

Split indexicality*

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Since [Kaplan \(1977\)](#), it is generally assumed that indexicality should be conceived as an inherent property of a subclass of context-dependent elements such as *I*, *you*, *here* or *now* - namely, those elements referring directly to (some parameter of) the utterance context. Focusing on two different phenomena involving the morphological category of person - shiftable indexicals (SIs) and logophoric pronouns (LPs) -, I argue that indexicality is not a property of discrete lexical forms, but that of a morphological feature, *ACTUAL*, which can combine with other features in the person paradigm in a constrained fashion. On this account, inspired by [Schlenker \(2003\)](#), indexical pronouns in languages such as English are elements which morphosemantic makeup involves a feature *ACTUAL*, restricting their potential referents to those of the utterance context. By contrast, SIs and LPs in languages such as Tigrinya or Ewe lack an *ACTUAL* feature, allowing their referents to be participants of reported contexts in attitude reports. This featural approach, combined with the appropriate competition mechanism, is able to explain most of the distributional and interpretive similarities between SIs and LPs, such as their common inference-triggering profile, where the choice of a standard, 3rd person pronominal element over either a LP/SI leads to a disjointness inference, excluding reference to the author of the report.

Keywords: indexicals, logophors, person features, pronouns, attitude reports, disjointness effects, Maximize Presupposition!

1 Introduction

Following [Kaplan \(1977\)](#), contemporary semantic theories assume that indexicality is a property shared by a dedicated subset of specific lexical items in natural languages, i.e. those elements that refer directly to some parameters of the utterance context. The class of indexicals typically includes first and second person pronouns (singular and plural), as well as adverbs such as *here*, *now*, *tomorrow* and *today*, which are interpreted as referring directly to various parameters of the utterance context - the speaker of *c*, the addressee of *c*, the location of *c*, and so on¹. This is reflected, notoriously, in the fact that indexicals are

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¹ In [Kaplan's](#) terms: "What is common to the words or usages in which I am interested is that the referent is dependent on the context of use and that the meaning of the word provides a rule which determines the referent in terms of certain aspects of the context. The term I now favor for these words is 'indexical'." ([Kaplan, 1977](#), p.490)

insensitive to intensional operators, something that Kaplan’s own *logic of demonstratives* aimed at accounting for. Elements such as *I* and *you* are, in this framework, treated very differently from their non-indexical counterparts such as *she/he/it*, which (and as acknowledged by Kaplan himself), can have non-indexical uses as well and depend on various operators in the sentence.

In the same time, a different stream of research in linguistics has steadily established a number of generalizations about pronominal systems in the world’s languages that provide evidence for a treatment of pronouns that does not seem to support such a distinction. For instance, research in comparative syntax has long been making a case for the existence of formal features reflected in pronouns (ϕ -features; cf. Adger and Harbour (2008)), such as PERSON, GENDER and NUMBER, that play a crucial role in phenomena such as case or agreement. There is also evidence that these features have a uniform semantics, being interpreted as presuppositions (Cooper 1979; Heim and Kratzer 1998; Sauerland 2003 i.a.). Crucially, from this perspective, pronouns are not treated as atomic entities, but as complex bundles of (syntactic and semantic) information consisting of features. A distinctive trait of features is that they can compose differently across paradigms, exhibiting different morphosyntactic profiles; for instance, while the PLURAL feature is realized as a suppletive form distinct from the singular form on both first and second person in the French paradigm, Mandarin Chinese realizes the same feature in a derivative way, affixing the plural morpheme *-men* to all persons, as well as to animate nouns:

	SG	PL	
(1)	[1] [ʒə]	[nu]	[Metropolitan French]
	[2] [ty]	[vu]	
	[3] [il]	[il]	
	<i>noun</i> [etzdjã] ‘student’	[etzdjã] ‘students’	

	SG	PL	
(2)	[1] <i>wo</i>	<i>wo-men</i>	[Mandarin Chinese, Bobaljik 2008: (8)]
	[2] <i>ni</i>	<i>ni-men</i>	
	[3] <i>ta</i>	<i>ta-men</i>	
	<i>noun</i> <i>xuésheng</i> ‘student’	<i>xuésheng-men</i> ‘students’	

In a similar fashion, the category of person can be expressed on more than three forms; this is especially clear when we consider the way features interact in a given paradigm, such as the interaction of person and number in Ilocano (Austronesian; Philippines), which displays clusivity. In that language, there are three number features [SINGULAR], [PLURAL] and [DUAL]; the dual inclusive first person form, *ta* is used to refer to the speaker and her addressee, while the plural inclusive denotes a plurality composed of at least the speaker, the addressee and others. Similarly, the exclusive singular first person *co* is used to refer to the speaker only, and the exclusive plural *mi* to refer to a plurality consisting of the speaker and others, crucially excluding the addressee, (3).

	Person	SG	DUAL	PL	
(3)	[1] inclusive	-	<i>ta</i>	<i>tayo</i>	[Ilocano, Bobaljik 2008: (12)]
	[1] exclusive	<i>co</i>	-	<i>mi</i>	
	[2]	<i>mo</i>	-	<i>yo</i>	
	[3]	<i>na</i>	-	<i>da</i>	

Interestingly, the augmentation of the number category with a feature DUAL causes the paradigm to expand, allowing the person feature [1] to be expressed on more than two forms; this is a case of ‘person split’.

Returning now to indexicals, the question we might want to ask in light of the above data is the following: given the assumption that pronouns are not atomic entities, but complex entities formed by primitives of the grammar, is there any evidence that could be provided in favor of a similar treatment of indexicality, i.e. in favor of defining ‘being indexical’ differently from ‘expressed by first and/or second person’? The main goal of this paper is to argue that there is; some languages make use of first and second personal elements that are strictly not indexical in the sense defined above. What I have in mind are various phenomena involving the interpretation of pronouns in attitude reports, in which first and second person elements (in a sense to be made precise in the course of this paper) are evaluated against the context of the report, not that of the context of the original utterance. The first phenomenon is that of ‘shifted indexicals’ (Schlenker 1999, 2003; Anand and Nevins 2004; Deal 2020 i.a.), illustrated in (4a) for Eritrea Tigrinya²:

- (4) a. Kidane kə-xɛyəd dɛliɛ ʔallɛxu ʔilu (nɛyru)
 Kidane COMP-IMPF.leave PRF.want.1SG AUX.1SG say.3SG.M AUX.3SG.M
 ‘Kidane_i said that he_i wanted to leave.’
- b. Kidane kə-xɛyəd dɛliu ʔallo ʔilu
 Kidane COMP-IMPF.leave PRF.want.3SG.M AUX.3SG.M say.3SG.M
 (nɛyru)
 AUX.3SG.M
 ‘Kidane_i said that he_{*i/j} wanted to leave.’

[Eritrea Tigrinya (Semitic)]

In (??), the first person markings on both the embedded verb *dɛliɛ* and auxiliary *ʔallɛxu* can refer either to the actual speaker or to the reported speaker, John (which is actually the preferred interpretation). As (4b) illustrates, a 3rd person pronoun cannot be used to cross-reference the author of the report.

In yet other, typologically unrelated languages, most of them from the Niger-Congo and Chadic families found in Africa, one can find dedicated ‘logophoric’ pronouns that refer to the reported speaker in similar environments (Hagège 1974; Clements 1975; Koopman and Sportiche 1989; Culy 1994a i.a.):

- (5) a. Kofi be yè dzo
 Kofi say LOG leave
 ‘Kofi_i said that he_{i/*j} left’
- b. Kofi be e dzo
 Kofi say 3SG leave
 ‘Kofi_i said that he_{*i/j} left’

[Ewe (Niger-Congo), Clements 1975]

Again, use of a 3rd person form indicates that the referent of the pronoun is distinct from the author of the report.

² Unless otherwise stated, all Eritrea Tigrinya examples come from personal fieldwork. Tigrinya data was elicited with the help of two native speakers from South Eritrea (regions of Debub and Gash-Barka, respectively). Here is a list of the glossing conventions used in this paper: .

SIs and LPs share many distributional and interpretive properties, among which:

- **Syntactic distribution.** Both classes of pronouns appear in the same kind of syntactic environments, namely, clauses headed by attitude verbs which appear to be hierarchically structured across languages (Culy 1994a; Sundaresan 2018; Deal 2020).
- **Long distance dependencies.** Both classes of elements can refer to their antecedents non-locally, sometimes one or more clauses apart (Nikitina 2012a; Pearson 2015; Park 2014a);
- **Agreement mismatches.** Both classes trigger agreement mismatches, where controllers that are not bearers of 1st person features invariably trigger first person agreement (Curnow 2002; Sundaresan 2012; Messick 2017; Knyazev 2022);
- **De se semantics.** Both classes share the same semantics, being preferably interpreted *de se* across languages (Schlenker 1999, 2003; Anand 2006; Pearson 2015; Bimpeh et al. 2022, 2023 i.a.);
- **Disjointness effects.** As (4b) and (5b) illustrate, the use of a 3rd person form *in lieu* of a LP/SI in attitude environments triggers the inference that their referents are disjoint, i.e. that the referent of the LP/SI cannot be the author of the report.

Such similarities, we argue, call for a unified explanation. However, a uniform account is yet to be found in the theoretical landscape of formally-oriented linguistics; in spite of early attempts like those of Schlenker 1999, 2003, more recent analyses tend to treat both phenomena in a separate way (Anand 2006; Baker 2008; Deal 2018, 2020). The goal of the present paper is to vindicate such a unified account, by providing a detailed cross-linguistic comparison of some of the properties listed above, alongside a formal treatment that is able to accommodate them. Following an early proposal by Schlenker (2003), we posit the following hypothesis: both SIs and LPs are in fact different surface realizations of similar underlying pronominal systems that differ on whether they lexicalize or not a feature ACTUAL. This feature acts as a restrictor on the semantic interpretation of pronominal variables, forcing them to pick out their referent from the utterance context. Not being a person feature *per se*, ACTUAL can compose with various other features in the pronominal paradigm, thus allowing for different partitions that, taken together, allow us to account for the observed distribution of both classes of pronouns. As a consequence, we observe that Kaplan’s original intuition about context-dependent elements can be refined, suggesting that the proper treatment of indexicality is to be done below the word level, ACTUAL being distinct from PERSON.

The remainder of this paper is structured as follows. §2 introduce both pronominal systems, highlighting their common distributional and interpretive similarities in light of a vast sample of cross-linguistic data. §3 offers an overview of formal analyses provided for both phenomena in the literature. §4 exposes our proposal, while §5 explores its various theoretical as well as empirical consequences, and discuss some alternative analyses further. §6 concludes, summarizing our main findings and discussing various consequences for our semantic theorizing about indexicality and context-sensitivity in general.

2 Introducing the phenomena: logophoricity and shifted indexicality

In many Sub-Saharan languages, a dedicated pronominal form is used in attitude reports to cross-reference the author of the report³:

- (6) a. Oumar Anta **inyemen** waa be gi
 Oumar Anta **LOG.ACC** seen AUX said
 ‘Oumar_i said that Anta had seen him_i.’
- b. Oumar Anta **won** waa be gi
 Oumar Anta **3SG.ACC** seen AUX said
 ‘Oumar_i said that Anta had seen him_{*i/k}.’
 [Donno So (Niger-Congo; Mali), Culy 1994a: (1)]

In some cases, the logophoric form can be realized as a verbal affix, as in the language Akoose (Niger-Congo, Bantu; Cameroon):

- (7) a. à hɔbé ǎ á-kàg
 3SG said REP 3SG-should.go
 ‘He_i said he_{*i/j} should go.’
- b. à hɔbé ǎ mə-kàg
 3SG said REP LOG-should.go
 ‘He_i said he_{i/*j} should go.’
 [Akoose, Hedinger 1984: 95]

Other languages, however, do not dispose of a dedicated element to refer to the reported author. Some, such as Germanic or Romance, use the 3rd person form to do so; however, this is not the only strategy; some languages use first and/or second person forms in attitude reports to refer to participants of the reported event, much like in English direct speech. This is illustrated in (8) for Zazaki (*s(c)* indicates reference to the speaker of the utterance context):

- (8) Hesen-i mi-ra va kε εz dɛwletia
 Hesen-OBL 1SG-OBL say COMP **1SG.NOM** rich.be.PRS
 ‘Hesen_i tells me_{s(c)} that he_{i/s(c)} is rich.’
 [Zazaki (Iranian), Anand and Nevins 2004: (4)]

In (8), the nominative first person εz embedded under *va* ‘say’ can either refer to *Hesen* or the utterance speaker. Use of such ‘shiftable indexicals’ (henceforth, SIs), has been reported for languages pertaining to different, typologically unrelated families, ranging from Semitic (Amharic, Schlenker 1999, 2003, LaTerza et al. 2015; Ethiopia Tigrinya, Spadine 2020; Eritrea Tigrinya, personal fieldwork) to Athabaskan (Slave, Rice 1986)

³ This paper is only concerned about logophoric *pronouns* in the seminal sense of Hagège (1974), and not by other linguistic elements that have been labeled ‘logophors’ with different theoretical implications in the generative literature, such as long-distance anaphors (i. e., anaphors that seem not to obey the ‘condition A’ principle of Binding Theory; see Kuno (1987), Reinhart and Reuland (1993), Charnavel and Sportiche (2016) i.a.). For arguments that the former class is not reducible to the latter, see among others Culy (1994a) and Dimmendaal (2001).

and Turkic (Turkish, Şener and Şener 2011, Özyıldız 2012, Oguz et al. 2020; Uyghur, Sudo 2012, Shklovsky and Sudo 2014, Wang 2023; Chuvash, Knyazev 2022). Here, too, morphological variation exists, allowing different surface realizations of shifted indexicality: for instance, in some Turkic languages, only agreement markers on the verb can be shifted; if the corresponding pronouns that control person agreement on the verb are overt, the shifted interpretation is not available anymore.

- (9) Alsu *pro* ber kajčan da miŋga bag-m-a-s-mɯn diep
 Alsu *pro* one when nPCL 1SG.DAT look.at-NEG-ST-POT-1SG COMP
 bel-ä
 know.ST-IMPF
 ‘Alsu_i knows that I_i would never look at me_{s(c)}’
 [Mishar Tatar (Turkic), Podobryaev 2014: (210)]
- (10) a. boris man-a *pro* san-ba ëçl-e-p te-ze kala-rj-ə
 boris I.OBJ *pro* 2SG-INS work-NPST-1SG say-COMP say-PST-3SG
 ‘Boris_i told me that I / he_i will work with you_{a(c)}.’
- b. boris man-a ep san-ba ëçl-e-p te-ze kala-rj-ə
 boris I.OBJ I.NOM 2SG-INS work-NPST-1SG say-COMP say-PST-3SG
 ‘Boris_i told me that I / *he_i will work with you_{a(c)}.’
 [Poshkart Chuvash (Turkic), Knyazev 2022: (28)]

Below, we expand on five additional properties that, we argue, are defining traits of both classes of pronouns.

