

# Cumulative Readings of Each

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## Cumulative Reading

Plural DPs generally give rise to **cumulative readings**.

- (1) Three copy editors caught  $\{ \text{a. the mistakes}, \text{b. four mistakes}, \text{c. all the mistakes} \}$ .  
 Editors      Mistakes  
 $e_1 \longrightarrow m_1$   
 $e_2 \longrightarrow m_2$   
 $e_3 \longrightarrow m_3$   
 $e_3 \longrightarrow m_4$

(2a) is true and (2b) is false in the same context.

- (2) Three copy editors caught  $\{ \text{a. every mistake}, \text{b. each mistake} \}$ .

This suggests that *every* has a cumulative reading, but *each* doesn't.  
 Contrary to this, we argue that *each* can have a cumulative reading, but only when the **Differentiation Condition** is satisfied.

## Differentiation Condition

**Differentiation Condition (DC):** (Tunstall 1998)

A sentence containing *each NP* can only be true of event structures where each individual in the restrictor of *each NP* is associated with a subevent that can be differentiated from the other subevents in some way.

The preferred way to differentiate the subevents is to have a one-to-one correspondence with the bearers of and overtly realized thematic-role distinct from that of *each NP* (a **co-participant**) (cf. Brasoveanu & Dotlačil 2015).

- With no quantificational co-participant, every individual in the restriction of *each* must have an event with a different location/time.

- (3) Take  $\{ \text{a. each}, \text{b. every} \}$  one of these apples.

- DC accounts for the tendency for *each* to take wide scope (Ioup 1975, Brasoveanu & Dotlačil 2015).

- (4) She knows a solution to  $\{ \text{a. each problem}, \text{b. every problem}, \text{c. all problems} \}$ .  
 $\forall > \exists \quad \exists > \forall$   
 ok            ?  
 ok            ok  
 ??            ok

DC predicts that the preferred reading of (2b) is one where *each* takes distributive scope over the co-participant *three copy editors*. Under the cumulative reading, DC is not satisfied.

## Predictions

- With another co-participant with which DC is satisfied, the cumulative reading should become available.

### Experiment 1

- (5) Three video games taught **each** quarterback two new plays.

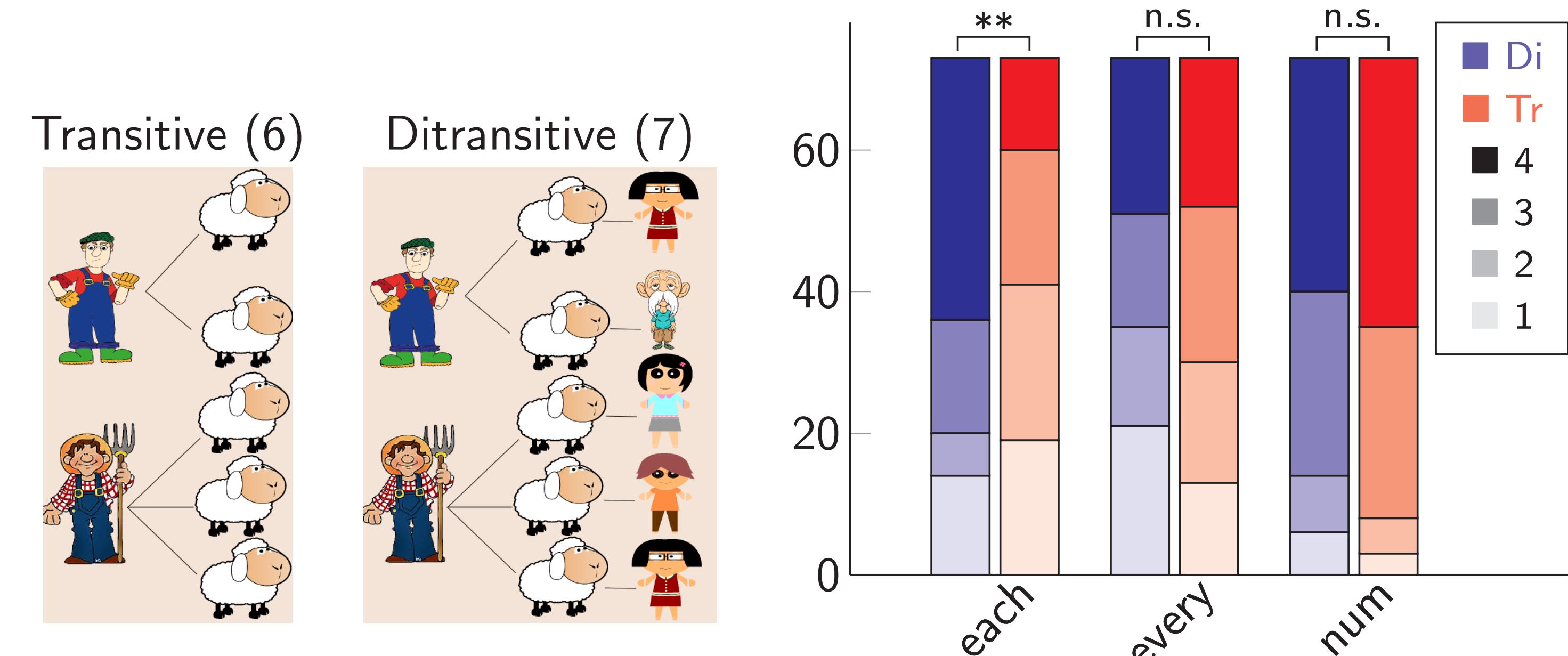
- The cumulative reading of (2b) should be judged true when each editor caught exactly one mistake (one-to-one situation).

