



Control theory and the relationship between logophoric pronouns and logophoric uses of anaphors

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Abstract

Long distance (or “exempt”) uses of anaphors in Eurasian languages are often compared to the special logophoric pronouns found in certain West African languages. By undertaking a close comparison, we show that Ibibio’s (Nigerian) dedicated logophor *imọ* and Japanese’s anaphor *zibun* display both striking similarities and some systematic differences, which we capture using control theory. Although *imọ* is intrinsically a pronoun and *zibun* an anaphor, both can be analyzed as bound by a null DP operator in the left periphery of the clause. We claim that when the containing clause is a complement or adjunct clause, the null DP operator undergoes obligatory control, such that the argument of the matrix verb that best matches its thematic role controls the null DP and becomes the ultimate antecedent of *imọ* or *zibun*. This captures the similarities between the two. The differences appear when the clause containing *imọ* or *zibun* is not in a position where obligatory control applies, as a relative clause or a root clause. In these contexts, Ibibio’s version of the null DP is ruled out, whereas Japanese’s version is permitted, being assigned a prominent (empathetic) antecedent from the sentence or discourse. This new use of control theory thus sheds light on both the similarities between logophoric pronouns and long-distance anaphors and their differences.

Keywords Logophoric pronouns · Long distance anaphors · Ibibio · Japanese · Obligatory control

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1 Introduction

One of the more striking crosslinguistic comparisons involving unrelated languages in the history of generative linguistics is the one between the dedicated logophoric pronouns of certain African languages and long-distance (LD, also called *exempt*) uses of anaphors in East Asian languages and Indo-European languages. The view that the two phenomena have something in common goes back to early generative discussions of both. For example, Clements (1975) showed how similar the specialized logophoric pronoun *yè* in Ewe is to the “indirect” uses of reflexive pronouns like *sibi* in Latin. Similarly, Sells (1987) developed a discourse representation theory approach to logophoric pronouns that explicitly draws from African data, East Asian languages (Japanese), and IE languages (Icelandic, Italian). The idea that these are related phenomena has been widely assumed ever since and is mentioned by virtually all works in this area. This is an interesting case for the notion of Universal Grammar, because it seems that an unusual grammatical quirk found in one particular linguistic area—the dedicated logophoric pronouns of some West African languages and perhaps only those (Culy 1994: 1059)—is akin to something that exists in a more subtle way—special uses of what are otherwise ordinary anaphors—in a larger range of unrelated languages.

Despite this robust tradition of relating African logophoricity to LD anaphora in Europe and Asia, very few works have compared the two in a truly balanced fashion, looking at languages of both kinds with equal attention and sophistication. This is not surprising, in that few researchers are equally equipped to study both West African languages and (say) East Asian languages in an even-handed way. But this is a potential problem, because many things appear similar only if one looks at them from a distance while squinting. It is possible, then, that the similarity between West African logophoricity and East Asian LD anaphora could turn out to be something of an illusion, not providing significant support for Universal Grammar after all.

In this article, we capitalize on (create) an opportunity to study in a more balanced way logophoricity in the West African language Ibibio (spoken in the Cross River region of Nigeria) and LD anaphora in Japanese. At an empirical level, we have elicited similar materials in both languages, using results gained from each language to guide additional inquiry into the other language. By doing this, we confirm and sharpen earlier results, showing that there are striking similarities in some subdomains, but also significant differences in other subdomains. At the theoretical level, we claim that advances in the theory of control shed new light on this pattern of similarity and difference. In particular, we argue that Landau’s (2013) synthesis of the distinction between obligatory control (OC) and nonobligatory control (NOC) is important in both Ibibio and Japanese, although in different ways.

Our top-level findings are that the logophoric pronoun *imò* in Ibibio and the anaphor *zibun* in Japanese behave very similarly when they are contained in a complement clause or adjunct clause—the syntactic contexts where OC happens, according to Landau (2013). In these contexts, both *imò* and *zibun* show a distinctive pattern of antecedence, where a subject can be the ultimate antecedent, but so can the oblique source phrase of a verb like ‘hear,’ whereas the goal of a verb like ‘tell’ cannot be the antecedent. We refer to this as the *logophoric* pattern of antecedence. It is shown for

Ibibio in (1) and (2) (cf. Clements 1975; Pearson 2013: 445), and for Japanese in (3) and (4), which are from Nishigauchi (2014: 190–191) (see also Sells 1987: 453–454; Oshima 2004).^{1,2}

- (1) Okon á-ké-dòkkò Edem [ké Emem í-máá-ghá ímò].
Okon 3SG-PST-tell Edem that Emem 3SG-like-NEG LOG
'Okon_i told Edem_k [IOp_{i,*k} that [Emem does not like him_{i,*k}]].'
- (2) Okon a-ke-kop a-to Emem [ke imò i-ma-i-dia
Okon 3SG-PST-hear 3SG-from Emem that LOG 3.LOG-PST-3.LOG-win
nsa-akak].
lottery
'Okon_i heard from Emem_k [IOp_{i,k} that [he_{i,k} won the lottery]].'
- (3) Keizi-wa sono seizika-ni [booryokudan-ga zibun-o
detective-TOP the politician-DAT gangsters-NOM self-ACC
sagasi-te-i-ru-koto-o] osie-ta.
search-AUX-PRS-COMP-ACC tell-PST
'The detective_i told the politician_k [zOp_{i,*k} that gangsters are searching for self_{i,*k}].
- (4) Keizi-wa sono seizika-kara [booryokudan-ga zibun-o
detective-TOP that politician-from gangsters-NOM self-ACC
odosi-te-i-ru-koto-o] kii-ta.
blackmail-AUX-PRS-COMP-ACC hear-PST
'The detective_i heard from the politician_k [zOp_{i,k} that gangsters are black-mailing self_{i,k}].'

This parallelism between Ibibio and Japanese extends to other, second order effects as well.

In contrast, when the clause containing *imò* or *zibun* is in some other syntactic position—e.g., a relative clause or a root clause—Ibibio and Japanese behave quite differently. Ibibio's *imò* is generally impossible in these contexts, as shown in (5). In contrast, *zibun* in Japanese is possible in these contexts, as shown in (6).

¹ All examples that are not attributed to a published source are from our fieldwork or native speaker judgments. New data from Ibibio comes from Dr. Willie Udo Willie, a native-speaker linguist living and working in the Ibibio-speaking area of Nigeria. The data was collected by way of a long series of 3-page questionnaires, sent once a week over the course of several months, with extensive opportunity for follow up. (Data on other topics was collected at the same time.) There is also valuable data on Ibibio's logophoric pronouns and how they compare with other pronouns and anaphors in the language in the Afranaph Ibibio questionnaire by Willie Udo Willie and Ken Safir. Another source is Newkirk (2017), who worked with a different speaker. Our data agrees with hers on all but three specific points, which are noted below. New data from Japanese comes from the native speaker judgments of the second author. Note that the indices in our examples show the readings of primary interest (good or bad), but not necessarily all the readings that a given sentence may have. This is particularly true for Japanese examples, where readings in which *zibun* takes a local subject antecedent are often not indicated.

² We follow the Leipzig glossing conventions, with the following additional abbreviations: EVID = evidential, FM = familiarity marker, FV = final vowel, H = honorific, HH = high honorific, INT = intensitive, LOG = logophoric pronoun, NH = nonhonorific. 1 and 2 are also used as indications of noun class in Lubukusu (roughly human singular and human plural).

- (5) a. *Okon a-ma a-duok [ngwet odo [se imo i-k-i-dep]]. (Ibibio)
 Okon 3SG-PST-3SG-lose book the REL LOG 3.LOG-PST-3.LOG-buy
 ('Okon_i lost [the book [IOp*_i that he*_i bought]].')
- b. *Ke akikere Okon, imo i-ma i-due.
 in thought Okon LOG 3.LOG-PST-3.LOG-guilty
 ('In Okon_i's opinion, he_i was guilty.')
- (6) a. Takasi-wa [[zibun-o sonkee-suru] onna-to] kekkon-si-ta. (Japanese)
 Takasi-TOP self-ACC admire-do woman-with marry-do-PST
 'Takasi_i married [a woman [zOp_i that admires self_i]].' (Nishigauchi
 2014: 185)
- b. Taroo-ni.yoruto zibun-wa waruku-nai-?(n(o)-da)soo-da.
 Taroo-according.to self-TOP bad-NEG-*no*-COP-EVID-COP
 'According to Taroo_i, self_i is not bad.'

Nevertheless *zibun* in (say) a relative clause is rather different from *zibun* in a complement clause, as recognized to varying degrees by previous researchers—see especially Kuno (1987) and Oshima (2004). In particular, *zibun* in a relative clause does not show the distinctive logophoric pattern of antecedence in (1–4); rather, it picks as its antecedent an NP that is an empathy locus rather than one with a particular thematic role.

Our hypothesis in a nutshell is within the tradition pioneered by Koopman and Sportiche's (1989) (K&S) study of logophoricity in Abe (see also Huang and Liu 2001 on Chinese, and Lebeaux 1984 for an early connection between control and operator binding). According to this view, both logophoric pronouns like *imo* and LD anaphors like *zibun* are (syntactically) bound variables which must be bound by a special null DP operator licensed in the periphery of the clause that contains them. Therefore, the structure of examples like (1) and (3) is roughly (7).³

- (7) Okon_i told Edem_k [Op_{i,*k} [Emem does not like LOG/SELF_{i,*k}]].

More distinctively (but still in line with K&S), we argue that Op in (7) is the kind of element that is subject to the theory of control, analogous in this respect to PRO in English. In particular, it falls under the principle in (8), which is a generalized version of Landau's (2013) Obligatory Control Signature.

- (8) *The Generalized OC Signature: (GOCS, preliminary)*
 If a clause with an intrinsically null DP (PRO, Op, ...) at its edge is generated within the extended projection of a verb, then the null DP is controlled by an argument of that verb. Which argument of the verb is the controller is determined by the thematic roles of the DPs involved.

We claim that this view sheds light both on why *imo* and *zibun* behave very similarly in some contexts and on why they diverge rather dramatically in other contexts. When

³Some care is needed with the term "operator." We use this in the syntactic sense of a fully phrasal nominal—not in the semantic sense in which an operator is often just a functional head that takes an element of some type and returns a meaning of similar type. Even in the syntactic tradition, the term operator is usually reserved for null DPs in A-bar positions, whereas we follow Charnavel (2019) in saying that some of these elements can count as A-positions.

they appear in a complement clause, (8) applies and assigns them antecedents by the same principles involving argument structure and thematic roles. In contrast, when they appear in relative clauses or root clauses, (8) does not apply. Then the Ops are left to rely on their own intrinsic features to find an antecedent by semantic/pragmatic means. The Op in Japanese has such features, so it can survive in non-OC environments, finding an empathy locus as its antecedent. In contrast, the Op in Ibibio lacks intrinsic features, so it crashes in non-OC environments, leading to the ungrammaticality of examples like (5).

The article is organized as follows. Section 2 discusses some preliminaries about the licensing of the operator in (7) and how it binds *imɔ/zibun* in its scope, including the implications of *zibun* being an anaphor whereas *imɔ* is intrinsically a pronoun. Section 3 then pauses to comment on the relationship of syntax to semantics in this area and why we think that a primarily semantic approach according to which the antecedent of a logophor or LD anaphor is stipulated to be an attitude holder or perspectival center fails to capture some relevant observations (for these languages). Section 4 focuses on the control relationship in (7) and how (8) explains the many similarities between *imɔ* and *zibun* when they appear in complement clauses and adjunct clauses. Section 5 takes up an apparent disanalogy between the control of PRO and the control of Op in (7), arguing that it need not undermine a unified account. Section 6 considers *imɔ* and *zibun* in noncomplement clauses, supporting the idea that Japanese's null operator can undergo non-obligatory control, whereas Ibibio's null operator cannot. Section 7 briefly concludes.

2 Preliminaries on operator licensing and binding

The idea that logophoric pronouns and LD anaphors are bound by a null DP operator is prominent in both subliterations. For example, Nishigauchi (2014) proposes it for Japanese specifically, and Charnavel (2019, 2020) argues for it at length as a general theory of LD anaphors, discussing French, English, Mandarin, Icelandic, and Norwegian, among other languages. On the African side, K&S proposed a version of it back in 1989; it is also adopted in Baker (1999); Speas (2004); Adesola (2005); Anand (2006); Deal (2020: 69, 114–116); among others. Even semantically-oriented approaches that do not commit to a null DP in the representation often assume that the logophor or LD anaphor is a variable bound by a lambda operator at the periphery of the complement clause, which is arguably approximately the same thing; see, for example, Pearson (2015) on logophoric pronouns in Ewe and Park (2018) on LD anaphoric *caki* in Korean. The motivations for such views are also broadly similar, starting from the fact that both logophoric pronouns and LD anaphors are typically found in embedded clauses, especially complement clauses. However, the details of the schematic structure in (7) are filled in somewhat differently in the two subcases, and we should have a good handle on the internal structures of the embedded clauses before going on to how the operator is controlled or bound from outside the embedded clause.

One relevant difference is the simple and uncontroversial fact that *zibun* in Japanese is intrinsically an anaphor, whereas *imɔ* in Ibibio is a pronoun when it

comes to basic Binding theory patterns. In other words, *zibun* is subject to Principle A of Chomsky's (1981) classic Binding theory, whereas *imo* is subject to Principle B. Thus *zibun* is possible with a local subject antecedent in both matrix and embedded clauses, as shown by the grammaticality of (9a). This canonical local use of *zibun* requires its antecedent to c-command it (Nishigauchi 2005), as shown by the badness of (9b). *Zibun* is similar in these respects to *self*-forms in English.

- (9) a. (Hanako-wa) Taroo-ga zibun-o seme-ta-(to omotte-i-ru).
 Hanako-TOP Taroo-NOM self-ACC blame-PST-COMP think-AUX-PRS
 'Hanako_k thinks that) Taroo_i blamed self_{i,k}.'
 b. *Taroo-no otosimono-ga zibun-o toraburu-ni makikon-da.
 Taroo-GEN lost.bag-NOM self-ACC trouble-into involve-PST
 ('Taroo_i's lost bag got self_i in trouble.')

In contrast, the Ibibio logophor *imo* (plural: *mm-imo*) is essentially the opposite in these respects. It cannot generally be used in a matrix clause, whether it is bound by the matrix subject or not ((10a); see Sect. 6.2 for examples and discussion).⁴ In embedded clauses it is possible when it does not have an antecedent in the embedded clause, as in (1) and (2), or when it has an antecedent that does not c-command it, as in (10b), but not when it has an antecedent that does c-command it in the same domain, as in (10c) (cf. Koopman and Sportiche 1989: 561, 564). Instead of (10c), Ibibio needs to use a logophoric reflexive consisting of the noun *idem* 'body' plus *imo* (compare the nonlogophoric reflexive seen in the grammatical version of (10a)). In these respects, *imo* is comparable to a plain pronoun like *her* or *him* in English.

- (10) a. Okon a-(i)-ma {idem (omo) / *imo}.
 Okon 3SG-(3.LOG)-love body his / *LOG
 'Okon_i loves himself_i/ him_{*i,k}' (see also Clements 1975: 150 on Ewe)
 b. Obuut a-ma-a-mam Okon ke ayín imo/omo
 shame 3SG-PST-3SG-hold Okon that son LOG/his
 a-ma-i-miem imo.
 3SG-PST-3.LOG-insult LOG
 'Okon_i is ashamed that his_i son insulted him_i.'
 c. *Okon a-ke-bo ke imo/anye i/a-m-i/a-kpi
 Okon 3SG-PST-say that LOG/he 3.LOG/3SG-PERF-3.LOG/3SG-cut
 imo.
 LOG
 ('Okon_i said that he_i cut him_i.'
 OK: ... *ke imo i-m-i-kpi idem imo* '... that he cut himself'

As Charnavel (2019, 2020) discusses at length, positing a null DP operator in the representation of LD-anaphoric examples like (3), (4), and (6) in Japanese, as in (7), is a way of reconciling the possibility of these examples with the anaphoric nature of

⁴In some African languages, like Edo (Baker 1999) and Yoruba (Pulleyblank 1986; Adesola 2005), the logophoric pronoun can also be used in matrix clauses as a strong/focused pronoun, especially when it is clefted. Since this does not happen in Ibibio (or Ewe), we do not consider how to account for this dual usage of the same forms here.

zibun displayed in (9). Anaphors generally need to have a c-commanding antecedent within (roughly) the minimal clause that contains them. That is true in (3) given the representation in (7), where Op is the local antecedent of *zibun*. In this way, Charnavel reduces LD anaphora to local anaphora in an attractive fashion that we adopt (see also Huang and Liu 2001: Sect. 5.2, Ex. 25; Tenny 2006; Sundaresan 2012; Park 2018; Sundaresan 2018).⁵ This line of thinking also strongly suggests that Op in Japanese is an A-position, given that anaphors typically need to be A-bound.⁶ In contrast, we need to be careful with (7) as a representation for (1) in Ibibio, to make sure that (7) does not violate Condition B on a par with (10c), given that pronouns need to not be locally A-bound. This could hold because Op is in an A-bar position in Ibibio, or because Op is a bit higher in Ibibio than it is in Japanese, outside the binding domain of the pronoun (or both). We return to this below.

Another consequence of the anaphor-pronoun distinction can be seen in complex sentences that have more than one logophor/anaphor in the same embedded clause. To set the stage for this, consider the doubly embedded clauses in (11) from Japanese and (12) from Ibibio. In structures like this, both *zibun* and *imɔ* are ambiguous: they can refer to (at least) the subject of the intermediate clause or the subject of the highest clause (see Clements 1975: 154 for Ewe and Nishigauchi 2014: 171 for Japanese).

- (11) Okon á-kére ké Edem á-ké-n-dòkkò ké Mfon é-kpóno
Okon 3SG-think that Edem 3SG-PST-1SG-tell that Mfon 3SG.3.LOG-respect
imɔ.
LOG
'Okon_i thinks that Edem_k told me that Mfon respects him_{i,k}.'
- (12) Taroo-wa [Hanako-ga [Ziroo-ga *zibun*-o semete-i-ta-to]
Taroo-TOP Hanako-NOM Ziroo-NOM self-ACC blame-AUX-PST-COMP
omotte i-ru-to] it-ta.
think AUX-PRS-COMP say-PST
'Taroo_i said Hanako_k thinks that Ziroo was blaming self_{i,k}.'

Now consider what happens when there are two logophors or LD-anaphors in the most deeply embedded clause. In Ibibio, it is possible for one instance of *imɔ* to refer to the intermediate subject and for the other instance of *imɔ* to refer to the highest subject. As a result, an example like (13a) has four possible readings.⁷ Similarly, (13b) is grammatical because the two instances of *imɔ* can be given difference antecedents,

⁵Note that it is not very plausible to regard the two uses of *zibun* to be a case of accidental homophony between a LD anaphor and a local anaphor, given that the LD use of a local anaphor is observed in many different languages, as emphasized by Charnavel (2019, 2020).

⁶This is Charnavel's view, adopted here for convenience, but we are potentially open to less standard alternatives, such as saying that *zibun* is some kind of generalized anaphor, which needs to be locally A or A-bar bound.

⁷Newkirk (2017: Ex. 13–15) reports that for her consultant sentences like (13) are only possible with both logophors referring to the intermediate subject, such that a sentence like (13a) has only one reading and (13b) does violate Condition B. A possible reason for the discrepancy is that in Newkirk's examples the highest verb is 'hear,' a less canonical licenser of logophoricity, with an experiencer subject rather than an agent, whereas the intermediate verb is 'say,' the licenser of logophoricity par excellence. Her consultant may have preferred readings where *imɔ* referred to the subject which was both closer and more canonical.

such that the sentence does not run afoul of Condition B of the Binding theory. This is true quite generally for logophors, holding also in Ewe (Clements 1975: 73), Yoruba (Anand 2006: 177), and Abe (Koopman and Sportiche 1989: 41, 44a).