2.1 A hierarchy of licensing predicates

A first feature that both SIs and LPs have in common is their distributional properties: both classes seems to be licensed in similar environments - namely, in complex clauses involving attitude predicates. As first noted by Culy (1994a), out of a sample of 48 logophoric languages, 29 would allow LPs to appear under *say*, while only a subset of this group (13) would allow LPs to appear under *think*; the same goes for *know*, where LPs are licensed for another subset of 6 languages out of the sample. This allows Culy (1994a) to conclude that LPs are licensed by a hierarchically-ordered set of attitude predicates forming an implicational scale: if a given language licenses LPs under any element in the scale, then it must also license them under any element to its right.⁴

- (11) **A hierarchy of logophoric licensers** [Culy 1994a: (10)]
 speech < thought < knowledge < direct perception

A similar hierarchy was subsequently proposed in various places to account for essentially the same fact about indexical shift (Anand 2006; Oshima 2006; Sundaresan 2012, 2018; Deal 2020). For instance, examining six different languages (Dhaasanac, Navajo, Nez Perce, Slave, Uyghur, Zazaki), Deal (2020) notes that while they all allow SIs to appear

⁴ It is unclear why Culy (1994a) includes the class of ‘direct perception’ verbs within his hierarchy, since he explicitly mentions that no language seems to license LPs under this category. I am reproducing the original proposal, without modifications.

in the scope of *say*, only Navajo, Slave and Uyghur allow them under *think*, and only Nez Perce licenses them under verbs of knowledge. The hierarchy arrived at therefore mirrors the one proposed by Culy for LP-languages:

- (12) **A hierarchy of SIs licensers** [After Deal 2020: 77]
 speech < thought < knowledge

Both hierarchies tell us that both SIs and LPs are licensed in very similar environments, if not identical.

2.2 A hierarchy of forms

In her study of indexical-shifting systems, Deal (2020) reports that classes of shiftable elements within a given language are constrained by the following hierarchy (in which **Time** and **Loc** respectively stand for the indexical adverbs *now* and *here* in a given language):

- (13) **Implicational hierarchy of indexical classes** [Deal 2020: (117)]
 Within and across languages, the possibility of indexical shift is determined by the hierarchy **Time < 1st < 2nd < Loc**. Indexicals of a certain class undergo shift in a particular verbal complement only if indexicals of classes farther to the left undergo shift as well.

Again, it seems that a similar generalization can be established within the logophoric domain: languages encoding reference to the reported addressee using a second person LP (LOG-2) appear to be typologically much scarcer than languages encoding reference to the reported author with a first person LP (LOG-1). However, it is possible to find languages with LOG-2, but no LOG-1 in Chadic languages, as in Pero (West Chadic; Nigeria), which uses a dedicated form *peemu* to refer to reported addressees (see §5.3 for more discussion about this class of languages):

- (14) ca peemu ta kayu laa mu mijiba
 say.PST LOG.2SG FUT drive away man DEM stranger
 ‘[He] said that he_{a(i)} is going to drive the stranger away.’
 (lit. ‘[He] said that you_{a(i)} are going to drive the stranger away.’)
 [Pero, Frajzyngier 1985: (23b)]

The case of Pero prevents us from deriving a strict implicational hierarchy such as (13) for logophoric elements; however, it remains possible to express the observed patterns in terms of a tendency that seems to reflect a similar constraint as the one active in IS-systems:

- (15) **Implicational hierarchy of logophoric classes**
 LOG-1 < LOG-1 + LOG-2 < LOG-2

This proposed hierarchy is discussed further in §5.

2.3 Long-distance dependencies

Although both classes of pronouns mainly occur in syntactic contexts involving one finite embedded clause in which the LP/SI cross-references another NP introduced in the matrix clause, both seem to be able to co-refer to elements in more than one clause up:

- (16) Marie be Kofi xɔse be yè na yè cadeau.
 Mary say Kofi believe COMP LOG give LOG gift
 ‘Mary_i said that Kofi_j believed that LOG_{i/j} gave LOG_{i/j} a gift.’
 [Ewe, Pearson 2015: (86)]

- (17) mjalaŋ yim-go ka: Tulo: ne: ka: yi ŋa mana-m
 Malang.M think-PRFVE COMP Tulo.F say COMP LOG PROG.have house-LNK
 kude.
 big
 ‘Malang_i thinks that Tuloo_j said that LOG_{i/j} has a big house.’
 [Tangale (Afro-Asiatic: Chadic, Nigeria), Haida 2009: (12)]

As noted by e.g. Hagège (1974), Stirling (1993) and Dimmendaal (2001), LPs in some languages can retrieve their antecedent from the global, discourse context, or even a nearby clause. This is exemplified in (18) from the seminal work on LPs by Hagège (1974): The informant introduces a topic for the subsequent sentences (*the ancestors*) that a logophoric pronoun can pick up as referent, about 13 minutes after the antecedent was uttered:

- (18) Sà:rà dús sò
 LOG scattered thus
 ‘They (the ancestors) thus scattered.’
 [Tuburi (Niger-Congo), Hagège 1974, cited in Stirling 1993: 263]

Analogous data can be provided for Moru (Nilo-Saharan) and Engenni (Niger-Congo) (Dimmendaal, 2001), Ewe (Bimpeh 2019, Bimpeh et al. 2022), Ainu (Bugaeva, 2008), among other languages. The logophoric domain thus appears to be broader than that of the embedded sentence.

Analogous patterns can be observed in IS-systems. As emphasized by Deal (2020) i.a., long-distance shifting is indeed one of the signature properties of shiftable indexicals, which are able to retrieve their reference two clauses up, as example (19) from Korean:

- (19) John-i Bill-i caki-uy emma-ka **na-lul** silhehanta-ko
 John-NOM Bill-NOM caki-GEN mom-NOM 1SG-ACC hate-COMP
 malhayssta-ko malhayssta
 said-COMP said
 ‘John_i said that Bill_j said that SELF_j’s mother hates **me_i**’
 [Korean, Park 2014b: (31)]

In (19), the first person indexical *na* is able to retrieve its reference from the intermediate context, even when embedded by two different attitude verbs (note that the reflexive *caki* here disambiguates the sentence, preventing the indexical to refer to Bill, the speaker of the most embedded level).

Also relevant for the purposes of comparison with LPs are instances of so-called ‘matrix’ indexical shift, where indexicals are able to shift even in the absence of matrix attitude verbs. This is illustrated below:

- (20) *Context: Nino and Dato have been dating for a significant period of time, and Nino tells Gio she loves Dato. If I overhear their conversation, I can tell you:*
 Nino-m m-i-txr-a-o (rom) Dato m-i-qvar-s-o
 Nino.ERG 1-APPL-say-3SG.AOR-o COMP Dato.NOM 1-APPL-love-3SG.PRS-o
 ‘Nino_i told me_{Gio≠Speaker} that I_i love Dato.’
 [Georgian (Kartvelian), [Thivierge 2022](#): (12)]

In Georgian, a phrase-final marker *-o* (a kind of quotative particle) license indexical shift; since this marker can also appear in matrix clauses, matrix indexicals can also receive a shifted interpretation, such as the person marker *m* in the verbal form *mitxrao*, which references not the speaker but Gio, the addressee of the original speech context; this seems to induce a double shift in perspective, in which the overall speaker adopts the point of view of Gio, which is then overridden by another perspective, that of the reported speaker Nino (whom the second indexical in *miqvarso* refers to).

Similar patterns have been reported for Kurmanji (Iranian; [Koev 2013](#)), as well as Ethiopia Tigrinya ([Spadine, 2020](#)). In light of the Tuburi data in (18), this shows us that both LPs and SIs do not seem to be constrained by locality effects, and can be licensed in contexts that do not involve syntactic embedding, with their licensors appearing at a higher, discourse level.

2.4 Pronoun-agreement mismatches

Both SIs and LPs can both be grouped into at least two kinds of clusters across languages, depending on the way person information is realized morphosyntactically. A first cluster concerns languages that express logophoricity or indexical shift using overt pro-forms. A second cluster groups languages where these properties are expressed only indirectly, through verbal agreement. For instance, in the languages Tamil and Telugu (Dravidian; India), reflexive pronouns *taan* and *tanu* trigger first person agreement on the verb in embedded clauses, as exemplified in (21) and (22):

- (21) Raman taan Sudha-vae virumb-ir-eeen-nnu so-nn-aan.
 Raman REFL.NOM.SG Sudha-ACC love-PRS-1SG-COMP say-PST-3SG.M
 ‘Raman_i said that he_{i,*j} is in love with Sudha’
 [Tamil, [Sundaresan 2018](#): (13)]

- (22) Raju [tanu parigett-ææ-nu ani] cepp-ææ-Du.
 Raju 3SG run-PST-1SG COMP say-PST-3SG.M
 ‘Raju_i said that he_i ran.’
 [Telugu, [Messick 2023](#): (10b)]

Interestingly, this pattern is identical to what [Curnow \(2002\)](#) dubs ‘first-person logophoricity’ for a large class of Nilo-Saharan languages (see also [Culy 1994b](#)), as illustrated in (23) for Donno So (Dogon, Mali):

- (23) a. Oumar inyeme jembɔ paza **bolum** miñ tagi
 Oumar LOG sack.DEF drop left.1SG 1SG.OBJ inform.PST
 ‘Oumar_i told me that he_i had left without the sack.’
- b. Oumar ma jembɔ paza **boli** miñ tagi
 Oumar 1SG.SBJV sack.DEF drop left.3SG 1SG.OBJ inform.PST
 ‘Oumar_i told me that I had left without the sack.’
- [Donno So, Culy 1994b: (20)]

In (23), the embedded verb *bolum* is inflected for the first person, in spite of the agreement controller being the logophoric form *inyeme*, which does not carry first person features under standard assumptions. This type of mismatch can also occur if the system does not have a specific logophoric pronoun, but where third person subjects trigger first person agreement in the embedded clause, just as in Tamil and Telugu. This is the case of the language Karimojong (Nilotic), as (24) shows:

- (24) àbu papà tolim ebè àlózì ijèz morotó
 AUX father say COMP 1SG.go.NPST 3SG Moroto
 ‘Father_i said that he_i was going to Moroto.’
- [Karimojong, Curnow 2002: (18)]

Here, the third person pronoun *ijèz* triggers first person agreement on the embedded verb, the sentence being used in order to express co-reference between the matrix and embedded subjects (the father). Interestingly, these agreement patterns (3rd person controlling 1st person agreement in the embedded clause) is also reported in languages that have been argued to display indexical shift. Languages Aqusha Dargwa and Tabasaran (Northeast Caucasian) both have shifty first person pronouns that can optionally trigger first person agreement on the embedded verb; interestingly, the shifted interpretation is available only in cases in which first person marking is realized; if not, the sentence receives an unshifted interpretation.

- (25) a. ?lis hanbikib [nu q’an **iub-ra** ili]
 Ali think.PST.3SG 1SG late became.1 COMP
 ✓ ‘Ali_i thought that he_i was late’
 ✓ ‘Ali_i thought that I was late’
- b. ?lis hanbikib [nu q’an **iub** ili]
 Ali think.PST.3SG 1SG late became.3 COMP
 ✗ ‘Ali_i thought that he_i was late’
 ✓ ‘Ali_i thought that I was late’
- (Aqusha Dargwa, adapted from Ganenkov 2021: (10-11))

- (26) a. rasul-di izu derben-di-s ag-idi-za k’udi p-nu.
 Rasul-OBL.ERG 1SG.ABS Derbent-OBL-DAT go-FUT-1SG COMP say-AOR
 ✓ ‘Rasul_i said that he_i would go to Derbent’
 ✗ ‘Rasul said that I would go to Derbent’
- b. rasul-di izu derben-di-s ag-idi k’udi p-nu.
 Rasul-OBL.ERG 1SG.ABS Derbent-OBL-DAT go-FUT COMP say-AOR
 ✗ ‘Rasul_i said that he_i would go to Derbent’
 ✓ ‘Rasul said that I would go to Derbent’

Aqusha Dargwa and Tabasaran being optional-shifting languages, the sentences (25a) and (26a) are ambiguous between an utterance-level reading (where the embedded 1SG pronoun and agreement marker both refer to the actual speaker) and a shifted reading (where they refer to the author of the report, Ali). However, sentences (25b) and (26b), in which the embedded subject is 1SG but the verb is inflected for third person, lack the shifted interpretation.

The agreement properties expressed above are puzzling, especially considering the fact that in all cases, none of the controllers of agreement seems to be specified for first person. Whatever the agreement mechanisms at play in these examples be (see Ganenkov 2021 and Messick 2023 for formal accounts of such ‘shifty agreement’), these data suggest morphosyntactic likeness of both classes of pronouns.

2.5 LPs and SIs are obligatorily interpreted *de se*

Another, relevant feature pertaining to both classes of pronouns is their *de se* semantics. *De se* are a distinct subtype of attitudes that involve first-personal or ‘self-locating’ beliefs (Perry 1977; Lewis 1979; Chierchia 1989). Typically, the content of a *de se* attitude can be felicitously attributed to an agent if he or she relates to that content in a first-personal way, i.e., recognizes that he or she is the experiencer of that content. As first observed by Clements (1975) for Ewe, and later confirmed for related languages as well (Schlenker 1999, 2003; Bimpeh 2019; Bimpeh and Sode 2021; Bimpeh et al. 2022, 2023), LPs unambiguously express *de se* reports⁵, rendering them infelicitous in non-*de se* scenarios in which the attitude holder is unaware that the content of the report is about himself, as (27) and (28) illustrate for Ewe and Ibibio, respectively:

- (27) *Context: an Asian woman was declared missing from a party touring the Eldgjá volcanic region in south Iceland after getting off the party’s bus to freshen up. She only hopped off the bus briefly, but had also changed her clothes - and her fellow travelers did not recognize her when she climbed back on again to continue the party’s journey. When the details of the missing person were issued, the woman reportedly didn’t recognize her own description [woman with a pink sweater] and unwittingly joined the search party for herself.*

a. Asia nyɔnu la xɔese be é bú
 Asian woman DEF believe.3SG COMP 3SG be
 ‘The asian woman_i believes that she_i is lost.’ ✗ *de se*

b. #Asia nyɔnu la xɔese be yè bú
 Asian woman DEF believe.3SG COMP LOG be
 ‘The asian woman_i believes that she_i is lost.’ ✓ *de se*

[Ewe, Bimpeh 2019: (15-16)]

- (28) *Context: Ekpe sings on occasion, but will never admit that he is any good. So one time, during one of his performances, you record him without his knowledge. Some*

⁵ However, LPs in Ewe and Yoruba have been reported to be compatible with a *de re* interpretation (Pearson 2015; Adesola 2005).

time later, you play back the recording to him without telling him who is singing. Ekpe doesn't recognize himself in the recording, and comments "he sings well."

- a. Ekpe a-bo ke anye a-diyono ikwo ikwo mfonmfon
 Ekpe 3SG-say COMP 3SG 3SG-know sing song well
 'Ekpe_i said that he_{i,j} sings well.' ✗ *de se*
- b. #Ekpe a-bo ke imo i-me i-diyono ikwo ikwo mfonmfon
 Ekpe 3SG-say COMP LOG LOG-PRS LOG-know sing song well
 'Ekpe_i said that he_i sings well.' ✓ *de se*
- [Ibibio (Niger-Congo), Newkirk 2019: (11)]

Analogously, SIs are unambiguously read *de se* in most languages (Schlenker 2003, Anand 2006, Deal 2020 a.o.)⁶; sentences involving SIs are judged true only in scenarios in which the reported speaker self-identifies with the attitude holder. Consider the following example from Eritrea Tigrinya:

- (29) ***De se context:*** Homer is watching a TV program in which he stars. When appearing on screen, he says: 'I am the best!'.
De re context: Homer is watching a TV program in which he stars. When appearing on screen, he does not recognize himself; he points to the bald guy and says: 'That guy is the best!'.
- a. Homer nsu eti zbelexku ?ilu
 Homer 3SG.NOM.M DEF best say.PST.3SG.M
 'Homer_i said that he_{*i,j} was the best.' ✗ *de se*
- b. Homer anε eti zbelexku (?ijε) ?ilu
 Homer 1SG.NOM DEF best (COP.1SG) say.PST.3SG.M
 'Homer_i said that he_i was the best.' ✓ *de se*

Sentence (29b), which involves a first person SI, is judged true only in a *de se* scenario, where Homer successfully recognizes himself when asserting that he is the best; the same sentence is judged infelicitous in a *de re* scenario, and a 3rd person pronoun must be used instead. Again, such as similarity regarding the inherent first-personal content of both LPs and SIs would be extremely puzzling if one assumes that both classes of pronouns do not share fundamental properties at their core.

