

Rescue *mo* and *ka*: the PPI status of Japanese connectives

In several languages (e.g. Hungarian, French, Italian), disjunction has been found to exhibit positive polarity item (PPI) properties (Szabolcsi 2004, Nicolae 2017, and others). Our objective is to investigate in depth the PPI status of both the disjunction *ka* and the conjunction *mo* in Japanese. (Goro and Akiba 2004, Goro 2007) claims that both disjunction and conjunction exhibit PPI properties in Japanese to explain that both obligatorily take wide-scope over a clause-mate negation when they occur in the object position as in (1).

- (1) Hanako-ga sushi-**ka/mo** piza-o/mo tabenakatta
Hanako-NOM sushi-OR/AND pizza-ACC/AND eat.NEG.PAST
'Hanako didn't eat sushi or/and pizza. (OR/AND \gg NOT)

But Shibata (2015) proposes a purely syntactic alternative explanation of (1). Namely, he proposes that countercyclic adjunction blocks reconstruction of *ka* and *mo* after obligatory object movement. Therefore Shibata doesn't need to ascribe PPI-status to *ka* and *mo*. But like Goro, Shibata also assume that disjunction and conjunction behave scopally uniformly in Japanese.

We report experimental results that distinguish between the PPI-analysis and Shibata's analysis, especially from 'PPI rescuing'. Our results argue directly against Shibata's proposal and in favor of the PPI analysis for Japanese *ka* since we demonstrate rescuing. For *mo*, the result is also consistent with the PPI analysis if the pragmatic principles of truth value judgements (Meyer and Sauerland 2009) are taken into account.

Methods We conducted a truth value judgement study. The study was conducted on a computer using PsychoPy v 1.81. Each trial consisted of the three phases as in (2):

- (2) a. A triple plus sign ("+++") would appear on the computer screen for 2000ms.
b. First, a sentence was presented, also for 2000 ms.
c. A picture context was presented automatically and participants were asked to press the 'Yes' button or the 'No' button to indicate whether sentence and picture matched.

The main experiment and two control experiment was carried out at the same time. Before carrying out the experiment, participants read the instruction and carried out 12 practice trials. Then Each participant was presented 124 sentences in total. Participants had three short breaks after reading every 31 sentences. The 56 target sentences (8 for rescuing with *mo*, 8 for rescuing with *ka*, 40 for control experiments) were mixed with 68 fillers. The order of presentation was randomized. The experiment took on average 40 minutes per subject. At this point, 12 adult native speakers of Japanese participated in the study.

Items The eight critical items tested for rescuing with *mo* are exemplified by sample item (3). The truth judgement for the picture shown below (3) depends on whether rescuing is available with *mo*. If rescuing is obligatory, (3) should be judged false because there are individuals who did NOT buy both apples and bananas, but also didn't by mangoes; namely, the person who bought only apples and also the person who bought only bananas. If rescuing isn't available though, the judgement should be that (3) is true, because then only those who bought neither apples nor bananas are required to buy mangoes to satisfy (3).

- (3) Ringo-**mo** banana-**mo** kawa-nakat-ta dono hito-mo mango-o kaimashi-ta
apples-AND bananas-AND buy-NEG-PAST which person-every mangoes-ACC buy-NEG
Lit. 'Everyone who didn't buy apples and bananas bought mangoes.'



One sample item testing for rescuing with *ka* is shown in (4). Because of the logical duality, the same picture as below (3) again yields different predictions. With disjunction though, if rescuing is available, speakers are predicted to judge (4) true since those who bought neither apples nor bananas did indeed buy mangoes. If rescuing isn't available though speakers are predicted to judge (4) false.

- (4) Ringo-**ka** banana-o kawa-nakat-ta dono hito-mo mango-o kaimashi-ta
 apples-OR bananas-ACC buy-NEG-PAST which person-every mangoes-ACC buy-NEG
 Lit. 'Everyone who didn't buy apples or bananas bought mangoes.'

Results and discussion According to our preliminary results, both critical items are judged as matching with a 'yes' response at a high rate, namely 100% for (3) and 83.3% for (4). At the same time, participants judged similar controls that are predicted to be false correctly with the 'no' response. So the 'yes' responses on the critical trials must be interpreted as subjects indeed perceiving a match between sentence and picture.

In the case of (4), our result argues unequivocally that rescuing must be available. The proposal of Shibata (2015) doesn't predict that *ka* should be able to scope below negation in (4). The result for (3) indicates that the narrow scope below negation cannot be the only interpretation of (3). Instead the scope of *mo* over negation must also be a possible construal. But the result is still consistent with rescuing making the NOT \gg AND interpretation available but it also allowing the AND \gg NOT interpretation – in other words, (3) being ambiguous. Then the truth responses follow the principle of *Truth Dominance* of Meyer and Sauerland (2009): participant judge (3) true because one of its interpretations is true.

Further prediction Our results indicate that the restrictor argument of a universal quantifier creates a downward monotone environment that licenses the rescuing of PPI *ka*. But at the same time, PPI *mo* can be interpreted in the immediate restrictor of the universal even though it is a downward entailing environment. We confirmed in further control experiments not targeting rescuing that indeed both *ka* and *mo* are grammatical in the restrictor of universals as well as other downward entailing environments (the scope of 'two or less').

References

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