- (13) a. Okon á-kére ké Edem á-ké-n-dòkkò ké èkà imò
Okon 3SG-think that Edem 3SG-PST-1SG-tell that mother LOG
é-kpóno imò.
3SG.3.LOG-respect LOG
'Okon_i thinks that Edem_k told me that his_{i,k} mother respects him_{k,i}.'
(4 ways ambiguous)
- b. Okon á-kére ké Edem á-ké-n-dòkkò ké imò i-kpóno
Okon 3SG-think that Edem 3SG-PST-1SG-tell that LOG 3.LOG-respect
imò.
LOG
'Okon_i thinks that Edem_k told me that he_k respects him_i.' (pragmatically most natural reading)

In contrast, when two instances of *zibun* occur in the lowest complement clause, they cannot refer to different LD antecedents, as shown in (14). Here both instances of *zibun* can refer to the matrix subject *Taroo*, and both can refer to the intermediate subject *Hanako*. However, it is quite degraded for one *zibun* to refer to Taro and the other to Hanako (Howard and Niyekawa-Howard 1976; Oshima 2006: 100). This effect is also found in other East Asian languages with LD anaphors: see Huang and Liu (2001: Ex. 13) on Chinese and Park (2018) on Korean.

- (14) Taroo-wa Hanako-ga zibun₁-no yuuzin-ga zibun₂-o
Taroo-TOP Hanako-NOM self-GEN friend-NOM self-ACC
semete-i-ta-to it-ta-to omot-ta.
blame-AUX-PST-COMP say-PST-COMP think-PST
'Taroo thinks that Hanako said that self₁'s friend was blaming self₂.'
- a. OK: zibun₁=zibun₂=Taroo
b. OK: zibun₁=zibun₂=Hanako
c. ??zibun₁=Taroo, zibun₂=Hanako
d. ??zibun₁=Hanako, zibun₂=Taroo
e. OK: zibun₁=Taroo or Hanako, zibun₂=zibun₁'s friend

Note that it is too simple to say that two instances of *zibun* in the same clause must have the same antecedent, perhaps because of a surfacy pragmatic principle. (14e) shows that it is possible for one *zibun* in the lowest clause to have the subject of the lowest clause as its (local) antecedent, while another *zibun* takes either of the higher subjects as its (LD) antecedent.⁸ This rather complex array of facts follows nicely from the null operator hypothesis. On this view, *zibun* always needs to have a clause-internal (and subject-like) antecedent in accordance with Condition A. There

⁸But see Iida (1992: 8–9) for a judgment that the (14e)-type reading is not possible either. We believe that a small pragmatic infelicity easily obscures the acceptability of these subtle examples, causing this reported difference.

are precisely two candidates in most embedded clauses: the subject of the clause and the unique Op (Op2) in the periphery of that clause, as sketched in (15).

- (15) Taroo_i thinks [Op1_i [Hanako_k said [Op2_n [[self_n's friend]_m was blaming self_{m,n}]]]]
n=i or n=k

Op2 in turn can be anteceded by either of the higher subjects (we return to how this fits with control theory in Sect. 4.2), but *zibun* in the most embedded clause cannot be anteceded by either of these directly (nor by Op1 directly), but only by being locally bound by Op2. If Op2 is anteceded by *Taroo*, then both *zibuns* in the embedded clause can refer to Taroo but neither can refer to Hanako. In contrast, if Op2 is anteceded by *Hanako*, then both *zibuns* can refer to Hanako, but neither can refer to Taroo. 'Zibun's friend' is also a possible binder for *zibun* in the object position regardless of what Op2 refers to; when that option is taken, the two instances of *zibun* do not corefer. The operator-based analysis combined with the fact that *zibun* is an anaphor thus accounts for the range of possible interpretations of a complex example like (14). The structure of the Ibibio example in (13a) is (16), which is essentially the same as (15). The crucial difference is that "Log" is a pronoun, not an anaphor. As such, it can be bound by an antecedent outside of its local clause, indeed by one at an indefinite syntactic distance. Therefore, either logophor in (16) can be bound by Op1 controlled by *Okon*, and either can be bound by Op2 controlled by *Edem*. This produces the four possible readings observed in (13a).

- (16) Okon_i thinks [Op1_i [Edem_k told me [Op2_k [[Log_{i,k} mother] respects Log_{k,i}]]]]

One further difference between Ibibio and Japanese that is relevant to our understanding of the null DP operators and how they bind pronouns and anaphors is the fact that logophoricity in Ibibio depends on the presence of particular complementizers in the embedded clause, whereas LD anaphora in Japanese does not. For example, in Ibibio the finite declarative complementizer *ke* 'that,' seen in all our examples so far, consistently licenses logophoric pronouns in its domain. In contrast, the complementizer *naña* 'how' does not. (17) gives a minimal pair.

- (17) a. Okon a-ma-a-kit ke Emem a-ma-a-yip ebót imó.
Okon 3SG-PST-3SG-see that Emem 3SG-PST-3SG-steal goat LOG
'Okon_i saw that Emem stole his_i goat.'
b. Okon a-ma-a-kit naña Emem a-yip ebót ɔmɔ/*imó.
Okon 3SG-PST-3SG-see how Emem 3SG-steal goat his/*LOG
'Okon_i saw Emem steal his_i goat.' (cf. Clements 1975: 157)

Data like these motivate the statements in (18) for Ibibio ("IOp" is short for "logophoric operator").

- (18) a. IOp is licensed by a certain set of C-like heads: *ke*, *mme*, *yak*, ...
b. A logophoric pronoun must be bound (c-commanded) by a coindexed IOp.

Note that the class of IOp-licensors is relatively broad in Ibibio; *naña* may be the only C that appears regularly in complement clauses and does not permit IOp. In

other African languages, the class of IOp-licensing Cs seems to be narrower, sometimes limited to a single C head historically related to the verb ‘say’ (e.g., *kO* in Abe; Koopman and Sportiche 1989: 583, *be* in Ewe; Clements 1975: 165). (18) also accounts for the fact that *imɔ* in Ibibio is possible inside CP complements but not inside derived nominalizations that have similar content but lack any C-like head. (19) is a minimal pair.

- (19) a. Okon i-kit-te n-dudue eka ɔmɔ/*imɔ.
Okon 3SG-see-NEG NMLZ-commit.fault mother his/*LOG
‘Okon_i does not see his_i mother’s mistake/fault.’
b. Okon i-kit-te ke eka imɔ a-ma-a-due.
Okon 3SG-see-NEG that mother LOG 3SG-PST-3SG-commit.fault
‘Okon_i does not see that his_i mother committed a fault.’

Third, (18) accounts for the well-documented fact that a logophoric pronoun can be used to refer to the subject of a verb like ‘tell’ only if it is inside the CP complement of ‘tell,’ not if it is used as (say) the possessor of the object of ‘tell.’ This is shown in (20). This suggests that the true licensing binder of the logophor is the Op licensed by C which is controlled by the subject, not the subject itself (see Koopman and Sportiche 1989: 579, 582, an observation replicated by Baker 1999 for Edo and Adesola 2005 for Yoruba).⁹

- (20) a. Emem a-ma-a-dokko eka ɔmɔ/*imɔ ke imɔ
Emem 3SG-PST-3SG-tell mother his/*LOG that LOG
i-ma-i-dep ebot.
3.LOG-PST-3.LOG-buy goat
‘Emem_i told his_i mother that he_i bought a goat.’
b. Emem_i told his_i/*Log_i mother [IOp_i C [Log_i bought a goat]]

Japanese is different in these respects. First, we saw in (9a) that *zibun* can occur outside the domain of an embedded complementizer as long as it has some other antecedent, such as the subject; thus there is no direct analog of (18b) in Japanese. Second, LD anaphora in Japanese does not depend on details of what lexical items are in the C-space, the way that logophoricity in African languages does. Rather, LD uses of *zibun* are possible in all Japanese complement types, including ordinary *-to* clauses, nominalized *-koto* clauses, and subjunctive *-yooni* clauses, among others. (21) shows that LD *zibun* is possible even inside a perception verb complement—the type of clausal complement that is least likely to license logophoric pronouns in the African languages—as noticed already by Culy (1994: 1079). This shows that Japanese has no direct analog of (18a) either.

- (21) Hanako-wa [doroboo-ga zibun-no kaban-o nusumu-no/tokoro]-o mi-ta.
Hanako-TOP thief-NOM self-GEN bag-ACC steal-COMP-ACC see-PST
‘Hanako_i saw the thief steal self_i’s bag.’

⁹Pearson (2015: 105) uses the same contrast in Ewe to argue that logophoric pronouns are bound by the attitude verb rather than by its subject. These data do not say exactly what the binder is, only approximately where it is.

(22) a. Okon_i told Edem_k [IOp_{i,*k} C=*ke* [Emem_n does not like LOG_{i,*k,n}]]
(Ibibio, =(1))
b. detective_i told politician_k [C=*koto* [zOp_{i,*k} PoV [gangster_n search
SELF_{i,n,*k}.]]]
(Japanese, =(3))

¹¹Charnavel (2019, 2020) calls her version of this head Op_{log} , using “operator” in the semantic sense; see fn. 3. Her pro_{log} also corresponds fairly well to our zOp . Section 3 discusses why it is doubtful that we can adopt her semantics for Op_{log} exactly, however. A significant question is whether $\text{PoV}/\text{Op}_{\text{log}}$ can take constituents other than TP as its complement, giving zOp scope over units other than a clause. In contrast to much of the literature, Charnavel (2019, 2020) argues that the answer is yes (at least in French). The empirical situation bearing on this is complex. Examples like (19a) show that IOp only has scope over clauses in Ibibio. In contrast, examples like ‘Taro admitted *zibun*’s guilt’ and ‘*zibun*’s mistake bothered Taro’ are possible in Japanese (e.g., Oshima 2004: 12, Ex. 16b). This might suggest that zOp can have scope over DP, as Charnavel claims. However, these could also be instances of local anaphora, made possible by *zibun* being an anaphor, not a pronoun. Also, if zOp can have scope over the vP not including the subject in Japanese, we might well lose our explanation of the fact that two *zibuns* in the same clause must get the same LD referent in examples like (14) (cf. Charnavel 2019: 225–227, especially Ex. 32). This issue calls for careful study.

3 Restrictions on logophoricity: Syntactic, semantic, or both?

At this point, one can ask whether our approach to these matters is too syntactic, such that we are missing the point of our data, which is that logophoricity is primarily a semantic phenomenon involving the semantics of attitude predicates and perspectival notions. One place this question is raised is by the Ibibio contrasts in (17) and (19), and our theoretical statement in (18). It may seem arbitrary and stipulative simply to list Cs that allow logophoricity and those that do not, without investigating their semantics and that of the CP-complementation structures in which they appear. Presumably there are deeper reasons why ‘see that’ constructions, which express propositional attitudes, allow logophors, whereas ‘see how’ constructions, which express perception complements, do not. This is especially true given the crosslinguistic hierarchy of logophor-licensing complements in Culy (1994: Sect. 4) (see also Speas 2004). Why not, then, simply say that logophors need to take attitude-holders as their antecedents, and skip the mechanics of licensing an IOp or zOp and subjecting it to the theory of control, as suggested to us by an anonymous reviewer? To address this concern, we pause the exposition of our analysis to outline briefly how we view the relationship of syntax and semantics in this domain and why we are not satisfied with a purely semantic approach.

It is true that much of the recent work on these topics has been stated in semantic terms, either in whole (Sells 1987; Pearson 2015; Park 2018; etc.) or in part (Nishiguachi 2014; Charnavel 2019, 2020; Anand 2006; etc.). One usefully clear example is Pearson (2015: 77), who starts her investigation of logophoric pronouns in Ewe by asserting (without references) that “logophoric pronouns are traditionally defined as elements that (i) obligatorily occur in the scope of an attitude predicate such as *believe* or *say* and (ii) are obligatorily construed as referring to the bearer of the attitude, such as the subject of *believe* or *say*.” Compare this to how we express our view: we say that logophoric pronouns (in Ibibio, at least) are obligatorily contained in the CP complement of a verb and must be bound (indirectly, via IOp) by the thematic subject of that verb. We use syntactically oriented terms like “verb,” “contained in,” “CP complement” and “(thematic) subject,” whereas Pearson uses semantically oriented terms like “attitude predicate,” “scope,” “construed as referring to,” and “attitude bearer.” Some linguists may be well-satisfied with the semantic version and see little need for a syntactic one. One (an anonymous reviewer) reminds us that “there is a long, motivated, tradition of attributing crucial interpretative properties to logophoric expressions, limiting their antecedents to logophoric centers (with apparently some crosslinguistic variation as to what counts as such). The approach taken in the paper crucially entails giving up the (widespread) hypothesis that logophoric phenomena are systematically related to such semantic notions as perspective.” In response, we think that there are two important points to bear in mind when comparing syntactic and semantic approaches in this area.

The first point is that there is an important sense in which a semantically-expressed generalization like Pearson’s and a syntactically-expressed generalization like ours can be taken to be saying close to the same thing. It is a truism that every natural language construction has both a syntax and a semantics. Moreover, there are good reasons to think that the two are closely related via the notion of compositionality. Indeed, there seem to be systematic correspondences, even homomorphic relationships,

Indeed, we have data that suggest that a purely semantic version is at least incomplete, and the syntactic perspective has something to offer, although more research is needed on all these points. Consider first the relationship between being an attitude predicate and being a verb that takes a CP complement. Are there verbs that take CP complements but are not semantically attitude predicates? The literature says yes. In such cases, our syntactic generalization says that logophoric phenomena might be found with such verbs, whereas Pearson's semantic generalization does not predict this. Some cases exist in Ibibio and Japanese. For example, logophoric pronouns are sometimes accepted in the complements of verbs like 'make,' 'let' and 'stop' in Ibibio, as in (23).

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The causative verb ‘make’ also licenses logophoricity in Yoruba (Oluseye Adesola, p.c.); note that ‘make’ selects a CP complement with an overt C in Yoruba (whereas C is null in (23a) in Ibibio).¹²

- (24) Adé mú kí kóládé dóbálè fún òun.
 Ade made that Kolade prostrate for LOG
 ‘Ade_i made Kolade bow down to him_i.’

Similarly, ‘stop’ allows LD-anaphoric *zibun* to refer to the matrix subject in (25a) in Japanese.

- (25) a. Taroo-wa (guuzen-ni-mo) Hanako-ga zibun-o
 Taroo-TOP accidentally Hanako-NOM self-ACC
 suisen-suru-no-o tome-ta.
 nominate-do-COMP-ACC stop-PST
 ‘Taroo_i (accidentally) stopped Hanako from nominating self_i.’
 b. Taroo-wa guuzen-ni-mo Hanako-ga sono supai-o
 Taroo-TOP accidentally Hanako-NOM that spy-ACC
 suisen-suru-no-o tome-ta.
 nominate-do-COMP-ACC stop-PST
 ‘Taroo accidentally stopped Hanako from nominating that spy.’

(25b) confirms that ‘stop’ is not an attitude verb in Japanese by showing that substituting one DP inside its complement for another coreferential DP preserves the truth value of the sentence. For example, if John happens to be a spy that Hanako is about to unwittingly nominate to a place of responsibility, and Taro doesn’t know this but he stops her nomination for a different reason, (25b) is still felicitous as long as the speaker and the addressee know that John is a spy. ‘Stop’ is different from attitude verbs like ‘say’ or ‘think’ in this respect. Similarly, one cannot sincerely say ‘John stopped Mary from riding a unicorn’ in Japanese unless one believes in unicorns, whereas one can say ‘John thinks that Mary rode a unicorn’ without oneself believing in unicorns. We do not have this kind of direct evidence that ‘make’ and ‘stop’ are not attitude verbs in Ibibio, but it is generally assumed that verbs with the same meanings in different languages largely behave the same in this respect. These examples then challenge the view that logophoric pronouns and LD anaphors are only possible in the complements of attitude verbs.

Next, compare the claim that the antecedent of a logophoric pronoun must be an attitude holder with the claim that it must be a thematic subject. One straightforward and often-drawn consequence of the claim that the antecedent must be an attitude holder is that the antecedent must denote a human being—indeed, a living, conscious human being (cf. Nishigauchi’s (2014) Awareness Condition). Current literature uses this as a crucial test to distinguish logophoric phenomena from both local anaphora

¹²In contrast, Pearson (2015: 96, Ex. 44) shows that a logophoric pronoun is not possible in the complement of a causative verb in Ewe, even though the complement is headed by *be*, superficially the same C that is selected by attitude verbs like ‘say,’ ‘think’ and ‘dream.’ This apparent crosslinguistic difference needs further investigation. There is room in our account to stipulate the difference, if ‘make’ in Ewe selects a version of *be* that does not license IOp whereas ‘make’ in Ibibio and ‘say’ in Ewe select versions of C that do license IOp (see (18a)).

(Charnavel 2019, 2020) and obligatory control (Landau 2021), which do not have humanness requirements.¹³ In contrast, thematic subjects do not necessarily have to denote humans. Indeed, logophors with inanimate subjects are attested in the West African languages. Clements (1975: 168–169) mentions that in Ewe an inanimate subject can be the antecedent of a logophoric pronoun in a semi-idiomatic construction where ‘X wants/says that Log V’ is used to mean ‘X is about to V.’ Ibibio has such a construction too, in (26). (27–28) give other acceptable cases of a logophoric pronoun with an inanimate subject.

- (26) Edim a-ke-bo ke imo i-ya-i-dep.
rain 3SG-PST-say that LOG 3SG-FUT-3SG-fall
‘It is about to rain.’ (lit. ‘Rain said that it will fall.’)
- (27) Ngwet odo a-ma-a-nam n-yem adi-maana ng-koot imo.
Book the 3SG-PST-3SG-make 1SG-want INF-again AGR-read LOG
‘The book_i made me want to read it_i again.’
- (28) (?)Masin odo a-ma-a-tre Okon u-diñ imo.
machine the 3SG-PST-3SG-stop Okon NMLZ-fix LOG
‘The machine_i stopped Okon from fixing it_i.’

No such examples exist in Japanese, where *zibun* always needs to have a person-denoting NP as its antecedent (Inoue 1976; Katada 1991). But this constraint holds even for instances of *zibun* used as a local anaphor, as in (9a), so it is not a property of LD/exempt anaphora per se. Rather, we can say that *zibun* simply has a [+animate] feature in the lexicon, which constrains what it can refer to—a case of partnership between the syntax and semantics. Future research will have to investigate to what degree examples like (26–28) are marked, involving anthropomorphizing the subject. It is not clear to us that they do, but we cannot fully evaluate this using our methods.¹⁴

One way that Charnavel (2019, 2020) seeks to operationalize a perspectival approach to logophoric phenomena is by looking at the interaction between logophors/LD-anaphors and evaluative adjectives like ‘good,’ ‘beautiful,’ etc. She claims that a logophoric operator is introduced by a head with the semantics ‘my complement is presented from x’s first person perspective,’ where x refers to the antecedent of the pronoun. One consequence of this is that evaluative adjectives within the domain of the head licensing logophoricity need to express the evaluation of the person which the logophoric pronoun refers to. This generalization does not carry over well to our languages. Consider (29) in Ibibio:

- (29) Okon i-yem-me yak Edem a-dep uyai ndise imo.
Okon 3SG-want-NEG COMP Edem 3SG-buy beautiful picture LOG
‘Okon_i does not want Edem to buy the beautiful picture of him_i.’

¹³However, it is not clear how reliable this is; see Marty (2020) for examples of LD anaphors with inanimate antecedents in French, and Landau (2021: Sect. 11.4) on topicalized inanimate DPs as NOC controllers in English.

¹⁴In particular, (28) was deemed to be an “unusual” thing to say by our collaborator. However, that was just as true for a version of (28) that uses the ordinary pronoun *anye* as the object of the embedded verb instead of *imo*. Hence, the markedness of the example should not be attributed to semantic conditions on the logophor *imo* per se, but rather to ‘machine’ being used as the subject of this verb.

