

## Exclusive disjunction and uncertainty in Marathi

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**Claim:** I introduce Marathi disjunctive *ka* which only expresses exclusive disjunction (*exclusive-or*), and show that its exclusive reading results from lexicalization of its uncertainty inference. In doing so, I challenge Gazdar’s (1979) universal that ‘no language has an exclusive disjunction morpheme’.

**Data:** Two particles, *kīwa* and *ka*, are used in Marathi to mark disjunction. Among them, disjunctive *ka* can only be interpreted as *exclusive-or* in various contexts where Marathi *kīwa* or English *or* can either be interpreted as *inclusive-or* or are ambiguous. English *or* has a wide-scope conjunction interpretation under negation (Szabolcsi 2002) or in the complement of equative clauses (Lassiter 2015), and distributive inference under the scope of a universal quantifier (Crnič et. al. 2015). Disjunctive *ka* does not adhere to either of these properties (see 1-4).

### 1. Disjunction and negation

<p>(a) <i>sita-la sineme kīwa naṭkə awḍət nahit</i> Sita-dat movies or plays likes neg.aux ‘Sita does not like movies or plays.’ → Sita doesn’t like either of movies or plays</p>	<p>(b) <i>sita-la sineme ka naṭkə awḍət nahit</i> sita-dat movies or plays likes neg.aux ‘Sita does not like movies or plays.’ → Sita doesn’t like one of movies or plays</p>
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### 2. Disjunction in the scope of universal quantifier

<p>(a) <i>ti-ne prātyekala chocolate kīwa biscuit dilə</i> she-erg everyone to chocolate or biscuit gave ‘She gave every kid a chocolate or a biscuit.’ → Some kids got chocolates; others got biscuits</p>	<p>(b) <i>ti-ne prātyekala chocolate ka biscuit dilə</i> she-erg everyone to chocolate or biscuit gave ‘She gave every kid a chocolate or a biscuit.’ → All kids got chocolates, or all kids got biscuits</p>
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### 3. Disjunction in the complement of equatives

<p>(a) <i>sita ram kīwa sam ewḍ<sup>hi</sup>-ts untsə ahe</i> Sita Ram or Sham equal-emph tall is ‘Sita is as tall as Ram or Sham.’ → Sita is as tall as Ram and Sham</p>	<p>(b) <i>sita ram ka sam ewḍ<sup>hi</sup>-ts untsə ahe</i> Sita Ram or Sham equal-emph tall is ‘Sita is as tall as Ram or Sham.’ → Sita is as tall as one of Ram or Sham</p>
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### 4. Disjunction in positive unembedded contexts

<p>(a) <i>ram ḍzewṇa-nəntər tṣəha kīwa coffee g<sup>heto</sup></i> Ram dinner-after tea or coffee takes ‘Ram drinks tea or coffee after dinner.’ → Ram drinks either of tea or coffee after dinner</p>	<p>(b) <i>ram ḍzewṇa-nəntər tṣəha ka coffee g<sup>heto</sup></i> Ram dinner-after tea or coffee takes ‘Ram drinks tea or coffee after dinner.’ → Ram drinks one of tea or coffee after dinner</p>
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Finally, *ka* has an **uncertainty inference** in addition to its exclusive interpretation. If the speaker knows or is certain about all the alternatives in question, *ka* cannot be used to mark such disjunction. See (5), where speaker’s prior knowledge of both the alternatives makes occurrence of *ka* infelicitous.

**5. Context:** Ravi & Ram work at the same place. Ravi knew that Ram was planning to visit either Pune or Mumbai. Few days later, he overhears that Ram went to Thane. Ravi wonders:

*ram puṇya-la kīwa / #ka mumbəi-la ḍzaṇar hota na*  
 Ram Pune to or Mumbai to going to was BQP

‘Wasn’t Ram planning to go to Pune or Mumbai?’

The infelicity of *ka* results from its incompatibility with the speaker’s prior knowledge. This uncertainty inference could also be understood as a specific case of the ignorance inference: an ignorance inference for a disjunction denotes the speaker not knowing which (and possibly how many) of the disjuncts is (or are) true; whereas the uncertainty or dubitative inference indicates the speaker’s puzzlement about which ‘one’ disjunct is true.

**Puzzle:** That *ka*, a monomorphemic disjunctive that can only be interpreted as *exclusive-or* goes against Gazdar’s (1979) universal. Gazdar ties this impossibility of *exclusive-or* morpheme to the logical properties of the *XOR* operator. Given the constraints against lexicalization of *XOR* (see Horn 1972, 1989, Katzir & Singh 2009, a. o.), the behaviour of *ka* raises following question: **How does the exclusive component of disjunction arise in the meaning of *ka*?**

**Analysis:** I argue that the exclusive component of the meaning of *ka* arises due to the lexicalization of its uncertainty inference.