### Experiment 2

## Experiment 1

- Task: Rate how well a sentence describes a picture
- Scale: 1 (worst) to 4 (best)
- 6 target items, 12 fillers, 78 subjects on MTurk

- (6) Two farmers sold  $\{ \text{a. each}, \text{b. every}, \text{c. five} \}$  sheep.  
 (7) Two farmers sold  $\{ \text{a. each}, \text{b. every}, \text{c. five} \}$  sheep to  $\{ \text{a. one}, \text{b. one}, \text{c. five} \}$  customer(s).

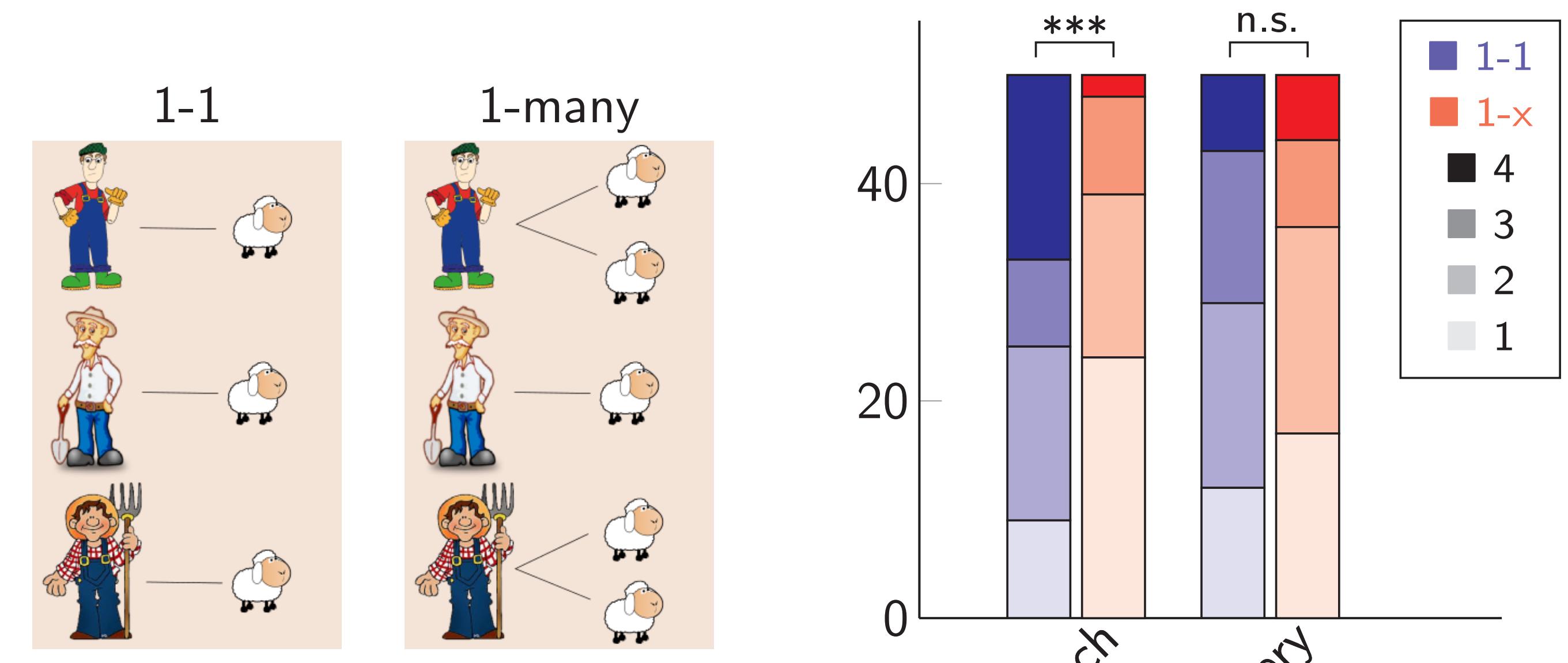


- Cumulative readings of *each* are more easily available in Ditransitive than in Transitive.
- Every* and numerals are not affected by Ditransitive vs. Transitive.

## Experiment 2

- Same task.
- Pictures only make the cumulative readings true
- 4 target items, 8 fillers, 50 subjects on MTurk.

- (8) Three farmers sold  $\{ \text{a. each}, \text{b. every} \}$  sheep.



- Cumulative readings of *each* are more readily available in one-to-one situations than in one-to-many situations.
- Situation type has no effects on *every*.

## Conclusions and Further Prospects

- Cumulative readings of *each* exist, but their availability is regulated by DC.
- The preferred way to satisfy DC is by assigning a wide distributive scope to *each* over a co-participant.

### Further Issues and Prospects:

- Cumulative readings of *each* can be derived by extending an analysis of cumulative readings of *every* (Schein 1998, Kratzer 2000, Champollion 2010).
- What exactly does DC say? In particular, (9) does not seem to entail that the students all read different books.
- (9) Each student read a book.

- What is the nature of DC? It is not a presupposition, as it does not project out, e.g. it can be questioned:

- (10) Did John give *each* girl a flower?

One possibility is to formulate DC as a *postsupposition* in the sense of Henderson (2014) (see also Brasoveanu 2012).

- Towards the typology of universal quantifiers: Tusnall (1998) suggests that *every* is subject to a weaker condition than DC, which requires each subevent to be differentiated by at least one other subevent, rather than all of them.