Here the logophor *imɔ* refers to the matrix subject ‘Okon,’ as usual. But ‘beautiful’ inside the same clause (indeed, the same DP) does not need to express Okon’s evaluation of the picture, but can be the speaker’s evaluation. Thus, (29) is compatible with a state of affairs in which Okon does not want Edem to buy the picture because Okon thinks it is ugly and will embarrass him if others see it.¹⁵ So the use of a logophoric pronoun does not correlate with the constituent containing it being presented from the perspective of the referent of the pronoun in any obvious way.¹⁶

This brings us to the debated issue of whether logophoric pronouns need to be interpreted as referring to their antecedents *de se*, as controlled PRO must. As Pearson (2015) discusses, the assumption that a logophor must be read *de se* is what explains why it must be in the scope of an attitude verb and why it must refer to the attitude holder, according to influential unpublished work by Heim (2002) and von Stechow (2002). More generally, a logophor needing to be interpreted *de se* would be a semantic property from which one might reasonably hope to derive other facts about how the logophor is used. However, Pearson claims that the logophor in Ewe does not need to be interpreted *de se*. We find the same in Ibibio. Consider a situation in which Okon is singing as he works around the house, and someone records him without him knowing it. A year later, Okon hears the recording when his friend plays it. He doesn’t recognize his own voice or remember that he sang this song. But he is impressed that the person on the recording sings very well, thinking to himself “That guy sings well.” The speaker, however, knows that the person that Okon heard in the

¹⁵The well-known fact that in African languages a single clause can have logophoric pronouns that refer to two different referents (see (13)) may also be a problem for a hypothesis like Charnavel’s, depending on whether one allows logophoric operators to have scope over constituents other than whole clauses or not (Charnavel does, but the African tradition starting from Koopman and Sportiche 1989 generally does not). Indeed Culy (1997: 849–850) uses this as an argument against the view that logophors express point of view in African languages. He concludes that “they are primarily indirect-discourse forms and usually do not represent point of view at all.” Pearson (2015: 110–112) discusses the issues posed by such sentences from her semantic perspective.

¹⁶Another test that Charnavel (2019, 2020) uses in pursuing a perspectival approach to logophoric phenomena is based on epithets like ‘the fool’ (building on Sells 1987). She claims that these expressions cannot be used to refer to a local attitude holder in French and English. If this generalization carries over to Ibibio and is combined with the semantic/perspectival claim that a logophoric pronoun like *imɔ* must refer to an attitude holder, it leads to the prediction that in syntactic positions where *imɔ* is possible referring to a given NP, ‘the fool’ will not be able to refer to that NP. We did a preliminary exploration of this in Ibibio, with mixed results. In (ia), the epithet *ifu-ntan ado* ‘the lazy fool’ can refer the goal of ‘tell’ but not the subject of ‘tell.’ This is negatively correlated with what *imɔ* can refer to, as predicted. However, in (ib), both *imɔ* and ‘the lazy fool’ appearing in the same position can refer to the source phrase ‘Edem,’ potentially contrary to the prediction of the semantic/perspectival approach.

- (i) a. Okon a-ma-a-dokko Edem ke Eno a-ya-a-nwam ifu-ntan ado/imɔ.
Okon 3SG-PST-3SG-tell Edem that Eno 3SG-FUT-3SG-help lazy-fool the/LOG
‘Okon_i told Edem_k that Eno will help the lazy fool_{k,n}*/him_i.*_k.’
b. Okon a-ma-kop a-to Edem ke ifu-ntan ado/imɔ i-di-di-ghe.
Okon 3SG-PST-hear 3SG-from Edem that lazy-fool the/LOG 3SG-FUT-come-NEG
‘Okon heard from Edem_k that the lazy fool_k/he_k will not come.’

We also found some apparent differences between rationale clauses and CP complements that are not predicted by either account. We conclude that it may be possible to investigate the relevant hypotheses further by comparing logophors with epithets, but it requires a larger and more careful study than we can perform here.

recording is Okon himself. Both (30a) with a logophor and (30b) with an ordinary pronoun were judged to be appropriate in this situation (and both also allow normal *de se* reference).

- (30) a. Okon a-kere ke imọ i-kwọ ikwọ ọfọn.
Okon 3SG-think that LOG 3.LOG-sing song well.
'Okon_i thinks that he_i sings well.'
- b. Okon a-kere ke anye o-kwọ ikwọ ọfọn.
Okon 3SG-think that he 3SG-sing song well.
'Okon_i thinks that he_i sings well.'

These judgments are contested. Bimpeh (2019) challenges Pearson's claim that logophoric *ye* can refer *de re* in Ewe, and Newkirk (2017: Ex. 11) reports that her consultant does not allow a non-*de-se* reading for an example like (30a) in Ibibio (see also Anand 2006: 56 on Yoruba). Pearson (2015: 98–101) herself discusses a range of reactions that her five consultants gave to sentences like these, and how she reached her conclusion despite this "noise." We take two lessons from this disagreement: that ordinary speakers find the standard mistaken identity situations quite confusing, and that the way they would most naturally talk about them uses neither a logophor nor a standard pronoun, but rather a descriptive DP—something like 'Okon thinks that someone/the guy in the recording sings well' (as in Bimpeh's production task). In fact, the situation in Japanese is not that different. Although *zibun* in a complement clause is usually interpreted *de se*, there are examples in which it can be interpreted *de re*, according to Oshima (2004: Ex. 10) (discussed also by Nishigauchi 2014: 173, Ex. 47). However, even Oshima (2006: 81) does not express much confidence in his judgments on the absence of *de re* readings in general. Clearly there is more work to be done on the empirical situation here. But it is at least questionable that the proposed *de se* semantics for logophors and LD anaphors provides unequivocal evidence for a purely semantic account in terms of perspectival notions. There should then be openness to saying that the syntax of complementation and control has something to add, we claim.¹⁷

We also claim that the syntax of control places some substantive restrictions on what can be the antecedent of a logophor or LD-anaphor that are not readily captured

¹⁷For completeness, we also mention that logophoric pronouns do not have to be interpreted as semantic variables in the sense that they do not need to have sloppy identity readings, but may be interpreted strictly in ellipsis contexts (i). In this, they differ from OC PRO, although they are like other syntactically bound items including anaphors.

- (i) Okon a-ya-a-dot enyin ke imọ i-di-dongo-ke, ye Emem nko.
Okon 3SG-FUT-3SG-place eye that LOG 3SG-FUT-sick-NEG and Emem also
'Okon hopes that he will not get sick, and Emem does too.'
='Emem hopes that Emem will not get sick' (sloppy) or ='Emem hopes that Okon will not get sick' (strict)

Similarly, LD *zibun* can get a strict or sloppy reading under ellipsis (Nishigauchi 2014: 172–173). Without going into details, we assume that this is a case of "vehicle change" (Fiengo and May 1994), possibly reducible to a semantic identity condition on ellipsis (van Craenenbroeck and Merchant 2013). (i) can have the syntax of [Okon_i hopes [Op_i that Log_i not get sick]] and [Emem_k hopes [Op_k that he_i not get sick]], where the underlined constituent is semantically parallel to its antecedent in the first conjunct in a way that allows it to delete at PF.

by any well-worked-out version of a purely semantic approach that we are aware of. Those data are included in the next section.¹⁸

We do not, however, want to overstate our case here. The data above show why we have not pursued a purely semantic hypothesis. These conclusions are somewhat tentative in that all these effects deserve to be studied more, from both syntactic and semantic perspectives. We also hasten to add that we by no means exclude the possibility that *imɔ* and *zibun* and similar elements have semantic properties that place further constraints on their usage. For example, we are very open to the possibility that the reason why some Cs license IOp in Ibibio and others do not can ultimately be explained in whole or in part in terms of the lexical semantics of those Cs and/or the particular verbs that select them. As another example, we believe that *zibun* and/or zOp in Japanese have semantic features that constrain them to refer to human antecedents, and in some cases to prominent empathized-with human antecedents. There may well be other reflections of a syntax-semantics partnership to be teased out and acknowledged here. Our main point is just that a purely semantic account focused on perspectival centers may not be complete and empirically motivated across the full typological range of languages, and there is room for an account based on CP-complementation and obligatory control to make a valuable contribution.

4 Obligatory control and logophoric behavior in clause-attached CPs

We are now ready to discuss our most distinctive hypothesis, that both logophoric pronouns and LD anaphors being bound by a null operator can lead to a control-theoretic explanation of a striking similarity between the two: the fact that when they appear in complement clauses they allow the same distinctive range of DPs to serve as their antecedents (e.g., (1–4)). This similarity holds despite the fact that *zibun* is intrinsically an anaphor and *imɔ* a pronoun, and despite the fact that there is no explanation for this characteristic pattern of antecedence within the normal Binding theory.

As outlined in Sect. 1, our strategy for explaining this similarity is to say that IOp in Ibibio and zOp in Japanese are both like PRO in English and similar languages in being intrinsically controllable elements, following an idea of K&S (1989: 582–583). As such, when IOp or zOp appear near the edge of a complement clause, they undergo obligatory control (OC). The principles of controller choice then apply

¹⁸Two reviewers ask whether Ibibio shows a “blocking effect” like the one known for Mandarin, where the presence of a first or second person pronoun disrupts a logophor/LD-anaphor, preventing it from taking a higher subject as its antecedent (e.g., examples like ‘Zhangsan_i told Mary/*me that Lisi hate self_i’). Huang and Liu (2001) and others have argued that this restriction derives from perspectival conflicts between the LD-anaphor and the first or second person pronoun. If this sort of blocking effect were found in Ibibio, it could be evidence for a perspectival analysis of logophors. However, no such blocking effect is found in Ibibio; see Afranaph (D19b, D20b, D21b) (Willie and Safir n.d.: 60–62) for relevant data. The situation is more subtle in Japanese. Oshima (2004: Ex. 5–6, originally from Kuno 1978) shows that local pronouns do not interfere with logophoric uses of *zibun* (when *zibun* is inside a CP complement) but do interfere with empathetic uses in relative clauses. This is exactly what our theory predicts. However, the full Chinese paradigm is not found robustly in other languages (for unknown reasons), such that Charnavel (2019: 35) does not consider it a valid test for exempt/LD anaphora. Therefore, we do not present the data or press this point here.

to lOp and zOp in essentially the same way, with the result that the same controllers are assigned to lOp and zOp in parallel structures. That controller is then understood as the ultimate antecedent of the pro-form bound by lOp or zOp (*imo* or *zibun*, respectively). OC thus neutralizes the intrinsic differences between lOp and zOp, causing the constructions to behave in fundamentally the same way in environments where OC applies. This use of OC—rather than NOC or simple pronoun binding—to establish the link between the ultimate antecedent and the null operator is a key feature of our analysis that distinguishes it from related ideas by Nishigauchi (2014) and Charnavel (2019), among others.

The theoretical background for this proposal comes from Idan Landau's (2013) synthesis of the results of the decades-long study of control. He states the "OC signature" as follows:

- (31) *The OC signature:* (Landau 2013: 29; see also Manzini 1983; Landau 2001)
In a control construction [... X_i ... [_S PRO_i ...] ...], where X controls the PRO subject of the clause S:
- a. The controller(s) X must be (a) co-dependent(s) of S.
 - b. PRO (or part of it) must be interpreted as a bound variable.

The fundamental insight of (31a) is that when a clause containing PRO is an argument or adjunct-modifier of a verb (or adjective), then PRO must be controlled by an(other) argument of the same verb. This is what Landau means by saying that X and S must be "co-dependents." The upshot of this is that PRO in CP complements and adjunct clauses must undergo a special form of control that places strong syntactic conditions on what can be the controller. In contrast, PROs contained in clauses in other syntactic positions (e.g., CP subjects and extraposed clauses in adjoined positions) are much less constrained as to what their antecedent can be—so-called nonobligatory control. We restate and generalize this condition as our working version of the OC Signature in (32) (= (8) above).

- (32) *The Generalized OC Signature: (GOCS, preliminary)*
If a clause with an intrinsically null DP (PRO, lOp, zOp, ...) at its edge is generated within the extended projection of a verb, then the null DP is controlled by an argument of that verb. Which argument of the verb is the controller is determined by the thematic roles of the DPs involved.

The crucial change between (31) and (32) is that (32) refers to a larger class of controllable elements, including lOp and zOp (and similar elements)¹⁹ as well as ordinary PRO. We assume that this is a natural class of elements, consisting roughly of

¹⁹Other elements akin to lOp and zOp to which (32) might apply are the Sp and Ad elements involved in indexical shift in Magahi according to Alok and Baker (2018) and the null DP in the specifier of CP in Bantu languages with agreeing C given the indirect agreement hypothesis of Diercks (2013). We do not explore these possibly related constructions in any detail here, although we appeal to them briefly in Sect. 4.2.

Like (31), (32) does not take into account the fact that overt anaphors (and perhaps pronouns) can appear in controlled positions in some languages, including the East Asian languages; see Landau (2013: 117–119) for an overview. This is relevant to how we should think of the class of controllable elements, which we leave open here.

minimal pronouns that are necessarily phonologically null and are licensed as the specifiers of special functional heads high in the clausal spine such that they are able to enter into syntactic relations with elements outside the clause (e.g., nonfinite T for PRO, particular Cs for IOp, the PoV head for zOp). Note that in addition to being specifiers, we assume below that IOp and zOp are subject-like in terms of the kind of thematic role that they receive from the head that licenses them (see (73) below). However, we do not attempt a precise definition of this class of controllable elements/positions here. For convenience, we refer to zOp and IOp taken together as a class as *lzOp*.

The other changes between (31) and (32) are more or less housekeeping matters, in pursuit of clarity. Landau's way of stating his precondition in (31) is a bit ambiguous as to whether or not control into a clause dependent on V is required or merely possible, although his discussion suggests that it is required. We make this explicit in (32), putting that control happens as well as what the controller must be on the consequent side of the conditional. In this, we are treating the GOCS as an active principle of grammar, whereas Landau arguably thought of (31) as a taxonomic generalization, setting out which instances of control count as OC as opposed to NOC. Second, we state that the controlled clause must be inside an extended projection of the matrix verb, replacing Landau's somewhat informal term "co-dependent," a cover term intended to include both complements and adjuncts. Third, we drop (31b) from our GOCS, since we do not consider the semantics of the relevant constructions beyond the remarks in Sect. 3. Fourth, we make explicit Landau's conclusion, synthesizing much previous work, that which argument of the matrix verb controls the null DP is not specified by the OC signature, but can vary from example to example in complex ways. We discuss this (up to a point) in Sect. 5 below.

This section is split into two subsections. Section 4.1 presents the basic case for (32): that arguments of the superordinate verb can control *lzOp*, depending on their thematic roles, whereas nonarguments in the superordinate clause cannot. Section 4.2 then discusses how subjects higher than the immediately superordinate subject can come to antecede *imọ* and *zibun* by a chain of control relationships. Section 5 takes up the important question of why the principles of controller choice seem to be somewhat different for IOp and zOp as opposed to PRO.

4.1 The core pattern

We proceed by exploring the similarities between *imọ* and *zibun* inside argument and adjunct clauses in more detail, showing that they fit well within the boundaries marked out by the GOCS.

First, if the superordinate verb is a dyadic one, selecting a subject and a clause, *imọ* in the complement clause can generally take the matrix subject as its antecedent. This is true for a wide variety of matrix verbs and is not very sensitive to the thematic role of the matrix subject. It is possible with agentive verbs like 'say' and 'deny,' with stative verbs like 'believe' and 'know,' and with experiencer verbs like 'be surprised.' It even extends to some nonattitude verbs, as seen in (23). (See Adesola 2005 for a list of verbs that license logophoricity in Yoruba.)

- (33) a. Okon a-ma-a-kañ ke imọ i-k-i-yip ebot.
Okon 3SG-PST-3SG-deny that LOG 3.LOG-PST-3.LOG-steal goat
'Okon_i denied that he_i stole a goat.'
- b. Enọ a-nim/a-diọññọ ke Edem i-mma-gha ímọ.
Enọ 3SG-believe/3SG-know that Edem 3SG.3.LOG-like-NEG LOG
'Eno_i believes/knows that Edem doesn't like her_i.'
- c. Okon a-me-kop ngkpa idem ke Emem í-maá-ghá
Okon 3SG-PERF-hear death body that Emem 3SG.3.LOG-like-NEG
imọ.
LOG
'Okon_i is surprised that Emem does not like him_i.'

A similar wide range of verbs allows LD *zibun* with the matrix subject as the antecedent in Japanese:

- (34) a. Taroo-wa zibun-ga okane-o nusun-da-koto-o hitee-si-ta.
Taroo-TOP self-NOM money-ACC steal-PST-COMP-ACC deny-do-PST
'Taroo_i denied that self_i stole the money.'
- b. Taroo-a Hanako-ga zibun-no hon-o nusun-da-to
Taroo-TOP Hanako-NOM self-GEN book-ACC steal-PST-COMP
sinzite-i-ru.
believe-AUX-PRS
'Taroo_i believes that Hanako stole self_i's book.'
- c. Taroo-wa Hanako-ga zibun-o kiratte-i-ru-koto-ni
Taroo-TOP Hanako-NOM self-ACC hate-AUX-PRS-COMP-DAT
odoroi-ta.
get.surprise-PST
'Taroo_i was surprised that Hanako hates self_i.'

This is in line with what the GOCS mandates, and is broadly similar to OC in English, where the subject of a dyadic verb often can control PRO inside the clausal complement of the verb.

In contrast, the GOCS does not allow an NP in the matrix clause which is not an argument of the matrix verb to control the operator and thus antecede *imọ* or *zibun*. The most obvious case of such an NP is the possessor of an argument of the matrix verb. Such an NP cannot in general antecede *imọ* in Ibibio, as shown in (35).

- (35) a. A-tańikọnnọ Trump a-ma-a-nam e-diọñọ ke imọ
3SG-talk.word Trump 3SG-PST-3SG-make 3PL-know that LOG
i-ya-i-ka North Korea urua mfen.
3.LOG-FUT-3.LOG-go N.K. week next
'Trump_i's spokesman_k announced that he_{k,*i} will go to North Korea
next week.'
- b. #Ngwet Trump a-ke-bo ke imọ i-mi-yaiya.
book Trump 3SG-PST-say that LOG 3.LOG-PERF-handsome
(‘Trump_i's book says that he_{*i} /it??_k is handsome.’)

These examples are designed to maximize the possibility that the content of the CP complement expresses the point of view of the possessor of the subject: politicians write books to express their own points of view, and the job of a spokesperson is to speak on behalf of their employer. Nevertheless, the logophor referring to the possessor Trump is strongly resisted in both cases: in (35a) it must refer to the spokesperson, and (35b) is possible only to the extent that *imɔ* can refer to the book rather than its author.²⁰ This shows that a structural condition is at work here (the GOCS), not just a semantic/pragmatic rule like a logophor refers to the most prominent discourse referent, or to the one whose perspective is being expressed. Japanese LD *zibun* is like Ibibio *imɔ* in this respect, as shown in (36).

- (36) a. Toranpu-no dairinin-wa kitatyoosen-no soosyoki-ga
Trump-GEN spokesman-TOP North.Korea-GEN president-NOM
asita zibun-to kaidan-suru-to koohyoo-si-ta.
tomorrow self-with meeting-do-COMP announce-do-PST
'Trump_i's spokesman_k announced that the president of NK is meeting
with self_{k/*i} tomorrow.'
- b. #Toranpu-no syuki-wa zibun-ga hansamu-da-to
Trump-GEN memorandum-TOP self-NOM handsome-be-PRS-COMP
nobete-ir-u.
state-AUX-PRS
(‘Trump_i's memorandum states that self_i is handsome.’)