2.6 Yet another common trait: disjointness inferences

It has long been noted that in LP languages, the use of a non-logophoric form in logophoric contexts prevents co-reference with the reported speaker: in Aghem (Niger-Congo; Cameroon), for instance, the use of the 3rd person pronoun *ù* instead of the logophoric form *é* indicates that its referent is not the reported speaker, Nsen, but some other, salient female individual:

⁶ Although variation exists here as well; some languages allow some of their indexicals to be read *de re* in attitude reports, such as the locative indexical *kine* 'here' in Nez Perce (Deal, 2019). However, there is no consensus about how these readings should be derived; see Pearson (2015) as well as Deal (2020); pp. 66 *sqq.*

- (30) a. Nnsini dze enyia é bvɛ nù [Aghem, Butler 2009: (10-11)]
 Nsen say COMP LOG fall FOC
 ‘Nsen_i said that she_i fell.’
- b. Nnsini dze enyia ù bvɛ nù
 Nsen say COMP 3SG fall FOC
 ‘Nsen_i said that she_{*i/j} fell.’

Examples such as (4b) and (29a) above illustrate the same phenomenon for SI-languages, suggesting another common-defining trait. Following Marty (2018), we will refer to this pattern as a *disjointness inference*:

- (31) **Disjointness inference** [Marty 2018: fn.1]
 A nominal expression α is interpreted as disjoint from a nominal expression β if the interpretation of α does not — exhaustively or partially — co-refer with or co-vary with that of β .

The generalization can be stated the following way:

- (32) **Disjointness inference in logophoric/shifty contexts**
 In a language L where logophoric marking/indexical shift obtains in configuration C (e.g., under an appropriate attitude verb), embedded 3rd person proforms cannot co-refer with a participant of the reported context.

To put it another way, whenever a language L has a LP/SI in its pronominal system, using a 3rd person form in lieu of the expected form will trigger the inference that their referents are distinct individuals.

A corollary of this observation is that languages triggering this kind of disjointness inferences allow embedded third persons to refer to actual speakers, when the subject of the sentence is not first-person (i.e., when actual and reported speakers do not coincide). Here are examples from Athabaskan language Slave:

- (33) a. behshine rayuhdi hadi
 sled 3SG.buy.FUT 3SG.say
 ‘He said that I will buy a sled.’
 ‘He_i said that he_j will buy a sled.’
- b. gosho ?eghalayuda yeniwe
 hard 3SG.work.FUT 3SG.want
 ‘He wants me to work hard.’
 ‘He_i wants him_j to work hard.’
- [Slave, Rice 1986: (31), (44)]

As both of these examples illustrate, the preferred interpretation for both sentences is the one in which the 3rd person form cross-references the actual speaker.

The following table provides a succinct view of the properties outlined for both phenomena; in the following sections, we survey the various proposals that have been made in the theoretical literature so far in order to capture some or all of the above properties (§3), before presenting our own (§4, 5).

Properties	Shiftable indexicals	Logophoric pronouns
Hierarchy of licensing predicates	✓	✓
Hierarchy of forms	✓	✓
Pronoun-agreement mismatches	✓	✓
<i>De se</i> readings	✓	✓
Disjointness inferences	✓	✓

Table 1: Properties of both systems across languages.

3 Previous analyses

3.1 The binding theory of logophoric pronouns

A widespread consensus treats LPs as obligatorily-bound elements (Koopman and Sportiche 1989; Heim 2002; von Stechow 2003; Anand 2006; Baker 2008; Pearson 2015; Deal 2018 i.a.). Most of these analyses are framed within an intensional system whereby attitude verbs are viewed as quantifiers over centered worlds, i. e. world-individual pairs conceived as tuples of type $\langle s, e \rangle$ (Lewis 1979, Chierchia 1989 a. o.). Within such a system, LPs are considered a special kind of pronoun that unambiguously pick up the center of the world it is evaluated against, i. e. the individual that the referent takes himself to be in the world of evaluation. Its main inspiration are the treatment of the silent pronominal *PRO* in sentences such as (34a), that Chierchia (1989) analyses as in (34c), where *PRO* is bound by the individual λ -abstractor at the left edge of the attitude verb:

- (34) a. John wants to learn how to dive-roll.
b. $[\lambda w_1.[w_1 \text{ John wants } [\lambda w_2.\lambda x_3.[w_2 \text{ PRO}_3 \text{ to learn how to dive-roll }]]]]$
c. $\llbracket \text{PRO to learn how to dive-roll} \rrbracket^{g,c} = 1$ iff $\lambda w.\lambda x.x$ learns how to dive-roll in w
d. $\llbracket \text{John wants PRO to learn how to dive-roll} \rrbracket^{g,c} = 1$ iff $\lambda w.\forall \langle w', y \rangle \in \text{WANT}_{\text{John},w}, y$ learns how to dive-roll in w' .

In words, the sentence will be true iff in all the worlds compatible with what John wants in w , the individual he takes himself to be in those worlds w' (the center of each of those worlds) learns how to dive-roll in w' . Intuitively, it seems possible to treat LPs in an analogous fashion: since they always denote the agent of the attitude of saying/believing (the logophoric center), one can posit that they also unambiguously denote the center of the embedded proposition, much like *PRO*. This line of analysis is pursued by von Stechow (2002, 2003), Heim (2002) and Pearson (2015) a. o., who assume (in different flavors) that much like control predicates, attitude verbs also introduce λ -abstractors for individuals in the left of their complements, and that LPs come endowed with a syntactic feature LOG that forces them to be bound by this abstractor. To illustrate, the Ewe sentence in (5) will be interpreted as in (35c):

- (5) Kofi be yè dzo
Kofi say LOG leave
‘Kofi_i said that he_{i/*j} left.’

- (35) a. $[\lambda w_1.[w_1 \text{ Kofi said}_{[log]} \text{ that } [\lambda x_{[log]}^2.\lambda w_3.[w_3 \text{ LOG}^2_{[log]} \text{ left }]]]]$
 b. $\llbracket \text{LOG left} \rrbracket^{g.c} = \lambda w.\lambda x.x \text{ left in } w$
 c. $\llbracket \text{Kofi said that LOG left} \rrbracket^{g.c} = \lambda w.\forall \langle w', y \rangle \in \text{SAY}_{K,w}, y \text{ left in } w'$

This analysis ensures the *de se* interpretation of the LP: since the pronoun is obligatory bound by the individual abstractor, it will unambiguously denote the center of the world-individual pair, that is, the individual that Kofi identifies himself with in his SAY-worlds counterparts, ruling out both non-coreferential and *de re* readings of LOG.

3.2 Shifting operators for indexicals

The most popular account of indexical shift so far is the so-called ‘monster account’ of [Anand and Nevins \(2004\)](#) and [Anand \(2006\)](#), and later expanded by [Deal \(2020\)](#). The starting point of the theory are examples such as (36), from the Indo-Iranian language Zazaki:

- (36) vizeri Rojda Bill-ra va ke ez to-ra miradisa
 yesterday Rojda Bill-to say.PST COMP 1SG 2SG-to angry.be.PRS
 ✓ ‘Yesterday Rojda_i said to Bill_j that he_i is angry at him_j.’
 ✓ ‘Yesterday Rojda_i said to Bill_j that I am angry at you.’
 ✗ ‘Yesterday Rojda_i said to Bill_j that I am angry at him_j.’
 ✗ ‘Yesterday Rojda_i said to Bill_j that he_i is angry at you.’
 [Zazaki, [Anand and Nevins 2004](#): (13)]

The sentence in (36) is only two-way ambiguous, relative to the context in which it is interpreted: in the reported context, the two indexicals *ez* and *to* will refer to the reported speakers and addressee (Rojda and John), respectively, while in the utterance context, they will refer to the speaker and addressee of that context. Crucially, mixed or ‘cross-contextual’ readings are excluded: in other words, indexicals must ‘shift together’ in Zazaki. In order to capture this, [Anand and Nevins 2004](#) propose the following generalization:

- (37) **Shift Together** [Adapted from [Anand 2006](#): 100]
 All SIs within a attitude-context domain must pick up reference from the same context (where an attitude-context domain is the scope of an attitude verb up to the scope of the next c-commanded attitude verb.)

Such a constraint has been reported to hold in a large body of SI-languages, and is considered by many to be the centrally-defining feature of indexical shift ([Anand 2006](#); [Deal 2018, 2020](#), a.o.).⁷ In order to capture this pattern, [Anand and Nevins \(2004\)](#) suggest

⁷ However, as widespread as it may be, the shift-together constraint is not attested in every SI-system. In many languages, mixed readings such as the ones ruled out in (36) are commonly observed:

- (38) Kemal va mı va e neveş-a çiqire
 Kemal say.PST.3SG 1SG.OBL say.PST.3SG 1SG.DIR sick-1SG why
 ✓ ‘Why did Kemal_i say that he_i thought that he_i is sick?’
 ✓ ‘Why did Kemal_i say that I thought that I am sick?’
 ✓ ‘Why did Kemal_i say that he_i thought that I am sick?’
 ✗ ‘Why did Kemal_i say that I thought that he_i is sick?’

that the shifting of indexicals is induced by the presence of a ‘monstrous’ operator $\hat{\omega}$ in the embedded clause.⁸ The semantics of this operator is straightforward: it rewrites the Kaplanian context coordinates of a context-sensitive expression α with the values of the *index*, or circumstances of evaluation, consisting of a similar set of coordinates (c.p. Zimmermann 1991, Von Stechow and Zimmermann 2005, Anand 2006):

$$(40) \quad \llbracket \hat{\omega} \alpha \rrbracket^{g,c,i} = \llbracket \alpha \rrbracket^{g,i,i}$$

Depending on the language, the operator is generally taken to be introduced by attitude verbs such as *say*, which then allows the first (and second) person in embedded clauses to refer to the reported speaker and addressee, respectively:

- (41) a. $\llbracket \hat{\omega} I \rrbracket^{g,c,i} = \llbracket I \rrbracket^{g,i,i} = \text{speaker}(i)$
 b. $\llbracket \hat{\omega} \text{you} \rrbracket^{g,c,i} = \llbracket \text{you} \rrbracket^{g,i,i} = \text{addressee}(i)$
 c. $\llbracket \text{Yesterday Rojda said to Bill that } \hat{\omega} I \text{ am angry at you} \rrbracket^{g,c,i} = 1$ iff $\forall i'$ compatible with what Rojda said in i , then the speaker in i' is angry at the addressee in i' .

Once the $\hat{\omega}$ is inserted, all indexicals within its scope inherits the value of the embedded context, thus capturing *shift together*. In this system, optionality is dealt with via structural ambiguity: optional shifting languages like Zazaki can produce both monstrous and monster-less structures, ensuring that an ‘unshifted’ reading is always available. Another, crucial aspect of the system concerns variation: since different indexicals shift under different verbs in various languages, it has been proposed that $\hat{\omega}$ can be parametrized. In some languages, the operator will only rewrite the *author* coordinate of i , leaving other indexicals unaffected.

[Mutki Zazaki (Indo-Iranian), Akkuş (2019): (80)]

- (39) a. *Boris says to Sonya:*
 (ep) san-ba ëçl-e-p
 I 2SG-INS work-NPST-1SG
 ‘I will work with you.’
 b. *Sonya reports to Macha:*
 boris man-ba ëçl-e-p te-ze kala-tj-ə
 boris 1SG-INS work-NPST-1SG say-COMP say-PST-3SG
 ‘Boris_i said that he_i will work with me_{s(c)}.’

[Poshkart Chuvash (Turkic), Knyazev 2022: (22)]

Other examples of shift together violations are attested in Mishar Tatar (Turkic; Podobryaev 2014), Kazan Tatar (Turkic; personal fieldwork), Kurdish (Indo-Iranian; Akkuş 2019), Kurmanji (Indo-Iranian; Koev 2013), Telugu (Dravidian; Messick 2017, 2022, 2023), Tamil (Dravidian; Sundaresan 2018), among other languages. All in all, this seems to suggest that *shift together* is not a systematic rule of shifty languages, but rather a violable preference, subject to linguistic variation (but see Deal 2020: appendix A for a dissenting view).

⁸ Anand and Nevins (2004) and Anand (2006) write OP_V for the context-shifting operator; the $\hat{\omega}$ -notation is from Sudo (2012).

$$(42) \quad \llbracket \widehat{\text{auth}} \alpha \rrbracket^{g, \langle s(c), a(c) \dots \rangle, i} = \llbracket \alpha \rrbracket^{g, \langle s(i), a(c) \dots \rangle, i}$$

Depending on the language and on what types of indexicals are shiftable, different flavours of $\widehat{\text{auth}}$ have to be posited in order to derive cross-linguistic data correctly; the most thorough implementation of this system is Deal (2020), which proposes a full-blown hierarchy of such operators that depends on the size of the embedded complement they appear in.

3.3 The binding approach to SIs

Another proposal to capture indexical shift can be found in Schlenker 1999, 2003, who derives indexical shift in terms of binding. In Schlenker’s theory, the meaning of attitude verbs is modified to allow them to quantify over contexts. Schlenker’s system consists of two main ingredients. The first is contextual variables of type k , which are directly represented in the syntax (in the spirit of Percus 2000) and can be quantified over by some attitude verbs, typically in languages that allow indexical shift; second, lexical specifications on indexicals that restrict the kind of contextual variables they can be associated with. In that system, every clause gets abstracted over by a λ -operator binding a contextual variable c^* , with the asterisk representing the ‘topmost’ context introduced at the utterance level; attitude verbs being context-shifters, they similarly introduce such an abstractor and variable c' at the edge of their complement. This is schematically represented in (43):

(43) **Monstrous semantics for say**

- a. $\llbracket \text{say} \rrbracket^{g, c} = \lambda p_{\langle k, t \rangle} . \lambda x_e . \forall c' \text{ compatible with what } x \text{ says in } c, p(c') = 1$
- b. $\llbracket \text{John says that I am a hero} \rrbracket^{g, c} = 1 \text{ iff } \forall c' \text{ compatible with what John says in } c, s_{c'} \text{ is a hero in } c'$

However, granting quantification over contexts for attitude verbs uniformly will not derive the adequate typology of IS, since this would wrongly predict every kind of indexical to be shiftable by the attitude, contrary to fact. In order to constrain the system, a restriction is introduced at the level of lexical entries of indexicals themselves in order to specify what kind of contextual variable indexicals are associated with. Person features are interpreted as presuppositions (Cooper 1983; Heim 2008; see §4 below), and the denotations of first and second person indexicals depend on the context pronoun they combine with. In languages such as English, first person indexicals encode a formal feature, [+ AUTHOR*], which presupposition is satisfied if the pronominal index is assigned to the utterance context speaker, rendering it unshiftable. The context pronoun c^* is, by assumption, a free variable that can never be bound.

