pair-list readings in questions. While as predicted by Beghelli (1997), PLAs to questions with *each* are more acceptable than analogous answers to questions with *every*, we found an unexpected effefct – structure still plays as much of a role for questions with the quantifier *each* as it does for questions with the quantifier *every*. To be more precise, we observe an asymmetry between the acceptability of PLAs depending on the structural position of the quantifier even for the quantifier *each*. Questions with subject quantifiers give rise to PLAs more easily than questions with an object quantifier – a conclusion expected for *every* but not at all for *each*.

What is puzzling about the asymmetry oberved with *each* is the possible source of such an asymmetry. Recall that the asymmetry with *every* has been attributed to a number of factors, including the fact that object-*every* is unable to form a proper syntactic configuration where it could take wide scope over an intermediate trace (Aoun & Li, 1993), a reconstucted copy (Agüero-Bautista, 2001), or form a $\sum$-sequence with the *wh*-phrase (May, 1985). According to these analyses, the grammar rules out the {object-*every* » *wh*-phrase} scopal configuration.

However, for *each*, a PLA is permitted from a structural perspective both when *each* occurs in subject and in object position. We can therefore argue that wherever the difference in acceptability comes from, it cannot stem from one configuration being grammatical and the other not. Rather, we should search for possible sources of this difference elsewhere, and we suggest, following Krifka (2001), that we turn to the information structure of a question.

According to Krifka (2001), the subject-object asymmetry effect arises from the different abilities of subjects and objects to act as topics, and therefore take wide scope. The latter is an essential part of being able to give rise to a PLA. Endriss (2009) also relates the wide scope abilities of a phrase and its topichood status. She argues that only topic-phrases are able to take wide scope. In the case of questions with quantifiers, we would then say that a quantifier phrase has to be the topic of a question in order to take scope over the *wh*-phrase, and give rise to a PLA.

Following Lambrecht (1996) and Lambrecht & Michaelis (1998), Eilam (2011) suggests that questions have the information structure focus (normally the *wh*-phrase) and the ground (the rest of the question), just like declarative sentences do. Yet, unlike the focus in a declarative sentence, the *wh*-phrase does not contribute new information. Rather, the focus status of a *wh*-phrase is a biproduct of the pragmatic status of a question. Eilam suggests that the *wh*-phrase the only candidate for question focus, since the rest of the question is typically given. We could then hypothesize that the quantifier phrase can act as a question topic.

It is extremely difficult to define what precisely a topic is. Endriss (2009) distinguishes two main components of topichood discussed in the literature: abouteness and familiarity. Endriss argues against including the familiarity part in the notion of topichood and follows Reinhart's (1981) definition of topichood as pragmatic aboutness. Reinhart (1981) discusses what it actually means to be about something. Since Reinhart focuses on declarative sentences, we will first lay out her view for declarative sentences, and later we will show how Eilam (2011) applies her theory to questions.

Reinhart (1981) appeals to the notion of a context set to introduce the notion of aboutness. Following Stalnaker (1978), she defines a context set as a set of propositions that "we accept to be true at this point" (Reinhart, 1981:78). During a conversation, interlocutors add new propositions to the context set. The crucial part of her analysis lies in the internal structure of the context set. For practical reasons, Reinhart suggests, it is unlikely that the context set is organized as a list of all the propositions in it. Rather, tha context set is centered around some topic, just like a library catalogue, using her metaphor. We could them think of NP-topics as referential entries under which we organize propositions in the context set.

Jaeger (2003) considers how the notion of topichood applies to questions. He defines the topic of a question as what the question primarily requests information about. Eilam (2011) further explains that the topic of a question is an address where the information contributed by the focus of a question will be stored. The information structure of a question ensures that their context set will be properly updated in the course of a conversation.

Quantifiers are probably not ideal candidates for being a topic even in a declarative sentence, since they are not referential Endriss (2009). However, Reinhart (1981) specifies that we could think of universally quantified NPs as denoting sets. In that sense, sentences containing universally quantified NPs can be understood as asserting something about the sets and their members. Topichood tests also confirm that universally quantified NPs can in principle be topics. For example, Endriss (2009) shows that universally quantified DPs can occur in German in the middle field position – a position where topics normally occur (Frey, 2004).

Let us now turn to *wh*-questions with universal quantifiers, and see how the information structure account would explaim the observed subject-object asymmetry. PLAs are normally available for questions with subject quantifiers, since subjects tend to be topics. Evidence for that generalization comes from the works of Li & Thompson (1976), Reinhart (1981), Lambrecht (1996), Erteschik-Shir (1997), and Krifka (2001)[2]. Objects, on the other hand, are not prototypical topics (Krifka, 2001), therefore questions with object quantifier phrases do not easily allow PLAs.

Krifka (2001) further observes that questions with focused quantifiers even in subject position cannot yield PLAs (24).

[2]Lambrecht (1996) mentions that even though subjects are often found to be topics, the notions of topic and subject need not be conflated, as they do not always refer to the same individual in a sentence.

(24) a. Which dish did EVERYONE make? Krifka (2001:24)
b. *Al the pasta, Bill the salad, and Carl the pudding.

In sum, subject and object quantifier phrases differ in their ability to act as topics – and consequently in their likelihood of taking wide scope over a *wh*-phrase and give rise to a PLA. We expect the effect of information structure to be the same for the quantifiers *every* and *each* – PLAs to questions with object quantifiers are expected to be less available than PLAs to questions with subject quantifiers. The example in (24) also shows that the topichood status of a question is a more flexible notion compared to such a structural dichotomy as subject vs. object. While a tendency exists for subjects but not objects to be topics, it seems possible to alter the default information structure of a question, making a PLA for an object-quantifier question possible. This consequence of the information structure analysis correctly predicts lower acceptability for PLAs to questions with object quantifiers. In order to arrive at a pair-list interpretation of such a question, a speaker has to access a non-default topic/focus configuration – the one where an object phrase acts as a topic, and a *wh*-phrase as the focus of a question.

5 Conclusion

In this paper we looked at the interaction of *wh*-phrases and quantifiers, focusing on their ability to give rise to different scopal readings. We used experimental data to test whether the strong distributivity of *each* can make PLAs equally availble regardless of its structural position in a question. Furthermore, we wanted to compare the behavior of *every* and *each* in their ability to give rise to PLAs depending on the structural position they occupy. The data revealed that while *each* facilitates the access to a pair-list reading compared to *every*, both quantifiers exhibit a subject-object asymmetry. Following Krifka (2001), Endriss (2009), and Eilam (2011), we proposed that it is the ability of a quantifier phrase to be construed as a topic that defines the likelihood of a PLA. Such an account allows us to explain the subject-object asymmetry observed for both quantifiers. What is crucial, an information structure analysis of the subject-object asymmetry does not completely rule out PLAs to questions with object quantifiers. Rather, such PLAs may appear less likely given the difficulties constructing a context where an object quantifier phrase would act as a topic.

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