The GOCS leaves a degree of latitude when it comes to triadic matrix predicates, asserting that one of its two NP/PP arguments controls the null DP in the CP complement, but leaving open which one does. Landau (2013: Sect. 5.1; 2015) simply refers to a complex array of syntactic, semantic and pragmatic factors. We add that thematic roles play a prominent role in this, following the spirit of Jackendoff and Culicover (2003) and related work. This holds for logophoric and LD-anaphoric constructions as well as for ordinary control. We mentioned in Sect. 1 that when the matrix verb is ‘tell,’ the agent-subject can be the antecedent of *imɔ* or *zibun*, but the goal cannot be (see (1) and (3)). Other communication verbs with an agent-goal-CP argument structure show the same pattern.²¹

- (37) a. Enɔ a-ke-bip Okon mme Emen a-ma-i-kid imɔ. (Ibibio)
Eno 3SG-PST-ask Okon Q Emen 3SG-PST-3.LOG-see LOG

²⁰There are sporadic examples that seem to point to the opposite conclusion. For example, (35b) improves somewhat with the subject *déiá Okon* ‘Okon’s letter.’ However, our consultant spontaneously used a plain pronoun (*anye*) instead of *imɔ* to refer to Okon even here, considered *imɔ* a bit marginal, and shared the intuition that the logophor may refer to the letter rather than to Okon. Therefore, we believe that, to the extent this is possible, it should be considered a case of metonymy, in which the DP ‘Okon’s letter’ is used to refer to Okon (compare Landau 2001: 135). Support for this is the fact that ‘Okon’s letter’ behaves like an animate DP rather than an inanimate one in preventing an experiencer object from controlling IOP in a sentence like ‘Okon’s letter showed the children_i that he doesn’t like them(*Log_i)’; contrast (42c). Nishigauchi (2014: 168) gives an example with *zibun* referring to Yamada in ‘Yamada’s letter’ in Japanese. However, in Japanese, the choice of Cs and predicates seem crucial for this effect in peculiar ways. We leave open the question how broadly metonymy is available in these cases.

²¹We note that when *zibun* appears in (what looks like) the embedded subject position, it can be understood as being coreferential with a matrix goal argument somewhat more easily, as in (i).

- ‘Eno_i asked Okon_k whether Emen saw her_i/him_{*k}.’ (cf. Clements 1975: 154)
- b. Okon á-ké-dòkkò Edem [ké Emem í-maá-ghá ímò]. (=1))
 Okon 3SG-PST-tell Edem that Emem 3SG-like-NEG LOG
 ‘Okon_i told Edem_k [lOp_{i,*k} that [Emem does not like him_{i,*k}]].’
- (38) a. Keizi-wa sono seizika-ni [booryokudan-ga zibun-o
 detective-TOP the politician-DAT gangsters-NOM self-ACC
 sagasi-te-i-ru-koto-o] osie-ta. (Japanese)
 search-AUX-PRS-COMP-ACC tell-PST
 ‘The detective_i told the politician_k [zOp_{i,*k} that gangsters are searching
 for self_{i,*k}]. (=3))
- b. Taroo-wa Hanako-ni Ziroo-ga zibun-o yonde-i-ru-to
 Taroo-NOM Hanako-DAT Ziroo-NOM self-ACC call-AUX-PRS-COMP
 tutae-ta.
 convey-PST
 ‘Taroo_i conveyed to Hanako_k that Ziroo is calling self_{i/*k}.’

That thematic roles are important here—not just grammatical functions/final syntactic positions—is confirmed by the fact that in Japanese the passive of ‘tell’ still allows the oblique agent to antecede LD *zibun* (Kuno 1987: 258).

- (39) Sono seizika-wa keizi-kara [booryokudan-ga zibun-o
 that politician-TOP detective-from gangsters-NOM self-ACC
 sagasi-te-i-ru-koto-o] osiet-rare-ta.
 search-AUX-PRS-COMP-ACC tell-PASS-PST
 ‘That politician_i was told by the detective_k that gangsters are searching for
 self_{i/k}.’

This behavior falls within the bounds laid down by the GOCS. (Ibibio does not have a passive construction to consider. On the fact that the subject is also a possible antecedent for *zibun* in (39), see the discussion below (43).)

Further evidence that thematic roles are important to the control of lZOp comes from the fact that other triadic matrix predicates behave differently. For example, ‘hear’ arrays its arguments differently from ‘tell.’ with the source encoded as an oblique internal argument and the goal/experiencer as the subject. With this verb, the internal source argument can be the logophoric antecedent, as shown already in

- (i) Taroo-wa Ziroo-ni zibun-ga iku-bekida-to it-ta.
 Taroo-TOP Ziroo-DAT self-NOM go-should-COMP say-PST
 ‘Taroo told Ziroo_k that self_k should go.’

However, this sort of example is special in that the *zibun*=Ziroo reading requires a context in which Ziroo was trying to send someone else instead of going himself, and Taroo suggests that Ziroo should not be sending someone else, as in English *Taroo told Ziroo that he himself should go*. This recalls the fact that *zibun* in Japanese can sometimes be used as an intensifier with a contrastive flavor (Oshima 2009). We tentatively analyze (i) as having some form of the intensifier use of *zibun*. Whether for this reason or some other, judgments about what can be the antecedent of *zibun* are clearer when *zibun* is in object position (or other nonsubject position), so we focus on such examples.

(2) and (4).²² Note that (4) in Japanese is closely parallel to (39) in thematic terms. In addition, the subject of ‘hear’ can also be the logophoric antecedent. We attribute this to the hearer being an experiencer as well as a goal (e.g., X can tell Y something if Y is in a coma, but Y cannot hear something from X if Y is in a coma). And while the argument structure of ‘hear’ is unusual, it is not unique: thematically similar (complex) predicates like ‘learn from’ and ‘receive a message from’ show the same pattern (see Clements 1975: 158 for Ewe). This confirms that the effect is systematic.²³

- (40) a. Okon a-ke-kop a-to Emem [ke imo i-ma-i-dia
Okon 3SG-PST-hear 3SG-from Emem that LOG 3.LOG-PST-3.LOG-
nsa-akak]. (Ibibio)
win lottery
‘Okon_i heard from Emem_k [IOp_{i,k} that [he_{i,k} won the lottery]].’ (=2)
- b. Emem a-ma-a-bo etop a-to Okon ke imo
Emem 3SG-PST-3SG-get message 3SG-from Okon that LOG
i-ya-i-di mfin.
3.LOG-FUT-3.LOG-come today
‘Emem_i got a message from Okon_k that he_{i,k} will come today.’
- (41) a. Keizi-wa sono seizika-kara [booryokudan-ga zibun-o
detective-TOP that politician-from gangsters-NOM self-ACC
odosi-te-i-ru-koto-o] kiita. (Japanese)
blackmail-AUX-PRS-COMP-ACC heard
‘The detective_i heard from the politician_k [zOp_{i,k} that gangsters are
blackmailing self_{i,k}].’ (=4)
- b. Taroo-wa Hanako-kara sono gainen-wa zibun-no
Taroo-TOP Hanako-from the idea-TOP self-GEN
hatumei-da-to osowat-ta.
invention-COP-COMP learn-PST
‘Taroo_i learned from Hanako_k that the idea was self_{i,k}’s invention.’

²²The third (and final) difference between our Ibibio data and Newkirk’s is that according to Newkirk (2017: Ex. 9b) the source phrase cannot be the antecedent of the logophor in an example like (40a). Our consultant also sometimes reports only the experiencer as the antecedent for *imo* in examples that are potentially ambiguous. However, when only the source phrase matches the logophor in person and number, he consistently allows the source phrase as an antecedent. He also allows the source phrase as antecedent when that is the more plausible reading, when he is primed in that direction, and sometimes without any support. This discrepancy is probably then just the fact that speakers do not always recognize right away all the readings that an ambiguous sentence can have.

²³An anonymous reviewer observes that a *ke*-complement in Ibibio can optionally be introduced by a verbal element (*bo* or *te*) which agrees with the matrix subject, asking whether this affects the choice of antecedent for *imo*. The answer is no. For example, with matrix verb ‘hear’ the verbal element must agree with the subject, not the source, but a logophoric pronoun can still refer to the source phrase (or the subject), as in (i). This shows that *bo* is not agreeing with IOp, an otherwise tempting hypothesis. See Baker (to appear) for discussion.

- (i) Ng-ke-kop n-to Emem (m-bo/*a-bo) ke Edem i-k-i-maa-gha imo.
1SG-PST-hear 1SG-from Emem 1SG-say/*3SG say that Edem 3SG-PST-3.LOG-like-NEG LOG
‘I heard from Emem_i that Edem does not like him_i.’

This antecedence pattern is broadly analogous to what one finds in English with *agree* and *propose*, where either argument of the matrix verb can control PRO in the complement (Landau 2013: 124). Overall, we see that agent, source, and experiencer arguments can control IzOp, but pure goal arguments cannot. We assume this is a natural class of thematic roles, roughly those that can project directly into the subject position. Note that while both logophoric/LD-anaphoric constructions and the OC control of PRO are influenced by thematic roles, the precise way that thematic roles influence controller choice is different. We return to this in Sect. 5.

There is a bit more to say about the thematic influences on control of IzOp. Consider the triple from Ibibio in (42) featuring *toiyo* ‘remember/remind.’ In the dyadic use of this verb as ‘remember,’ the experiencer argument can antecede *imɔ* (42a). However, in the triadic use of the verb, translated as ‘remind,’ the corresponding argument cannot antecede *imɔ* when the subject is a true animate agent (42b). In this respect, ‘remind’ behaves just like the communication verbs ‘tell’ and ‘ask’ (see (37)). However, if the verb is used triadically and the subject is an inanimate causer, then the corresponding argument can antecede *imɔ* again, as in (42c).

- (42) a. Okon learn-PST-a-ma-a-toiyo ke imɔ i-kpina i-dep
Okon 3SG-PST-3SG-remember that LOG 3.LOG-should 3.LOG-buy
adesi.
rice
‘Okon_i remembered that he_i should buy rice.’
- b. Nditɔ e-ma-e-toiyo Okon ke mm-imɔ/*imɔ
children 3PL-PST-3PL-remind Okon that PL-LOG/*LOG
i-ma-i-dep adesi.
3.LOG-PST-3.LOG-buy rice
‘The children_i reminded Okon_k that they_i/*he_k bought rice.’
- c. Ukpɔk ekpat adesi a-ma-a-toiyo Okon ke imɔ
empty bag rice 3SG-PST-3SG-remind Okon that LOG
i-kpina i-dep adesi.
3.LOG-should 3.LOG-buy rice
‘The empty bag of rice reminded Okon_i that he_i should buy rice.’

Like ‘remind’ in this respect is ‘show.’ In contrast, the goal of ‘tell’ resists anteceding *imɔ* even if the subject is inanimate. Similar forces are at work in Japanese. We cannot fully replicate (42), since verbs like ‘remind’ are derived explicitly from ‘remember’ by the *-sase* causative, which brings with it additional syntactic structure. However, Nishigauchi (2014: 191–192) gives a contrast very similar to (42b) vs. (42c) involving ‘tell’ in Japanese. He compares (38a), where LD *zibun* can only refer to the human agent ‘detective,’ with (43), where the matrix subject is an inanimate NP ‘letter.’ In (43), *zibun* can refer to the matrix goal, as long as the politician actually reads and understands the letter—i.e., as long as ‘the politician’ is an experiencer as well as a goal.

- (43) Sono tegami-ga sono seizika-ni [booryokudan-ga zibun-o
that letter-NOM that politician-DAT gangsters-NOM self-ACC
sagasi-te-i-ru koto]-o osie-ta.
search-AUX-PRS that-ACC tell-PST
'The letter showed the politician_i that gangsters were searching for self_i.'
(Nishigauchi 2014: 192)

The surprise here is that a logophor cannot take the direct object as its antecedent in (42b). We take this to be a fact about theta-theory: the same verb cannot select a true agent argument and a true experiencer argument at the same time.²⁴ In other words, <causer, experiencer> and <agent, goal> are possible theta-grids, but <agent, experiencer> is not. (Hopefully, this is ultimately a fact about how people conceive of and describe events, but that obviously goes far beyond the current discussion. For other evidence that the choice of a causer vs agent subject can affect the interpretation of the internal argument, see Folli and Harley 2005.) Since (42b) has an agent subject, the object must be parsed as a goal rather than as an experiencer.²⁵ As such, it cannot control IOp in the CP complement. In contrast, (42a), (42c), and (43) do not have agents, so the internal argument can be parsed as an experiencer, and thus it can control IOp. The passive example in (39) from Japanese also testifies to these forces. The internal argument of 'tell' cannot control zOp in the active version, but it can in the passive version. In the passive version, the agent argument selected by 'tell' is either suppressed entirely or demoted to a source argument (note that it is marked by *kara* 'from' in (39)). This allows the goal argument of 'tell' to be considered an experiencer, and as such it can control zOp.

The paradigm in (42) gives some additional evidence for syntactic factors being at work in determining the antecedent of a logophoric pronoun. Compare (42b) with the lexical causative verb 'remind' to the periphrastic causative construction 'cause to remember' in (44). The two examples can have similar meanings. Nevertheless, they differ in how the logophor can be interpreted: in (42b) it cannot refer to the person whose memory is jogged, whereas in (44) it can.

²⁴ An alternative approach would be to appeal to a thematic hierarchy, saying that agents are higher-ranked theta-roles than experiencers, and only the highest ranked argument in a clause can control IOp. Then an experiencer could not control IOp in the presence of an agent, treating this as a fact about control theory rather than a fact about theta-theory. However, this approach leads to some ranking paradoxes, especially when one considers IOp as a possible controller of IOp, as we do in Sect. 4.2.

²⁵ An anonymous reviewer suggests that 'remind' does not mean 'make remember' but rather is a specialized version of 'tell,' a communication verb. We agree that 'remind' *can* be used as a communication verb rather than a causative verb, but we believe that it can also be used as a causative verb (as in (42c)). We would think that this possibility should be enough to license the logophor in (42b) on a purely semantic-perspectival view.

The same reviewer points out that it should be possible for 'children' in (42b) to be interpreted as a causer rather than an agent, on a par with 'the empty bag of rice' in (42c), in which case the singular logophor referring to Okon should become acceptable. We agree with this in principle, but find that there is a strong preference to interpret a human causer as being an agent, at least out of the blue. We would not be surprised if *imo* referring to Okon in (42b) would become more acceptable if the sentence was presented in a strong context that made it clear that it was merely seeing the children that jogged Okon's memory about his previous rice-buying, without any agency or awareness on the part of the children. (If this is the case, it is consistent with our theory, but would blur this distinction between our account and a purely perspectival one somewhat.) We have not investigated this.

- (44) Nditọ e-ma-e-nam Okon a-toiyo ke imọ i-kpina
 children 3PL-PST-3PL-make Okon 3SG-remember that LOG 3.LOG-should
 i-dep adesi.
 3.LOG-buy rice
 ‘The children_k made Okon_i remember that he_i should buy rice.’

This contrast seems mysterious when considered only from the angle of perspectival centers and who mentally represents the content of a clause. But it makes sense in terms of the GOCS, where IOp is controlled by the thematic subject of the verb that selects the CP that contains it. In (44), that verb is ‘remember,’ with the rememberer as its experiencer argument. In contrast, in (42b) the selecting verb is ‘remind,’ and its remindee argument is not an experiencer. Here which verb the potential antecedent is an argument of makes a crucial difference. Similarly, *imọ* can refer to Okon in ‘Edem made Okon think that... *imọ*...’ but not in ‘Edem convinced Okon that... *imọ*...’.

Moving beyond CP complements, another context of OC is adjunct clauses of various kinds in English and other languages (see Landau 2021 for extensive discussion). For example, PRO controlled by the matrix subject is possible inside rationale clauses (*Chris bought the peppers in order PRO to make a curry*) and temporal clauses (*It always rains before PRO snowing*), among others. Similarly, some adjunct clauses allow logophoric pronouns referring to the matrix subject in Ibibio, and some allow LD *zibun* referring to the matrix clause in Japanese. In particular, this is possible with rationale clauses in both languages, as shown in (45) and (46). Here an IZOp at the edge of the adjunct clause is controlled by the matrix subject and binds *imọ/zibun* inside the adjunct clause.

- (45) Okon a-ma-a-dibe mbaak Emem a-di-kit imọ. (Ibibio)
 Okon 3SG-PST-3 SG-hide so.that Emem 3SG-PROH-see LOG
 ‘Okon_i hid so that Emem would not find him_i.’
- (46) Taroo-wa Hanako-ga zibun-ni kizuka-nai-yooni kakure-ta. (Japanese)
 Taroo-TOP Hanako-NOM self-DAT notice-NEG-COMP hide-PST
 ‘Taroo_i hid so that Hanako would not notice self_i.’

In Ibibio, different adjunct clauses behave differently in this respect. (47) shows that temporal and causal adjunct clauses do not allow logophoric pronouns that refer to the matrix subject.

- (47) a. *Okon á-ma-á-dat fbo’k ké ìnì do’kto’ á-ké-tèmméké imọ
 Okon 3SG-PST-3SG-take drug at time doctor 3SG-PST-instruct LOG
 i-bó i-dát.
 3.LOG-say 3.LOG-take
 (‘Okon_i took the medicine when the doctor told him_i to take it.’)
- b. Okon a-ke-ka Lagos sia anye/*imọ a/i-ki-yem
 Okon 3SG-PST-go Lagos because he/*LOG 3SG/3.LOG-PST-want
 adi-kit Enò.
 INF-see Eno
 ‘Okon_i went to Lagos because he_i wanted to see Eno.’

We can attribute this variation to the role that complementizers play in licensing IOp in Ibibio: some Cs license IOp and some do not, as stated in (18a). We can simply add *mbaak* ‘so that’ to the list of Cs that do license IOp, along with *ke* ‘that,’ *mme* ‘whether,’ and *yak* ‘subjunctive,’ and we can add *sia* ‘because’ and *ke ini* ‘when’ to the list of Cs that do not license IOp, along with *naña* ‘how.’ The contrast between (45) and (47) within the realm of adjunct clauses is thus like the contrast between (17a) and (17b) in the realm of complement clauses. Again, there may well be semantic reasons that help to explain why some Cs allow this and others do not, either in whole or in part, but we leave this open.²⁶ In contrast, LD *zibun* is possible in a wider range of adjunct clauses in Japanese, including ‘because’ clauses and ‘when’-clauses (and also ‘if’ clauses). (48) gives two examples.²⁷

- (48) a. Takasi-wa [Yosiko-ga zibun-o tazunete-ki-ta node] uresigat-ta.
Takasi-TOP Yosiko-NOM self-ACC visit-come-PST because happy-PST
‘Takasi_i was happy because Yosiko came to visit him_i.’ (Sells 1987: 464).
- b. Mari-ga zibun-ni mizu-o kake-ta toki, Takasi-wa hidoku
Mary-NOM self-DAT water-ACC pour-PST when Takasi-TOP greatly
odoroi-ta.
be.surprised-PST
‘Takasi_i was surprised when Mary poured water on self_i.’ (Nishigauchi 2014: 165)

This is expected given that zOp is not licensed by particular Cs in Japanese, but rather by PoV, a head high in the T-space that can be present in any finite clause. Thus, zOp is possible in any adjunct clause, just as it is possible in any complement clause. The contrast between (48) in Japanese and (47) in Ibibio in the domain of adjunct clauses is parallel to the contrast between (21) in Japanese and (17b) in Ibibio in the domain of complement clauses.²⁸

Finally, consider the possibility of the object of a causative verb controlling an lzOp inside the subject of that verb. The GOCS as formulated in (32) allows this, since the controlled-into clause can be anywhere in the extended projection of the verb. Theta-role receiving CPs are more common as the complements of verbs than as thematic subjects generated in Spec VoiceP, for selectional reasons, but causative verbs allow CP subjects in some languages. Indeed, Landau (2001) argues that examples like [it would damage John [PRO to perjure himself]] has an OC analysis in English (as well as an NOC analysis). The issue does not arise in Ibibio, which does not allow bare CP subjects; one needs to say something like ‘[The news [that he won the lottery]] helped Okon’ and the carrier noun ‘news’ has its own arguments

²⁶Here again our educated guess is that semantic distinctions will partially account for the differences between different types of adjunct clauses, but not entirely. On the possibility that the adjuncts in (47) attach higher than the one in (45) and this influences the possibility of OC taking place, see fn. 46.