(44) **English first person indexical**

$$\llbracket I_n c_i \rrbracket^{g, c} = g(n) \text{ if } g(n) = s(c^*), \text{ undefined otherwise.}$$

However, SIs are lexically specified to refer to the author of the bound context pronoun, c_i :⁹

⁹ Note that in this system, SIs are interpreted as definite descriptions of some sort, analogous to e-type pronouns (Evans 1980, Elbourne 2005). This is necessary in order to obtain the correct truth-conditions for sentences in SI-languages; for if the pronoun was interpreted as a free variable with a presupposition, such as (45), this would yield an obviously wrong result, the value of $g(n)$ being unable to co-vary with

(46) **Shiftable first person indexical**

$\llbracket I_n c_i \rrbracket^{g,c*} = s_{g(c_i)}$ if $\exists!x$ s.t. $x = s_{g(c_i)}$, undefined otherwise.

The optional shifting behavior of SIs here depends on which λ -operator binds the context pronoun it combines with. For instance, in our example sentence schematized in (47), two values could be assigned to the indexical, resulting in two different interpretations: if $i = 3$, the context pronoun is bound by the matrix binder, resulting in an unshifted reading; if $i = 7$, the context pronoun is bound by the binder introduced by *say*, and a shifted reading obtains.

(47) $[\lambda c_3^* [\text{John says } [\lambda c_7 [I c_i] \text{ am a hero }]]]$

A central feature of that theory, which our own will make crucial use of, is the presuppositional nature of the features that each indexical bears; we discuss the presuppositional approach of person features in detail in §4.1 below.

An important aspect of the binding approach is that it does not enforce *shift together* effects, as illustrated in (36); this has often been taken as an argument against it (see i.a. Deal 2020: pp. 23 *sqq.*). However, *shift together* effects *can* be captured within this system, and solution strategies have been proposed (Schlenker, 2011); in any case, the great amount of variation observed with respect to *shift together* data requires accommodation of any shifting strategies discussed in the literature so far.¹⁰

4 A featural account of indexicality

Our proposal is that both classes of pronouns have a similar underlying structure, namely, non-indexical person features unspecified with respect to the context they are interpreted

the context pronoun quantified over with the attitude verb:

(45) $\llbracket I_n c_i \rrbracket^{g,c*} = g(n)$ if $g(n) = s_{g(c_i)}$, undefined otherwise.

¹⁰ We refer the reader to Deal 2020: Appendix A for a thorough discussion on the topic within the operator-based approach. While I do not wish to address the issue of *shift together* in detail here, let me just mention the following: if, as the examples mentioned in fn. 7 suggest, *shift together* is not taken as a central property of shifting indexicals but as a general preference for anaphora resolution, the argument against the binding approach is considerably weakened. In fact, the so-called ‘3/4 pattern’ observed in examples such as (38) and related languages (see notably Özyıldız 2012 for Turkish, and Akkuş 2019 for Mush Kurdish and Mutki Zazaki) could be analyzed as an instance of the famous Dahl’s puzzle involving sloppy readings (Dahl, 1973):

- (48) John said that he likes his mother. Bill did (...) too.
- Bill did ⟨ say that J likes J’s mother ⟩ too.
 - Bill did ⟨ say that B likes B’s mother ⟩ too.
 - Bill did ⟨ say that B likes J’s mother ⟩ too.
 - #Bill did ⟨ say that J likes B’s mother ⟩ too.

If this is so, then one could argue that *shift together* is not a specific constraint pertaining to indexical shifting, but rather, a general constraint on pronominal anaphora; therefore, any account of the latter, such as Fox (2000)’s *Rule H*, could in principle account for the former. See Tyler (2015) for a proposal along these lines for Turkish.

against. This makes sense intuitively, since both author-logophoric pronouns and 1st-person shifted indexicals each refer to the author of a context that must not be the actual context of utterance (Schlenker, 2003); what follows is a particular implementation of this idea.

4.1 The morphosemantics of person

The core of the proposal lies in the lexical entries assumed for the pronouns in the relevant systems. On the grammatical side, we assume that pronouns are endowed with a dedicated set of features taken to be universal across languages (Corbett, 2006), consisting of *person*, *gender* and *number*. These features are uniformly interpreted as presuppositions restricting the range of possible referents the pronouns denote (Cooper 1979; Sauerland 2008b; Heim 2008). I will thereon focus on person features, assuming that the present proposal can be applied, *ceteris paribus*, to gender and number as well. Following a number of recent proposals (Sauerland 2003, 2008b, McGinnis 2005, Bobaljik 2008, Harbour 2016, Sauerland and Bobaljik 2022), I take the features in (49) to be universally active across languages (where 1, 2, 3 stand for the respective persons); those features are given the partial semantics denotations in (50). In line with most current research in the semantics of person (Cooper 1983; Heim 2008; Sauerland 2008b; Stokke 2010; Sudo 2012; Charnavel 2019, Sauerland and Bobaljik 2022 a.o.), I take person features to be interpreted as presuppositions, i.e. partial functions of type $\langle e, e \rangle$ restricting the domain of interpretation of the expression they are associated with (the pronoun itself being treated as a variable, cf. Heim and Kratzer 1998); since 3rd person pronouns are devoid of person features, no entry is associated with them.

- (49) a. 1: [AUTHOR]
 b. 2: [PART]
 c. 3: []

- (50) a. $\llbracket \text{AUTHOR} \rrbracket^{g,c,i} = \lambda x : s(c) \sqsubseteq x.x$
 b. $\llbracket \text{PART} \rrbracket^{g,c,i} = \lambda x : s(c) \sqsubseteq x \vee a(c) \sqsubseteq x.x$

The PART feature denotes a function from individuals to individuals that has to include or be equal to the speaker or addressee, while the AUTHOR feature has to include or be equal to the speaker exclusively. The inclusion relation \sqsubseteq is motivated by the fact that these entries can be pluralized when combined with number features, cf. Sauerland and Bobaljik (2022). On this particular view, person features form a scale, based on semantic markedness (Sauerland, 2008b); each feature in the scale is entailed by the features above it. As a consequence, the scale assumes that the 3rd person is an elsewhere (or default) form, being the most unmarked person category across languages (an early proponent of this approach being Benveniste 1966)¹¹. Crucial for our purposes is that the meaning of the AUTHOR feature be a subset of the PART feature; this asymmetry derives a

¹¹ Contrary to other person inventories, such as those found in Zwicky (1977), Noyer (1997) or Harley and Ritter (2002), we posit no privative [+ HEARER] feature for the 2nd person. This is a way to address Zwicky's 1977 observation that person inventories of the form 1 | 1+2, 2 | 3, in which the inclusive first person is conflated with second person in the morphology, are unattested across languages (see Harbour 2016: 71 *sqq.*, as well as Sauerland and Bobaljik 2022 for discussion).

non-monotonic scale on which a mechanism of strengthening takes place; being of equal complexity, the feature AUTH is an alternative of PART in the sense of [Katzir \(2007\)](#), and can therefore be fed to a competition algorithm in order to derive the correct distributional patterns observed (see §4.4).

Turning now to the semantics of features, two points are in order. Following the standard treatment of indexical expressions stemming from [Kaplan \(1977\)](#), I am assuming a double-indexing system where the interpretation function is relativized here to an assignment function g , an index i and a context c . The index is standardly assumed to capture the sensitivity of expressions to modal and temporal operators, while the context parameter is needed to account for the meaning of indexical expressions. A less standard assumption of the proposed system is that, as noted by [Heim \(2008\)](#), the indexical meaning usually attributed to first and second person *pronouns* in standard theories stemming from [Kaplan \(1977\)](#) is not assumed here: in our system, the 1st and 2nd *person features* are treated as indexical partial functions, on a par with other features such as number and gender ([Cooper 1983](#); see also [Stokke 2010](#)) for discussion. A consequence of such a treatment of person features is that their meaning aligns with the one conferred to other features, i.e., partial identity functions from indices on variables to individuals, interpreted by the following rule:

- (51) **Pronouns and trace rule** [[Heim and Kratzer 1998](#), [Heim 2008](#)]
 If α is a pronoun or a trace, n is a pronominal index, g an assignment, i and c contexts, then
- a. $\alpha_n \in \text{dom}(\llbracket \cdot \rrbracket^{g,c,i})$ iff $n \in \text{dom}(g)$;
 - b. If $\alpha_n \in \text{dom}(\llbracket \cdot \rrbracket^{g,c,i})$, then $\llbracket \alpha \rrbracket^{g,c,i} = g(n)$.

This, among other benefits, provides a uniform semantics for all features, treating them as presuppositions restricting the domain of individuals that the assignment function can select. The resulting semantics for pronouns in a language such as English is the following:

- (52) a. $I_n \in \text{dom}(\llbracket \cdot \rrbracket^{g,c,i})$ iff $\left\{ \begin{array}{l} n \in \text{dom}(g) \\ s(c) \sqsubseteq g(n) \end{array} \right\}$. If so, then $\llbracket I_n \rrbracket^{g,c,i} = g(n)$.
- b. $\text{you}_n \in \text{dom}(\llbracket \cdot \rrbracket^{g,c,i})$ iff $\left\{ \begin{array}{l} n \in \text{dom}(g) \\ s(c) \sqsubseteq g(n) \vee a(c) \sqsubseteq g(n) \end{array} \right\}$. If so, then $\llbracket \text{you}_n \rrbracket^{g,c,i} = g(n)$.
- c. $\text{he/she/it}_n \in \text{dom}(\llbracket \cdot \rrbracket^{g,c,i})$ iff $n \in \text{dom}(g)$. If so, then $\llbracket \text{he/she/it}_n \rrbracket^{g,c,i} = g(n)$.

4.2 Basic setup and the structure of pronouns

Assuming such an inventory, how should LP and IS-systems be accounted for? In the previous section, we saw that the two phenomena display a sufficiently similar distributional profile to be accounted for in a theoretically uniform way. The present proposal is a step towards achieving precisely this. Informally, our proposal follows early insights by [Schlenker \(1999, 2003, 2004\)](#) who proposes to treat LPs as first person pronouns that are lexically specified to refer to authors of a non-actual context.

In the present system, indexical pronouns are not atomic entities, but the spellout of complex structures consisting of various elements. Similarly to [Schlenker 2003](#), I assume an extensional system in which context pronouns are represented in the syntax, and in which attitude verbs that are able to host LPs/SIs are quantifier over contexts of type $\langle k, \langle k, t \rangle \rangle$. Not all attitude predicates, however, are context binders: in order to capture the variation regarding the licensers of shifted indexicals/logophoric pronouns discussed in §2.1, we must allow for parametric variation in the quantificational power of attitude predicates. Allowing any verb to quantify over the whole set of index parameters would obviously give us wrong results, predicting constructions involving modals, for instance, to be able to host LPs/SIs in the languages at stake, contrary to fact. Following the proposal of [Schlenker \(2011\)](#), we posit accessibility restrictions directly within the lexical entries of verbs themselves (i.e., in the kind of abstractor they are able to introduce). We will therefore adopt the monstrous semantics outlined in (43) for attitude verbs that license either SIs/LPs in their complements:

$$(43) \quad \llbracket \text{say } c_i \phi \rrbracket^{g,c} = \lambda x. \lambda w. \forall c' \text{ compatible with what } x \text{ says in } w : \llbracket \phi \rrbracket^{g[c_i \rightarrow c']}$$

However, as per the hierarchies mentioned in §2.1, we saw that a verb such as *think* in the languages Aghem and Zazaki does not allow for LPs/SIs in their complements. We should therefore assume a simple Hintikka semantics for these verbs, quantifying over worlds only and therefore, unable to bind LPs/SIs:

$$(53) \quad \llbracket \text{think } w_i \phi \rrbracket^{g,c} = \lambda x. \lambda w. \forall w' \text{ compatible with what } x \text{ thinks in } w : \llbracket \phi \rrbracket^{g[w_i \rightarrow w']}$$

The pronouns themselves are complex structures. Pronominal indices combine with a context pronoun c of type k which, in turn, combine with any of the person features exposed in (49). Pronominal indices are of type $\langle k, e \rangle$, that is, individual concepts of sorts ([Von Stechow and Heim, 2011](#)). This straightforwardly allows us to derive the *de se* semantics associated with such pronouns, discussed in §2.5: pronouns here denote functions from context-worlds to individuals, and the pronominal index will only be in the domain of our assignment function g if it includes a context-world variable as well. This allows us to correctly rule out *de re* co-reference, as desired.

4.3 The feature [ACTUAL]

The main difference between LP/SI systems and English-like systems is that, in the latter, first and second person forms consist in a person feature augmented with an ACTUAL feature, which is the main theoretical innovation of the present proposal. The ACTUAL feature is not a person feature *per se* but, as its name indicates, an indexical feature that restricts the evaluation of the person feature it attaches to to the actual context of utterance. The ACTUAL feature (of type $\langle k, k \rangle$) ensures that the referent of the variable is included or equals a participant coordinate (author or addressee) of the actual context. It takes a contextual pronoun c_i and identifies it with the context of utterance, c^* (which, following [Schlenker 2003](#), we endow with an asterisk to mark its special status):

$$(54) \quad \textbf{The ACTUAL feature}$$

$$\llbracket \text{ACTUAL} \rrbracket^g = \lambda c : c_i = c^*.c_i$$

In light of this, consider English-like systems first, in which first and second person pronouns are not shiftable. The first person pronoun in English will have the following structure, consisting of the pronoun and its numeral index, the ACTUAL feature, and the AUTHOR person feature. Application of ACTUAL ensures that the context variable denotes the utterance context¹².

(55) **Structure of English first person**

$$[[[[[pro_5 c^*] ACTUAL] AUTHOR] = I$$

- (56) a. $[[pro_5]]^g = \lambda c.g(5)(c)$ pronominal index (type $\langle k, e \rangle$)
 b. $[[c_i]]^g = g(c_i)$ context pronoun (type k)
 c. $[[ACTUAL]]^g = \lambda c : c_i = c^*.c$ ACTUAL feature (type $\langle k, k \rangle$)
 d. $[[AUTHOR]]^g = \lambda c.\lambda x : s(c) \sqsubseteq x.x$ person feature (type $\langle e, e \rangle$)

- (57) a. $[[pro_5]]^g([[c_i]]^g) = g(5)(g(c_i))$
 b. $[[[pro_5 c_i]]]^g([[ACTUAL]]^g) = g(5)(g(c^*))$
 c. $[[[[[pro_5 c^*] ACTUAL]]]^g([[AUTHOR]]^g) = g(5)(g(c^*))$ iff $\left\{ \begin{array}{l} s(c^*) \sqsubseteq g(5)(g(c^*)) \\ \# \text{ otherwise} \end{array} \right\}$.

The final entry of the English first person is the following:

$$(58) \quad [I_5 c^*] \in \text{dom}([[\cdot]]^g) \text{ iff } \left\{ \begin{array}{l} 5 \in \text{dom}(g) \\ s(c^*) \sqsubseteq g(5)(g(c^*)) \end{array} \right\}. \text{ If so, then } [[I_5 c^*]]^g = g(5)(g(c^*)).$$

This yields a ‘genuine’ first person indexical, which can only be felicitously used if the value assigned by g to its index and that of the contextual variable c^* includes the speaker of c^* , the actual speaker.

