Control, logophorocity, and harmonic modality in Gengbe desire reports[1]

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Abstract. With a special focus on jussive clauses, we present and account for a puzzling interaction between mood choice, embedding verb choice, and antecedent choice for logophoric subjects in attitude reports in Gengbe (a Niger-Congo language closely related to Ewe, spoken in southern Togo and Benin). The account draws on the property theory of control (Chierchia, 1984; Dowty, 1985), the property theory of imperatives (Portner, 2004), and the view that logophors abstract to yield derived properties (Pearson, 2015). Insofar as Gengbe jussive clauses are similar in distribution and function to Romance subjunctive clauses, a primary theoretical contribution of the paper is in showing that Portner's property analysis of imperatives can be fruitfully extended to subjunctive clauses, thereby achieving a theoretical unification of sentence mood and verbal mood. We also a sketch a variant of the account couched in Kratzer's (2013) decompositional approach to embedding, whereby jussive clauses in Gengbe desire reports instantiate harmonic modality.

Keywords: attitude reports, control, jussives, logophors, modality, mood

1. Introduction

The grammatical category MOOD is typically taken to subsume at least two subtypes. Following Portner's (2009) terminology, SENTENCE MOOD has to do with clause type oppositions like those illustrated in (1), and VERBAL MOOD prototypically has to do with selected verbal forms such as the well studied Romance indicative/subjunctive opposition illustrated with the Spanish data in (2).

(1) SENTENCE MOOD
- a. John left. — DECLARATIVE
- b. Did John leave? — INTERROGATIVE
- c. Leave! — IMPERATIVE

(2) VERBAL MOOD
- a. Juan cree que Pedro **es** feliz. — INDICATIVE
  'Juan believes that Pedro is.IND happy.'
- b. Juan quiere que Pedro **sea** feliz. — SUBJUNCTIVE
  Lit.: 'Juan wants that Pedro be.SBJV happy.'

The context for this paper is set by the theory of sentence mood advanced by Portner (2004) and further elaborated by Portner (2007); Zanuttini et al. (2012). Following the widely influential tradition of Stalnaker (1978), Portner takes the position that declarative clauses denote propo-

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sitions and that making an assertion amounts to adding a proposition to the Common Ground, which can be modeled as a set of propositions. In a similar vein, Portner follows Hamblin (1973); Karttunen (1977) in analyzing interrogative clauses as denoting sets of propositions, and follows Ginzburg (1995); Roberts (1996) in modeling question speech acts as adding a set of propositions to the Question Set, which can be modeled as a set of sets of propositions. Finally, Portner's main contribution is in building on a proposal due to Hausser (1980) and analyzing imperative clauses as denoting properties of individuals. For Portner, directive force involves adding a property to the addressee's To-Do List, which is a set of properties that the participants in the conversation mutually assume that the addressee will try to make true of herself.

In this context, the narrow goal of this paper is to argue that JUSSIVE clauses in Gengbe[2] are also fruitfully analyzed as denoting properties of individuals, as evidenced primarily by how they interact with antecedent choice for logophoric pronouns in embedded contexts. We define jussive clauses in Gengbe as clauses that contain the preverbal marker *nɛ́́*, a marker which we correspondingly call the jussive marker and gloss as JUSS.[3] Some representative examples illustrating the distribution and interpretation of jussive clauses in Gengbe are given in the bracketed constituents in (3)–(6).

(3) [Kòfí **nɛ́́** ɖù nű́].
Kofi JUSS eat thing
'Kofi should eat.' / 'I want Kofi to eat.'

(4) Kòfí dóòű́sɛ́́ɛ̀̀ Àkú [bé **nɛ́́** ɖù nű́].
Kofi encourage Aku COMP JUSS eat thing
'Kofi encouraged Aku to eat.'

(5) Ámá́ **dʒí** [bé **Àkú nɛ́́** ɖù nű́].
Ama want COMP Aku JUSS eat thing
'Ama wants Aku to eat.'

(6) Ámá́ **kɛ́́ɖóédʒí** [bé **Àkú nɛ́́** ɖù nű́].
Ama believe COMP Aku JUSS eat thing
'Ama believes that Aku should eat.'

Assuming for the sake of argument that we are right in analyzing jussive clauses as property-denoting, what is the theoretical significance of this conclusion? If jussive clauses distributed and functioned just like imperative clauses, then our conclusion would simply count as further supporting evidence for Portner's theory of clause types, but not a novel theoretical proposal.

[2]Gengbe (also known as *Gen* or *Mina*) is a Niger-Congo language closely related to Ewe and spoken in southern Togo and Benin. According to Ethnologue, it has 278,900 speakers worldwide. All of the data reported here were collected at Indiana University by the authors in consultation with Gabriel Mawusi, a middle-aged male native Gengbe speaker from Batonou, Togo.

[3]A full list of the abbreviations we use in glosses is as follows: ACC = accusative, COMP = complementizer, EXH = exhortative, INDIC = indicative, JUSS = jussive, IMP = imperative, LOG = logophor, PL = plural, POT = potential, PRM = promissive, SBJV = subjunctive, 1/3SG = 1st/3rd-person singular

But in fact, jussive clauses do not function like imperative clauses: of the examples in (3)–(6), the only one we are aware of that could be translated using an imperative clause is (4), and even this is possible only in languages like Korean that allow embedded imperatives (see e.g. Zanuttini et al. 2012). Instead, jussive clauses behave more like Romance subjunctive clauses, useable to express optative-like meaning in unembedded contexts (3), and found in complements to directive (4) and desiderative (5) predicates. The only non-subjunctive-like behavior is witnessed in (6), where the jussive marker is embedded under 'believe' and expresses a deontic semantics; in Romance, by contrast, mood choice under 'believe' is subject to inter- and intra-linguistic variation, but the subjunctive in this environment in those cases where it is possible is not associated with a deontic semantics. (See e.g. Giorgi and Pianesi 1997 for a survey of mood choice in Romance.)