²⁷There are, however, some semantic/pragmatic restrictions, such that LD *zibun* is not always possible in ‘when’ clauses in Japanese; see Nishigauchi (2014) for discussion. We abstract away from these additional factors.

²⁸We thank an anonymous reviewer for discussion, pushing us on our analysis of adjunct clauses and suggesting this simplification of our theory.

(often covert) to be concerned with. Japanese, however, does allow CP subjects with the nominal complementizer *koto*. Nishigauchi (2014: 188–189) reports that *zibun* inside a CP subject cannot take the object of a (nonpsychological) causative predicate as its LD antecedent in an example like (49a). However, we find that this pattern of anaphora is possible in a largely similar example like (49b) with main verb ‘save.’

- (49) a. *C.kyoozyu-ga zibun-o in'yoo-sita koto-ga Takasi-o
 Prof.C-NOM self-ACC quote-do.PST that-NOM Takasi-ACC
 yuumei-ni si-ta.
 famous-DAT make-PST
 ('That Prof C quoted him_i made Takasi_i famous.')
- [_{CP} That zOp*_i PoV [Professor C quoted self_i]] made [_{SC} Takasi_i famous]]
- b. C.kyoozyu-ga zibun-o suisen-si-ta koto-ga Takasi-o
 Prof.C-NOM self-ACC recommend-do-PST that-NOM Takasi-ACC
 sukut-ta.
 save-PST
 'That Prof C recommended him saved Takasi (even though he never found out about it).'
- [_{CP} That zOp_i PoV [Professor C recommended self_i]] saved Takasi_i.

The structural difference is that in (49b), the object *Takasi* is an argument of the same predicate ‘save’ that the CP subject is an argument of. Therefore, the object is a possible controller for zOp at the edge of the CP subject, according to the GOCS (as long as its thematic role is appropriate). In contrast, we claim that *Takasi* in (49a) is the accusative case-marked subject of a small clause headed by ‘famous,’ and the small clause as a whole is the complement of the causative verb ‘make.’ Therefore, the GOCS does not allow *Takasi* to be the OC controller in (49a). This contrast shows again that it is important whether the CP and the NP that controls into it are arguments of the same syntactic item. Moreover, note that *Takasi* does not have to be aware of the fact that Professor C recommended him for the LD anaphora to be possible in (49b). This is another challenge to the view that logophoric phenomena are shaped only by semantic notions that center on whose perspective a CP is presented from.²⁹

Overall, the data in this section show two things. First, there are strong similarities between how the logophoric pronoun in Ibibio behaves and how LD *zibun* in Japanese behaves when they appear inside CPs generated inside projections of the verb. In this, we confirm and extend an observation that has been in the literature since Clements (1975). Second, there are somewhat more abstract but important similarities between both of these constructions and the obligatory control of PRO in languages like English, which are captured by saying that both fall under a general-

²⁹Nishigauchi also observes that (49a) becomes acceptable if ‘famous’ is replaced by the psychological adjective *utyooten-ni* ‘crazy’—arguably a perspectival effect. Our interpretation from the syntactic angle of the GOCS (not incompatible with Nishigauchi’s) is that the causer argument of a psych predicate like ‘make crazy’ can count as an internal argument of ‘crazy’ as well as an external argument of ‘make’ (Pesetsky 1995: Ch. 6). Since the experiencer is also an argument of ‘crazy,’ it can control lzOp inside the causer argument on such a view.

ized version of Landau's OC signature.³⁰ This second result is the more novel one, given that logophoric phenomena have more often been compared to NOC than to OC (e.g., see Nishigauchi 2014: Sect. 3).

4.2 Super-LD anaphors and chained control

The GOCS asserts as a syntactic condition that the controller of lzOp at the edge of CP has to be an argument of the same verb that CP is dependent on. This explains contrasts like (33) vs. (35) and (49a) vs. (49b). However, there is a major challenge to this view which we have already seen. This is the fact that *zibun* in a doubly embedded CP complement can take the subject of the highest verb as its antecedent as well as the subject of the intermediate verb. This was shown in (12) above; (50) gives another example, from Nishigauchi (2014: 171).

- (50) Takasi-wa [Mari-ga [minna-ga zibun-o erabi soo-da-to]
 Takasi-TOP Mary-NOM everyone-NOM self-ACC elect likely-COP-COMP
 it-ta-to] omow-ta.
 say-PST-COMP think-PST
 'Takasi_i thought that Mary_k said that everyone is likely to elect self_{i,k}.'

This seems unlike OC, since a zOp in the lowest CP can apparently be bound by the highest subject, which is not an argument of the verb that selects the lowest CP.

Considering this more carefully, there are (potentially) two zOps in (50), either of which could conceivably be controlled by *Takasi* and bind *zibun*: one at the edge of the CP complement of 'think' and one at the edge of the CP complement of 'say.' This gives the two possibilities in (51), neither of which serves our analytical needs well.

- (51) a. Takasi_i thought [that zOp1_i PoV [Mary_k said [that (zOp2_k) PoV [everyone will elect self_i,]]]]
 b. Takasi_i thought [that (zOp1) PoV [Mary_k said [that zOp2_i PoV [everyone will elect self_i,]]]]

In (51a), Takasi controls zOp1 locally, but then zOp1 binds *zibun* at a significant distance, from outside the minimal clause that contains it. For Ibibio, this representation is possible because *imɔ* is a pronoun, which can be bound at an indefinite syntactic distance (see the discussion of (13)/(16)). But for Japanese *zibun*, (51a) runs afoul

³⁰ An anonymous reviewer asks if partial and split control of lzOp is possible, suggesting that this would strengthen the connection with OC that we posit (cf. Landau 2013: Sect. 5.2, 5.3). The answer is that we cannot tell for sure. A plural logophor in Ibibio can be partially bound by one or more singular antecedents in examples like '(Udo_i thinks that) Ekepe_k said that they_{i+k} ate all the rice' (Newkirk 2017: Ex. 6, 7). However, we do not know how to tell whether such examples have a plural lOp that is partially controlled by the singular subject and exhaustively binds the plural logophor, or whether they have a singular lOp that is exhaustively controlled by the singular subject and partially binds the plural logophor. Since the logophor is a pronoun, the second possibly is a real one. Similarly, while *zibun-tati* 'zibun-PL' allows apparent partial or split readings, there is some indeterminacy of analysis for it too. *-Tati* can be an associative plural marker (Nakanishi and Tomioka 2004, etc.), so we cannot exclude the possibility that zOp is controlled by a single controller and the phrase *zibun-tati* refers to '(zibun_{sg})' and others associated with (zibun_{sg}). At the very least, there is no disanalogy with the OC of PRO here.

of the fact that as an anaphor *zibun* must have a binder in its local clause—no farther away than zOp2. For this reason, the two most immediate forebearers of our operator analysis, Nishigauchi (2014: 171–172) and Charnavel (2019, 2020), both opt for (51b), where the relationship between zOp and *zibun* is local but the relationship between zOp and its antecedent/controller is not. But (51b) appears to violate the GOCS, running contrary to the idea that OC is crucially involved for LD-anaphors inside CP complements. Rather, Nishigauchi invokes nonobligatory control and Charnavel makes use of syntactically unconstrained pronominal coreference. In this section, we argue that examples like (50) are compatible with an OC analysis after all, and indeed provide new support for it.

The key to our analysis is to realize that even in (51b), a zOp can be present in the periphery of the complement of ‘think.’ That zOp (zOp1) is naturally controlled by the highest subject Takasi. We then propose that zOp1 can count as an OC controller of zOp2, giving the representation in (52) for the reading of (50) in which *zibun* refers to *Takasi*. We call this *chained control*.

- (52) Takasi_i thought [that zOp1_i PoV [Mary_k said [that zOp2_i PoV [everyone will elect self_i]]]]
 |_____OC_____||_____OC_____||_____local binding_____||

Although the idea of one operator controlling another one is unfamiliar, there is independent motivation for it from parallel constructions in other languages. Consider briefly allocutive agreement in Magahi, studied by Alok (Alok and Baker 2018; Alok 2020, 2021). In matrix clauses, the Magahi verb can bear a second agreement morpheme, appearing outside normal subject agreement, as seen in (53a). This second agreement records whether the addressee of the sentence is nonhonorific (NH), honorific (H), or high honorific (HH) relative to the speaker.

- (53) a. Ham jaa-it h-i / h-i-au / h-i-o / h-i-ain. (Alok 2020: 9 (13))
 I go-PROG be-1.SG / be-1.SG-NH / be-1.SG-H / be-1.SG-HH
 ‘I am going.’ (said to anyone/to a friend/to an elder/to a societal leader)
 b. [Ad C(Fin) [I am going]]
 ↙/Agree

Following a generative tradition beginning with Oyharçabal (1993), Alok (2021) argues that in (53a) a C-like head (Fin, he claims) enters into Agree with a null DP *Ad* that is in the periphery of the clause and denotes the addressee (see Speas and Tenny 2003). This is sketched in (53b). Moreover, Magahi is a bit special in that it allows allocutive agreement in embedded clauses. In this context, Alok claims that *Ad* can undergo control by an argument (the goal) of the matrix verb. As a controllable null DP related to pragmatic/discourse notions, this *Ad* is rather like our IzOp, and is also subject to the GOCS (cf. fn. 19). Most relevant to our current topic is the fact that when allocutive agreement is present in the complement of a verb like ‘tell,’ two distinct possibilities are attested. First, the embedded allocutive marking can show the honorificity status of the referent of the goal of ‘tell’ relative to the referent of the agent of ‘tell.’³¹ In this case, allocutive marking on the embedded verb is poten-

³¹Note that the matrix goal *Bantee* can control the embedded *Ad* in (54) but the matrix subject *Santee* cannot because of thematic-role matching condition on OC. This is different from IzOp, where thematic

tially different from an allocutive marking on the matrix verb (54a). Alternatively, the marking on the embedded verb can resume the allocutive marking on the matrix verb, showing the honorific status of the addressee relative to the speaker (54b).

- (54) a. Santee-aa Bantee-aa-ke kahl-**ain** ki Ram Chhotu-aa-ke
Santee-FM Bantee-FM-DAT told.3SG-HH that Ram Chhotu-FM-ACC
dekh**l-au**.
saw.3SG-NH
'Santee told Bantee that Ram saw Chotu.' (said to a teacher; *au* = Santee's NH r'ship to Bantee) (Alok, p.c.)
[Ad_i=HH C:HH [Santee told Bantee(NH)_k [Ad_k=NH that:NH [Ram saw Chotu]]]]
- b. Santee-aa Bantee-aa-ke kahl-**ain** ki Ram Chhotu-aa-ke
Santee-FM Bantee-FM-DAT told.3SG-HH that Ram Chhotu-FM-ACC
dekh**l-ain**.
saw.3SG-HH
'Santee told Bantee that Ram saw Chotu.' (said to a teacher; *ain*=Speaker's HH r'ship to Addressee)
[Ad_i=HH C:HH [Santee told Bantee(NH)_k [Ad_i=HH that:HH [Ram saw Chotu]]]] (Alok, p.c.)

Alok concludes that there are two possible controllers of the Ad in the embedded clause: one is the matrix object, resulting in (54a); the other is the Ad in the matrix clause, resulting in (54b). The second possibility is operator-to-operator control—i.e., chained control, parallel to what we posit in (52). The two possible forms of allocutive agreement in (54) are analogous to the two possible LD-antecedents for *zibun* in (50), according to our analysis.

Indeed, it is fairly easy to get chained control to follow from the principles of control that we have already formulated. Crucially, the higher zOp in (52) is not much farther away from the lower zOp than the intermediate subject *Mary* is: they are both part of the same clausal complex. We simply need to adjust the GOCS so that it reads as in (55), with the added phrase highlighted.³²

- (55) *The Generalized OC Signature: (GOCS, final)*
If a clause with an intrinsically null DP (PRO, lOp, zOp, Ad, ...) at its edge is generated inside an extended project of a verb V, then the null DP is controlled by an argument of some head in the extended projection of V. Which argument is the controller is decided thematically.

In fact, we should make this change anyway. Our original formulation of the GOCS was a bit informal in that it referred to the arguments of a verb, not taking into account the mainline view that verbs are not unitary syntactic items, but rather the results of amalgamating a series of heads, including V, v/Voice, and perhaps also one or

matching implies that the matrix subject can control but the matrix goal argument cannot. See Sect. 5 for discussion.

³²Compare Landau (2001: 118), who presents a version of the OC signature that is explicitly stated in terms of VP shells, not just simple verbal heads.

more Appl heads. Given this decomposition, the controller in ordinary subject control is technically the argument of v/Voice, not an argument of the V head that the controlled-into CP is the complement of. Similarly, the controller in ordinary cases of goal control may technically be the argument of Appl, not of the V that CP is the complement of. A natural way to recapture what was intended is to state the GOCS over the sequence of theta-role assigning heads that anchors a clause, rather than over a single head. (55) does this. Now the PoV head that takes zOp as its argument is also part of the verbal extended projection that starts at the V head and ends at C. As such, its argument is on par with the agent argument of v/Voice or the goal argument of Appl: any of them can be the OC controller. Nor is it anomalous that there are two possible obligatory controllers of the lower zOp in (52) on our analysis: the subject *Mary* and the zOp in the intermediate clause. We have seen that with the verb ‘hear,’ either the experiencer argument or the source argument of the matrix clause can control the lzOp in the CP complement. Similarly, in the domain of conventional control, either the matrix subject or the matrix oblique can control PRO with verbs like *propose* (Landau 2013: 124). The claim that either Ad or the matrix goal can control the lower Ad in (54) and that either zOp1 or the matrix agent can control zOp2 in (52) is thus not outside what is expected for OC.

Now we can switch from defense to offense on this topic, deriving a prediction from the GOCS that alternative accounts do not make. In Magahi, chained control of Ad is subject to a kind of clause-level locality that shows that it is a syntactically constrained form of OC. This can be seen in (56), where a CP complement is embedded inside another CP complement. Suppose that the highest verb and the middle verb have different allocutive markers, as in (56a). Then consider allocutive marking on the lowest clause. This can resume the marking on the middle verb, but it cannot resume the allocutive marking on the highest verb.

- (56) a. Santee-aa baabaa-ke kah-**kau** ki Banteaa socha
 Santee-FM grandfather-DAT told-3SG-NH that Bantee think
 h-o ki Ram parichha paas ho gel-o/*au.
 be.3SG-H that Ram exam pass become went.3SG-H/*NH
 ‘Santee told grandfather that Bantee thinks that Ram passed the test.’
 (Alok, p.c.)
- b. *[Ad_i=NH C:NH [Santee told gr-father:H_k [Ad_k=H C:H [Bantee think
 [Ad_i=NH C:NH [Ram pass]]]]]]
- c. [Ad_i=NH C:NH [Santee told grandfather:H_k [Ad_k=H C:H [Bantee
 think [Ad_k=H C:H [Ram pass]]]]]]

This pattern follows from (55), which implies that Ad at the edge of the lowest clause must be controlled by an argument of some head in the middle clause. The Ad of the middle clause qualifies (it is an argument of C/Fin; see Sect. 5), but the Ad of the highest clause clearly does not. This confirms that the option between (54a) and (54b) is really the option between two local obligatory controllers, not an option between obligatory control and some syntactically unconstrained form of nonobligatory control.

Our prediction, then, is that zOp must also be locally controlled in this way, although it takes care to construct and judge the relevant examples. Consider a complex

four-clause sentence with a structure like (57). This starts with a structure like (52) and embeds it once more, as the CP complement of ‘say.’

- (57) John said [that *zOp1* Mary thinks [that *zOp2* Bill told *zibun*₁ [that *zOp3* the professor will recommend *zibun*₂]]].

As (56) has three successive Ads, so (57) has three successive *zOps*, one just below each of the three complementizers ‘that.’ The only possible controller for *zOp1* is the highest subject ‘John.’ Then we put instances of *zibun* in the clauses headed by ‘told’ and ‘recommend.’ *Zibun1* must be locally bound by *zOp2* (or *Bill*), so what it can refer to will tell us what controls *zOp2*. Similarly, *zibun2* must be locally bound by *zOp3* (or ‘professor’), so what it can refer to will tell us what we most want to know: what can control *zOp3* in this structure. Parallel to (52), there should be two possible controllers of *zOp2*: *Mary* or *zOp1*, where *zOp1* is controlled by *John*. Let us focus on the reading where *zibun1* refers to *Mary*. Now if Japanese is like Magahi in allowing only local chained control, in accordance with the GOCS, *zOp3* can be controlled by the closest subject, *Bill*, or by the closest *zOp*, *zOp2* (controlled by *Mary*), but not by the more remote *zOp*, *zOp1* (controlled by *John*). The prediction, then, is that when *zibun1* refers to *Mary* in (57), *zibun2* can refer to *Mary* or *Bill*, but not to *John*. This prediction is correct, as shown by (58). The first three readings are the ones in which ‘self1’=*Mary*, and indeed when this is the case ‘self2’ can refer to *Mary* ((58a)) or *Bill* ((58b)) but not to *John* ((58c)) (see also Oshima 2006: 101). We conclude that local chained control is possible in Japanese, but not a nonlocal NOC-like (syntactically unconstrained) kind of control.

- (58) John-wa Mary-ga Bill-ga zibun-ni sensei-ga zibun-o
 John-TOP Mary-NOM Bill-NOM self-DAT prof.-NOM self-ACC
 suisen-suru-hazu-da-to it-ta-to omotte-i-ru-to
 recommend-do-likely-COP-COMP say-PST-COMP think-AUX-PRS-that
 it-ta.
 say-PST
 ‘John said Mary thinks Bill told self₁ that the professor will recommend self₂.’
- John_i said Mary_k thinks Bill_n told self_{1k} that the professor will recommend self_{2k}.
 - John_i said Mary_k thinks Bill_n told self_{1k} that the professor will recommend self_{2n}.
 - *John_i said Mary_k thinks Bill_n told self_{1k} that the professor will recommend self_{2i}.
 - John_i said Mary_k thinks Bill_n told self_{1i} that the professor will recommend self_{2i}.
 - *John_i said Mary_k thinks Bill_n told self_{1i} that the professor will recommend self_{2k}.

Also relevant to this topic is the fact that *zibun1* can refer to *John* rather than *Mary* in (58), as expected. In this case too there are restrictions that follow from the theory of obligatory control. If *zibun1* refers to *John*, then *zibun2* can also refer to *John* (58d)

(or to Bill), but it cannot refer to Mary—the (58e) reading is also out. This restriction is also predicted by the GOCS in (55). If *zibun1* refers to John, it must be because *zOp2* in (57) is controlled by *zOp1*, which is controlled by John. This implies that *zOp2* is not controlled by Mary in this case. Now according to (55), the only possible controllers of *zOp3*, the local antecedent of *zibun2*, are *Bill* and *zOp2*, which here is chain-controlled by *John*. In particular, *Mary* is not an argument of ‘told,’ the verb that selects the CP containing *zOp3*. Therefore, it is not a possible controller of *zOp3* given (55). Again, it turns out that control of *zOp* displays the kind of clause-level locality that is enforced by the theory of OC. What looked like it might be a serious problem for the OC-based analysis turns out to be a strength.³³

We can replicate this result in a simpler structure with “only” three levels of embedding by taking advantage of the fact that with the verb ‘hear’ either the experiencer subject or the oblique source can be the antecedent of *zibun* in a complement clause, as shown in (4) and (41). Consider then the example in (59). We imagine this sentence uttered in the context in which Taroo got a recommendation letter from a famous professor for his application to grad school. Taroo tries to keep this secret, thinking that he would be ashamed of himself if he could not get in anywhere even with this recommendation. But he happens to learn that Hanako knows about the recommendation, and he wants to find out who told Hanako. This context should favor a reading of (59) in which *zibun1* refers to Hanako and *zibun2* refers to Taroo. However, we find that (59) does not allow this reading.