4.3.1 Logophoric systems

Logophoric systems share a common basis with English-like systems, with the important difference that in addition to ‘genuine’ first person forms, they also make available one (or more; see §5) additional logophoric pronoun which is devoid of the ACTUAL feature; as a consequence, its context pronoun is not required to be identified with the context of utterance, and is able to be bound by the attitude verb. A logophoric pronoun is therefore a first person that is devoid of an ACTUAL feature.

(59) **Structure of a speaker logophor**

$$[[[[[pro_2 c_i] AUTHOR] = LOG$$

¹² For readability, we endow context variables with alphabetical indexes $i, j, k...$ and pronouns with numerical indexes. However, this is just a notational variant, and bears no consequence on the ontology of indexes assumed here.

- (60) a. $\llbracket pro_2 \rrbracket^g = \lambda c. g(5)(c)$ pronominal index (type $\langle k, e \rangle$)
 b. $\llbracket c_i \rrbracket^g = g(c_i)$ context pronoun (type k)
 c. $\llbracket AUTHOR \rrbracket^g = \lambda c. \lambda x : s(c) \sqsubseteq x.x$ person feature (type $\langle e, e \rangle$)

- (61) a. $\llbracket pro_2 \rrbracket^g(\llbracket c_i \rrbracket^g) = g(2)(g(c_i))$
 b. $\llbracket [pro_2 c_i] \rrbracket^g(\llbracket AUTHOR \rrbracket^g) = g(2)(g(c_i))$ iff $\left\{ \begin{array}{l} s(c_i) \sqsubseteq g(2)(g(c_i)) \\ \# \text{ otherwise} \end{array} \right\}$.

- (62) $[\text{LOG}_2 c_i] \in \text{dom}(\llbracket \cdot \rrbracket^g)$ iff $\left\{ \begin{array}{l} 2 \in \text{dom}(g) \\ s(c_i) \sqsubseteq g(2)(g(c_i)) \end{array} \right\}$. If so, then $\llbracket [\text{LOG}_2 c_i] \rrbracket^g = g(2)(g(c_i))$.

An advantage of this system is that features can be combined to yield complex pronominal entries: featural combination is therefore parametric, and varies across languages (see below). As an illustration, take a language like Wan (Niger-Congo), which has first person logophors in its lexicon. We assume that the features in (63) are active in Wan, and are interpreted as in (64):

(63) **Featural system of languages with 1st person LP**

- a. $I_5 = \llbracket [pro_5 c^*] \text{ACTUAL} \rrbracket \text{AUTHOR}$
 b. $\text{LOG}_4 = \llbracket [pro_4 c_i] \text{AUTHOR} \rrbracket$
 c. $\text{you}_2 = \llbracket [pro_2 c_i] \text{PART} \rrbracket$
 d. $\text{it}_7 = pro_7$

- (64) a. $[I_5 c^*] \in \text{dom}(\llbracket \cdot \rrbracket^g)$ iff $\left\{ \begin{array}{l} 5 \in \text{dom}(g) \\ s(c^*) \sqsubseteq g(5)(g(c^*)) \end{array} \right\}$. If so, then $\llbracket [I_5 c^*] \rrbracket^g = g(5)(g(c^*))$.
 b. $[\text{LOG}_4 c_i] \in \text{dom}(\llbracket \cdot \rrbracket^g)$ iff $\left\{ \begin{array}{l} 4 \in \text{dom}(g) \\ s(c_i) \sqsubseteq g(4)(g(c_i)) \end{array} \right\}$. If so, then $\llbracket [\text{LOG}_4 c_i] \rrbracket^g = g(4)(g(c_i))$.
 c. $[\text{you}_2 c_i] \in \text{dom}(\llbracket \cdot \rrbracket^g)$ iff $\left\{ \begin{array}{l} 2 \in \text{dom}(g) \\ s(c_i) \sqsubseteq g(2)(g(c_i)) \vee a(c_i) \sqsubseteq g(2)(g(c_i)) \end{array} \right\}$. If so, then $\llbracket [\text{you}_2] \rrbracket^g = g(2)(g(c_i))$.
 d. $\text{it}_7 \in \text{dom}(\llbracket \cdot \rrbracket^g)$ iff $7 \in \text{dom}(g)$. If so, then $\llbracket [\text{it}_7] \rrbracket^g = g(7)$.

Note that these entries are organized hierarchically, both in terms of *complexity* (each structure is strictly more complex than the former) and in terms of semantic strength (they entail each other from the bottom up). This will prove important to derive the correct anaphoric patterns observed so far, as well as the disjointness inferences mentioned in §2.6. Wan has therefore a *bona fide* first person indexical, which always denote the actual speaker; it also has a speaker logophor with a very similar semantics, save from the ACTUAL feature. As a consequence, its reference will not be constrained by the indexical

presupposition induced by this feature, and the context pronoun within it will be able to be bound by the attitude verb, denoting the speaker of the reported context, as desired.

A direct consequence of our theory is that LOG forms are, at their core, first- (and/or second-)personal elements (something already hinted at in [Schlenker 1999](#)). The first-personal nature of LPs as an hypothesis to explain their distribution and evolution is not new ([Westermann 1907](#); [Clements 1975](#)); it was invoked notably by [Faltz \(1985\)](#) to explain, among other things, the fact that in the Anlo dialect of Ewe, the first person form *ye* is used both as the first-person logophor and as the first person singular genitive clitic in matrix clauses ([Faltz 1985](#); pp. 261 *sqq*), suggesting a common first-personal origin. Such an hypothesis makes a number of welcome predictions, some of which will be discussed in the next sections. Note also that this contrasts with what has been proposed in most formal accounts of logophors, ([von Stechow 2002, 2003](#), and more recently [Bimpeh et al. 2022, 2023](#)), which all assume that logophoric pronouns are third person pronouns specified with a stipulative LOG feature ([Bimpeh et al. 2023](#)'s account is discussed in more detail in §5.5).

4.3.2 Shiftable indexicals systems

Consider now languages with SIs. According to the present theory, they make use of the exact same set of person features as logophoric languages, with the difference that no ACTUAL feature has grammaticalized: consequently, first and second person forms are always contextually unspecified, being free to be bound either by the matrix context-binder, or to the binder introduced by the attitude verb.

(65) Featural system of languages with shiftable indexicals

- a. $I_4 = [[pro_4 c_i] \text{ AUTHOR}]$
- b. $you_2 = [[pro_2 c_i] \text{ PART}]$
- c. $it_7 = pro_7$

- (66) a. $[I_4 c_i] \in dom(\llbracket \cdot \rrbracket^g)$ iff $\left\{ \begin{array}{l} 4 \in dom(g) \\ s(c_i) \sqsubseteq g(4)(g(c_i)) \end{array} \right\}$. If so, then $\llbracket [LOG_4 c_i] \rrbracket^g = g(4)(g(c_i))$.
- b. $[you_2 c_i] \in dom(\llbracket \cdot \rrbracket^g)$ iff $\left\{ \begin{array}{l} 2 \in dom(g) \\ s(c_i) \sqsubseteq g(2)(g(c_i)) \vee a(c_i) \sqsubseteq g(2)(g(c_i)) \end{array} \right\}$. If so, then $\llbracket [you_2] \rrbracket^g = g(2)(g(c_i))$.
- c. $it_7 \in dom(\llbracket \cdot \rrbracket^g)$ iff $7 \in dom(g)$. If so, then $\llbracket [it_7] \rrbracket^g = g(7)$.

In the present theory, shiftable first (and second) person forms have exactly the same morphosemantic makeup as logophors: crucially, LP-systems differ from IS-systems in that in the former, the first person is the result of morphological spellout of a more complex bundle of features [ACTUAL, AUTHOR], stemming from the grammaticalization/lexicalization of the ACTUAL feature, leaving the logophoric pronoun specified only with AUTHOR.

The present theory makes a number of welcome predictions regarding indexical shifting. Of importance is that it predicts global optionality in shifting (just like in [Schlenker 2003](#)), since every person-specified element will always be able to obtain its reference via the matrix context pronoun, or the embedded one. We take this to be a welcome result,

considering that indexical shift is by and large an optional phenomenon (cf. Sundaresan 2018). Second, by parametrizing which indexicals can shift in a given language and which verbs can bind context pronouns in their complements, we are able to capture the various patterns of variation introduced above, while preserving our main empirical insight - that LPs and SIs share a common first-personal morphological and semantic basis.

4.4 Featural presupposition maximization

The present analysis allows us to straightforwardly capture the disjointness effects mentioned in §2.6 in terms of anti-presuppositions over person features, triggered by the use of a 3rd person form in shifted contexts. Laid out in informal, Gricean terms, the idea is quite simple: when reporting what someone said, a speaker s of a logophoric/indexical shifting language L is expected to use a first-person form whenever the reported speaker (the subject of the matrix clause) co-refers with the subject of the embedded clause. If the speaker uses a 3rd person form instead, then she antipresupposes that both forms do not co-refer, so their referents must be distinct individuals or distinct *centers*, i.e. world-individual pairs.

As first observed by Heim (1991) and in a parallel fashion by Hawkins (1991), some utterances involving presupposition triggers seem to be infelicitous in contexts where the truth of a presuppositionally stronger element is entailed, i.e. where the presuppositionally stronger element is common ground:

- (67) a. The moon is bright.
 b. #A moon is bright.

The definite in (67a) presupposes that earth has only one moon, which is satisfied in the utterance context; consequently, uttering (67b) will be perceived as odd if uttered in a context in which it is common ground that there is only one moon. Heim (1991) convincingly argues that this kind of inferences cannot readily be analyzed as scalar implicatures, because both pairs are equally informative in the given context. She proposes the pragmatic principle *Maximize Presupposition!* to account for the fact that cooperative speakers tend to prefer more informative presuppositional alternatives over their less-informative counterparts. This principle is stated in (68):

- (68) **Maximize Presupposition! (standard version; to be revised)**
 Do not use ϕ in context C ¹³ if there is a $\psi \in \text{ALT}(\phi)$ s.t.
- a. the presuppositions of ψ and ϕ are satisfied within C ;
 - b. $\llbracket \psi \rrbracket^C = \llbracket \phi \rrbracket^C$, and
 - c. the presupposition of ψ (ψ_π) asymmetrically entails the presupposition of ϕ (ϕ_π).

Taken as a pragmatic filtering condition on utterances, the principle states that, given a presuppositional element ϕ that has a set of alternatives $\text{ALT}(\phi)$, speakers should prefer

¹³ In what follows, following standard usage, I use capital C here to denote the stalnakerian context set (Stalnaker, 1974), that is, the set of all possible worlds compatible with the *common ground*, that is, the set of all possible propositions compatible with what the interlocutors in a conversation believe/take for granted and not subject for further discussion. This is to be contrasted with the Kaplanian context c used so far.

to use any member of that set ψ if it is (i) presuppositionally stronger, and (ii) true in the context of utterance. If a competent and cooperative speaker were to utter ϕ under those conditions, then the hearer would consistently infer that she did not utter the presuppositionally stronger ψ on purpose, and that the speaker does not know whether ψ is the case or not: in other words, the utterance of ϕ would give rise to an *antipresupposition* (Percus, 2006). It is commonly accepted that this inference is eventually strengthened somehow, leading the hearer to infer that the speaker does not believe ψ to be true (Spector 2003; Sauerland 2004b, 2004a; Chemla 2008 i.a.).

Now, if *MP!* is a general principle guiding speakers and hearers alike in the interpretation of presuppositions, and if person features are presupposition triggers, we should expect to observe *MP!*-related effects in the pronominal domain as well. This is indeed the case. Consider the following example:

(69) *Context: John is speaking to Mary.*

- a. #John is happy.
- b. I am happy.
- c. #Mary is happy.
- d. You are happy.

(adapted from Schlenker 2005: (18))

While in that context, both *John* and *I* refer to the speaker, and *Mary* and *you* to the addressee, sentences involving proper names instead of indexicals are perceived as deviant. As previously argued by Schlenker (2005) and Marty (2017), if uttered in a context where John is the speaker and Mary is the addressee, sentences (69a) and (69c) will be perceived as odd because in that context, indexicals *I* and *you* are favored by *MP!* over the proper name DPs if they are meant to refer to the same individual.

The same principle applies to pronouns, as (70) show:

(70) *Context: John is the speaker and $g(3) = \text{John}$.*

- #He₃ is happy.

Here, the pronoun *he*, via *MP!*, triggers the antipresupposition that the referent to which the assignment function g maps the index 3 does not include either the speaker $s(c)$ or the addressee $a(c)$ (which is the meaning of PART), and that, similarly, $g(3)$ does not include $s(c)$ (the meaning of AUTHOR). This is illustrated in (72), where ALT_π denotes the set of presuppositional alternatives of a given element:

- (71) a. 1: $\llbracket \text{I}_1 c^* \rrbracket^g = s(c^*) \sqsubseteq g(1)(g(c^*))$
 b. 2: $\llbracket \text{you}_2 c^* \rrbracket^g = s(c^*) \sqsubseteq g(2)(g(c^*)) \vee a(c^*) \sqsubseteq g(2)(g(c^*))$
 c. 3: $\llbracket \text{he}_3 c^* \rrbracket^g = g(3)$

- (72) a. $\text{ALT}_\pi(\llbracket \text{he}_3 c^* \rrbracket^g) = \left\{ \begin{array}{l} s(c^*) \sqsubseteq g(2)(g(c^*)), \\ s(c^*) \sqsubseteq g(2)(g(c^*)) \vee a(c^*) \sqsubseteq g(2)(g(c^*)) \end{array} \right\}$
 b. \leadsto the referent of $g(2)(g(c^*))$ is neither $s(c^*)$ or $a(c^*)$.
 c. \leadsto the referent of $g(2)(g(c^*))$ and John must be distinct individuals.

That the inferences in (72) are genuine antipresuppositions (i.e., inferences derived from the non-use of presuppositional elements in a given context) is verified by the fact that they do not project in universally-quantified sentences, as other antipresuppositions do (Sauerland, 2008a); just as in (73a), the presupposition of the plural feature associated with *his sisters* is compatible with one of the students having only one sister, in (73b) the presupposition associated with the person feature of *he* is compatible with an interpretation in which the denotation of *every assistant* includes the speaker.

- (73) a. Every student_i should invite his_i sisters (and therefore, John_i should invite his_i sister). [Sauerland 2008a; (31b)]
 b. Every assistant_i likes when he_i is done writing a chapter (including me_i).

4.5 Deriving disjointness inferences under attitudes

Recall that, when used, LPs or SIs cannot pick up a referent distinct from the reported speaker. However, when a regular, third person pronoun is used in the same environment, a disjointness inference arises, and the third person has to be interpreted as distinct from the reported speaker.

