

Interpreting data: A case study

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1 Background on additive particles

The English additive particles are *also*, *too*, and *as well*. They have a negative counterpart *either*. Their conditions on use are similar to those for verb phrase ellipsis: they requires an antecedent of basically the same form as the thing they attach to. Here are some representative examples:

- (1) a. Lisa played the piano. ALONSO played an instrument too.
- b. Lisa played the piano. She played the CELLO too.
- c. Lisa played the piano. She TUNED it too.

Shai Cohen has a wealth of data showing that these additive particles can have truth conditional effects. Some examples:

- (2) The elevator's weight limit is 1,000 lbs. Al, Bob, and Chad collectively weight 900 lbs. Darrell, who is not in the elevator, weighs 150 lbs.
 - a. If Darrell were in the elevator, it would be over the weight limit.
 - b. If Darrell were in the elevator too, it would be over the weight limit.

Example (2a) is ambiguous: on one reading, Darrell joins the others in the elevator, and the claim is true. On another reading, Darrell is in there alone, and the claim is false. Example (2b) admits only the true reading: *too* forces us to add Darrell to the group in the elevator.

The next example works similarly:

- (3) When Sylvie found out that three of her employees conspired to kill her, she was perturbed; and when we informed her that the group of conspirators included George too, she was completely devastated.

Finally, the sort of example that provides initial motivation for the pilot study we did last Friday:

- (4) A: If a Martian came to the party, Sam would scream.
 B: If a werewolf came to the party, Sam would scream too.
- (5) A: If a Martian came to the party, Sam would scream.
 B: If ANY alien came to the party, Sam would scream.
 C: #If ANY alien came to the party, Sam would scream too.

The example of interest is (5C). When we compare it with (5B), we see that it must be *too* that causes the problem. Intuitively, the problem is that C's claim is not properly an additional fact — it overlaps with A's claim, and thus it doesn't count as new and different enough to warrant *too*. This suggests a sort of 'no overlap' requirement on the use of *too*. What is the nature of this requirement?

2 Hypothesis

Shai Cohen has proposed the following hypothesis about the ‘no overlap’ requirement:

- (6) In discourses of the form

ANT . . . *if A, then B too*

where ANT is the antecedent phrase for *too*, the use of *too* will sound strange if the consequent B is part of a causal chain of events that would have prevented ANT from happening.

The independent variable is the complex causal relation (present or absence), and the dependent variable is the subject’s judgment about whether the conditional sentence follows from an initial scenario.

3 Methods

Instructions given Subjects were given the following instructions:

- (7) In this questionnaire you are requested to read six scenarios, each followed by a sentence. Your task is to determine to what degree on a scale of 1 to 5 is each sentence supported by the preceding scenario. 1 designates the highest degree of support, and 5 the lowest. Thank you for your help!

Sample test condition Each condition has (a) and (b) versions. In the (a) version, the consequent of the conditional with *too* doesn’t designate something that was part of the causal chain that would have prevented the scenario from taking place. In the (b) version, the consequent is part of such a causal chain. For example:

- (8) **Scenario:** At the baseball game last Sunday, the ball hit John, who was sitting in the stadium. If someone had been in the seat in front of him, that person would have deflected the ball and prevented John from getting hit.

Condition (a): If Rosie had gone to the game instead of John, with the ticket he had, she would have been hit too.

Condition (b): If Rosie had been in the seat in front of John, she would have been hit too.

There were two versions of the questionnaire, with (a) and (b) conditions evenly distributed across them and no single questionnaire containing both the (a) and (b) versions of the same example.

Details

- i. The subjects were 22 undergraduates with linguistic training and 3 linguistics graduate students, all at UMass Amherst
- ii. The study took place on December 7, 2007.
- iii. One subject’s questionnaire had to be removed because s/he gave different ratings for different interpretations s/he thought of for the same scenario. Another subject’s data was removed because, after turning in the questionnaire, he reported realizing that he misunderstood one of the scenarios.

4 Analysis

Unfortunately, we have a null result: the average scores for the (a) and (b) versions are almost identical.

(9) Average response values by condition

1 a	4.1	1 b	3
2 a	3.0714286	2 b	2.6
3 a	2.4	3 b	2.7857143
4 a	3.3571429	4 b	2.9
5 a	2.7	5 b	2.6428571
6 a	3.9285714	6 b	4.4
3.259523817		3.0547619	

In addition, the subjects' behavior was fairly uniform. Thus, though the hypothesis might well be true, we did not obtain support for it with this study.

I see a few factors that probably contributed to this null result:

The scenarios are complicated. The concern is that speakers move immediately to the conceptual level, rather than paying close attention to the language itself. One is reminded of the following old riddle:

(10) As I was going to St. Ives I met a man with seven wives,
Each wife had seven sacks, each sack had seven cats,
Each cat had seven kits: kits, cats, sacks and wives,
How many were going to St. Ives?

People tend to start solving this as a combinatoric problem. They neglect the simple first sentence, even though it at least strongly suggests that only the narrator is going to St. Ives.

For the current questionnaire, people might not have paid much attention to *too*.

The task isn't the right one. Subjects were asked to say whether the scenario supported the conditional statement. This encourages them to approach the conditions from a problem-solving perspective, rather than from the linguistic perspective that is desired.

What causes what? It can be very difficult to say whether one thing caused another, and even experts sometimes disagree on specific cases for their domains. Thus, we might expect some test conditions to do better than others.

A fuller questionnaire With only six conditions in total, we don't have much protection from problematic conditions. In addition, there were no fillers in the study, which might have led to *too-saturation*.

5 Conclusion

What are the conditions of use for the English additive particles? There is a wealth of data that points us in the direction of a ‘no overlap’ condition, but the precise nature of that condition remains elusive. This study was an attempt to explore the hypothesis that the relevant condition is intimately related to causality. The independent variable was a certain causal relation, and the prediction was that this variable would affect speakers’ judgments.

Unfortunately, though the hypothesis might be correct, we did not obtain a result this time around. There was no significant difference in the average responses for the (a) and (b) conditions. This is too bad, but we learned a lot about how to construct a better questionnaire the next time around. We need to find simpler conditions, and we need to think more about the task that subjects are asked to perform. It seems sensible to try a small pilot study again before moving to a full study, given that the current questionnaire also didn’t turn up any useful patterns (at least as far as I can see).