- (59) #Taroo-wa Hanako-kara Ziroom-ga zibun-ni sensei-ga zibun-o
 Taro-TOP Hanako-from Ziroom-NOM self-DAT prof-NOM self-ACC
 suisen-si-ta-to itta-to kii-ta.
 recommend-do-PST-COMP say-COMP hear-PST
 Not: ‘Taroo_i heard from Hanako_k that Ziroom told self_k that the professor recommended self_i.’
 Taroo_i heard from Hanako_k [that *zOp1*_k Ziroom_n told self₁_k [that *zOp2*_{k,n,*i} prof recommended self₂_{k,n,*i}]]

If we only require that *zOp* (or *zibun* itself) needs to refer to a logophoric center, it is not clear why *zOp2* cannot refer to Taro here. But the GOCS together with the assumption that a clause can only contain a single *zOp* correctly restricts this. *zOp2* in (59) can only be directly controlled by the closest subject *Ziroom* or the closest (unique) *zOp*, *zOp1*. *zOp1* in turn can be controlled by either *Taro* or *Hanako*, but not both (since it is singular here). Whichever NP controls *zOp1* can antecede *zibun2* as well as *zibun1*, by way of chained control. But the one that does not control *zOp1*

³³Oshima (2006: 103–107) argues for a pragmatic explanation of this paradigm, based on conflicts in perspective taking. However, his account crucially depends on an observation from Culy (1997) that subsequent research has not borne out. The claim is that in Japanese, where two *zibuns* need to have the same LD referent, a plain pronoun rather than *zibun* can be used for non-*de-se* reference to the antecedent, whereas in African languages where two logophors do not need to have the same referent, a plain pronoun cannot refer to the logophoric center. In fact, a plain pronoun can refer to the logophoric center in Ibibio (30b), as well as in Yoruba (Adesola 2005) and at least some dialects of Ewe (Pearson 2013). It is of course possible that some other semantic or pragmatic account in terms of perspectives could account for the paradigm in (58), but we are not the best people to explore every version of such an account.

cannot antecede *zOp2* and *zibun2* directly, because it is not an argument in the clause that immediately contains the clause that hosts *zOp2*.

Having scored a quick goal or two on offense (we hope), we need to return to defense to say something about a problem that our use of chained control raises around the edges of our current topic (pointed out by two anonymous reviewers). If an operator like *zOp* or *Ad* can control another *zOp* or *Ad*, then should *zOp* also be able to control *PRO*? It seems like this is allowed by the GOCS in (55), which treats *zOp*, *Ad*, and *PRO* on a par. Therefore, we apparently predict that there could be what looks like long distance control in examples with a structure like (60).

(60) John_i thinks that [*zOp*_i Mary_k decided [*PRO*_i to go home early]].

But this prediction is false for Japanese and Ibibio, as shown by (61).

- (61) a. John-wa Mary-ga hayaku kaer-oo-to
 John-TOP Mary-NOM early go.home-INT-that
 kessin-si-ta-to omot-ta. (Japanese)
 decision-do-PST-COMP think-PST
 ‘John_i thinks that [*zOp*_i Mary_k decided [*PRO*_{k,*i} to go home early]].’
 b. Okon a-ma-bo ke Edem a-yem adi-dep adesi. (Ibibio)
 Okon 3SG-PST-say that Edem 3SG-want INF-buy rice
 ‘Okon_i said that [*IOp*_i Edem_k want [*PRO*_{k,*i} to buy rice]].’

Although we cannot explore this issue fully here, we sketch a possible answer to this. We start by observing that the problem is not just about an operator controlling *PRO*. Sometimes it is impossible for an operator to chain-control another operator as well. Although *zOp* can control a *zOp* in Japanese and *Ad* can control *Ad* in Magahi, the *Op* that is involved in upward complementizer agreement in Bantu languages under Diercks’s (2013) indirect agreement hypothesis cannot participate in chained control. This is implied by the data in (62).

- (62) a. Alfredi ka-bol-el-a ba-ba-andu **a-li**
 1.Alfred 1.SUBJ-said-APPL-FV 2-2-people 2-that
 ba-kha-khile.
 2.SUBJ-FUT-conquer
 ‘Alfred told the people that they will win.’
 Alfred_i told the people_k [*bOp*_{i,*k} that [they will win]] (Diercks 2013:
 358, Ex. 1b)
 b. Alfredi ka-a-lom-a **a-li** ba-ba-andu ba-mwekesi-a
 1.Alfred 1.SUBJ-PST-say-FV 1-that 2-2-people 2.SUBJ-reveal-FV
ba-li/*a-li o-mu-keni k-ol-a.
 2-that/*1-that 1-1-guest 1.SUBJ-arrived-FV
 ‘Alfred said that people revealed that the guest arrived.’ (Diercks 2013:
 371, Ex. 39)
 Alfred_i say [*bOp*_i that [people_k revealed [*bOp*_{k,*i} that [guest arrived]]]]

Example (62a) is a basic example of upward C-agreement in noun class (gender and number) in Lubukusu. Diercks argues that it is the result of C agreeing locally with a

null DP that is bound by the immediately superordinate subject. We adopt a version of this view, calling the null DP *bOp* (for “Bantu-operator”), and assuming that it is controlled by the matrix subject *Alfredi* in accordance with the same principles according to which *IzOp* is controlled by the subject of the higher verb in *Ibibio* and *Japanese*.³⁴ (Note for example that *bOp* is controlled by the matrix subject but not by the matrix goal in (62a), just as *IOp* and *zOp* are.) Then (62b) shows what happens with C-agreement in cases of multiple embedding comparable to (54) in *Magahi*. In *Lubukusu*, there is only one possible outcome: C must agree with the immediately superordinate subject ‘people’ and cannot resume the form of the higher C, which agrees with the highest subject ‘Alfred.’ This implies that *bOp* in *Lubukusu* can only be controlled by the subject of the clause anchored by the verb that selects it; it does not have the option of being controlled by the *bOp* near the top of that clause. There is thus only one possible outcome for agreement on a doubly embedded C in *Lubukusu*, whereas there are two possible outcomes in *Magahi*, as in (54). This puts the puzzle we face in a larger context: the question is now why *Ad* and *zOp* allow an operator to control them, whereas *PRO* and *bOp* do not.

The near-minimal comparison between *Ad* in *Magahi* and *bOp* in *Lubukusu* points toward an answer. A fundamental difference between the two is that *bOp* in *Lubukusu* has no intrinsic phi-features, but simply inherits the phi-features of its controller, whereas *Ad* does have intrinsic phi-features—it is [+2nd person]. That *bOp* does not have intrinsic phi-features is shown by the fact that it can be controlled by an antecedent with any person-number-gender value. It then inherits those values, which show up on the agreeing C, as seen in (62) and (63).

- (63) a. **N**-a-bol-el-a Nelsoni **n**-di ba-keni
 1SG.SUBJ-PST-say-APPL-FV Nelson 1SG-that 2-guests
 ba-a-ch-a.
 2.SUBJ-PST-go-FV
 ‘I told Nelson that the guests left.’ (Diercks 2013: 366, Ex. 20a)
- b. **Ewe** w-a-bol-el-a Nelsoni **o**-li ba-keni
 you 2SG.SUBJ-PST-say-APPL-FV Nelson 2SG-that 2-guests
 ba-a-rekukh-a.
 2.SUBJ-PST-go-FV
 ‘You told Nelson that the guests left.’ (Diercks 2013: 369, Ex. 31)

In contrast, *Ad* in *Magahi* always acts like a second person element, regardless of the phi-features of its controller. One sign of this is that agreement with *Ad* shows a three-way distinction between nonhonorific, honorific and high honorific (see (53a)), which is otherwise found only with second person pronouns and agreement in *Magahi*. (Third person elements show a two-way distinction, and first person elements are only nonhonorific; see Alok and Baker 2022). Another sign of this is that pronouns in the complement clause that are bound by *Ad* must themselves be second

³⁴Diercks himself assumes that “*bOp*” is a subject-oriented anaphor locally bound by the matrix subject, but he struggles some to work this out (Diercks 2013: 374–377) and moves away from the idea in later work (Diercks et al. 2020). There are also direct agreement accounts of *Lubukusu*, which do not posit an empty DP in Spec CP, like Carstens (2016), but we do not take the space to compare them here. See Baker (to appear) for discussion.

person, a form of indexical shift (Alok and Baker 2018; Alok 2020). A third sign is that allocutive marking on the embedded verb does not vary with the person features of the goal argument that controls it, but only with its honorificity features, as shown in (64). (Note that agreement in Magahi never copies number or gender features, so person and honorificity are the only phi-features that are relevant here.)

- (64) a. Santeeaa **Banteeaa-ke** kahl-o ki adamiaa chal gel-**au**.
 Santee Bantee-DAT said.3SG-H that worker walk went.3SG-NH
 ‘Santee told Bantee that the worker left.’ (speaking to gr-father; NH
au=Santee’s r’ship to Bantee) (Alok, p.c.)
- b. Santeeaa **hamraa** kahl-o ki adamiaa chal gel-**au**.
 Santee me.DAT said.3SG-H that worker walk went.3SG-NH
 ‘Santee told me that the worker left.’ (speaking to gr-father; NH
au=Santee’s r’ship to speaker) (Alok, p.c.)
- c. Professor X **apne-ke** kah-l-a-thin ki adamiaa chal
 Professor X you.HH-DAT said.3SG-HH that worker walk
 gel-**au**.
 went.3SG-NH
 ‘Professor X told you that the worker left.’ (speaking to a prof; NH
au=prof’s r’ship to the other prof) (Alok, p.c.)

This comparison thus points to the descriptive generalization in (65).

- (65) A controllable null DP without interpretable intrinsic features cannot be controlled by a DP that originates outside the matrix VoiceP (i.e., not by any of the Ops); a controllable null DP with interpretable intrinsic features can be.

Now it is natural that PRO behaves like bOp in this respect, since PRO in complement clauses also has no intrinsic phi-features, but inherits them from its controller (*I decided [PRO to pinch myself/*yourself]*, *You decided [PRO to pinch yourself/*herself]*, etc.). To complete the story, we need to say that zOp in Japanese does have intrinsic interpretable features, causing it to pattern with Ad rather than with bOp and PRO in this respect. That is less obvious, but not unreasonable. Although zOp does not have person features, we can say that zOp is at least [+animate], given that *zibun* always needs an animate antecedent in Japanese. In addition, we may be able to say that zOp is [+empathy], having in mind Kuno’s (1978, 1987) observation that LD *zibun* needs to have an empathized-with antecedent in certain contexts. We return to this fact about Japanese in Sect. 6.

The next question is, of course, what theoretical principle(s) does the generalization in (65) follow from. We propose that it is a consequence of the Phase Impenetrability Condition (PIC). This is strongly suggested by the fact that (65) mentions the VoiceP as a crucial dividing line: things within VoiceP, including the thematic subject, can control PRO and bOp, whereas things above VoiceP, including zOp in the upper TP space and bOp in the CP space, cannot control PRO or bOp. The fact that VoiceP should be an important locality domain is expected within Chomsky’s (2000, 2001) theory of phases. With this in mind, we propose that DPs without intrinsic interpretable features are at risk of violating the Principle of Full Interpretation at LF unless they receive features within the syntactic derivation. In particular, they avoid

the violation if they undergo OC, thereby receiving features from their controller. This control must happen before the featureless DP is sent to the LF interface. According to Chomsky (2001: 14), this Spell Out happens for an element within the domain of phase head X at the completion of the maximal projection of the next phase head that contains XP. The first phase that contains a subject PRO or something from the IOp/zOp/bOp/Ad family is the CP complement. The next largest phase is the VoiceP that contains the V that selects the CP complement. Therefore, featureless DPs like PRO and bOp need to be controlled by something inside VoiceP. The matrix subject qualifies, but a bOp or zOp does not. The key assumptions of this account are in (66a,b); they derive (66c), which is essentially equivalent to (65).

- (66)
- a. A DP with no interpretable features is ruled out at LF (a special case of Full Interpretation).
 - b. A DP can get features from a controller only if the controller is in the phase that immediately properly contains the smallest phase containing DP (from the PIC).
 - c. A DP without features that is locally contained in CP must be controlled by a DP inside the VoiceP that contains CP.

In contrast, a DP with intrinsic features, like Ad or zOp, can survive at Spell Out without immediately undergoing control. It can then potentially be bound within a larger domain in a variety of ways, including being controlled in a larger constituent within the domain defined by GOCS (the matrix CP, by zOp/IOp), undergoing some form of NOC when GOCS does not apply (see Sect. 6.3), participating in bound variable anaphora, or perhaps other processes. No doubt there is plenty more that should be said about all this, but that is what we can say about it here.³⁵

A further question is where IOp in Ibibio fits into this typology: is it featureless, like PRO, or featured like zOp? Does it allow chained control or not? Unfortunately, we cannot tell by the methods used in this section, because pronominal *imɔ* does not need to be locally bound by IOp the way anaphoric *zibun* needs to be locally bound by zOp (see (13)/(16)). However, the ideas in (66) come up again in Sect. 6, where we claim that zOp can undergo NOC but IOp cannot. This falls into place if IOp is featureless, like bOp.

5 Toward a unified theory of controller choice

In Sect. 4, we discussed in detail how the GOCS, a principle originally motivated by the study of PRO, the null subject of nonfinite clauses, usefully constrains what can

³⁵Suppose that we take a strong interpretation of the GOCS according to which it requires a CP that depends on a verb and that contains a controllable element to undergo OC, at least for complements. Is that requirement satisfied by a chained control structure in which zOp (or Ad) controls another zOp (or Ad) in a way that complies with the PIC? We suggest that the answer is yes as long as the GOCS is interpreted as an interface requirement on a verb that takes a CP as its complement (not a requirement on the null DP inside the CP complement, as (66a) is). Then the GOCS must be satisfied within the next phase up from the smallest phase that contains V. The smallest phase that contains V is the matrix VoiceP, and the next phase above that is the matrix CP. This CP contains zOp and Ad as well as the subject, so those do count as possible obligatory controllers for satisfying a V-centered condition like the GOCS. Again, there is more to say, but we have said some things without obviously contradicting ourselves yet.

be the antecedent of a logophor or a LD-anaphor that appears inside a complement clause or an adjunct clause. This explains why a subject can be an antecedent but not the possessor of a subject, why an argument of the verb that selects the CP can be an antecedent but not the argument of a verb that does not select the CP, and why there is a strict clause-level locality to the chained control of one operator by another. A second, much more general similarity has also been assumed throughout: that which argument of the matrix verb is the controller can vary across examples, influenced by the thematic roles of the arguments. Thus, agent, causer, source, and experiencer arguments can control IzOp, with the result that they are the ultimate antecedents of logophors and LD-anaphors, but pure theme and goal arguments cannot.

However, there is also a salient difference between logophoric constructions and ordinary control constructions with respect to this matter of controller choice. Although thematic roles influence both, it seems that they do so in quite different ways. In particular, themes and goals are not on the list of possible controllers for IzOps, but they can be at the top of the list of possible controllers for PRO.³⁶ Object control is common for PRO but rare in the logophoric constructions, attested only with experiencer objects when there is no agentive subject. This difference is illustrated vividly within a single sentence in the examples in (67a,b), which have both a logophoric element and a PRO subject in the same embedded clause. Here the matrix object is the controller of PRO (as in the English analogs) whereas the matrix subject is the antecedent of the logophor or LD-anaphor, implying that it is the controller of IzOp. The question, then, is why is there this systematic difference?

- (67) a. Okon a-ma-a-temme Emem edi-kpóno imọ. (Ibibio)
 Okon 3SG-PST-3SG-instruct Emem INF-respect LOG
 ‘Okon_i instructed Emem_k [IOP_{i,*k} C [PRO_{k,*i} to respect him_{i,*k}]].’
 b. Taroo-wa Hanako-ni zibun-o itawaru-yoo
 Taroo-TOP Hanako-DAT self-ACC take.care.of-COMP
 meizi-ta. (Japanese)
 order-PST
 ‘Taroo_i ordered Hanako_k [zOP_i C [PRO_{k,*i} to take care of self_{i,k}]].’

This disanalogy has dissuaded many from pursuing an OC approach to logophoric constructions and similar phenomena (e.g., see Landau 2015: 38).³⁷ While a full account of controller choice goes far beyond the scope of this article, in this section we

³⁶ A converse case is that oblique source phrases are acceptable controllers for IzOp in Ibibio and Japanese, but they are not in general possible controllers of PRO (*Chris_i heard from the lawyer_k [PRO_{i,*k} to file the appeal by tomorrow]). We do not discuss this difference here, hoping that it will be amenable to a similar treatment.

³⁷ An anonymous reviewer says that this problem does not arise in a semantically-oriented theory that does not posit an IzOp, intimating that it could be an undesirable artifact of our approach. We are not sure that this is true. For example, Pearson (2015) presents a semantic approach in which both PRO and Ewe’s logophor *ye* have an intrinsically *de se* semantics, wanting to derive from this the fact both PRO and *ye* can only appear in embedded clauses and that both refer to the attitude holder (if any). Pearson (2015: 83) also claims that controller choice for PRO follows/should follow on this sort of view. If that is so, it is not clear to us how PRO and the logophor can get different antecedents in an example like (67a). (The reviewer may, however, have another version of the semantic/perspectival hypothesis in mind that does not aspire to cover PRO and thus avoids this problem.)

sketch a line of analysis that holds promise for explaining this difference in terms of a difference in the theta-roles of the controlled item. If this sketch is deemed promising, it should mitigate skepticism about a control analysis on these grounds, allowing the positive analogies expressed in the GOCS to carry the day.

The first point to make relevant to this is that for PRO subject control in the presence of an object is not as rare and idiosyncratic to the verb *promise* as is often thought. Subject control is in fact the norm for verbs of commitment, including *swear*, *vow*, *pledge*, and *threaten*, as well as *promise* (Sag and Pollard 1991; Jackendoff and Culicover 2003; Landau 2013: 129). If a language or languages happen to have fewer verbs in this semantic class than in the class of directive verbs like *order*, which favor object control, that need not have any deep theoretical importance. The preference of object control over subject control when it comes to PRO is thus not as unequivocal and syntactically significant as it has been taken to be in the tradition of the Minimal Distance Principle. In this light, the fact that subject control is normal when it comes to the control of IzOps is not as troubling.

As the next step, we invoke the phenomenon of “control shift” (see Landau 2013: 136–148 for a thorough review of the literature on this topic). We use this to argue that controller choice is a function not only of the thematic roles of the matrix arguments but also a function of the thematic role of the controlled item. Although *promise* is usually a subject control verb, it can shift to object control when its CP complement has a nonagentive subject that bears a beneficiary role, as shown in (68b,c). The collocation *to be allowed to* gives the best-known cases and perhaps the most acceptable ones, but control shift is not restricted to that, as shown in (68c). ((68c) is the English version of a German example from Panther and Köpcke 1993, accepted by 71% of English speakers and 86% of German speakers; see Landau 2013: 145.)

- (68) a. John_i promised Mary_k [PRO_i to come to the party].
 b. Grandpa_k promised the children_i [PRO_i to be able/allowed to stay up for the late show]. (Landau 2013: 136 Ex. 237c)
 c. Jürgen_k promised Harry_i [PRO_i to be promoted].

Conversely, *persuade* and *ask* are object control verbs, but they can shift to a subject control reading with infinitival clauses that have the same kinds of nonagentive benefactive subjects. ((69c) is also the English version of a German example from Panther and Köpcke 1993, accepted by 75–90% of German speakers, depending on the verb, and by 18–30% of English speakers; see Landau 2013: 145.)

