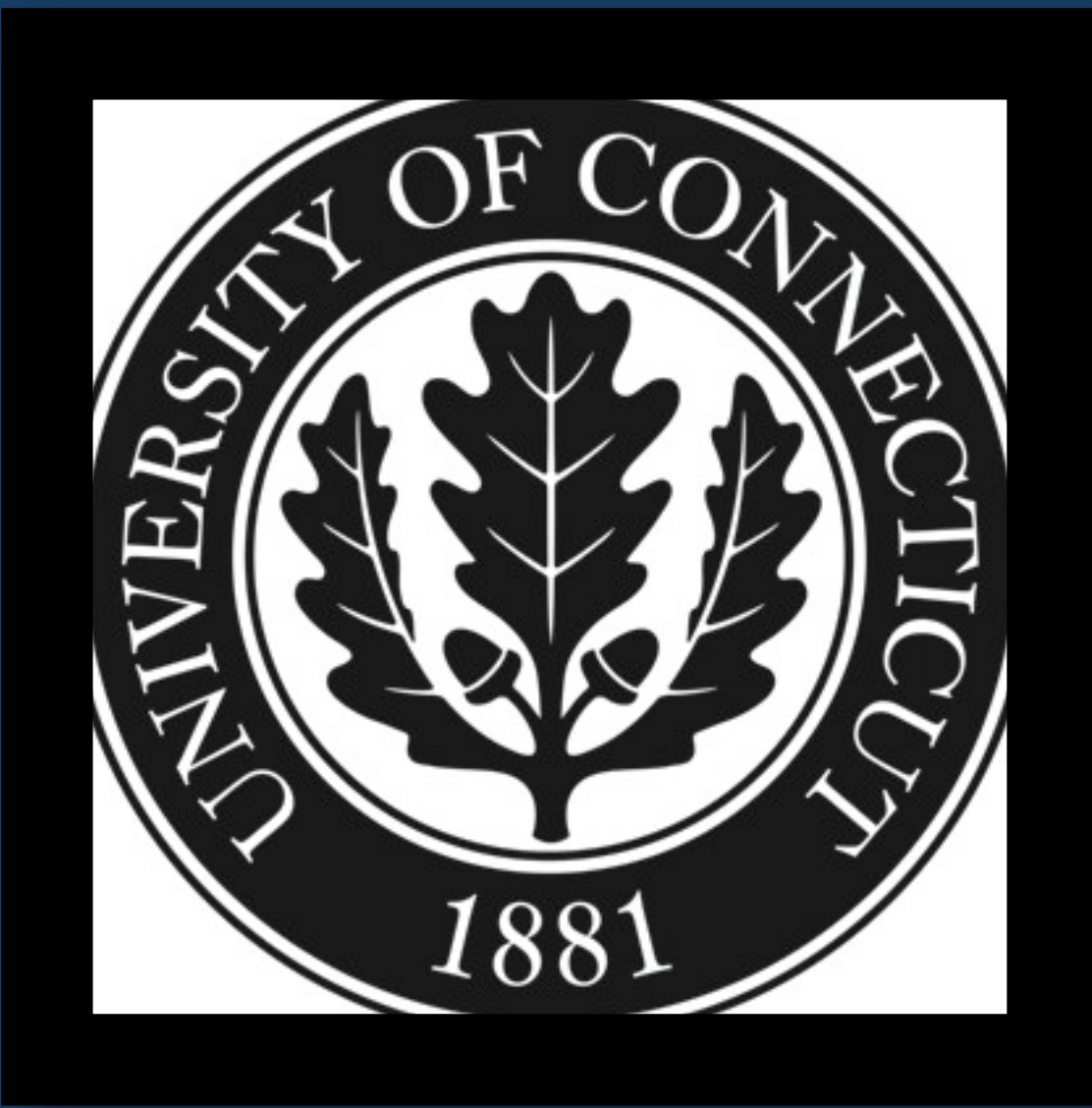# Asymmetries Between Both and All

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## Introduction

I. Pre-nominal/Floated positions
1. a. Both apples have been eaten.
   b. Apples have both been eaten.
2. a. All apples have been eaten.
   b. Apples have all been eaten.

II. Quantity and Kind
3. a. Both apples and bananas have been eaten. (A or B)
   b. Apples and bananas both have been eaten. (A or B)

**Scenario A (5/5, 5/5)**
There are 5 apples and 5 bananas on the table. 5 apples and 5 bananas have been eaten.

**Scenario B (3/5, 3/5)**
There are 5 apples and 5 bananas on the table. 3 apples and 3 bananas have been eaten.

4. a. All apples, bananas, and cherries have been eaten. (C but **not D**)
   b. Apples, bananas, and cherries have all been eaten. (C or D)

**Scenario C (5/5, 5/5, 5/5)**
There are 5 apples, 5 bananas, and 5 cherries on the table. 5 apples, 5 bananas and 5 cherries have been eaten.

**Scenario D (3/5, 3/5. 3/5)**
There are 5 apples, 5 bananas, and 5 cherries on the table. 3 apples, 3 bananas and 3 cherries have been eaten.

III. Both/All
5. a. Both apples and bananas have all been eaten.(A)
   **b. All apples and bananas have both been eaten.(#A)**

6. a. #All apples, bananas, and cherries have both been eaten.
   b. #Both apples, bananas, and cherries have all been eaten.

For 6, there are no obvious scenarios where either of them can be true, given one item can only belong to one kind.

**Asymmetry I (5b):**
When appearing alone, *both* in floated position can refer to kinds and prenominal *all* can refer to quantity. When there are two quantifiers, prenominal *all* **cannot refer to quantity** while *both* in floated position cannot refer to kinds.