Given that the distribution and interpretation of Gengbe jussive clauses is not absolutely identical to the distribution and interpretation of Romance subjunctive clauses, we do not mean to suggest that they should have identical analyses. But we do take our property analysis of Gengbe jussive clauses to be highly suggestive of the more general utility of taking Portner's type-theoretic approach to sentence mood and extending it to verbal mood as well, thereby contributing to a theoretical unification of the two major mood subtypes. Making this case constitutes a broader theoretical aim of this paper, and in the course of carrying out this broader aim, we will suggest below that Romance subjunctive clauses are also fruitfully analyzed as property-denoting.

The organization of the rest of this paper is as follows. In section 2, we lay out our core data and puzzles. In section 3, we show that the data can be accounted for via three key proposals: (1) logophors are obligatorily bound by an attitude predicate (following Pearson 2015), (2) jussive clauses denote properties, and (3) Gengbe 'want' selects for a property whereas Gengbe 'believe' is flexible in being able to select for either a property or a proposition. In section 4, we unpack these proposals, grounding them in ideas found in previous literature and advancing independent Gengbe-internal and cross-linguistic support for them. In section 5 we compare two analytical strategies for implementing the property analysis of jussive clauses, one whereby the jussive marker is an individual abstractor *à la* Zanuttini et al. (2012) and one whereby the jussive marker is an individual-relative priority modal that harmonizes with the embedding predicate in embedded contexts *à la* Kratzer (2013). Finally, section 6 concludes.

2. Core data and puzzles

The first observation we make is that Gengbe has a logophoric pronoun *jè* which at first glance seems to behave like an ordinary logophor in the sense of Clements (1975): it must be embedded under a speech or attitude predicate, and it is obligatorily co-referential with the subject of that predicate. In (7), multiple embedding gives rise to the expected ambiguity whereby *jè* can be co-referential either with *Ámā́* (the subject of the immediately higher clause) or with *Kòfí* (the matrix subject).

(7) **Kòfí**$_1$ bé **Ámā́**$_2$ kā́ɖóédʒí [bé **jè**$_{1/2/*3}$ ɖù nū́].
Kofi say Ama believe COMP LOG eat thing
'Kofi said Ama believes that he/she (= Kofi/Ama) ate.'

With this in mind, the core puzzle we want to solve is the observation that when *jè* is embedded under *dʒí* 'want', the availability of different antecedents interacts with mood choice. As seen in (8), when *dʒí* embeds the mood marker *lá* (which we analyze as a potential marker, following Essegbey's 2008 treatment of Ewe *a*), the logophor obligatorily co-refers with the subject of the immediately higher clause (the hallmark of obligatory control in the sense of Landau 2000), but as seen in (9), when *dʒí* embeds the jussive marker *nɛ́*, the logophor is obviative with respect to the subject of the immediately higher clause and instead obligatorily co-refers with the subject of a higher embedding clause.[4]

(8) (Àkú$_1$ bé Kòfí$_2$ bé) **Ámā́**$_3$ **dʒí** [bé **jè**$_{(*1/*2/)3/*4}$ **lá** ɖù nū́].
Aku say Kofi say Ama want COMP LOG POT eat thing
'(Aku said that Kofi said that) Ama wants to eat.' (control)

(9) (**Àkú**$_1$ bé) **Kòfí**$_2$ bé Ámā́$_3$ **dʒí** [bé **jè**$_{(1/)2/*3/*4}$ **nɛ́** ɖù nū́].
Aku say Kofi say Ama want COMP LOG JUSS eat thing
'(Aku said that) Kofi said that Ama wants him (= (Aku/)Kofi) to eat.' (obviation)

The pattern in (8)–(9) is not unique to *dʒí* 'want' but is found also with other attitude predicates expressing desiderative, intentional or promissive meaning such as *wɔ̀súsú* 'intend', *dʒɛ̀àgbàgbá* 'try', *lɔ̃̀* 'agree', and *fjɛ̃̀dʒɔ̀gbè* 'pledge'.

While we take the mood–coreference interaction in (8)–(9) to be the core explanandum of this paper, there are two subsidiary puzzles that we take to be important clues in understanding (8)–(9), and we want to make sure that our analysis accounts for these subsidiary puzzles as well. The first subsidiary puzzle has to do with what happens when the complement to *dʒí* 'want' has a non-logophoric, full-NP subject. In this situation, what we see is that the mood marker *lá* is simply unacceptable (10) and *nɛ́* has to be used instead (11).

(10) *Kòfí bé Ámā́ **dʒí** [bé **Àkú lá** ɖù nū́].
Kofi say Ama want COMP Aku POT eat thing
Intended: 'Kofi said Ama wants Aku to eat.'

[4]Further strengthening the analytical connection to control and obviation phenomena, it bears noting that logophoric *objects* behave differently, admitting free choice of antecedent in the context of jussive marking (and potential marking would be ungrammatical here because of the full-NP subject; cf. (10)):

(i) **Kòfí**$_1$ bé **Ámā́**$_2$ **dʒí** [bé Àkú$_3$ **nɛ́** kpó **jè**$_{1/2/*3}$].
Kofi say Ama want COMP Ama JUSS see LOG
'Kofi said Ama wants Aku to see him/her (= Kofi/Ama).'

This subject/object asymmetry is likely connected to the fact that control is a subject-oriented phenomenon: generally only subject positions can be controlled. Unfortunately, though, this subject/object asymmetry is not something that we will be able to account for in this paper.

(11) Kòfí bé Ámā́ **dʒí** [bé **Àkú nɛ̄́** ɖù nū́].
Kofi say Ama want COMP Aku JUSS eat thing
'Kofi said Ama wants Aku to eat.'

The second subsidiary puzzle has to do with what happens when *dʒí* 'want' is replaced with *kā́ɖóédʒí* 'believe'. As we already saw in (7) above, *kā́ɖóédʒí* 'believe' can combine with complements that are not overtly marked for mood. But overt mood marking is also possible. Considering first full-NP subjects in the complement clause, we see that both *lá* and *nɛ́* are acceptable and give rise to a difference in meaning suggested by the supplied free translations: *lá* gives rise to a future-oriented meaning (12) whereas *nɛ́* gives rise to a deontic meaning (13).