- (69) a. John_k persuaded/asked Mary_i [PRO_i to come to the party].
 b. Susie_i persuaded the teacher_k [PRO_i to be allowed to leave early].
 (Landau 2013: 136, Ex. 238b)
 c. ?Paul_i asked Egon_k [PRO_i to be helped with his work].

Given that which matrix argument controls PRO is influenced by properties of the controlled item, a path opens up to understand the paradoxical (67): PRO and IzOp are different elements, with different semantic roles, so it is not surprising that they can have different controllers.

To flesh this out, we think that some of the best insights into control shift come from Panther and Köpcke (1993) (P&K) and Jackendoff and Culicover (2003) (J&C).

P&K point out that when PRO bears a beneficiary role but not an agent role, as in (68b,c) and (69b,c), its controller is the NP that counts as the beneficiary of the event denoted by the matrix verb. The one who benefits from a promising event is canonically the one who receives the promise, i.e. the object, so (68b,c) have object control. In contrast, the one who benefits from an act of asking or persuasion is canonically the one who does the persuading, i.e. the subject, so (69b,c) have subject control. P&K thus envision the Principle of Role Identity in (70).

- (70) The semantic-pragmatic roles of the controller and PRO are (nearly) identical.

While P&K's view is promising for control shift, it is weak on unshifted control, as in (68a) and (69a). Here PRO has an agent role, and it is indeed controlled by the agent of the matrix verb in (68a)—but not in (69a).³⁸ On this point, we take inspiration from J&C, who use the notion OBLIGATED to account for (68a) and an analog of (69a) with the verb *order*. Note that the embedded clauses in such sentences are semantically like imperatives, in that the subject is obligated to perform the action denoted by the VP. Hence the sentences in (71a) are felicitous parallel to those in (72a), whereas the sentences in (71b) are anomalous parallel to those in (72b).

- (71) a. Be quiet! Be examined by a doctor!
 b. #Be tall! #Believe that the sky is green!
- (72) a. Mary promised/ordered John to be quiet/to be examined by a doctor.
 b. #Mary promised/ordered John to be tall/to believe that the sky is green.

Capturing this parallel in syntactic terms, we assume that the infinitival complements of verbs like *promise* and *order* contain a null imperative morpheme (a Jussive head; Zanuttini 2008; Zanuttini et al. 2012).³⁹ This head, like the matrix version in (71), assigns an OBLIGATED thematic role to the subject in Spec TP, overlaying it on the thematic role(s) that the subject gets from its first-merge position. Meanwhile, J&C claim that the subject of *promise* is associated with an OBLIGATED thematic role, whereas the object of *order* is associated with an OBLIGATED thematic role. (Note that a given noun phrase can have more than one thematic role according to Jackendoff's long-standing research program.) We imagine that which argument of a verb is associated with an OBLIGATED role can be discerned apart from control by considering what is implied by a sentence with the verb taking only NP or finite CP arguments, where there is no control. For example, *John promised Mary a favor* implies that John is under an obligation to do something, whereas *?John ordered Mary a difficult task* implies that Mary is under an obligation to do something (although this is a Jackendoff-inspired program, not a fully established result). Then the unshifted

³⁸ Panther and Köpcke (1993) address this by claiming that PRO, the subject of *promise*, and the object of *persuade* all bear the AG role, where AG is “the prospective performer of the embedded action.” However, this is patently not the normal agent role; see Landau (2013: 146) for a critique on these grounds.

³⁹ Alternatively, we might say that the complement of ‘order’ has an imperative head, whereas the complement of ‘promise’ has a distinct volitional/promissive head—a different member of the category Jussive. That version would track better what can be seen overtly in Korean and Japanese (Zanuttini et al. 2012; Landau 2013: 98).

control patterns in (68a) and (69a) also follow from (70), where it is the OBLIGATED role that is matched. This account can then be generalized to other classes of object control predicates by positing other kinds of covert jussive or root-modal heads in the infinitival complement. For example, $CAN_{\text{permission}}$ in the infinitival CP could lead to object control with *permit* and *allow*, CAN_{ability} in the infinitival CP could lead to object control with *teach* and *enable*, $WILL_{\text{volition}}$ in the infinitival CP could lead to object control with *persuade* and *advise*, and so on.⁴⁰

Given this sketch of how controller choice might work for PRO, we can apply it to logophoric and LD-anaphoric constructions. The crucial new assumption is (73).

(73) LOp/zOp receives (only) an agent-(like) thematic role from C/PoV.

Given (73), IOp matches the agent argument of *instruct* in (67a) better than it matches the goal/theme argument of *instruct*, so the agent is selected as the controller of IOp. Crucially, there is no jussive/modal head associated with the CP or PoVP projection which can overlay another thematic role on its specifier and channel control into other veins. In addition to the fact that it gives the result we want, we imagine that (73) can be motivated by the fact that the logophoric C is a grammaticized version of the verb ‘say’ in some African languages, including Ewe (Clements 1975: 165–168), Abe (Koopman and Sportiche 1989: 583), and Edo (Baker 1999: Ex. 39), among others.

(74) Ama (gblo) be yè-Do+Nku
 Ama say that(=say) LOG-remember
 nyOnuGi. . . . (Ewe, Clements 1975: 156)
 girl
 ‘Ama_i said that she_i remembered the girl who. . . .’

If C is a grammaticalized version of ‘say,’ it stands to reason that the thematic role that C assigns to IOp is similar to the one that ‘say’ assigns to its specifier—namely, agent (cf. Koopman and Sportiche 1989: 583). See also Speas and Tenny’s (2003) conception of p-roles (pragmatic roles) assigned by left-peripheral heads as a system that is parallel to the normal thematic roles of verbs. The upshot is that LzOp needs to be controlled by the most agent-like argument in the matrix clause—an agent, or lacking an agent a source or experiencer.⁴¹ This provides the other piece for understanding (67).

⁴⁰In particular, we assume that the infinitival complements of these clauses contain *root* modals (not epistemic modals) which arguably do take the subject as a kind of semantic argument—an intuition that goes back to early generative work like Perlmutter (1971) and Jackendoff (1972). See Hacquard (2010: 84) for this intuition in a more contemporary context; she writes, “All root modals describe possibilities and necessities given particular circumstances of the world of evaluation, *usually centered around the subject*” (a preference not fully captured in her approach, in our view). There is much to be done to cache this out properly and show that it is enough like assigning a thematic role to be part of the same system as ordinary roles like agent, goal, and experiencer.

Given that a single NP can be associated with multiple thematic roles, the question also arises as to why the less familiar roles like OBLIGATED or VOLITION determine how control happens in (69a) rather than the ordinary role of agent. We unfortunately have nothing insightful to say about this at this point.

⁴¹Extending this idea, one can say that a (verbal) complementizer can also take a second null argument, parallel to the goal argument of ‘say’/‘tell.’ That is what Ad is in Magahi, according to the Alok/Baker view that we discussed briefly in Sect. 4.2. Then given theta-role matching (70), Ad will be controlled

This analysis sketch makes an interesting prediction which suggests that it is on the right track. Its leading idea is that thematic matching is at the heart of controller choice (70), but for control of PRO in nonfinite clauses this is often obscured by the presence of a covert jussive/modal head inside the nonfinite clause which adds another thematic role to PRO. The question arises, then, whether there are infinitival complements that do not contain a covert jussive/modal. If so, we would expect to see the bias toward having an agent-subject control an agent-subject null DP show up with PRO as well. A case in point is control with propositional verbs—a less-studied class discussed by Landau (2013: 158–159). He says that English has only two verbs in this class, *claim* and *pretend*, although the Romance languages have more (Kayne 1984: 112). Now we detect no semantic evidence of a jussive or modal element in the complement of (75): this does not mean that Mary must pay the fine, or that she has permission to pay the fine, or the ability to pay the fine, or that she intends to pay the fine, but simply that she *did* pay the fine in the worlds that are compatible with what she claimed.

(75) Mary_i claimed [PRO_i to have paid the fine].

So the complement clause in (75) is plausibly a pure infinitival CP, without a modal layer. Now *claim* can also take a goal argument. Nevertheless, our prediction is that, in the absence of any overriding jussive/modal flavor, *claim* will induce subject/agent control, not object control. This is correct, as seen in (76); (77) is a similar example in French, where this class of verbs is said to be more common. So subject control in the presence of an internal argument emerges for PRO just where PRO is most like IzOp—where it bears an agent-like thematic role without any jussive/modal overlays.⁴²

- (76) a. Mary_i claimed to the judge_k [PRO_i to have paid the fine].
 b. *Mary_k claimed to the (male) judge_i [PRO_i to have contradicted himself_i].
- (77) J'ai affirmé au juge avoir fait une grave
 I.have affirmed to.the judge have.INF made a serious
 erreur. (Viviane Deprez, p.c.)
 error
 'I affirmed to the judge to have made an error.' (I made the error, not the judge.)

We conclude that it is very possible that the same theory of controller choice—one rooted in the matching of fine-grained and multilayered thematic roles—applies both

by the goal of a matrix verb like 'tell,' not by its subject, which aligns with the data involving allocutive marking in (54) and (56).

Example (49b) pushes at the limits of our theta-matching analysis. Although the object of 'save' is not an experiencer, it is plausibly a benefactee, not just a plain theme/patient. That might be enough to satisfy (70) in the absence of any other possible controller permitted by the GOCS.

⁴²One might, however, go on to predict that control will shift to the goal of *claim* when the subject of the embedded clause has a goal thematic role, as in *Mary_i claimed to the judge_k [PRO_{i,*k} to have been given t a bribe]*. This is false. We do not know why control shift happens in similar circumstances with *promise* but not with *claim*.

to the control of PRO and to the control of the operators that underlie logophoric and LD-anaphoric constructions. There is thus no firm reason to be skeptical of an OC-based analysis of the latter on these grounds.

6 Logophors and LD anaphors outside of OC contexts

So far, we have seen that logophoric pronouns and LD anaphors have some different intrinsic properties, as do the operators that bind them. These differences, however, are largely neutralized when *imo* and *zibun* are minimally contained in a CP generated inside VP/TP, because both operators undergo the same process of obligatory control. This leads to the question of what happens when they appear in a CP that is not generated inside an extended projection of the verb, where OC does not apply. Then we might expect logophoric pronouns and LD anaphors to diverge in systematic ways. In this last main section, we show that this is true for two relevant cases: relative clauses and root clauses. LOp is simply ruled out in such CPs in Ibibio, severely limiting the use of logophoric pronouns inside them. In contrast, zOp in Japanese is possible, undergoing a form of NOC. When this happens, zOp gets an antecedent that is pragmatically constrained to be an *empathy locus*, as defined by Kuno and Kaburaki (1977), but is not syntactically constrained by the GOCS (Kuno 1972, 1987). As such, what can antecede *zibun* in these contexts is notably different from what can antecede *zibun* in a complement clause, as mentioned by Kuno (1987: 257–258) and developed by Oshima (2004, 2006). These overarching generalizations are stated in (78).⁴³

- (78) a. If lOp does not undergo OC in accordance with the GOCS, it is ruled out.
b. If zOp does not undergo OC, it is assigned a prominent [+empathy] antecedent (=“NOC”).

We go on to claim that (78) is essentially another effect of (65)/(66), the statement that DPs without intrinsic interpretable features must get such features from a controller by the completion of the next phase. (78a) follows from (65)/(66) given that lOp does not have intrinsic interpretable features, whereas (78b) is compatible with (65) given that zOp does have intrinsic interpretable features.

⁴³ Many previous researchers have detected some duality in what can be an antecedent for an LD anaphor in Japanese and other languages. Sells (1987) discusses this as Source/Self versus Pivot. Oshima (2004) talks of logophoric versus empathic *zibun*. Nishigauchi (2014) talks about pro binding *zibun* taking a sentient focus or an empathy focus as its (NOC) controller. Charnavel (2020) talks about pro_{Log} taking as its antecedent an attitude holder or an empathy locus. We fall squarely in this tradition. One distinctive aspect of our view is supporting the Kuno/Oshima hypothesis that what kind of antecedent an LD anaphor can take is intrinsically related to the role/ position of the clause containing the anaphor (adopted also by Park 2018 for Korean and suggested by Huang and Liu 2001: Sect. 5.3 for Mandarin; see also Sells 1987: 466). In contrast, Charnavel (2019, 2020) neglects this factor, and Nishigauchi (2014: 180, Ex. 19) downplays it. The other distinctive feature of our view is our analysis of the self/sentient/attitude type of antecedence in terms of the theory of OC, including a strengthened theoretical connection with the African languages. In contrast, what we have to say about the restriction that NOC zOp takes [+empathy] antecedents, stipulated in (78b), is not particularly distinctive.

6.1 Relative clauses

Consider first relative clauses. These are generated inside a nominal projection, not a verbal/clausal projection. As such, they are not a context of OC according to the GOCS. Indeed, to the extent that infinitival relative clauses are possible in English, their PRO subjects do not need to be locally controlled, as seen in (79).

- (79) Mary_i thinks that on the table there is [a good book [PRO_{i,arb} to read to herself_i/oneself at bed time]].

Given this, the generalization in (78a) says that IOp should not be possible in the CP-periphery of a relative clause in Ibibio. The result of this is that logophoric pronouns should be very limited inside relative clauses. In general, that is true, as shown by the badness of the examples in (80) with *imɔ* referring to the subject of the matrix clause.

- (80) a. Okon a-ma-a-duɔk ngwet odo se anye/*imɔ
Okon 3SG-PST-3SG-lost book the REL he/*LOG
i-k-i-dep.
3.LOG-PST-3.LOG-buy
'Okon_i lost the book that he_i bought.'
b. Okon a-ke-dɔ awonwaan a-(i)-maa-gha anye/?*imɔ.
Okon 3SG-PST-marry woman 3SG-(3.LOG)-like-REL him/?*LOG
'Okon_i married a woman who likes him_i.'

It is not, however, accurate to say categorically that *imɔ* is impossible inside a relative clause. It is possible when the whole structure is embedded in a larger complement clause, as in (81) (see also Clements 1975: 156; Culy 1994: 1074). Here there is an IOp in the CP complement of 'think' which can be the antecedent of the pronoun *imɔ* inside the relative clause. It is thus more precise to say that a relative clause cannot have IOp in its periphery (= (78a)) than to say that a relative clause cannot have a logophoric pronoun inside it.

- (81) Okon a-kere ke ami m-ma n-duɔk ngwet se imɔ
Okon 3SG-think that I 1SG-PST-1SG-lost book REL LOG
i-ki-n-nɔ miin.
3.LOG-PST-1SG-give me
'Okon_i thinks [IOp_i that I lost [the book [(*)IOp) that he_i gave me]]].'

It is also instructive to compare the relative clause in (80a) with the interrogative complement in (82).

- (82) Okon a-ma-a-toiyo se Enɔ a-k-i-nɔ imɔ.
Okon 3SG-PST-3SG-remember what Enɔ 3SG-PST-3.LOG-give LOG
'Okon_i remembered what Enɔ gave him_i.'

The goodness of (82) implies that an IOp is licit in the periphery of a [+wh] complement clause, which features the same C-space element *se* as the relative clause does in (80a). This implies that (80a) is not ruled out because there is no room for an IOp in the CP-periphery of a clause that has a wh-movement dependency. Rather, the

position of the clause as a whole is the crucial factor: whether it is the complement of the verb, as in (82), or not, as in (80). This supports our claim that the configurational constraint on OC formulated in the GOCS is a central factor.

Another observation confirms that it is the GOCS, not the lexical specification of the relative complementizer, that generally prevents IOp from appearing in a relative clause. Logophoric pronouns can be found in relative clauses in Ibibio in the special case in which the relative clause modifies the object of an intensional verb like ‘want’/‘seek,’ as in (83). See Sells (1986: 447) and Culy (1994: 1074) for similar examples.

- (83) Okon a-sak a-yem [awo-nwaan [se i-di-dò **imò**].
 Okon 3SG-PROG 3SG-look.for woman who 3SG-FUT-marry LOG
 ‘Okon_i is looking for a woman who will marry him_i.’

Note that it is not enough that the relative pronoun is inside the scope of the intensional verb; it must be inside the scope of the relative complementizer as well. Thus it is not possible for a logophoric pronoun to be the possessor of the object of ‘seek’/‘want,’ whether or not the object is also modified by a relative clause, as shown by (84).

- (84) Okon a-sak a-yem anwaan ɔmò/*imò (se i-di-yaiya).
 Okon 3SG-PROG 3SG-seek wife his/*LOG REL 3SG-FUT-be.beautiful
 ‘Okon_i is looking for his_i (future) wife (who will be beautiful).’

This shows that one cannot explain (83) simply by decomposing ‘seek DP’ into ‘want [IOp [PRO to find DP]]’ (see den Dikken et al. 2018), where there could be an IOp in the complement of abstract ‘want’ (as suggested by an anonymous reviewer). Such an IOp would have scope over the possessor of the object as well as the relative clause, which should make (84) good with the logophor. Similarly, it is not clear that a purely semantic account that takes the subject of an intensional verb to be a kind of attitude holder (as suggested by another anonymous reviewer) is enough to distinguish (83) from (84). Rather, it seems that the IOp that binds the logophor in (83) must be in the C-space of the relative clause. What is special about (83) as opposed to (80) is that an IOp in the relative clause can exceptionally undergo OC by the matrix subject in (83). The generalization seems to be that this is possible only when the verb that selects the direct object is also subcategorized for taking a CP complement. Guided by this, we suggest that a kind of reanalysis happens in the derivation of LF in examples like (83), such that the head of the object is incorporated into the predicate, and the erstwhile relative clause counts as the complement of the verb. In other words, (83) is analyzed at LF as ‘Okon_i woman+ wants [–[that a woman marry him]].’ Executed properly, it would be possible for a IOp in Spec CP of the erstwhile relative clause to undergo OC as a (derived) complement of the verb ‘want.’ Then an example like (83) is the proverbial exception that proves the rule: IOp is possible in principle in Spec CP of a relative clause but it needs to undergo OC in order to be interpreted and this does not happen in ordinary relative clauses that do not undergo reanalysis.

In contrast, LD *zibun* in Japanese is readily available inside relative clauses, taking an antecedent inside the immediately superordinate clause, without the restrictions that we see in Ibibio, as in (85) (contrast (80b)).

- (85) Takasi-wa [[zibun-o sonkee-suru] onna-to] kekkon-si-ta. (=6a)
 Takasi-TOP self-ACC admire-do woman-with marry-do-PST
 ‘Takasi_i married [a woman [zOp_i that admires self_i]].’ (Nishigauchi 2014: 185)

There is nevertheless an important difference between *zibun* in relative clauses and *zibun* in complement clauses in Japanese as well: the conditions on the antecedent of zOp are different in the two environments. The matrix subject can generally serve as the antecedent for *zibun* in both cases, but a matrix source cannot antecede *zibun* inside a relative clause (see (86a)). Furthermore, a matrix goal can antecede it if aided by the use of the benefactive auxiliary *kure* in the matrix clause, as shown in (86b).⁴⁴ These observations show that *zibun* in relative clauses is sensitive to *empathy*, as argued by Kuno (1978) and Oshima (2004), among others. According to Kuno and Kaburaki (1977), subjects tend to be more empathized with than other arguments, and that is especially true with a subject-centered verb like ‘hear’ (Kuno and Kaburaki 1977: Sect. 3.2). On the other hand, the non-subject-centered element *-kure* (Kuno and Kaburaki 1977: Sect. 2.1–2.2) has the function of putting the non-subject over the subject on the empathy hierarchy. Thus, the pattern in (86) is what is predicted by the view that *zibun* in relative clauses takes an empathy locus as its antecedent.