- (30) a. Nnsini dze enyia é bvũ nù [Aghem, Butler 2009: (10-11)]
 Nsen say COMP LOG fall FOC
 ‘Nsen_i said that she_i fell’
 b. Nnsini dze enyia ù bvũ nù
 Nsen say COMP 3SG fall FOC
 ‘Nsen_i said that she_{*i/j} fell’

In our terms, disjointness obtains here because the choice of (30b) over its logically stronger counterpart (30a) triggers an antipresupposition about its referent: that *Nsen* refers neither to the author nor to the addressee of either contexts. The alternatives of the third person pronouns are all these pronominal forms, the denotations of which are entailed by those of the second and first person pronouns, but not vice versa. By *MP!*, these alternatives are excluded from the anaphoric pattern: *ù*, if used, has to denote an individual that is not a participant in the reported context.

$$(74) \text{ ALT}_\pi(\llbracket \dot{u}_n c_i \rrbracket^g) = \left\{ \begin{array}{l} s(c_i) \sqsubseteq g(n)(g(c_i)), \\ s(c_i) \sqsubseteq g(n)(g(c_i)) \vee a(c_i) \sqsubseteq g(n)(g(c_i)). \end{array} \right\}$$

Since we are interested in the kind of inferences triggered in attitude reports environments, we will need to give an account of person presupposition projection in complex sentences. Following Heim (1992), I will consider that sentences of the form *x believes that p* have to be analyzed as context updates relativized to doxastic alternatives (Hintikka, 1969), and sentences of the form *x says that p* as updates relativized to SAY-compatible alternatives. Thus, a sentence like

- (75) Nsen₅ said that 3SG₅ fell.

Will be analyzed as involving an attitude verb *say* quantifying over *say*-alternatives of Nsen; upon asserting (75), the common ground *CG* will be updated with the context-worlds compatible with those in which Nsen said that she fell, provided that *Nsen* and *she* are co-referential (76a) and triggering the antipresupposition in (76b).

- (76) a. For any common ground *CG*, $CG + Nsen_5 \text{ said that } she_5 \text{ fell} = \{c \in CG : \forall c' \in \text{SAY}(N, w(c^*)), g(5)(g(c')) \text{ fell in } c'\}$.
- b. **Antipresupposition of (75) (with epistemic step):**
 $\rightsquigarrow CG - [\forall c' \in \text{SAY}(N, w(c^*)) [s(c') \sqsubseteq g(5)(g(c')) \wedge a(c') \sqsubseteq g(5)(g(c'))]]$.
 \rightsquigarrow it is common ground that $g(5)(g(c'))$ is not a participant in the reported context.

The antipresupposition here forces participants to derive a disjointness inference that excludes reference to participants of the reported context when a 3SGform is used. The analogous inference observed in SI-systems can be accounted for in the same fashion.

The principle of *MP!* in (68) needs to be refined, however, because we ultimately want the presuppositions of pronouns to be computed not only against the set of the *actual* context and common ground, but the set of possible contexts that the attitude verb quantifies over. Here we follow a suggestion by Stalnaker (2014) to understand the common ground not merely as a set of possible worlds, but as a set of K(aplanian)-contexts - that is, centered worlds containing time and place parameters as well. The relevant competition mechanism for antipresuppositions should be adjusted in order to refer to this augmented notion of common ground, the set of all possible K-contexts κ :

- (77) **Maximize presupposition! (relativized to possible contexts)**
Do not use ϕ with respect to the current common ground *C* and assignment *g* if $\exists \psi \in \text{ALT}(\phi)$ such that
- $\forall c \in C, \phi \in \text{dom}(\llbracket \cdot \rrbracket^{g,c,C})$ and $\psi \in \text{dom}(\llbracket \cdot \rrbracket^{g,c,C})$
 - $\forall c \in C, \llbracket \phi \rrbracket^{g,c,C} = \llbracket \psi \rrbracket^{g,c,C}$, and
 - $\forall c \in \kappa$, if $\psi \in \text{dom}(\llbracket \cdot \rrbracket^{g,c,C})$, then $\phi \in \text{dom}(\llbracket \cdot \rrbracket^{g,c,C})$, but not the other way around.

This revised statement of *MP!* allows us to enforce competition among alternative utterances with different presuppositional strengths across possible contexts κ , thought of the set of possible contexts *c*: for two alternatives ϕ and ψ , using ϕ over ψ will be infelicitous if i) both have their respective presuppositions satisfied in *C*, ii) both are denotationally equivalent, and iii) the presuppositions of ψ asymmetrically entails the presuppositions of ϕ across every possible context $c \in \kappa$.

5 Further predictions

5.1 First person blocking

As initially noted by Hyman and Comrie (1981) for Gokana, logophoric pronouns generally cannot take 1st person pronouns as antecedents. In other words, for a given speech report, when the reported and current speaker are one and the same individual, a logophor cannot be used.¹⁴ We refer to this as the *1-LOG pattern:

¹⁴ Hyman and Comrie (1981) make a less stronger claim, stating only that (78a) is preferred over (78b).

- (78) a. mm kɔ mm dɔ
 1SG said 1SG fell
 ‘I_i said I_i fell’
 b. #mm kɔ mm dɔ-ɛ
 1SG said 1SG fell-LOG
 ‘I_i said I_i fell’ [Gokana, Hyman and Comrie 1981: (11)]

- (79) a. Kofí ŋa bə yi lɔ Áma
 Kofi know COMP LOG love Ama
 ‘Kofi_i knows that he_{i/*j} loves Ama’
 b. #ŋə ŋa bə yi lɔ Áma
 1SG know COMP LOG love Ama
 Intended: ‘I_i know that I_i love Ama’
 [Danyi Ewe (Niger-Congo, Togo); O’Neill 2015: (3a, c)]

A similar pattern can be found in Wan (Niger-Congo, Ivory Coast; Nikitina 2012a), various varieties of Ewe (Pearson 2015, Bimpeh 2019), as well as Ibibio (Niger-Congo, Southern Nigeria; Newkirk 2017). This is correctly predicted by the antipresupposition account, given the asymmetrical hierarchy of features posited in (63): in cases in which the antecedent is first person and refers to the current speaker, a first person must be used in the embedded sentence, on pains of triggering the disjointness inference in (81) (in which ‘ $\sim^{\#}$ ’ indicates that the resulting inference is irremediably odd in that context):

- (80) a. #I₃ know that LOG₃ love Ama.
 b. $ALT_{\pi}(LOG_3) = s(c^*) \sqsubseteq g(3)(g(c'))$

(81) **Antipresupposition of (80) (with epistemic step):**

- a. $\sim^{\#} CG_{-}[\forall c' \in SAY(s(c^*), w(c^*)) [s(c^*) \sqsubseteq g(3)(g(c'))]]$.
 b. $\sim^{\#} g(3)(g(c'))$ is not the actual speaker.

Since the feature set of the first person asymmetrically entails that of LOG, any utterance of LOG in a context such as that of (80) where $g(3)(g(c')) = s(c^*)$ will trigger the inference in (81) and therefore be perceived as deviant; as a consequence, LOG cannot be used here. Note that this kind of blocking actually provides evidence that the computation of anaphoric patterns seem to be guided solely by a blind mechanism of competition between elements of distinct presuppositional strength (Heim 1991; Magri 2009, 2011), and not by general requirements of informativity: if that were the case, in a context where the referents of both 1 and LOG were intended to refer to the same individual, we should not predict the disjointness inference to go through in case LOG is used, contrary to fact.

5.2 Second person antecedents

Another interesting typological fact that our theory can derive concerns the use of 2nd person in both SI- and LP-systems. Both exhibit in some languages a special case of

‘person neutralization’ between third and second person; as a consequence, LPs/SIs can take second person antecedents as well as third, with singular and plural number features alike. As already discussed, first person antecedence is excluded:

- (82) a. là gé fà súglù é lo
 2SG said LOG.SG Manioc DEF ate
 ‘You_i said you_i had eaten the manioc.’
 b. à gé mɔ kú má
 2PL said LOG.PL house EQUAT
 ‘You_i said it was your_i house.’ [Wan, Nikitina 2012a: (5a, b)]

Similarly, in the language Golin (Chimbu, Papua New Guinea), a shifty first person is used to refer to the reported author when referred to with a second person pronoun in the matrix clause:

- (83) i [maul wo-y-a di] pri-n-g-e
 2 hole motion-1SG-DIST perceive-2-AS-PROX
 ‘You_i think you_i dug the hole.’
 (84) i [yal ire na si-m-u-a] di-n-g-e
 2 man TOP.PROX 1SG strike-3-REP-DIST say-2-AS-PROX
 ‘You_i say someone hit you_i.’ [Golin, Loughnane 2005: (35)-(36)]

The phenomenon is actually broader, extending to various other reference-tracking systems, such as those found in the Sino-Tibetan languages Jingpho (Zu, 2018) and Newar (Coppock and Wechsler, 2018), as well as languages from the Himalayas, the Caucasus, the Andes, and Highlands New Guinea (San Roque et al., 2017). For instance, Newar possesses an affixal form of logophoric marking that attaches to the verb, and expresses co-reference with the reported author when used in embedded clauses. The form (glossed here as EGO, following Coppock and Wechsler 2018), can take both third or second person antecedents, just as the African logophoric varieties discussed above:¹⁵

- (85) Chā: cha bwe wan-ā dhakà: dhàl-a
 2SG.ERG 2SG.ABS run.away-EGO-PST COMP say:PST
 ‘You_i said that you_i ran away’
 [Kathmandu Newar, Coppock and Wechsler 2018: (11)]

On the present account, the above patterns are correctly predicted: it is expected that a sentence where the author of the embedded speech event is referred to using a 2nd person pronoun will be infelicitous, regardless of what his discourse status in the actual context is; a SI/LP should be used instead because it is presuppositionally stronger - which is just what we observe. The generalization is the following: if a language *L* realizes the AUTHOR feature on a morphologically distinctive element in the pronominal paradigm, then this element has to be used whenever co-reference with the reported speaker is intended:

¹⁵ Of importance here is the observation, however, that this type of affixal marking differ from the African logophoric type in that it also appears in matrix clauses. While both LOG-marking and LPs in the languages discussed here *can* have matrix uses (see the discussion in Nikitina 2012a), it is not their preferred distribution.

(86) **Author reference obtains whenever possible**

If L lexicalizes AUTHOR, then in configurations such as $[2SG_n \dots \text{say } [2SG_n \dots \phi]]$, then $\sim CG_{-}[\forall c' \in \text{SAY}(a(c^*), w(c^*)) [s(c^*) \sqsubseteq g(n)(g(c')) \wedge s(c') \sqsubseteq g(n)(g(c'))]]$.

This generalization can be accounted for as follows: the sentence (87a) has the alternatives in (87b); consequently, uttering (87a) will trigger the antipresupposition in (87c):

(87) a. #You₁ know that 2SG₁ love Ama.

b. $\text{ALT}_{\pi}(2SG_1) = \left\{ \begin{array}{l} s(c^*) \sqsubseteq g(1)(g(c')), \\ s(c') \sqsubseteq g(1)(g(c')) \end{array} \right\}$

c. **Antipresupposition of (87a) (with epistemic step):**

$\sim^{\#} CG_{-}[\forall c' \in \text{SAY}(a(c^*), w(c^*)) [s(c^*) \sqsubseteq g(1)(g(c')) \wedge s(c') \sqsubseteq g(1)(g(c'))]]$.

$\sim^{\#} g(1)(g(c'))$ is not a speaker in either contexts.

Since the actual addressee is co-referential with the reported speaker, a non-actual first person form must be used; using the second person would trigger the inference that both are disjoint in reference, contrary to fact.

5.3 Encoding of reported addressees

As mentioned in §2.2, both systems differ in the way they encode reference to reported addressees. A major locus of variation concerns the ability of second person to refer to reported addressees in addition to actual ones. For instance, Wan allows second person pronouns to refer to reported addressees:

(88) è gé zò fé là fà pólì
3SG said come then 2SG LOG.SG wash
'She_i said come and wash me_i.' [Wan, Nikitina 2012a: (18)]

Analogous patterns can be found for logophoric languages Aghem (Hyman and Watters 1979; Butler 2009), Mundang (Hagège, 1974), Engenni (Thomas, 1978), and Akoose (Hedinger, 1984) (all Niger-Congo). However, in some other languages, including Ewe and Donno So, second person marking always refer to actual addressees and cannot be used for reported addressees - third person must be used in that case. This is illustrated in (89)-(90):

(89) Be indvembe velaa uñ tembeliñ giya
3PL LOG.PL come 2SG.OBJ found.NEG.1PL said.3PL
'They_i said that they_i didn't find you when they_i came.'
[Culy 1994b: (6b), after Kervran and Prost 1986]

(90) Kofi gblɔ na wo bè yè-a-dyi ga-a na wo
Kofi speak to 3PL COMP LOG-T-see money-D for 3PL
'Kofi_i said to them_j that he_i would seek the money for them_j.'
[Nikitina 2012a: (23), after Clements 1975]

Again, a similar pattern can be observed in SI-systems. In the language Nez Perce (Penu-tian; U.S.A.), shifting of the 2nd person indexical 'ee is not allowed if the reported addressee is not identified as such by the reported speaker, Mary:

- (91) *Context: Mary is organizing a big dinner at a restaurant with waiters to help serve food. She hears that a certain waiter named John is being a nuisance. She tells the nearest waiter, ‘John should go home’. Unbeknownst to her, she’s talking to John.*¹⁶

#Meeli-nm pee-n-e Caan-e ’ee cikliitoq-o’qa
 Mary-ERG 3/3.say-PST-REM.PST John-ACC 2SG.CL go.home-MOD
 lit. ‘Mary told John_i that you_i should go home.’

[Nez Perce, Deal 2020: (121)]

This seems to suggest that, at least in those languages, pronominal paradigms differ with respect to which feature they lexicalize. More precisely, they differ in that the 2nd person pronoun also bears the ACTUAL feature, restricting its referent to the current speech act participants:

(92) **Featural system of LP systems with unshiftable second person**

- a. $I_5 = [[[pro_5 c^*] \text{ACTUAL}] \text{AUTHOR}]$
- b. $\text{LOG}_4 = [[pro_4 c_i] \text{AUTHOR}]$
- c. $\text{you}_2 = [[[pro_2 c^*] \text{ACTUAL}] \text{PART}]$
- d. $\text{he}_7 = pro_7$

(93) **Featural system of SI systems with unshiftable second person**

- a. $I_5 = [[pro_5 c_i] \text{AUTHOR}]$
- b. $\text{you}_2 = [[[pro_2 c^*] \text{ACTUAL}] \text{PART}]$
- c. $\text{he}_7 = pro_7$

As a consequence, languages with systems such as (92) possess two ‘genuine’ indexical forms with different person specifications, alongside a full-fledged LOG form, while languages with the paradigm in (93) have only one fully specified indexical, the 2nd person pronoun.

Conversely, if the feature ACTUAL is able to lexicalize on different persons, one should expect to find languages that have unshifty first person alongside shifty second person/second person logophors: although typologically rare, such languages are indeed attested. Goemai and Mupun (West Chadic, Nigeria), for instance, have LOG addressees:

- (94) k’wal yin gwa goe tu ji
 talk say SG.M.LOG.2 OBLIG kill SG.M.LOG.1
 ‘He_i said he_j should kill him_i’
 (lit. ‘He_i said you_j should kill me_i’)

[Goemai, Hellwig 2006: 219]

¹⁶ The example in (91) clearly illustrates the fact that what matters here is reference to centers/world-individual pairs, and not merely to individuals; as emphasized by Deal (2020), the sentence is judged felicitous under its *de re* reading. As discussed in §2.5, the same goes for the data at stake in this paper.

- (95) n-sat n-wur nə gwar ji
 1SG-say PREP-3SG COMP 2SG.LOG come
 ‘I told him_i that he_i should come’
 (lit. ‘I told him that 2SG.LOG should come.’)