(12) Kòfí bé Ámā́ **kā́ɖóédʒí** [bé **Àkú lá** ɖù nū́].
Kofi say Ama believe COMP Aku POT eat thing
'Kofi said Ama believes that Aku will eat.'

(13) Kòfí bé Ámā́ **kā́ɖóédʒí** [bé **Àkú nɛ̄́** ɖù nū́].
Kofi say Ama believe COMP Aku JUSS eat thing
'Kofi said Ama believes that Aku should eat.'

Finally, when the full-NPs in (12)–(13) are replaced by the logophor, yet another interesting pattern emerges: when the mood marker *lá* is used, the logophor can take either of the higher subjects as its antecedent, just as in (7) where there is no overt mood marking. This is illustrated in (14). But when the mood marker *nɛ́* is used, we see the return of the *dʒí* 'want'-like behavior witnessed in (9) above: only the more distant subject is available as an antecedent. This is illustrated in (15).

(14) **Kòfí**$_1$ bé **Ámā́**$_2$ **kā́ɖóédʒí** [bé **jè**$_{1/2}$ **lá** ɖù nū́].
Kofi say Ama believe COMP LOG POT eat thing
'Kofi said Ama believes that he/she (= Kofi/Ama) will eat.'

(15) **Kòfí**$_1$ bé Ámā́$_2$ **kā́ɖóédʒí** [bé **jè**$_{1/*2}$ **nɛ̄́** ɖù nū́].
Kofi say Ama believe COMP LOG JUSS eat thing
'Kofi said Ama believes that he (= Kofi) should eat.'

The behavior seen in (12)–(15) is not unique to *kā́ɖóédʒí* 'believe'; it is also borne out for other predicates including *ɲā́* 'know', *gblɔ̀* 'say', and *kúùdɪ̃ĩ́* 'dream'.

3. The proposed solution in three stipulations

The goal of this section is to show that all of the puzzles associated with the data from the previous section can be accounted for with just three rather mundane stipulations. (We call them stipulations for now so as to focus on how they account for the data rather than on how they might be independently justified; the task of independently justifying the stipulations is taken up in section 4.) We will first describe the three stipulations, and then show how they make sense of the data.

The perspective from which we approach the puzzles begins with the recognition that these puzzles reduce to three kinds of asymmetries: logophoric subjects pattern unlike full-NP subjects, the jussive marker patterns unlike the potential marker, and 'want' patterns unlike 'believe'. One way or another, then, the grammar of Gengbe will need to draw a distinction in each of these three areas. Each of the three stipulations we advance targets one of these asymmetries, putting the bulk of the explanatory burden on the semantic type system. Portner (2004) establishes the utility of exploiting the type system in understanding mood contrasts, which we take to provide a kind of *a priori* justification for going down this path.

The first stipulation identifies a contrast between logophors and ordinary full-NPs or pronouns: namely, what is special about a logophor is that it has to be bound by an attitude predicate (following Pearson 2015, who builds on Heim 2002; von Stechow 2002, 2003). So, if a structure contains a logophoric pronoun, that pronoun can be bound by an attitude predicate in the immediately higher clause, as in (16a), or by an attitude predicate in some higher clause, as in (16b), but if it is not bound by any attitude predicate at all, as in (16c), then the structure is ungrammatical.

(16) **Stipulation #1:** A logophor has to be bound by an attitude predicate:
a. Kofi say [Ama **believe** [λx. [**LOG**$_x$ eat]]] OK
b. Kofi **say** [λx. [Ama believe [**LOG**$_x$ eat]]] OK
c. Kofi say [Ama believe [LOG$_x$ eat]] ungrammatical

The second stipulation identifies a contrast between jussive and potential marking: in particular, the Gengbe jussive marker *nɛ́́* contributes an individual argument whereas the potential marker *lá* does not. Assuming for concreteness that a Gengbe clause with no mood marking has a type $\langle st \rangle$ denotation, this means that a jussive-marked clause will be type $\langle e, st \rangle$, as in (17a). By contrast, the potential marker has no interesting type-theoretic effect, as in (17b).

(17) **Stipulation #2:** *nɛ́́* 'JUSS' contributes an individual argument but *lá* 'POT' does not:
a. [Kofi eat]$_{\langle st \rangle}$ $\rightarrow$ [λx . Kofi JUSS eat]$_{\langle e,st \rangle}$
b. [Kofi eat]$_{\langle st \rangle}$ $\rightarrow$ [Kofi POT eat]$_{\langle st \rangle}$

Finally, the third stipulation identifies a contrast between between *dʒí* 'want' and *kɑ́́ɖóédʒí* 'believe': *dʒí* 'want' is type-theoretically rigid in only being able to combine with a property-denoting complement, whereas *kɑ́́ɖóédʒí* 'believe' is type-theoretically flexible in being able to combine either with a property-denoting complement or a proposition-denoting complement. This is schematized in (18).

(18) **Stipulation #3:** *dʒí* 'want' can only combine with a property whereas *kɑ́́ɖóédʒí* 'believe' can combine with either a proposition or a property:
a. $[\![\text{dʒí}]\!] = \lambda P_{\langle e,st \rangle} \lambda x \lambda w. \forall w' \in \text{BEST}_{desire}(\text{DOX}(x,w))\text{: } P(x)(w')$ $\langle \langle e, st \rangle, \langle e, st \rangle \rangle$
b. $[\![\text{kɑ́́ɖóédʒí}]\!] = \lambda p_{\langle st \rangle} \lambda x \lambda w. \forall w' \in \text{DOX}(x,w)\text{: } p(w')$ $\langle st, \langle e, st \rangle \rangle$
b′. $[\![\text{kɑ́́ɖóédʒí′}]\!] = \lambda P_{\langle e,st \rangle} \lambda x \lambda w. [\![\text{kɑ́́ɖóédʒí}]\!](P(x))(x)(w)$ $\langle \langle e, st \rangle, \langle e, st \rangle \rangle$
$= \lambda P_{\langle e,st \rangle} \lambda x \lambda w. \forall w' \in \text{DOX}(x,w)\text{: } P(x)(w')$