- (86) a. #Yuuzin-wa Hanako-kara [[Taroo-ga zibun-ni tutae-ta] nyuusu-o]
 friend-TOP Hanako-from Taroo-NOM self-DAT tell-PST news-ACC
 kii-ta.
 hear-PST
 ‘The friend heard from Hanako_i [the news [that zOp*_i Taro told self*_i]].’
 b. Sono hito-wa Hanako-ni [[Ziroo-ga zibun-ni nokosi-ta]
 that person-TOP Hanako-DAT Ziroo-NOM self-DAT leave-PST
 kotoba-o] osiete-kure-ta.
 words-ACC tell-BEN-PST
 ‘That person_i told Hanako_k [the words [Ziroo left for self_{i,k}]] (benefit-ing Hanako).’

The examples in (86) contrast with (3) and (4) where *zibun* is in a complement clause: in that context, a source phrase can antecede *zibun* even though it is not a locus of empathy, and a goal phrase cannot antecede *zibun* even if it is a locus of empathy. In other words, thematic roles are paramount for the antecedent of *zibun* in CP complements, whereas discourse prominence (topicality, empathy) is paramount for the antecedent of *zibun* in relative clauses, as stated in (78b). The distinction between OC environments and NOC environments thus is significant in Japanese too, but in a

⁴⁴Nishigauchi (2014: 193) claims that *zibun* can refer to the matrix goal even in a CP complement of ‘tell’ if (and only if) the complement also contains empathy-loaded elements like ‘come’ and *kure* ‘do for.’ This motivates his denial of Oshima’s (2004) claim that the syntactic role of the CP containing *zibun* is a crucial factor as to whether *zibun* is logophoric or empathetic (for us, whether zOp undergoes OC or NOC). We assume that this is because *kure* can introduce an operator in its specifier distinct from the zOp we have emphasized here; see Ikawa (2022) for independent evidence. Since this operator is not as high in the clause as zOp (but rather below T), it is not subject to OC. Therefore, it also undergoes a type of NOC, sensitive to pragmatic prominence (including empathy) rather than thematic role. To avoid this factor, we restrict ourselves to examples without *kure* in the clause containing *zibun*.

more subtle way than in Ibibio: *zOp* is possible in NOC environments, but how it is controlled is detectably different.

6.2 Matrix clauses

A second non-OC environment where these forces are at work is matrix clauses contained in a connected discourse. Ibibio's *imọ* is generally impossible in this situation. Thus, *imọ* is bad in (87), even in a “free indirect discourse” style environment. See also Afranaph (Willie and Safir [n.d.](#): 58–59, Sect. 4.4.2.4), where a pronoun referring to a discourse topic outside the sentence is always the ordinary pronouns *anyelọmọ*, never the logophor *imọ*.

- (87) *Idem a-maa-kpa Okon adi-kit ndise omo ke ngwet odo. Nso
body 3SG-PST-3SG-die Okon INF-see picture his in book the what
se imọ i-di-dokko eka imọ?
COMP LOG 3.LOG-FUT-tell mother LOG
(‘Okon_i was surprised to see his_i picture in the book. What would he_i tell his_i mother?’)

In contrast, Japanese does allow *zibun* in a root clause to take an antecedent in discourse. But here too that antecedent must be an empathy locus—the person from whose perspective the sentence containing *zibun* is presented (Oshima [2004](#): 12; see also Sells [1987](#): 455; Nishigauchi [2014](#): 172).

- (88) Tokiko-wa aozame-ta. Masaki-wa zibun-o okizarinisite
Tokiko-TOP pale-PST Masaki-TOP self-ACC leave.behind
itte-simat-ta-no-da.
go-end.up-PST-no-COP
‘Tokikio_i turned pale. Masaki had gone leaving self_i behind.’

Similarly, *zibun* (and Korean *caki*; Park [2018](#)) is possible in a root clause following an adjunct like ‘according to X’ or ‘in X’s opinion.’ In contrast, *imọ* in Ibibio is not possible in this context:⁴⁵

- (89) a. Ke akikere Okon, Emem/*imọ i-ma i-due. (Ibibio)
in thought Okon, Emem/LOG 3.LOG-PST-3.LOG-guilty
‘In Okon_i’s opinion, Emem/*he_i was guilty.’
b. Taroo-ni.yoruto zibun-wa
Taroo-according.to self-TOP
waruku-nai-?(n(o)-da)-soo-da. (Japanese)
bad-NEG-no-COP-EVID-COP
‘According to Taroo_i, self_i is not bad.’

⁴⁵We observe also that if the subject of a sentence like (89a) is the epithet *ifu-ntan ado* ‘the lazy fool,’ this cannot refer to Okon. Charnavel ([2019](#): 145) offers this as a test to show that ‘according to X’ creates an attitudinal context in French. Then if *imọ* merely needs to take an attitude holder as its antecedent, (89a) should be possible.

We conclude from this that zOp is licit in unembedded clauses in Japanese; it is then assigned a prominent antecedent from the discourse context in ways similar to how NOC PRO can be in languages like English. In contrast, lOp is not in general possible in unembedded clauses in Ibibio, this not being a context of OC.

Here again there is some nuance to the Ibibio facts that we comment on and flag for future study. As in other African languages, Ibibio's logophoric pronoun can be used in what looks like a root sentence that appears in a sequence of sentences like (90) (see also Clements 1975: 170–171; Adesola 2005: 216; Pearson 2015: 103). This is possible if and only if “Then I cooked the rice” is something that Okon said (see Pearson 2015: 103 for Ewe).

- (90) Okon a-ma-n-dòkko miin ke imò i-ma-i-dep udia ye
 Okon 3SG-PST-1SG-tell me that LOG 3.LOG-PST-3.LOG-buy yam and
 adesi.
 rice.
 (Ndion) imò i-ma-i-tem adesi odo.
 then LOG 3.LOG-PST-3.LOG-cook rice the
 ‘Okon_i told me that he_i bought yams and rice. Then he_i cooked the rice.’

We sense a significant difference between the context in (90) and the one in (87). Pearson suggests that examples like (90) are cases of modal subordination in the sense of Roberts (1989). At first glance that seems plausible, but a closer look reveals several disanalogies. (90) does not fit the profile of modal subordination in that there is no modal with scope over the pronoun in the second sentence (overtly, anyway). Nor is the antecedent of the pronoun within the scope of the modal quantifier in the first sentence (assuming the antecedent is *Okon*, which is not in the scope of ‘tell’). Nor does the semantics of modal subordination seem quite right here. In ordinary modal subordination, the modal quantifier that has scope over the second sentence does not have to be the same as the one in the first sentence (see Roberts 2020), whereas in (90) it must be ‘tell’ that (in effect) has scope over the second sentence.

Instead of modal subordination, we claim that examples like (90) involve ellipsis: the second sentence has the underlying form [*Okon_i told me [lOp_i that [then Log_i cooked the rice]]*], the clausal complement moves out by focus movement (or something), and [*Okon_i told me [lOp_i that –]*] then elides under parallelism with the preceding sentence (compare pseudo-gapping and fragment answers). As support for this hypothesis, consider (91), which is like (90) except that the CP-selecting verb is ‘deny’ rather than ‘tell.’

- (91) Okon a-ma-a-kañ ke imò i-ki-yip ebot. (Ndion) imò
 Okon 3SG-PST-3SG-deny that LOG 3.LOG-PST-steal goat then LOG
 i-ma-i-wot ebot odo.
 3.LOG-PST-3.LOG-kill goat the
 ‘Okon denied that he stole a goat. Then he killed the goat.’

The English analog of (91) is hardly a coherent discourse. In particular, ‘He killed the goat’ cannot be interpreted as a continuation of what Okon denied doing by (something like) modal subordination; presumably the negative semantics of ‘deny’ prevents this. In contrast, (91) in Ibibio is coherent, and it is understood as meaning that

Okon denied that he killed the goat. This is what the ellipsis hypothesis predicts, since it should be possible to delete ‘Okon denied that CP’ in the second sentence under identity with the first sentence as much as with any other verb. (Compare English, where it is possible to answer the question “What did John deny?” with the elliptical answer “That he killed the goat.” Note that this implies that English and the African languages allow clausal ellipsis in a somewhat different range of environments.) This ellipsis proposal raises many questions, but at least it can explain the most salient semantic facts about (90) and (91), as well as why (90) is good but (87) is not. In (87), there is no plausible matrix clause that could take the second sentence as its complement and delete under identity with the first sentence. On this interpretation, (90) is not a counterexample to (78a).

6.3 Discussion

We have seen that there is a systematic difference between Ibibio logophoric pronouns and Japanese LD anaphors when they are used outside of canonical environments of obligatory control, as stated in (78), repeated as (92).⁴⁶

- (92) a. If IOp does not undergo OC in accordance with the GOCS, it is ruled out.
 b. If zOp does not undergo OC, it is assigned a prominent [+empathy] antecedent.

The question then arises as to why this difference holds. As we hinted above, we suggest that this is another reflection of the difference between null DP operators that have intrinsic features and those that do not, as expressed in (65)/(66), which was originally motivated by consideration of when chained control is allowed. Suppose that IOp in Ibibio does not have intrinsic interpretable features, like bOp in Lubukusu rather than like zOp in Japanese or Ad in Magahi. This is not an obvious choice, but it is not an unreasonable one either. LOp may not have fixed phi-features, in that logophors in Ibibio can refer to a second person matrix subject as well as to a third person subject, as shown in (93) (see also Clements 1975 on Ewe), and to plural subjects as well as singular ones.⁴⁷

⁴⁶ Another environment in which Japanese allows LD anaphors but Ibibio does not allow logophoric pronouns is in ‘because’/‘when’/‘if’ adjuncts (see (47) vs. (48)). In Sect. 4.1 we treated this as a simple matter of what heads license I/Ops in the two languages. In light of this section, an alternative that does not depend on item-by-item selectional properties might be to say that these adjunct clauses are contexts of NOC, not OC, in Ibibio and Japanese (whereas rationale clauses are a context of OC). Then zOp is possible in these adjuncts in Japanese for the same reason it is possible in relative clauses and matrix clauses—it can undergo NOC—whereas IOp in Ibibio is not possible. This alternative has some attractions. For example, *zibun* in adjunct clauses in Japanese seems to need an [+empathy] antecedent, not just a thematic subject (Oshima 2004). This would follow from the alternative account. However, the alternative account would presumably need to be grounded in some syntactic difference between those adjuncts that allow OC and those that do not in Ibibio/Japanese (for example, perhaps the former are inside VP and the latter are outside it; cf. Landau 2021). We leave investigation of this alternative to future research.

⁴⁷ Like Ewe, *imo* in Ibibio cannot refer to a first person matrix subject. We do not have a formal explanation as to why first person and second person are different in this respect.

- (93) Afo a-kere ke imo i-m-i-sop idem.
 you 2SG-think that LOG LOG-PERF-LOG-quick body
 ‘You_i think that you_i are smart.’

We suggested above that zOp in Japanese has the feature [+animate], since it qualifies as the local antecedent of *zibun*, which requires an animate antecedent. In contrast, lOp probably is not [+animate] in that inanimate antecedents are not strictly ruled out for *imo* in Ibibio (see (26–28)). We also mentioned that zOp in Japanese might have an interpretable feature like [+empathy]. That is motivated by the data seen in this section, where NOC zOp needs to have a [+empathy] antecedent; if we say that zOp itself is [+empathy], then this reduces to a case of feature matching/compatibility between a pronoun and its antecedent. But there is no comparable motivation for saying that lOp is [+empathy] because NOCed lOp is ruled out. The only feature that lOp may have is a language particular feature [+log]. But this feature probably has no semantic interpretation in its own right; rather it is a diacritic feature that serves only to distinguish morphologically between pronouns that are bound by lOp and pronouns that are not (cf. Heim 2002; von Stechow 2002; Pearson 2015; Park 2018).

Suppose that lOp is indeed devoid of intrinsic interpretable features. Then it, like bOp in Lubukusu, must undergo OC within the next phase in order to get features and pass muster with Full Interpretation at the point of Spell Out. But OC happens only in CP complements and adjuncts to the clause, according to the GOCS. Therefore, lOp is ruled out in other environments, including relative clauses (unless they become complements by reanalysis) and root clauses. In contrast, zOp has interpretable features that allow it to survive Spell Out without being controlled. We already saw in Sect. 4.2 that this allows zOp in a complement clause to be controlled by a DP outside of the matrix VoiceP, such as another zOp. Now we see that this also allows zOp to occur outside of a complement clause, where OC does not apply, in which case it receives a suitable antecedent in discourse. The descriptive generalization in (92) can thus be taken as another case of the reasoning in Sect. 4.2. The only new assumption is that lOp does not have interpretable features, which was left open in Sect. 4.2.

There is a complication which we must leave to future work. This concerns (again) the status of ordinary PRO. In Sect. 4.2, we said that PRO also has no intrinsic phi-features, like bOp and (now) lOp. This explained why it cannot be controlled by an operator like bOp, zOp, or lOp. But now the prediction should be that PRO cannot undergo NOC but only OC. This of course seems to be false. Probably what we are forced to say amounts to the claim that there are really two kinds of PRO, which are formally different items: OC PRO, which has no features, and NOC PRO, which does have some intrinsic features. Such a claim is not unprecedented. Landau (2013: Ch. 7) reviews how most work since the earliest generative research on the topic has accepted a fundamental dichotomy between OC and NOC. Landau himself argues that NOC PRO is intrinsically [+human] whereas OC PRO is not, and that NOC PRO’s antecedent must be either a “logophoric center” (in a broader sense than ours, which includes goals and addressees as well as agents and sources) or a discourse topic. These restrictions are similar to those that hold for zOp, and could motivate

saying that NOC PRO has intrinsic features that OC PRO lacks.⁴⁸ Then we would need some kind of statement that explains why the fully-featured version of PRO cannot appear in the Spec TP of a complement clause. We are not too troubled by this, since it is known that the theory of where PRO can and cannot appear needs work in any case (why is it only in the specifier of certain nonfinite clauses, this no longer following from case theory or the PRO theorem?). More needs to be done on this, certainly. But this article is not primarily about PRO, and we are almost at the end of it.

We wrap up by pointing out that (92b) makes some interesting additional predictions about *zibun* in Japanese. In (58) above, we considered a four-clause structure to argue that zOp in a deeply embedded complement clause can only access a super-LD antecedent by way of a chain of zOps such that one zOp controls the next highest zOp. (92b) implies that a zOp in a deeply embedded relative clause should work differently: it should be able to access super-LD antecedents directly, as long as they meet the empathy/prominence condition. This direct access would leave intervening zOps free to be controlled by other NPs, allowing two *zibuns* to have different referents in a way that differs from (58). Example (94) is relevant to checking this: here whether zOp₂ is controlled by zOp₁ or *Hanako* is independent of whether zOp₃ is anteceded by *Hanako* or *Taroo*, given the structure in (95)

- (94) Taroo-wa Hanako-ga hisyo-san-ga sensei-ga zibun₁-no.tame.ni
 Taroo-TOP Hanako-NOM secretary-H-TOP prof-NOM self-for.the.sake.of
 kai-ta suisen.zyoo-o zibun₂-ni-wa mise-nai-daroo-to
 write-PST recommendation.letter-ACC self-DAT-TOP show-NEG-will-COMP
 omotte-ir-u-to it-ta.
 think-AUX-PRS-COMP say-PST
 ‘Taroo said Hanako thinks the secretary won’t show self₁ the recommenda-
 tion letter which the professor wrote for self₂.’
 OK: self₁=Taroo or Hanako; independently OK: self₂=Taroo or Hanako
- (95) Taroo_i said that [zOp_{1i} Hanako_k thinks that [zOp_{2i} or _k the secretary won’t
 show self₁ [the recommendation letter [zOp_{3k} or _i the professor wrote for
 self₂]]]].

Indeed, we find that the two *zibuns* can take different antecedents in (94) more readily than in (58), although parsing these examples is a bit of a challenge.

One final question is whether zOp in a relative clause can take a higher zOp as its antecedent. An example like (96) suggests that this is possible.

⁴⁸The movement theory of control (Hornstein 1999, and subsequent work) is another familiar case of drawing a sharp empirical and theoretical distinction between OC PRO and NOC PRO: the former is subsumed to a trace of movement, whereas the latter is taken to be pro, a null pronoun. Hornstein’s suggestion that the pro version is a last resort item, inserted only when syntactic options fail (for him movement, for us the GOCS) may have merit in our context too, saying why OC is obligatory where possible, at least in complement clauses.

- (96) Hanako-wa Taroo-kara Ziroo-ga zibun-o unda hito-o
 Hanako-TOP Taro-from Ziro-NOM self-ACC give.birth person-ACC
 mituke-ta-to kii-ta.
 find-PST-COMP hear-PST
 ‘Hanako heard from Taroo_i that Ziroo found the person who gave birth to self_i.’
- (97) Hanako heard from Taro_i that [zOp_{1i} Ziro found [the person who [zOp_{2i} give birth to self_i]]].

In (96), *zibun* can refer to the oblique source *Taro*, even though that is not an empathy locus, whereas this is not felicitous in the simpler (86a). Here the source phrase *Taro* can control zOp₁ in the CP complement of ‘hear’; this zOp₁ can then serve as the proximal antecedent for zOp₂ inside the relative clause, as shown in (97).⁴⁹ As a result, *zibun* can refer to Taro by this sequence of zOps. Conversely, (98) shows that a NOCed zOp in a relative clause can control zOp in a complement clause, broadening its range of possible antecedents to include the [+empathy] matrix goal.

- (98) Hanako-ga Taroo-ni Ziroo-ga zibun-ni niau-hazu-da-to
 Hanako-NOM Taro-DAT Ziro-NOM self-DAT suit-should-COP-COMP
 itte-i-ta syatu-o okutte-kure-ta.
 say-AUX-PST shirt-ACC send-BEN-PST
 ‘Hanako sent Taroo_i the shirt which Ziroo was saying will suit self_i.’
- (99) Hanako sent Taroo_i [the shirt that [zOp_{1i} Ziroo said that [zOp_{2i} *t* will suit *zibun_i*].]]

In a simpler sentence, zOp in a complement clause cannot refer to a goal argument (see (3)). But in (98) it can, because zOp₁ in the relative clause can be anteceded by a [+empathy] goal argument, and zOp₁ in the relative CP can be an OC controller of the zOp₂ in the complement clause, parallel to other cases of chained control. There are obviously more interactions to consider than we can take up here, but the first order predictions are promising. A practical upshot of this is that if one wants to see the different antecedent-taking possibilities for OC zOp and NOC zOp in Japanese, one needs to be careful to make the structure as simple as possible, because the presence of additional zOps that can control or antecede the zOp of interest can make a significant difference.

7 Conclusion

In this article, we have sharpened our understanding of the familiar comparison between dedicated logophoric pronouns in West African languages (specifically Ibibio) and long-distance uses of anaphors in IE and East Asian languages (specifically

⁴⁹This assumes that zOp itself can be a [+empathy] element, even in a complement clause, as an anonymous reviewer helped us to realize. This is consistent with our view that zOp has intrinsic interpretable features, including probably [+empathy] (as well as [+animate]).

Japanese) and what it means for linguistic theory. The comparison has several layers. The first layer is one of difference: dedicated logophors are pronominal whereas anaphors are anaphoric with respect to the clause-internal interactions regulated by classical Binding theory. The second layer is one of strong similarity: both elements can be bound by a null DP operator in the clausal periphery, and the null operator in both cases undergoes obligatory control, yielding a characteristic pattern of antecedence for pro-forms contained in verb-phrase-internal clauses. The third layer is one of difference again: when null DP operators are in clauses that are not generated inside larger clauses, the logophoric operator in the African language is ruled out, whereas the anaphoric operator in the East Asian language can be assigned a prominent (empathetic) antecedent from the larger sentence or discourse. These layered patterns are a testimony to a robust Universal Grammar. First, UG provides for the licensing of null DP operators in the clausal periphery, a formal resource that languages can coopt for partly different functions. Second, UG provides the theory of obligatory control, which crucially distinguishes CP complements and adjuncts from relative clauses and root clauses. In this form, control theory applies not only to dedicated logophors and long distance anaphor constructions, but also ordinary PRO, another specialized null DP at the edge of a clause, a larger (partial) unification.

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