[Mupun, [Frajzyngier 1997](#): (35)]

Since both Goemai and Mupun exhibit both classes of logophoric pronouns (first and second person), we can capture their paradigm with the following person hierarchy:

(96) **Featural system of languages with speaker and addressee logophors**

- a. $I_5 = [[[pro_5 c^*] \text{AUTHOR}] \text{ACTUAL}]$
- b. $\text{LOG.1}_4 = [[pro_4 c_i] \text{AUTHOR}]$
- c. $\text{you}_2 = [[[pro_2 c^*] \text{PART}] \text{ACTUAL}]$
- d. $\text{LOG.2}_7 = [[pro_7 c_i] \text{PART}]$
- e. $\text{he}_9 = pro_9$

Note that, in such a system, the second person logophoric form is the morphological spell-out of the PART feature, the most unspecified person feature: this correctly predicts that the second person indexical (which is endowed with both a PART and ACTUAL feature) can only be used in logophoric contexts to denote actual addressees, as example (97) confirms:

- (97) n-sat n-wur nə wur ji
 1SG-say PREP-3SG COMP 2SG come
 ‘I told him that you should come.’

[Mupun, [Frajzyngier 1997](#): (36)]

Last, one can find languages with LOG addressees, but no LOG authors. This is the case of West Chadic language Pero:

- (14) ca peemu ta kayu laa mu mijiba
 say.PST LOG.2SG FUT drive away man DEM stranger
 ‘[He] said that he_{a(i)} is going to drive the stranger away.’
 (lit. ‘[He] said that you_{a(i)} are going to drive the stranger away.’)

[[Frajzyngier 1985](#): (23b)]

The Pero pattern can be described using the following hierarchy:

(98) **Featural system of languages with addressee logophors only**

- a. $I_5 = [[[pro_5 c^*] \text{AUTHOR}] \text{ACTUAL}]$
- b. $\text{you}_2 = [[[pro_2 c^*] \text{PART}] \text{ACTUAL}]$
- c. $\text{LOG.2}_7 = [[pro_7 c_i] \text{PART}]$
- d. $\text{he}_9 = pro_9$

This last pattern is mirrored in IS-systems by languages that have shifty second person, but unshifty first person. such as Adioukrou and Obolo, in which second person pronouns can denote non-actual addressees, and first person are restricted to current speakers:

- (99) li dad wɛl nɛnɛ ɔny ùsr ir el
 3SG.F say.PST 3PL DEM 2SG build.IMP 3SG.OBJ house
 ‘She_i said to them_j you_j build her_i a house.’
 (lit. ‘She_i said to them_j you_j build me_i a house.’)
 [Adioukrou (Kwa; Ivory Coast), Hill 1995: (8)]

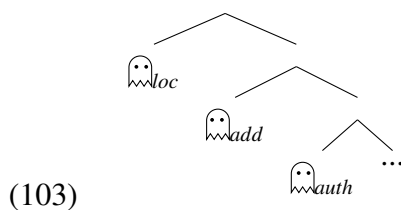
- (100) ògwú úgâ ókêkitó ító íkíbé gwúñ kãñ ɔmɔ ìkâtùmú
 DEM mother be crying.PST cry say child 3SG.POSS 3SG tell.PST.NEG
 ìnyí òwù yê íbé òwù kàgɔɔk ífit yì
 give 2SG INTR say 2SG follow.NEG play play
 ‘The mother_i was crying and said: "My_i child_j, did I_i not tell you_j not to join this dance group"?'
 (lit. ‘The mother_i was crying and said her_i child_j, did she_i not tell you_j not to join this dance group?’)

- (101) ògwú énrìèèñ òbê, òwù ‘nga kãñ ‘mgbɔ kèyí irè ‘mbùbàn,
 DEM man say.PST 2SG mother 3SG.POSS time DEM be curse
 tap nyî ɔmɔ
 put.IMP give.IMP 3SG
 ‘The man_i said "Mother_j, this time (even if) you_j curse me_i..."’
 (lit. ‘The man_i said his_i mother_j, this time (even if) you_j curse him_i...’)
 [Obolo (Niger-Congo; Cameroon and Nigeria), Aaron 1992: (22)-(23)]

The featural specification of the 2nd person in Adioukrou and Obolo is similar to that found in the system of Pero, with the exception that these languages do not lexicalize the element corresponding to AUTHOR only.

- (102) **Featural system of languages with unshifty first person + shifty second person**
 a. $I_5 = [[[pro_5 c^*] \text{AUTHOR}] \text{ACTUAL}]$
 b. $you_7 = [[pro_7 c_i] \text{PART}]$
 c. $it_9 = pro_9$

Interestingly, this last pattern is not predicted by current operator-based approaches to indexical shift. The system of Deal (2020), for instance, aims at accounting for the variation observed in IS-systems above by expanding the typology of $\hat{\omega}$ so as they come into different varieties, depending on the kind of context parameter they can shift. She adopts a ‘cartographic’ approach where each operator appears in a dedicated position within the functional sequence, which ultimately explains generalizations such as the hierarchy (13) mentioned in §2.2:



Lexical bundling is allowed between two adjacent operators within the hierarchy, but not between non-adjacent classes of $\hat{\omega}$ within the sequence. For instance, the entire sequence can be bundled together to form the primitive $\hat{\omega}$ that shifts all indexicals within its scope, (104a); similarly, $\hat{\omega}_{add}$ and $\hat{\omega}_{auth}$ can be bundled together to yield a $\hat{\omega}_{pers}$ that only shifts person indexicals, (104b). However, the system is designed so as to rule out any operator that would shift only the *addressee* while leaving the *author* coordinate untouched, as in (104d):

(104) **Varieties of shifty operators (Deal, 2020)**

- a. $[[\hat{\omega}\alpha]]^{g,c,i} = [[\alpha]]^{g,i}$ (attested in Matses)
- b. $[[\hat{\omega}_{pers}\alpha]]^{g,c,i} = [[\alpha]]^{g,<s(i),a(i),l(c),t(c)>,i}$ (attested in Uyghur)
- c. $[[\hat{\omega}_{auth}\alpha]]^{g,c,i} = [[\alpha]]^{g,<s(i),a(c),l(c),t(c)>,i}$ (attested in Slave)
- d. $*[[\hat{\omega}_{add}\alpha]]^{g,c,i} = [[\alpha]]^{g,<s(c),a(i),l(c),t(c)>,i}$ (unattested?)

However, the Adioukrou and Obolo data outlined above would precisely require an operator of this kind, allowing shifting of 2SG while leaving 1SG unaffected.

We will conclude this section by noting that the paradigms described in (98) and (102) are extremely rare, to be found only in languages pertaining to the Chadic branch (Nikitina, 2012b). This directly relates to the discussion concerning hierarchies of logophoric/shiftable elements outlined in §2.2 above: morphological encoding of reported addressees seems to be severely restricted, and no language seem to use a dedicated form for logophoric addressees while allowing the first person to be contextually unspecified - in the present terms, be devoid of an ACTUAL feature. In other words, the following featural pattern is unattested:

(105) **An unattested featural hierarchy**

- a. 1: [AUTHOR]
- b. 2: [PART, ACTUAL]
- c. LOG.2: [PART]
- d. 3: []

It therefore seems that the ACTUAL feature has to grammaticalize on the first person in order to grammaticalize further on the second person, although more diachronic data about the languages at stake is needed at this point.

All in all, the above data provides additional evidence for a compositional analysis of indexicals, in which their person specifications are not viewed as atomic but rather, complex tuples consisting of one or two person features augmented with an ACTUAL feature.

5.4 Actual speaker reference and the availability of inferences

Although they involve similar morphosemantic pieces of information, a major difference between LP- and SI-systems concerns the extent to which the disjointness inference discussed above is mandatory in the latter. We mentioned in various places (§3.2, 3.3, 4.3.2) that indexical shift is largely an optional phenomenon: although reference to the reported

speaker is usually preferred for embedded indexicals, speaker reference is in principle always possible. It is therefore legitimate to ask whether these languages behave uniformly with respect to disjointness inferences, since they convey attitude reports through ambiguous structures. We therefore expect to find IS-systems in which the use of a 3rd person pronoun *in lieu* of an indexical does *not* give rise to a disjointness inference. Consider the following examples from Farsi (Iranian; Iran) and Tsez (Northeast-Caucasian; Dagestan), both languages in which indexical shift is a possibility. In those, 3rd person reference to reported speakers is allowed, as (107) and (109) illustrate:

(106) Leila be Mina goft barat ketab xaridam
 Leila to Mina say.PST for-2SG book buy.PST-1SG
 ‘Leila_i told Mina_j that I_{i,s(c*)} bought a book for you_{j,a(c*)}.’

(107) Leila be Mina goft *pro* asabanie
 Leila to Mina say.PST *pro* angry-is-3SG
 ‘Leila_i told Mina_j that she_i is angry.’

(Farsi, [Anvari 2020](#): (18)-(57))

(108) Irbahin-ä di Ğayibiyaw yoł=λin eλi-x
 Ibrahim-ERG 1SG.ABS wrong/foolish be.PRS-QUOT say-PRS
 ‘Ibrahim_i says that I_{i,s(c*)} am wrong.’

(109) Irbahin-ä za Ğayibiyaw yoł=λin eλi-x
 Ibrahim-ERG DEM.ABS wrong/foolish be.PRS-QUOT say-PRS
 ‘Ibrahim_i says that he_{i,j} was wrong.’

(Tsez, [Polinsky 2015](#): (27)-(58))

In those contexts, it seems that no person antipresupposition about the reported speaker can be derived from the embedded use of third person, just as it would be in English.¹⁷ However, further data suggests that things are actually more intricate. As noted by [Anvari \(2020\)](#) for Farsi, when a given context or construction enforces a shifted reading, the ambiguity pertaining to indexical reference is lifted, and the inference goes through. In Farsi, this type of construction is enforced with 2nd person indexicals, which obligatory have to shift in certain contexts, contrary to their 1st person counterparts. This is exemplified in (110), in which the 2nd person indexical *azat* has to shift towards the reported addressee, and a 3rd person NP is used to refer to the actual speaker, Sajjad:

¹⁷ It should be mentioned that [Polinsky \(2015\)](#) only provides the example (109) involving a demonstrative, without providing its counterpart involving no pronoun (the way Tsez usually encodes 3rd person, see [Polinsky 2015](#), p. 22). Since Tsez is a North-Daghestanian language, just like Northern Tabasaran (see examples (26a) and (26b) above), it might be expected that embedded clauses with silent subjects showing third person agreement on the embedded verb (and not first person) trigger a disjointness inference, just as (??) does. This requires to be investigated further.

- (110) *Sajjad to Qazal:*
 Leila be Mina goft Sajjad **azat** asabaniye
 Leila to Mina say.PST Sajjad from.2SG angry.be.3SG
 ✓ ‘Leila_i told Mina_j that Sajjad is angry at her_j’
 ✗ ‘Leila_i told Mina_j that Sajjad is angry at Qazal’
 (Farsi, Anvari 2020: (42))

As Anvari (2020) notes, although Farsi is an optional shifting language, the configuration above forces indexical shift to obtain, as the infelicitous, non-shifted parse of the same sentence indicates. What is interesting here is the fact that the utterance speaker, Sajjad, can be referred to using a 3rd person NP, *Sajjad*, which is otherwise prohibited in matrix sentences: a speaker cannot normally refer to herself using a 3rd person element (a similar pattern can be observed in some of the languages discussed so far; see i.a. examples (33a) and (33b) from §2.6). Anvari (2020) accounts for this by positing a dedicated pragmatic constraint, the *ban against illeism*, which prevents a speaker to refer to herself using 3rd person. Under the shifty operator theory adopted by Anvari (2020), the *shift together* constraint laid out in §3.2 applies, and therefore any 1SG element has to be interpreted as shifted as well, referring to the embedded speaker, Leila, and not to Sajjad. Therefore, the ban against illesim is lifted at the embedded level, and a 3SG element can be inserted in order to refer to the utterance speaker, thus salvaging the intended interpretation of (110). However, as previously mentioned, if the inference cannot go through because the construction is ambiguous between a shifted and an indexical reading, as in (106) (or when the sentence does not feature any indexicals whatsoever), then a 3SG element cannot refer to the utterance speaker, just as it would be in simple clauses. This is exemplified further in (111)-(112):

- (111) *Sajjad to Qazal:*
 #Leila be Mina goft Sajjad **azash** asabaniye
 Leila to Mina say.PST Sajjad from.3SG angry.be.3SG
 Intended: ‘Leila_i told Mina_j that Sajjad is angry at her_j’
 (Farsi, Anvari 2020: (45))

- (112) Leila be Mina goft barat ketab xaride
 Leila to Mina told for.2SG book bought.3SG
 ✗ ‘Leila_i told Mina_j that she_i bought her_j a book.’
 ✓ ‘Leila_i told Mina_j that she_k bought her_j a book.’
 ✓ ‘Leila_i told Mina_j that she_{i,k} bought you a book.’
 (Farsi, Anvari 2020: (55))

The above sentence only has two readings available, depending on whether a shifty interpretation is selected for indexicals. When shifted, the 2SG element *barat* shifts towards the reported addressee, Mina. If so, then the use of a 3SG element triggers a disjointness inference at the embedded level, and *xaride* cannot refer to the embedded speaker, Leila. On the other hand, whenever a non-shifted parse is preferred, then *barat* refers to the utterance addressee and the use of the 3SG element triggers a disjointness inference that only obtains at the matrix level, excluding reference to the actual speaker and addressee; the 3SG element is therefore free to refer back to Leila or some other individual. Again, this pattern can be double-checked in a configuration where shifting cannot obtain at all, e.g. under predicates such as *fekr-kardan* ‘think’:

- (113) *Sajjad to Qazal:*
 #Leila fek-kard Sajjad asabaniye
 Leila think.PST Sajjad angry.be.3SG
 ‘Leila thought that Sajjad was angry’

(Farsi, Anvari 2020: (47))

In (113), the predicate *fek-kard* ‘thinks’ does not license indexical shift; it is thus expected that the use of 3rd person NP *Sajjad* to refer to the utterance speaker will trigger our familiar disjointness inference and, as a result, will sound odd in that context.

Anvari (2020) establishes the following generalization:

(114) **Indexical shift feeds the Ban Against Illeism (BAI)**

In shifting configurations (e.g., with 2nd person indexicals embedded under *say*), (114b) blocks (114a):

a. *[A to B]: x told y that [$\hat{\omega}$ [... 3SG _{x} ... 2SG _{y} ...]]

b. [A to B]: x told y that [$\hat{\omega}$ [... 1SG _{x} ... 2SG _{y} ...]]

The reasoning is as follows: both the BAI and insertion of a $\hat{\omega}$ can therefore be thought of as constraints applying in a certain order, much like in an OT-style model (cf. Smolensky and Legendre 2006; Hendriks and De Hoop 2001). The BAI, taken as a highly-ranked constraint, is enforced and prevents speaker reference using third person NPs. Whenever $\hat{\omega}$ is inserted, as in (112), reference to the reported speaker is made possible by shifting of the 1st person, i.e. shifting here bleeds BAI, thus blocking structures such as (114a).