The fine-grained semantics of desire predicates will not be relevant for anything that follows but we assume for concreteness as in (18a) that 'want' involves a bouletic (BEST_{desire}-based) ordering source over the attitude holder's doxastic alternatives, essentially following von Fintel (1999) (though cf. also Heim 1992; Giannakidou 1999 and many others for variations on this theme). Von Fintel's semantics for 'want' is modified here so that the first argument of 'want' is a property whose unsaturated individual argument gets identified with the attitude holder (see Chierchia 1984, 1990; Dowty 1985, and more recently Stephenson 2010; Pearson 2016 for more sophisticated variants of this basic idea). As for 'believe', we adopt for concreteness the standard Hintikkan view that it effects universal quantification over the attitude holder's doxastic alternatives; crucially for us, it comes in both a $\langle st, \langle e, st\rangle\rangle$ variant, as in (18b), as well as a $\langle\langle e, st\rangle, \langle e, st\rangle\rangle$ variant, as in (18b′), the latter of which can be derived from the former as a type shift. Just like we did for 'want' in (18a), the type-shifted variant of 'believe' in (18b′) is set up in such a way that the unsaturated position associated with the property argument gets identified with the attitude holder.

With these three stipulations in place, all of the puzzling asymmetries laid out in the previous section immediately follow. Consider first what we called the core puzzle, i.e., the interaction seen in desire reports between mood marker choice and antecedent choice for logophors, repeated schematically in (19)–(20).

(19) Kofi_1 say [Ama_2 want [$\text{LOG}_{*1/2}$ POT eat]] want+LOG+POT → CTRL

(20) Kofi_1 say [Ama_2 want [$\text{LOG}_{1/*2}$ JUSS eat]] want+LOG+JUSS → OBV.

The unavailability of a long-distance antecedent construal for the logophor in (19) follows from the fact that only the local antecedent construal results in 'want' combining with a type $\langle e, st\rangle$ complement, which is the only kind of complement it accepts. As schematized in (21), local binding of the logophor by 'want' renders the relevant complement a type $\langle e, st\rangle$ expression (21a), whereas long-distance binding of the logophor by 'say' preserves the type $\langle st\rangle$ status of the complement to 'want' and therefore results in type-mismatch-induced uninterpretability (21b).

(21) want+LOG+POT induces control:
a. Kofi say Ama [$\text{want}_{\langle\langle e,st\rangle,\langle e,st\rangle\rangle}$ [λx. LOG_x POT eat]$_{\langle e,st\rangle}$] ← OK
b. Kofi say [λx.Ama $\text{want}_{\langle\langle e,st\rangle,\langle e,st\rangle\rangle}$ [LOG_x POT eat]$_{\langle st\rangle}$] ← *

In (20), by contrast, when a jussive-marked clause is used, the opposite holds. Local binding of the logophor by 'want' conspires with individual-argument-introducing JUSS to yield a type $\langle e, \langle e, st\rangle\rangle$ complement for 'want', and this yields a type mismatch. But long-distance binding of the logophor by 'say' ensures that the complement to 'want' is type $\langle e, st\rangle$ (achieved via the JUSS-induced individual argument added onto an underlyingly type $\langle st\rangle$ clause), so the structure is interpretable. (We assume here and in what follows that 'say' is like 'believe' in being able to accept both $\langle st\rangle$ and $\langle e, st\rangle$ complements.)

(22) want+LOG+JUSS induces obviation:
a. Kofi say Ama [want$_{\langle\langle e,st\rangle,\langle e,st\rangle\rangle}$ [$\lambda x \lambda y$. LOG$_x$ JUSS eat]$_{\langle e,\langle e,st\rangle\rangle}$] ← *
b. Kofi say [λx.Ama want$_{\langle\langle e,st\rangle,\langle e,st\rangle\rangle}$ [λy. LOG$_x$ JUSS eat]$_{\langle e,st\rangle}$] ← OK

The two subsidiary puzzles also fall into place. The first of the two subsidiary puzzles was that when 'want' embeds a full-NP subject, the embedded clause cannot be potential-marked and instead must be jussive-marked, as repeated schematically in (23)–(24).

(23) *Kofi say [Ama want [Aku POT eat]] want+full-NP+POT → *

(24) Kofi say [Ama want [Aku JUSS eat]] want+full-NP+JUSS → OK

The facts in (23)–(24) now similarly follow from type-theoretic principles, as schematized in (25). With no logophoric binding at stake, the potential marker results in a type $\langle st\rangle$ denotation, which 'want' cannot handle, whereas the jussive marker yields a type $\langle e,st\rangle$ complement, appropriate for 'want'.

(25) a. Kofi say [Ama want$_{\langle\langle e,st\rangle,\langle e,st\rangle\rangle}$ [Aku POT eat]$_{\langle st\rangle}$] ← *
b. Kofi say [Ama want$_{\langle\langle e,st\rangle,\langle e,st\rangle\rangle}$ [λx.Aku JUSS eat]$_{\langle e,st\rangle}$] ← OK

Finally, the second of the two subsidiary puzzles was the observation that when 'want' is replaced by 'believe', all of the restrictions go away, except that a logophor in a jussive-marked clause still resists local binding just like it does for 'want'. This is repeated schematically in (26)–(29).

(26) Kofi say [Ama believe [Aku POT eat]] believe+full-NP+POT → OK

(27) Kofi say [Ama believe [Aku JUSS eat]] believe+full-NP+JUSS → OK

(28) Kofi$_1$ say [Ama$_2$ believe [LOG$_{1/2}$ POT eat]] believe+LOG+POT → AMBIG.

(29) Kofi$_1$ say [Ama$_2$ believe [LOG$_{1/*2}$ JUSS eat]] believe+LOG+JUSS → OBV.

Turning first to (26)–(27), type-theoretic flexibility for 'believe' ensures that both kinds of mood markers will be acceptable when no logophors are present. As schematized in (30), potential-marking yields a type $\langle st\rangle$ complement and jussive-marking yields a type $\langle e,st\rangle$ complement.

