

Decomposing necessity: The Hausa exclusive particle ‘sai’ as a window into the building blocks of modal meaning

Summary: We discuss the modal uses of the Hausa exclusive particle *sai* (\approx only). We argue that the distribution of *sai* in modal environments provides evidence for the following claims on the composition of modal meaning that have been independently made in the literature: i) Future-oriented modality involves a prospective aspect operator that can be realized covertly in some languages (e.g. English, Kratzer 2012) and overtly in others (e.g. Gitksan, Matthewson 2012, 2013). ii) Necessity interpretations arise from exhaustifying possibilities, i.e. an exhaustivity operator applying to existential modality (see Kaufmann 2012 for the case of imperatives and Leffel 2012 for a relevant analysis of necessity meaning in Masalit). iii) The interpretation of conditionals involves a modal operator in the consequent (Kratzer 1986). In short, we show that future-oriented necessity in Hausa decomposes into EXH(\diamond (PROSP)), with *sai* contributing exhaustivity and overtly realizing Kratzer’s MUST-operator in conditionals.

Data: *sai* is an exclusive particle which usually associates with a focus-fronted constituent (1). When combining with the subjunctive, however, focus-fronting is prohibited and *sai* appears to obtain a reading as a future-oriented necessity modal (2) (see table 1 for an overview).

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| (1) DIRECT OBJECT FOCUS:
<i>Sai tuwō</i> mātā sukà girkà.
SAI fufu women 3PL.PFV.REL cook
“The women only cooked FUFU.” | (2) DEONTIC NECESSITY:
According to the Nigerian law,
... <i>sai</i> Audù yà tàfi fuřsùnà.
SAI Audu 3SG.M.SUBJ go prison
“Audu must go to jail.” |
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	Epistemic	Deontic	Circumstantial	Weak necessity
necessity	X	✓	✓	✓
possibility	X	X	X	n.a.

Table 1: Sai + prospective: possible readings

Analysis: We defend a unified analysis of *sai* as an exclusive operator with the meaning in (3) (from Coppock & Beaver 2014 for *only*), even in examples like (2). The modal reading crucially depends on the ‘subjunctive’, which requires a (in this case covert) modal operator.

$$(3) \llbracket \text{sai} \rrbracket = \lambda p. \lambda w. \exists p' \in \text{ALT} [p'(w) \wedge p' \geq p]. \forall p' \in \text{ALT} [p'(w) \rightarrow p \geq p']$$

We argue that the so-called ‘subjunctive’ is actually a defective prospective aspect expressing “dependent subsequent inception” (Schuh 2003, cf. Mucha 2013:406):

$$(4) \llbracket \text{PROSP} \rrbracket^g = \lambda P_{\langle l, st \rangle}. \lambda e. \lambda t. \lambda w. [P(e)(w) \wedge \tau(e) \succ t]$$

It is used in future-oriented modal sentences in general (e.g. with *dōlè* ‘it is necessary that...’), but not e.g. with present epistemic modality (where the Continuous TAM is used instead). In contrast to other aspects, which are of type $\langle i, st \rangle$, the prospective is of type $\langle l, \langle i, st \rangle \rangle$. It is thus dependent: it requires a higher modal operator for existential closure of the event variable. A bare prospective is usually interpreted as an imperative (5). Mucha (2013) thus assumes a covert imperative operator, which requires exhaustification in (5) (following Kaufmann 2012).

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| (5) Kà biyā!
2SG.PROSP pay
“(You) pay!” | (6) [EXH OP _{Imp} [PROSP [you pay]]]
(7) $\llbracket \text{OP}_{Imp} \rrbracket^c =$ (adapted from Kaufmann 2012)
$\lambda f. \lambda g. \lambda P. \lambda t. \lambda w. \exists w' \in O(f_{CG(c)} \cup f, g, c_T, w) [\exists e [P(e)(t)(w')]]$
simplified below to $\lambda P. \lambda w. \exists w' \in \text{MB}(w) [\exists e [P(e)(w')]]$ |
|---|---|

Kaufmann suggests that the universal reading of imperatives arises from a combination of an existential OP_{Imp} operator, and EXH because with overt anti-exhaustifiers such as ‘for example’ (where EXH is absent), possibility readings are available.

We propose that the reading found in (2) can be derived in a similar fashion: the bare prospective requires insertion of a covert operator (OP_{Imp}). Exhaustification is provided by *sai* in these examples (8). The alternatives in ALT are other future possibilities (e.g. $\exists w' \in MB(w)[\exists e[Audu\text{-}pays\text{-}a\text{-}fine(e)(w') \wedge \tau(e) \succ t]]$). Any such possibility not entailed by the prejacent is excluded. Hence, *sai* has the effect of excluding all future possibilities except Audu going to prison.

- (8) [*sai* [OP_{Imp} [PROSP Audu goes to prison]] (simplifying over tense)
- a. $[[PROSP\ Audu\ goes\ to\ prison]]^t = \lambda e.\lambda w. Audu\text{-}goes\text{-}to\text{-}prison(e)(w) \wedge \tau(e) \succ t$
- b. $[[OP_{Imp}\ PROSP\ Audu\ goes\ to\ prison]]^t$
 $= \lambda w.\exists w' \in MB(w)[\exists e[Audu\text{-}goes\text{-}to\text{-}prison(e)(w') \wedge \tau(e) \succ t]]$
- c. $[[sai\ OP_{Imp}\ PROSP\ Audu\ goes\ to\ prison]]^t$
 $= \lambda w.\forall p' \in ALT[p'(w) \rightarrow [\lambda w.\exists w' \in MB(w)[\exists e[Audu\text{-}goes\text{-}to\text{-}prison(e)(w') \wedge \tau(e) \succ t]] \geq p']]$,
 defined iff $\exists p' \in ALT[p'(w) \wedge p' \geq \lambda w.\exists w' \in MB(w)[\exists e[Audu\text{-}goes\text{-}to\text{-}prison(e)(w') \wedge \tau(e) \succ t]]]$.

Conditionals: The combination of *sai* + PROSP also occurs in the consequent of conditionals:

- (9) Ìdan àkwai hanyà, sai ìn tūkà ka.
 If exists road SAI 1SG.PROSP drive 2SG
 “If there is a road, I’ll drive you.”

While *sai* has previously been described as a ‘sequence indicator’ (*then*) in this use (Kraft 1970), we propose that our analysis of the modal sentence in (2) should be extended to conditionals. The consequent of (9) contains a covert possibility operator OP_{Imp} and the sequential interpretation stems from the aspectual shift induced by the prospective. Under this account, Hausa provides overt evidence for an analysis of *If*-clauses as restricting a modal operator (which is covert in languages like English or German, see Kratzer 1978 et seq.).

Semantic universals in the modal domain: Hausa is a further language in which future-oriented modal readings require a prospective aspect, lending support to the idea of covert prospective aspects in languages where this is not expressed overtly (e.g. English, Kratzer 2012). In addition, in Hausa necessity interpretations appear to arise from the combination of existential quantification over possible worlds (i.e. possibility) and exhaustification. This has been proposed for other languages as well (Leffel 2012), and fits well with Kaufmann’s (2012) analysis of imperatives, thus pointing to a potentially universal strategy for deriving necessity meaning that some languages grammaticalize in their modal system. Moreover, necessity thus derived overtly instantiates Kratzer’s MUST operator in conditionals, thus lending support to an analysis of conditionals as involving (possibly covert) modal operators.

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