The present theory allows us to account for blocking of parses such as (114a) with our *MP!* principle without appealing to a dedicated mechanism such as the BAI: whenever a shifted parse containing a $\hat{\omega}$ is selected, reference to the reported speaker using a 3rd person NP will be excluded, since a stronger presuppositional pronoun compatible with the same index was available and should have been used instead. However, our theory still needs to explain why sentences such as (107) repeated here do not generate this kind of inference:

- (107) Leila be Mina goft *pro* asabanie
 Leila to Mina say.PST *pro* angry-is-3SG
 ‘Leila _{i} told Mina _{j} that she _{i} is angry’

[Farsi, Anvari 2020: (57)]

As Anvari (2020) makes clear, this sentence does not generate a disjointness inference at the embedded level, since the third person marker *asabanie* can refer to the reported speaker, Leila.

In line with Anvari’s conclusions about the Farsi data, a way to account for the absence of disjointness inferences in ambiguous cases such as (107) would be to assume that competition is disrupted when two different LFs have the same surface form, preventing speakers and hearers alike to derive inferences: as a consequence, competition and blocking can only be observed in structures that enforce the parse of $\hat{\omega}$, ruling out competitors without the operator.¹⁸ In order to implement this idea within the present framework, we could assume a constraint that would rule out competition for a dedicated LF if the latter is

¹⁸ See Sudo (2018) for an analogous proposal regarding the distribution of *come* vs *go* in attitude reports.

ambiguous between two different binding configurations. As a consequence, the alternatives of (107) could be either (115c) or (115e), depending on which binding configuration (115b) or (115d) the sentence is computed:

- (115) a. Leila told Mina that she₇ is angry.
 b. λc_3^* [Leila [said λc_7 [that [3SG c_7][[is]][angry]]]]]
 c. $\text{ALT}(115) = \left\{ \begin{array}{l} \lambda c_3^* [\text{Leila} [\text{said } \lambda c_7 [\text{that} [2\text{SG } c_7][[\text{is}]][\text{angry}]]]], \\ \lambda c_3^* [\text{Leila} [\text{said } \lambda c_7 [\text{that} [1\text{SG } c_7][[\text{is}]][\text{angry}]]]] \end{array} \right\}$
 d. λc_3^* [Leila [said λc_7 [that [3SG c_3][[is]][angry]]]]]
 e. $\text{ALT}(115) = \left\{ \begin{array}{l} \lambda c_3^* [\text{Leila} [\text{said } \lambda c_7 [\text{that} [2\text{SG } c_3][[\text{is}]][\text{angry}]]]], \\ \lambda c_3^* [\text{Leila} [\text{said } \lambda c_7 [\text{that} [1\text{SG } c_3][[\text{is}]][\text{angry}]]]] \end{array} \right\}$

In sum, these data argue that there are at least two kinds of languages: those in which disjointness inferences in complex sentences are systematic (Tigrinya, Navajo), and those in which such inferences are merely optional, observed only in specific contexts in which shifted readings are favored (Farsi, Tsez). Variation of this type is actually expected in the present framework: disjointness effects being inferences, they are predicted to be defeasible in cases in which pronominal reference is ambiguous. We therefore should expect to find contexts that systematically disrupt them in a consistent fashion. For instance, Marty (2018) observes that sentences such as (116a) in English are infelicitous in standard contexts, where the identity of Sue is known among participants of the conversation:

- (116) *Context: Sue had to comment on her essay for a class.*
 a. #She₁ criticized Sue_i's work.
 b. She_i criticized her_i work.
 c. \sim #Sue didn't criticize her own work. [Marty 2018: (15)]

According to Marty, (116a) is infelicitous in that context because the use of the proper name *Sue* instead of its structurally simpler, pronominal alternative *she* triggers the antipresupposition in (116a)c (a scalar implicature in Marty's framework) that the referents of both nominal expressions are distinct, which conflicts with the Common Ground. This is because both (116a) and its structurally simpler alternative (116b) are contextually equivalent (mutually entail each other) in that context. However, this inference disappears in contexts such as (117), in which identity of the referent of *she* is still under discussion (i.e., not part of the CG), and binding principle B is obviated:

- (117) *Context: the students had to comment their own essay for a class and file a written report. Sue's work has been reviewed, but the paper bears no name.*
 a. A: Who wrote that report?
 b. B: I don't know... She_i criticized Sue_i's work, so it must be Sue.
 c. \rightsquigarrow Sue didn't criticize her own work.

In (116b), contextual equivalence does not obtain between alternatives, and therefore no inference is predicted to arise. Marty (2018) argues that contexts such as (116a) give rise to *strong disjointness effects*, while cases such as (116b) are *weak disjointness* scenarios.

We could, in fact, argue that the variation in disjointness patterns explored above stem from a similar dichotomy between what is taken to be the most relevant configuration in default embedded contexts for the languages at stake. This, however, does not prevent this distinction to be grammaticalized, and vary across structures accordingly: for instance, since Farsi does not allow the predicate *think* to bind context pronouns to shift indexicals, any use of a third-person pronominal element under that predicate will trigger a strong disjointness inference at the matrix level only, as opposed to what happens under *say/tell* in that language, which allows indexicals to shift and therefore, disjointness inferences to arise at the embedded level. It remains to be further investigated whether change in the body of information available in the CG about the identity of referents might influence speakers/hearers in the kind of inference they derive when a given sentence is uttered.

Last, note that such variation is made possible only because ambiguity in reference for indexicals is hard-wired within the pronominal system of SI-languages: in LP-systems, which have grammaticalized the distinction between shiftable and non-shiftable elements, no such ambiguity persists, and disjointness inferences systematically go through.

5.5 An alternative account: Bimpeh et al. (2023)

Recent work by Bimpeh et al. (2023) propose a system close to the present proposal, which also builds on a presuppositional account of LPs. Having provided evidence that LPs in Ewe, Yoruba and Igbo can systematically eschew binding locality effects in ellipsis and under focus-sensitive terms such as *only*, Bimpeh et al. (2023) propose a system close to our own, in which LPs are presuppositionally-restricted variables. Their proposal draws on a solution by Sauerland (2013) to account for analogous data involving strict readings of reflexive anaphors, which can exhibit the same interpretive properties in focus-sensitive contexts (see also McKillen 2016). Taking a similar approach to person features as the one adopted here, they take this common behavior of LPs and SELF-anaphors as a support that ϕ -features can be ignored during the computation of focus alternatives (Spathas 2009; Jacobson 2012; Sauerland 2013 a.o.). They assume that LPs are complex elements composed of two different syntactic pieces: a feature LOG, and a variable *pro*. The latter is a variable over individuals concepts (of type $\langle s, e \rangle$) that can either be bound or free, while the former is a presuppositional feature that enforces reference to the attitude holder (the speaker coordinate of the index, in the present system's terms), ensuring *de se* readings. In Bimpeh et al. (2023)'s system, which is fully extensional, world variables are present in the syntax and come with every individual or predicate type. A sentence such as (118) has the following truth conditions:

- (118) a. Eli_i thinks that LOG_i won.
 b. $\llbracket (118)a \rrbracket = \forall w_x \in Dox_{Eli}, x$ won in w .
 c. $\llbracket Eli \rrbracket = \lambda w_x$. The person in w named 'Eli'.
 d. $\llbracket win \rrbracket = \lambda w_x. \lambda z$. z wins in w .
 e. $\llbracket LOG \rrbracket^g = \lambda f_{\langle s, e \rangle}. \lambda w_x : f(w_x) = x.x$
 f. $\llbracket LOGP \rrbracket^g = \llbracket LOG \rrbracket^g(\llbracket pro_i \rrbracket^g) = [\lambda w_x : \llbracket pro_i \rrbracket^g(w_x) = x.x]$

The denotation of LOG is a presuppositional function from world-center pairs to their center, i.e. that individual which the attitude holder takes himself to be in w . Since the 'center-mapping' function that is the presupposition of LOG can be ignored during the

computation of focus alternatives, this derives strict readings of LPs in both ellipsis and *only*-contexts.

The analysis of [Bimpeh et al. \(2023\)](#) bears numerous similarities with the present system. It equally makes use of presuppositional entries for person, and also seeks to wire the meaning of logophors directly within the lexical entries of the pronoun. I take this to be a virtue, since it allows to straightforwardly capture the fact (rarely mentioned in the literature) that LPs can have matrix uses: in such cases, the presupposition carried by LPs is simply accommodated, deriving the semantics of standard embedded reported speech. Another similarity relates to the representation of world variables in the syntax: this is required, so the individual variable associated with the world variable always denote the *center* of that world, and not some other inhabitant of it. Note that this is very similar to our system, where it is assumed that attitude verbs quantify over contexts represented with context variables on the pronouns; context pronouns are simply finer-grained coordinates. However, an important difference lies in the entries assumed for LPs themselves. While, for [Bimpeh et al. \(2023\)](#), the LP is a variable augmented with a LOG feature, in the present system, it is a first-person element that lacks an ACTUAL feature. The featural makeup of pronouns is therefore different in the two theories, LPs being considered first-personal elements only in the present approach.

This raises an interesting question about the ontology of features argued for here: is there any point of data that could be used in order to adjudicate between the two approaches? As a matter of fact, it seems that there is. The first concerns cases in which the first person directly competes with the LP, as in the *1-LOG pattern discussed in §5.1. In the present system, *1-LOG patterns are expected, since they results in two first-person elements that compete at the presuppositional level: in cases of co-reference with the actual speaker, first person must always be used over LOG, since the former is presuppositionally stronger. However, it is less clear how the LOG-feature analysis derives this: some competition between forms is likely to be assumed to explain disjoint reference patterns, but in a very intuitive way, any element specified for person with an additional LOG feature is expected to be strictly more complex than an element endowed with a person feature only. Under current approaches to alternatives ([Katzir 2007](#); [Fox and Katzir 2011](#); [Trinh and Haida 2015](#); [Breheny et al. 2018](#) i.a.), in order to count as an alternative of ϕ , an element ψ has to be at-most-as-complex than ψ :

- (119) **Structural complexity ([Katzir, 2007](#)):** Let ϕ, ψ be parse trees. ψ can be said to be at-most-as-complex as ϕ (noted $\psi \leq \phi$) if we can transform ϕ into ψ by
- a. deleting constituents of ϕ ,
 - b. contracting (i.e., merging and identifying nodes) constituents of ϕ ,
 - c. replacing constituents of ϕ with constituents of the same category from the Substitution Source of the language.

As a consequence, per (119), more complex forms at the morphological level could not be taken as a competitor to simpler forms. This effectively prevents the LP (which consists of [3, LOG] in [Bimpeh et al.](#)'s system) to count as an alternative to the 1st person and consequently, does not allow any strengthening inference of the kind discussed in §4.4 to be derived.

The second point concerns logophoric agreement. As discussed in §2.4, some languages such as Gokana or Kana (Niger-Congo, Nigeria; [Ikoro 1996](#)) express logophoric-

ity through affixation on the verb (without a proper logophoric pronoun). In those, third as well as second person can trigger logophoric agreement on the embedded verb:

- (120) a. #oò kò oò dɔ
 2SG said 2SG fell
 ‘You_i said you_i fell.’
 b. oò kò oò dɔ-ε
 2SG said 2SG fell-LOG
 ‘You_i said you_i fell’

[Gokana, Hyman and Comrie 1981: (10)]

In principle, agreement requires feature matching or subsumption (Shieber 2003, Bernardi and Szabolcsi 2008); in order to obtain, a subset of features of the controller need to be reflected on the target of agreement. Since languages such as Gokana seems to express logophoric agreement with either third- or second-person controllers, it is difficult for Bimpeh et al. (2023) to motivate that an element which does not bear a LOG feature but only a 2SG feature is able to trigger logophoric agreement. In the same fashion, any system positing a dedicated LOG feature is at pains to explain why languages such as Donno Sò realize first person agreement on the verb when the controller is a LOG form since, in such accounts, LPs are third person (see the discussion in Bimpeh et al. 2023):

- (23) a. Oumar inyemɛ jɛmbɔ paza **bolum** miñ tagi
 Oumar LOG sack.DEF drop left.1SG 1SG.OBJ inform.PST
 ‘Oumar_i told me that he_i had left without the sack.’
 b. Oumar ma jɛmbɔ paza **boli** miñ tagi
 Oumar 1SG.SBJV sack.DEF drop left.3SG 1SG.OBJ inform.PST
 ‘Oumar_i told me that I had left without the sack.’

[Culy 1994b: (20)]

In the system outlined here, however, these facts follow from the inherent first-personal nature of LOG forms, which are able to trigger first-personal agreement due to their featural specification as first person.

6 Conclusion

The present work aims at offering a new picture of indexicality, arguing in light of cross-linguistic data that it should not be conceived as an inherent semantic property pertaining to a discrete set of lexemes across languages but rather, is best viewed as a formal morphosyntactic feature that can attach to various forms in a given paradigm. Drawing from data about cases of ‘pseudo-indexical’ anaphoric patterns in unrelated languages making use of logophoric pronouns and shiftable indexicals, we argued that in both these systems, author- and addressee-referring forms (with the various person feature combinations they are specified with) can lack a further piece of morphological information, a feature ACTUAL, which is required to properly anchor their referents within the actual discourse context. This accounts assumes that first and second person pronouns are complex forms endowed with a context variable *c* that can be bound at the embedded or matrix levels;

indexical reference obtains when indexicals are specified with the ACTUAL feature, enforcing binding at the utterance level, much like in the spirit of Schlenker (2003). The theory allows us to derive a wide range of cross-linguistic similarities between the two classes of expressions, related to both their meaning and distribution, ranging from their sensitivity to reported speech/attitude environments to their ability to trigger disjointness inferences. The theory has far-reaching typological, as well as theoretical, consequences, providing evidence for a treatment of indexical expressions as complex entities rather than atomic - a conclusion independently reached by various researchers in different traditions (c.p. Nikitina 2012a, 2012b; Deal 2021). For instance, our account predicts that ACTUAL could compose with different morphosyntactic categories, and not be restricted to nouns. This seems to be borne out: adverbs such as *here* and *now* can be indexical, just like verbs such as *come* and *go* can be (Oshima 2006; Sudo 2016). Here, too, cross-linguistic variation is expected: one should be able to find expressions that are indexical in a given language but ‘pseudo-indexical’ in others. This is the case, for instance, with the Nez Perce temporal indexical *watiisx* (‘tomorrow’), which can refer to either context depending on the situation:

- (121) a. *Watiisx pro ciq'aamqal-niin 'itamyaanwas-x pe-k-yu'.*
 1.day.away 1SG dog-with town-to S.PL-go-PROSP
 ‘Tomorrow I’m going into town with my dog.’
- b. *ke-x mawa pro capaakayx-tato-∅ 'atamooc, kaa watiisx*
 C-1 when 1SG wash-HAB.SG-PRS car.NOM then 1.day.away
hi-weeqi-yo'qa.
 3.SUBJ-rain-MOD
 ‘Whenever I wash my car, it rains the next day.’
 [Nez Perce, Deal 2020: (155)-(153)]

As emphasized by Deal (2020), the fact that *watiisx* can be properly bound by the temporal quantifier *mawa* in (121b) shows that its meaning, although compatible with that of the English indexical *tomorrow* in contexts such as that of (121a), cannot be that of a genuine indexical form: in our terms, *watiisx* combines with a context variable c_i that may, but crucially need not, be bound at the utterance level, not being specified with ACTUAL. In light of such data, more variation is to be expected across categories, depending on how a given language lexicalizes ACTUAL on context-dependent forms.

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