(30) Type flexibility for 'believe' renders believe+full-NP+POT / believe+full-NP+JUSS both OK:
a. Kofi say [Ama believe$_{\langle\langle st\rangle,\langle e,st\rangle\rangle}$ [Aku POT eat]$_{\langle st\rangle}$] ← OK
b. Kofi say [Ama believe$_{\langle\langle e,st\rangle,\langle e,st\rangle\rangle}$ [λx. Aku JUSS eat]$_{\langle e,st\rangle}$] ← OK

Turning next to (28), here again type-theoretic flexibility for 'believe' ensures the availability of both binding options: as schematized in (31), long-distance binding yields a type $\langle st\rangle$ complement and local binding yields a type $\langle e,st\rangle$ complement.

(31) Type flexibility also enables both binding options for believe+LOG+POT:
a. Kofi say [λx. Ama believe$_{\langle\langle st\rangle,\langle e,st\rangle\rangle}$ [LOG$_x$ POT eat]$_{\langle st\rangle}$] ← OK
b. Kofi say [Ama believe$_{\langle\langle e,st\rangle,\langle e,st\rangle\rangle}$ [λx. LOG$_x$ POT eat]$_{\langle e,st\rangle}$] ← OK

Finally, we turn to (29): why does a jussive-marked clause force long-distance binding of the logophor? The answer is that local binding conspires with jussive marking to yield a type $\langle e,\langle e,st\rangle\rangle$ complement, which 'believe' (just like 'want') cannot tolerate. This is schematized in (32).

(32) But even with type flexibility, believe+LOG+JUSS induces obviation:
a. Kofi say [Ama believe$_{\langle\langle st\rangle,\langle e,st\rangle\rangle/\langle\langle e,st\rangle,\langle e,st\rangle\rangle}$ [$\lambda x\lambda y$. LOG$_x$ JUSS eat]$_{\langle e,\langle e,st\rangle\rangle}$] ← *
b. Kofi say [λx. Ama believe$_{\langle\langle e,st\rangle,\langle e,st\rangle\rangle}$ [λy. LOG$_x$ JUSS eat]$_{\langle e,st\rangle}$] ← OK

In short, we have now seen that all of the data in section 2 follow from the three stipulations in (16)–(18) about the expressions involved in the relevant structures. The task now before us is to independently justify these stipulations.

4. Revisiting the three stipulations

4.1. A logophor has to be bound by an attitude predicate

The first of our three stipulations, namely that a logophor has to be bound by an attitude, is not new to us and so we will not dwell on it extensively here. Pearson (2015) defends this view, attributing it to earlier work by Heim (2002); von Stechow (2002, 2003). It is a rather straightforward way of deriving the generalization that logophors can appear only in attitudinal contexts. Insofar as these authors were concerned with facts quite different from those at issue here, we take their work as providing independent justification for this proposal.

We are not committed to any particular way of encoding this proposal into the grammar, but for concreteness, we can adopt Pearson's (2015) approach, following Heim (2002); von Stechow (2002, 2003), in hypothesizing that logophors enter the derivation with an uninterpretable feature [log]. This feature must be checked via binding by an operator that also bears the [log] feature. Attitude predicates bear the [log] feature, and an attitude predicate can pass this feature to an individual abstractor in the left periphery of its CP complement. Returning to our three crucial cases in (33), (33a–b) are both grammatical because the [log] feature on the logophor is checked by its binder, whereas (33c) crashes because the [log] feature on the logophor is not checked.

(33) a. Kofi say [Ama **believe**$_{[log]}$ [λ x$_{[log]}$. [**LOG**$_{x[log]}$ eat]]] OK
b. Kofi **say**$_{[log]}$ [λ x$_{[log]}$. [Ama believe [**LOG**$_{x[log]}$ eat]]] OK
c. Kofi say [Ama believe [LOG$_{x[log]}$ eat]] ungrammatical

4.2. *Nɛ́* 'JUSS' contributes an individual argument whereas *lá* 'POT' does not

We turn our attention now to the proposal that the jussive marker *nɛ́* contributes an individual argument whereas the potential marker *lá* 'POT' does not. The first thing to note is that in unembedded contexts, *lá* is typically used to express future possibility (34) (cf. Essegbey 2008), whereas *nɛ́*, as already seen in the introduction, is used to indicate a speaker-oriented desire or priority (35).

(34) Kòfí **lá** ɖù nű́.
Kofi POT eat thing
'Kofi will/might eat.'

(35) Kòfí **nɛ́** ɖù nű́.
Kofi JUSS eat thing
'Kofi should eat.' / 'I want Kofi to eat.'

We also note that Ameka (2008), investigating the cognate Ewe jussive particle *né*, provides some examples suggesting that this marker sometimes has an optative flavor, and we have confirmed that the same is true for Gengbe, as in (36).

(36) gbɔ̀gbɔ̀ vɔ́-wó **nɛ́** dògó.
spirit bad-PL JUSS exit
'Let evil spirits come out.' (Gengbe version of Ameka's 2008:152 Ewe example)

We take this priority-oriented, optative-like status to be highly suggestive that *nɛ́* is in the same family of morphemes identified by Zanuttini et al. (2012) as jussives, which for them include imperatives (37), promissives (38), exhortatives (39), and (possibly) optatives (40) — though their focus is on the former three and they do not commit to a particular analysis of optatives. The data in (37)–(40) are all taken from their paper.

(37) Cemsim-ul sa-**la**.
lunch-ACC buy-IMP
'Buy lunch!' (Korean imperative, Zanuttini et al. 2012:1234)

(38) Cemsim-ul sa-**ma**.
lunch-ACC buy-PRM
'I will buy lunch.' (Korean promissive, Zanuttini et al. 2012:1234)

(39) Cemsim-ul sa-**ca**
lunch-ACC buy-EXH
'Let's buy lunch.' (Korean exhortative, Zanuttini et al. 2012:1234)

(40) k^ha:y
eat-IMP.3SG
'Let him eat.' (Bhojpuri optative, Zanuttini et al. 2012:1252)

Zanuttini et al. (2012) propose that jussives are individual abstractors that, when standing in a sufficiently local syntactic configuration with the subject, bind that subject and impose a person restriction on it, as schematized in (41). What distinguishes different kinds of jussives is the value of the person restriction: second-person for imperatives, first-person (exclusive) for promissives, and first-person (inclusive) for exhortatives. The person value also determines whose To-Do List the property gets added to when the utterance is successful in its illocutionary aim: the addressee's for imperatives, the speaker's for promissives, and both the speaker's and the addressee's for exhortatives.