**Asymmetry II (4a):**
*All* in prenominal position cannot refer to kinds while *both* can, as is also noted in Bobaljik 2001.

All lions, tigers, and bears are scary. (member)
Lions, tigers, and bears are all scary. (member and kind)
All students, professors, and clowns have come to the meeting.
Students, professors, and clowns have all come to the meeting.

Note that because of the maximality of definite DPs, I restrict my attention to bare plural nominals and leave aside generic readings of bare plurals.

## Previous Account

**Hoeksema 1996**
A similar phenomenon: Distributive reading: both>each, #each>both.

7. a. ?The Beatles and the Rolling Stones **both each** made over a million dollars. (8 million dollars)
   b. #The Beatles and the Rolling Stones **each both** made over a million dollars.

Analysis:
Both is a presuppositional quantifier with presupposition IXI = 2

7b. Each > Both
Each(Both(Predicate)){b,s}
= B(P){b} & B(P){s}
= for all x ∈ B, P(x)=1 & all y ∈ S, P(y)=1 & IxI=IyI=2
Presupposes that only two elements are in the Beatles and the Rolling Stones --> presupposition failure --> infelicitous

7a. Both > Each
Both(Each(P)){b,s}
= Each(P){b} & Each(P){s}
= for all x ∈ b, P(x)=1 & all y ∈ s, P(y)=1
No presupposition --> felicitous

## Proposal

**Applying Hoeksema 1996 to 5b**
**5. b. All apples and bananas have both been eaten.(#A)**

All(Both(P)){apples, bananas}
= Both(P){a} & Both(P){b}
= for all x ∈ a, P(x)=1 & all y ∈ b, P(y)=1 & IxI=IyI=2
Presupposition: 2 apples and 2 bananas.
Presupposition failure --> Infelicitous.

**Prediction(failure)**

**Scenario E (2/2, 2/2):** 2 apples and 2 bananas are on the table, 2 apples and 2 bananas have been eaten.
10. #All apples and bananas have both been eaten.
All(Both(P)){apple, banana}
= Both(P){a} & Both(P){b}
= for all x ∈ a, P(x)=1 & all y ∈ b, P(y)=1 & IxI=IyI=2
Presupposition: 2 apples and 2 bananas.--> felicitous? Why?

**Generalization I:**
When two quantifiers modify one NP in terms of kind and quantity, the higher quantifier defines the kind/group, the lower one defines the quantity/group members.

1. Conceptually Intuitive

2. Implicitly assumed in Hoeksema's analysis.
Both(Each)--> each member in both bands
Each(Both)--> both members in each band
*Each(Both) --> each members in both bands
#The twins and the parents each both kept a dairy.

**Problem**
Prediction:
Groups consist of two members --> No presupposition failure. But...
8. #The Clintons, the Bushes and the Obamas each both had a personal assistant.(6 personal assistants)

E(B(P)){c, b, o}
= B(P){c} & B(P){b} & B(P){o}
= for all x ∈ c, P(x)=1 & all y ∈ b, P(y)=1 & for all z ∈ o, P(o)=1

Potential Reason: unique nouns and *each*.
9. a. #?The Beatles and the Rolling Stones both each made a solo album.
   b. The twins and the parents both each kept a diary.
(Note: stress on *both* and pause after *both* help to get the reading.) But...
   c. #The twins and the parents each both kept a diary.

Potential Reason(2nd attempt): something weird about *each*.
The Beatles and the Rolling Stones *each* made a solo album. How many albums?

**Generalization II:**
*All* in some positions or configurations cannot refer to kind/group.

1. Prenominal position (asymmetry II):
#All apples, bananas and cherries have been eaten. (D)

2. Being the first of two quantifiers modifying one NP.
Apples, bananas and cherries all have been eaten.(D)
#Apples, bananas and cherries all have both been eaten.(2/2)

**Back to Asymmetry I (5b and 10)**
#All apples and bananas have both been eaten.(E) (D)

1. *All* must refer to kinds while *both* must refer to amount. (Generalization I)
2. *All* being in prenominal position (as well as the higher of the two quantifiers) cannot refer to kinds.
3. Contradiction between 1 and 2 entails 5b/10 cannot be felicitous in any context.

**Prediction: When two quantifiers modify the kind and the quantity of an NP, *all* cannot be the higher one.**

Note that this prediction works only when the two quantifiers define kinds and amount. There are cases where two quantifiers both define amounts: All students must each keep a diary. Since the *all* in prenominal position doesn't quantify over kinds here, the sentence is not a counterexamaple to the prediction.

## Open Questions

1. To formalize Generalization I.

2. Need A uniform account of the constraints on the kind reading of *all*.
   linguistically specified kinds vs. background knowledge
   1) All owls hunt. (kind reading) (Lyn Shan Tieu p.c.)
   potential asymmetry between *both* and *all*
   2) #There are two kinds of owls. Both owls hunt. (kind)

3. More constraints on *all*, e.g. predicate
   1) *John is all a doctor, a teacher, and a farmer.
   2) John is both a teacher and a doctor.

4. Account of constraints on *each* "distributing into groups" and others
   1) #Each of John's parents kept a diary.
   2) John's parents each kept a diary. (Scott AnderBois p.c.)

5. Language & Dialect variation

## Conclusions

1. Although the analysis seems to be on the right track, Hoeksema 1996 is problematic in accounting for the data, and generates incorrect predictions. The relevant asymmetry might be deduced from some feature of *each*.

2. Asymmetry I can be deduced by two generalizations without referring to the presupposition failure of *both*.

3. Generalization I is rather general and requires a formal explanation.

4. Generalization II extends the asymmetry between prenominal and floating quantifiers to a broader domain, potentially arguing against floating quantifier as a linguistic category.(Hoeksema 1996)

## Acknowledgements & References

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