Given that both *ka* and *kīwa* can mark disjunction, these disjunctors essentially compete with one another; with the choice between them coming down to speaker’s epistemic-doxastic states. The choice of *kīwa* indicates the available alternatives to the best of the speaker’s knowledge, whereas choice of *ka* indicates the available alternatives to the best of speaker’s belief. The usage of *ka* indicates that speaker perhaps knew – even if vaguely – or was expected to know the ‘true’ alternative but has likely forgotten its identity. To compensate for this newly arisen uncertainty, the speaker offers the addressee with alternatives they believe could be true under the given circumstances. Therefore, the speaker’s choice of *ka* indicates not only that there are two or more alternatives, but that only one of them is true – only that the speaker is now uncertain about which one. Thus, by using *ka* to provide the alternatives, speaker makes the addressee know of their own epistemic uncertainty, as well as doxastic commitment (see 6).

6. Context: A grandfather is telling an anecdote to his grandchildren. Since it happened many years ago, he cannot exactly recall where it took place, but has a hunch about the same. He begins the anecdote thus:

*mi punya-t ka / #kīwa mumbai-t hoto tew<sup>h</sup>a-tfi goftə*  
 I Pune-at or Mumbai-at was then-gen story

‘This story goes back to when I was living in Pune or Mumbai.’ → This story goes back to when the speaker was living in either Pune or Mumbai, but he is not exactly sure which city.

In (6), the speaker’s uncertain state of mind prohibits them from using *kīwa*, who prefer *ka* instead.

Using Hintikka’s (1962) **epistemic and doxastic operators**, usage of *ka* could be modelled as follows:

7.  $B_sA \wedge K_s \neg B$ , where  $A = (a \vee b)$ ,  $B = (a \wedge b)$ , and  $a$  &  $b$  denote propositions

Hintikka defines the epistemic and doxastic operators as follows:

**8. Hintikka’s epistemic and doxastic operators**

- (a)  $K_cA$ : in all possible worlds compatible with what  $c$  knows, it is the case that  $A$   
 (b)  $B_cA$ : in all possible worlds compatible with what  $c$  believes, it is the case that  $A$

Using (8), (7) could be re-stated as follows: ‘speaker believes  $a$  or  $b$  is true, and knows that  $a$  and  $b$  is not true’. That speaker believes that either of the alternative could be true follows from their **doxastic commitment**, whereas that only one alternative is true follows from their **epistemic state**, thus giving rise to the exclusive interpretation of *ka*.

Evidence in support of *ka* denoting the speaker’s belief ( $B_sA$ ) comes from the domain of free choice disjunctions. Zimmerman (2000) points out that free choice effects arise ‘... because disjunctions are conjunctive lists of epistemic possibilities.’ If the use of *ka* was to indicate epistemic possibility and not the speaker’s doxastic commitment, *ka* needs to occur felicitously to give rise to free choice interpretation. This prediction is not borne out:

9. *#tu bus-ne ka taxi-ne dzau fəktos*  
 you bus by or taxi by go.inf can  
 (intended) ‘You can go by bus or by taxi.’

The presence of exclusive disjunctive *ka*, and the analysis that ties its exclusive inference to its own uncertainty, allows us to reformulate Gazdar’s (1979) universal as follows:

**‘No language lexicalizes logical operator XOR to express exclusive disjunction.’**

Lastly, it is worth noting that Marathi speakers can employ particle *ki* in addition to *ka* and *kīwa* to mark disjunction. Some grammars of Marathi (see Dhongde & Wali 2009) consider *ka* and *ki* as alternants. If their observation is correct, the analysis presented here for *ka* should naturally extend to *ki*.

**References:** Crnič, L., E. Chemla, & D. Fox. 2015. Scalar Implicatures of Embedded Disjunction. **Dhongde**, R. V., & K. Wali. 2009. Marathi. **Gazdar**, G. A. 1979. Pragmatics: Implicatures, presupposition and logical form. **Hintikka**, J. 1962. Knowledge and belief. **Horn**, L. R. 1972. On the semantic properties of logical operators in English. **Horn**, L. R. 1989. A Natural History of Negation. **Katzir**, R., & Singh R. 2009. On the absence of XOR in natural language. **Lassiter**, D. 2015. Epistemic Comparison, Models of Uncertainty, and the Disjunction Puzzle. **Simons**, M. 2001. Disjunction and Alternativeness. **Szabolcsi**, A. 2002. Hungarian disjunctions and positive polarity. **Zimmermann**, T. E. 2000. Free Choice Disjunction and Epistemic Possibility.