(41) For any phrase XP,
$[\![\text{JUSS}[\text{person: } v]_k \text{ XP}]\!]^{g,c} = [\lambda x : x = [\![[\text{person: } v]_k]\!]^{g,c} . [\![\text{XP}]\!]^{g[k\to x],c}]$
(Zanuttini et al. 2012:1265)

In a footnote (p. 1252, note 30), Zanuttini et al. mention a suggestion by Patrick Grosz for fitting optatives into this setup, namely by 'relaxing the restriction that it should be possible for the addressee to bring about the situation described', so that the property associated with the optative is added to the addressee's To-Do List and 'the addressee is committed to the judgment that a world in which [the content associated with the optative holds] is preferable to one in which [it] doesn't, even though we know that the addressee cannot bring the world to this preferable state'. While conceivable, this suggestion seems to us to fit awkwardly with the fact that on this view, imperatives, promissives and exhortatives all receive an analysis whereby the person restriction they impose matches the participant associated with the targeted To-Do List, whereas optatives target the addressee's To-Do List despite generally being compatible with subjects of any person value.

In light of this, what we would like to suggest as an alternative is that optatives induce individual abstraction without any person restriction. The status of the utterance as a property has the discourse-theoretic effect of endowing it with a 'world-to-word' direction of fit (in the sense of Searle 1969), but the lack of person restriction has the consequence that it is not directed at any particular individual's To-Do List. This has the pragmatic effect of expressing a wish without imposing on anyone an obligation for its fulfillment. Applied to the Gengbe jussive marker *nɛ́́*, this analysis amounts to (42).[5] (Cf. Sæbø 2009 for a strikingly similar approach to English *have*, though we will resist the urge to speculate here on whether an analytical connection between jussives/optatives and *have* is a good thing or not.)

(42) $[\![\text{nɛ́́}]\!] = \lambda p \lambda x.p$

In short, (42) helps make sense of otherwise puzzling asymmetries in how logophors behave in Gengbe attitude reports, and the suggestion made here now is that (42) is independently motivated by the broader distribution and function of the jussive marker in Gengbe paired with Zanuttini et al.'s (2012) property-theoretic approach to jussives. Despite these virtues, one might be reluctant to assign such a near-vacuous denotation to the jussive marker. In section 5

[5] Actually, it is an oversimplification to say that *nɛ́́* comes with no person restriction: it disallows first-person subjects, both in matrix and in embedded contexts. The significance of this fact is unfortunately something that will have to be left for future research.

below, we entertain the alternative view that the jussive marker, in addition to contributing an individual argument, also has a modal semantics. First, though, we need to unpack our third proposal concerning the type-theoretic status of 'want' and 'believe'.

4.3. *Dʒí* 'want' can only combine with a property whereas *kā̋ɖóédʒí* 'believe' can combine with either a proposition or a property

The third and final proposal that we need to substantiate is the idea that *dʒí* 'want' can only combine with a property whereas *kā̋ɖóédʒí* 'believe' is type-theoretically flexible in being able to combine either with a proposition or with a property. This proposal goes against the recent grain in the formal semantics literature of treating *all* clauses in a type-theoretically uniform way, whether that be as propositions (as explored by Stephenson 2010) or as properties (as explored by Pearson 2013), regardless of whether the clause is embedded or not, controlled or not, or interpreted *de se* or not. But it is not a new idea either: Dowty (1985) proposes that non-control complements are proposition-denoting whereas control complements are property-denoting, which, as Dowty discusses, has as a consequence that some embedding verbs (those that disallow control) are type $\langle st, \ldots \rangle$, others (those that only accept control complements) are type $\langle \langle e, st \rangle, \ldots \rangle$, and still others (those that admit both control and non-control complements) are $\langle st, \ldots \rangle / \langle \langle e, st \rangle, \ldots \rangle$-flexible.

Here we would like to entertain a variant of Dowty's (1985) proposal whereby what determines whether the complement is proposition- or property-denoting is not whether it is controlled but rather what kind of mood marking it has. By way of independent motivation, consider the observation that English *want* admits nonfinite complements but not finite complements (43) whereas *believe* is flexible in admitting both kinds of complements (44).

(43) a. John **wants** [Bill **to be** happy].
b. *John **wants** [that Bill **is** happy].

(44) a. John **believes** [Bill **to be** happy].
b. John **believes** [that Bill **is** happy].

This situation bears a striking resemblance to that of Romance: 'want' is rigid in only accepting subjunctive complements to the exclusion of indicative complements, as seen in the Spanish and Italian examples in (45) and (46), respectively, whereas 'believe' gives rise to variability: it ordinarily takes an indicative complement in Spanish (47) and an subjunctive complement in Italian (48).

(45) Juan **quiere** [que Pedro {**sea**/***es**} feliz].
'Juan wants that Pedro be.SBJV/INDIC happy.' Spanish

(46) Gianni **vuole** [che Pietro {**sia**/***è**} felice].
'Gianni wants that Pietro be.SBJV/INDIC happy.' Italian

(47) Juan **cree** [que Pedro **es** feliz].
'Juan believes that Pedro is.INDIC happy.' Spanish

(48) Gianni **crede** [che Pietro **sia** felice].
'Gianni believes that Pietro be.SBJV happy.' Italian

We can encode these subcategorization facts via a cross-linguistic extension of the same type-theoretic machinery that supports our analysis of the Gengbe facts. In particular, suppose that cross-linguistically, 'want' rigidly selects for a property (49) whereas 'believe' flexibly selects for either a proposition or a property (50).

(49) $[\![\text{want}]\!] = \lambda P_{\langle e,st\rangle} \lambda x \lambda w. \forall w' \in \text{BEST}_{desire}(\text{DOX}(x,w))\text{: } P(x)(w')$ $\langle\langle e,st\rangle,\langle e,st\rangle\rangle$

(50) a. $[\![\text{believe}]\!] = \lambda p_{\langle st\rangle} \lambda x \lambda w. \forall w' \in \text{DOX}(x,w)\text{: } p(w')$ $\langle st,\langle e,st\rangle\rangle$
b. $[\![\text{believe}']\!] = \lambda P_{\langle e,st\rangle} \lambda x \lambda w. \forall w' \in \text{DOX}(x,w)\text{: } P(x)(w')$ $\langle\langle e,st\rangle,\langle e,st\rangle\rangle$

Then the subcategorization facts follow, as long as Romance subjunctive clauses and English nonfinite clauses (regardless of whether they are controlled or not) are property-denoting just like Gengbe jussive-marked clauses (51), whereas finite indicative clauses are proposition-denoting (52).

(51) Infinitives/subjunctive clauses
a. $[\![\text{PRO to be happy}]\!] = [\lambda x \lambda w$. x is happy in w] $\langle e,st\rangle$
b. $[\![\text{Bill to be happy}]\!] = [\lambda x \lambda w$. Bill is happy in w] $\langle e,st\rangle$
c. $[\![\text{Pedro sea feliz}]\!] = [\lambda x \lambda w$. Pedro is happy in w] $\langle e,st\rangle$

(52) Finite indicative clauses
a. $[\![\text{Bill is happy}]\!] = [\lambda w$. Bill is happy in w] $\langle st\rangle$
b. $[\![\text{Pedro es feliz}]\!] = [\lambda w$. Pedro is happy in w] $\langle st\rangle$

To be sure, there is a rich set of empirical facts and a rich literature surrounding the question of what grammatical factors conspire to determine what kind of finiteness or mood marking a clause will have in a given environment. (See e.g. Portner and Rubinstein 2013 for a recent assessment.) Our type-theoretic proposal is intended not as a *replacement* for existing proposals about what semantic properties characterize indicative- vs. subjunctive-selecting verbs but rather as an *implementation* of any such proposal. It does not say anything interesting about *why* verbs have the type signature they do and hence ultimately needs to be embedded into a theory that does.

5. Harmonic modality?

It is crucial to our account of the data that the jussive marker *nɛ́* contributes an individual argument, and in section 4.2 above, we proposed that this is *all* the jussive marker does. But our analysis is also consistent with the view that *nɛ́* does more than just this. And given that this marker occurs in contexts associated with a priority semantics, we would like to entertain the

possibility that *nɛ́́* is a priority modal in the sense of Portner (2007, 2009). The individual argument it contributes could then be understood naturally as an argument that helps determine the set of worlds that the modal quantifies over, as in (53) (the basic shape of (53), discounting the individual argument, is inspired by the approach to modals found in Kratzer 2013). According to (53), *nɛ́́* combines with a situation description *p* and returns a relation between individuals and situations. This relation is true of an individual *x* and a situation *s* iff all those worlds compatible with *x*'s priorities in *s* are worlds that contain a situation verified by *p*. (Actually, this is a simplification: technically, we need a circumstantial modal base and a priority-oriented ordering source: see Portner 2009:135. We suppress this detail here for ease of presentation.)

(53) $[\![\text{nɛ́́}]\!] = \lambda p_{\langle st\rangle}\lambda x\lambda s.\forall w' \in \text{PRIORITY}(x,s)\text{: } \exists s' [s' \leq w' \wedge p(s')]$
where $\text{PRIORITY}(x,s) = \{\forall w \mid w \text{ is compatible with x's priorities in s}\}$

This approach then has consequences for the compositional semantics of desire reports like (54).

(54) Ámɑ́ **dʒí** [bé **Àkú nɛ́́** ɖù nɔ́́].
Ama want COMP Aku JUSS eat thing
'Ama wants Aku to eat.'

With modal meaning built into the jussive marker, we need to correspondingly shift the modality out of the desire predicate. In particular, we can adopt the semantics for *dʒí* 'want' in (55), thereby arriving at a meaning like (56) for the desire report in (54).

(55) $[\![\text{dʒí}]\!] = \lambda P_{\langle e,st\rangle}\lambda x\lambda s.\text{want}(s) \wedge \text{EXPERIENCER}(s) = x \wedge P(x)(s)$

(56) [Ama want COMP Aku JUSS eat thing] =
$\exists s$ [want(s) $\wedge$ EXPERIENCER(s)=Ama $\wedge$ $\forall w' \in$ PRIORITY(Ama,s): $\exists s'$ [$s' \leq w' \wedge$ Aku eats in s']]
'There is a situation *s*, *s* is a wanting whose experiencer is Ama, and all those worlds compatible with Ama's priorities in *s* are worlds in which there is a situation in which Aku eats.'

This approach reflects a Kratzer 2013-style decompositional 'neo-Davidsonian' approach to clausal embedding (cf. also Moulton 2009; Bogal-Allbritten 2016; Grano 2016).[6] On this analysis, *dʒí* ... *nɛ́́* ('want ... JUSS') instantiates the same kind of harmonic modality that Kratzer (2013) points to in motivating her approach to clausal embedding, such as the examples in (57)–(58).

(57) It seems to us entirely **desirable** that there **ought to** be a constitutional amendment. (Kratzer 2013:slide 17)

[6] One notable way in which we depart from these previous approaches, though, is that the previous approaches treat the attitude predicate as composing with its clausal complement via Predicate Modification (or Restrict), whereas we treat it as composing with its complement via Functional Application. This is needed on our account in order for the attitude predicate to be able to regulate the type of its complement ('want' needing a property but 'believe' being compatible with either a property or a proposition).

(58) The urgency of the situation **requires** that the dig **must** continue regardless of the weather and comfort. (Kratzer 2013:slide 18)

In examples like (57)–(58), the bolded modals in the embedded clause seem to be redundant with the bolded embedding predicates. On Kratzer's decompositional approach to embedding, this redundancy is readily made sense of, because the modality is located solely on the modals and the embedding predicates merely serve to help fix the modal base(/ordering source) by supplying a situation variable.

A potential source of cross-linguistic support for the harmonic modality approach to (54) comes from the Yiddish and Yiddish English *want…should* locution, exemplified in (59)–(60).

(59) Ikh **vil** er **zol** geyn.
1SG want 3SG should go
'I want him to go.' (Yiddish, Sadock 2012)

(60) You **want** I **should** help you?
(see discussion at `http://languagelog.ldc.upenn.edu/nll/?p=11847`)

Here we see a striking parallel between Yiddish/Yiddish English and Gengbe in the sense that in both languages, 'want' routinely embeds a marker that, in matrix contexts, can be used to express priority semantics. If Yiddish (and Yiddish English) 'should' and Gengbe *nɛ́* are to have the same analysis, this means either that 'should' does not have a modal semantics but is rather merely an individual abstractor, or that Gengbe *nɛ́* does have a modal semantics, along the lines suggested here.

To recap, there are two ways of cashing out the proposal that *nɛ́* has the type-theoretic consequence of introducing an individual argument. On this first approach we entertained, it is a pure individual abstractor with no other content. On the second approach we entertained, it is a priority modal that introduces an individual argument which in turn helps determine the worlds that the modal quantifies over. Notably, the individual argument plays very different roles depending on which approach is taken: on the first approach, it corresponds to the hypothetical individual on whose To-Do List the relevant property is placed and who consequently bears an obligation to make the property true of herself. On the second approach, by contrast, it corresponds to the individual whose desires or goals make the content associated with the property a priority.

It will be beyond the scope of this paper to adjudicate between these two approaches, but a couple of issues at stake can be mentioned. One potential advantage of the modal approach is that it more readily makes sense of the fact that *nɛ́* can be embedded into a belief report in such a way that it has a transparent priority-oriented semantics, as in (61). On the individual abstractor approach, it is unclear why the mere status of the embedded clause as a property would give it a priority flavor. (It also bears noting that in examples like this, the modal approach commits us to positing an appropriate modal in the left-periphery of the embedded clause, just as Kratzer 2013 does for belief reports that do not contain an overt modal.)

(61) Ámá̋ **kɑ̋ɖóédʒí** [bé **Àkú nɛ̋** ɖù nɯ́].
Ama believe COMP Aku JUSS eat thing
'Ama believes that Aku should eat.'

The two approaches also have different consequences for the illocutionary force of examples like (62). On the individual abstractor approach, (62) has a special illocutionary force in virtue of being property-denoting and the priority flavor is a consequence of this. But on the modal approach, (62) is just an assertion (proposition-denoting, the individual argument of the modal being, by hypothesis, speaker-bound in matrix contexts) and its priority flavor is a consequence of its modality. More research will be needed to determine what kind of illocutionary force (62) in fact has.

(62) Kòfí **nɛ̋** ɖù nɯ́.
Kofi JUSS eat thing
'Kofi should eat.' / 'I want Kofi to eat.'

6. Conclusions

The central narrow conclusion of this paper is that a property analysis of Gengbe jussive clauses helps make sense of an otherwise puzzling interaction between embedding verb choice, mood choice, and antecedent choice for logophors. Of broader significance is the prospect of extending this property analysis to subjunctive and infinitival clauses on a cross-linguistic scale, thereby enabling a theoretical unification across superficially disparate but underlyingly related mood categories. In this connection, an important question that still needs to be addressed is: if we are correct in extending the property analysis of jussive clauses to subjunctive clauses and infinitives cross-linguistically, why do the specific puzzles we see in Gengbe not show up in more familiarly studied languages? We think that it is because Gengbe has two properties that are not typical among better studied languages. First, it has logophoric pronouns, which are crucial to the central puzzle. Second it has 'full' (in the sense of being 'finite' or 'non-truncated') clauses as complements to verbs like 'want'; if this were not the case, we might not expect to see overt logophors or overt mood markers in these complements and hence the puzzles would not arise. So the suggestion is that it is only when these two properties co-occur in a language that they conspire with the possibly universal type-theoretic principles entertained in this paper to give rise to the set of puzzling facts that we saw in section 2.

There is one final theoretical point to be made: we think that it is also in light of the two aforementioned properties of Gengbe that we see in Gengbe the recruitment of logophoricity to achieve syntactic control. In (63), repeated from (8) above, the subject of the bracketed clause is obligatorily identified with an argument of the immediately higher clause, which is precisely the hallmark of obligatory control in the sense of Landau (2000).

(63) (Àkú$_1$ bé Kòfí$_2$ bé) **Ámɛ̋$_3$ dʒí** [bé **jè**$_{(*1/*2/)3/*4}$ **lá** ɖù nɯ́].
Aku say Kofi say Ama want COMP LOG POT eat thing
'(Aku said that Kofi said that) Ama wants to eat.'

This is significant for two reasons. First, it possibly constitutes evidence against Landau's

(2015:38) claim, following Culy (1994), that logophors never occur in obligatory control complements. If 'obligatory control complement' is to be defined in a non-circular way, it seems to us difficult to escape the conclusion that (63) instantiates a logophor in an obligatory control complement. Second, speaking more broadly, our analysis of (63) is consonant with the recent trend in control theory of not viewing controlled subjects as instantiations of a dedicated inaudible pronoun PRO but instead as a species of expression that enjoys wider grammatical currency such as minimal pronouns (Kratzer, 2009; Landau, 2015) or DP copies left behind by movement (Hornstein, 1999). Both the minimal pronoun approach and the movement approach give rise to the expectation that controlled subjects should be phonologically overt under some conditions (as overt pronouns or as pronounced copies, respectively). And also on both approaches, control is not a theoretically primitive notion but is rather an emergent consequence of the lexical items in the sentence and how they interact with each other, which is precisely how our theory treats Gengbe sentences like (63).

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