You Will Always Have *Me*:

A Compositional Theory of Person

A Dissertation Presented

by

Kaden Holladay

Submitted to the Graduate School of the
University of Massachusetts Amherst in partial fulfillment
of the requirements for the degree of

DOCTOR OF PHILOSOPHY

August 2023

Linguistics

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For my mom, Lynn,

and for my grandfather, Clint

I wish I knew, I wish I knew

What makes me ‘me’, and what makes you ‘you’

It’s just a different point of view

A state of mind I’m going through

— *Cat Stevens*

ACKNOWLEDGEMENTS

I am foremost indebted to the members of my dissertation committee, Kyle Johnson, Rajesh Bhatt, and Jim Cathey.

This dissertation would not have been remotely possible without Kyle's feedback and support. I have never met a more methodical thinker. He has an incredible gift for honing in on what few good proposals there are amidst my sea of bad ones, and his meticulous evaluation (and constant re-evaluation) of the assumptions behind our theorizing benefitted this thesis immensely.

It's unfortunate that the term 'concept generator' is already being used for other purposes, as I find it such a fitting nickname for Rajesh. Each of our meetings was a chain reaction of ideas – many of them bizarre, and all of them worth pursuing. His unwavering excitement about everything he sets his sights on propelled this project past the inevitable false starts and dead ends.

I am deeply grateful to Jim for his advice about and interest in this research, for his close reading of the prospectus and defense draft, and for being my Finnish mentor for many years.

Beyond my committee, I also want to thank Ana Arregui for teaching a wonderful seminar on the interpretation of phi features, which framed much of my thinking about person and indexicality; Vincent Homer, who helped me make sense of semantic stuff when I was out of my depth; and Faruk Akkuş, who always has a relevant piece of data to share. Barbara Partee was a constant source of encouragement during my graduate career, and helped me to recognize a red herring in the

early stages of the dissertation research. Graduate school would not have been on the table at all if not for Daniel Altshuler; it was only under his advising that I was able to transform my haphazard collection of undergraduate linguistics courses into something resembling a graduate application portfolio.

I am so happy to have shared time at UMass with the graduate students that I did, both inside and outside of linguistics. Jonathan Pesetsky deserves special mention for his always having two ears to lend to a new idea (he shares with most people the property that he has two ears). I want to thank also Andreas Hayash, Chris Hammerly, Polina Kasyanova, Mariam Asatryan, Alex, Zahra Mirrazi, and Deniz Özyıldız for the fellowship, the skiing, the late-night discussions, the chess games, the dinner parties, and all the other things that make graduate school more fun that it's supposed to be.

Lastly I want to thank my family, who each inspire a different kind of curiosity about the world.

ABSTRACT

***YOU* WILL ALWAYS HAVE *ME*:**

A COMPOSITIONAL THEORY OF PERSON

AUGUST 2023

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This thesis investigates the morpho-syntactic makeup of personful expressions in natural language, especially personal pronouns. The central hypothesis guiding the inquiry is that a Kaplanian utterance context c (to which the interpretation function over morpho-syntactic expressions is relativized) is formally structured so as to privilege a unique entity that it contains. Specifically, I take a context to be a centered situation – a situation that privileges exactly one entity (its 'center') as a primitive. In root clauses, that center is the utterance author a.

(1) **The Centered Contexts Hypothesis (CCH)**

$c = \langle a, s \rangle$

The CCH differs from the usual treatment of utterance contexts in a two-dimensional semantics, where the context includes, in addition to the author coordinate, a co-ordinate whose variable h ranges over hearers (*i.e.* addressees).

(2) **A typical alternative**

$c = \langle a, h, s \rangle$

Abstracting away from other points of variation in how contexts are structured (like whether they contain time or location coordinates, for example), the relevant difference between contexts like those in (1) and (2) is whether the identity of an utterance's addressee is logged.

I will show that conception (1) has some empirical advantages over conception (2). Chief among these is that the CCH predicts the kinds of person systems that are attested in natural languages. To see why the way contexts are formally constructed bears on that typological question, consider that if contexts take the form in (2), then it is a straightforward task for the language learner – and for the analyst – to posit person features like those in (3).

(3) a. $[\![\textsc{author}]\!]^c = [\![\textsc{author}]\!]^{\langle a,h,s \rangle} = a$

b. $[\![\textsc{hearer}]\!]^c = [\![\textsc{hearer}]\!]^{\langle a,h,s \rangle} = h$

Under the CCH by contrast, while there is a correlate of (3a), there is no correlate of (3b), as illustrated in (4).

(4) a. $[\![\textsc{author}]\!]^c = [\![\textsc{author}]\!]^{\langle a,s \rangle} = a$

b. $[\![\textsc{hearer}]\!]^c = [\![\textsc{hearer}]\!]^{\langle a,s \rangle} = ?$

The CCH thus bears on how directly notions like 'author' and 'addressee' can be morpho-syntactically encoded. In particular, while authorhood can be cashed out in the morphosyntax by way of a single feature (4a), akin to (3a), addresseehood cannot be cashed out along the lines of (3b).

A methodological assumption I adopt throughout is that features (including but not limited to person features) are ordinary syntactic objects which Merge to form larger expressions. That is, no feature geometries or hierarchies are assumed

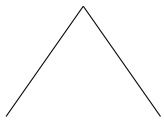
in this work. Each feature has an ordinary semantic denotation that can be represented in the lambda calculus, and the interpretation of multi-featural expressions is determined as a function of the interpretation of its parts.

In that micro-compositional spirit, I argue that second person is a phrase whose daughters are (i) first person and (ii) a feature (termed ADDRESSEE below) that denotes an ⟨e, e⟩ function from authors to addressees.

(5) **First person**

AUTHOR

(6) **Second person**



In conjunction with the meaning of AUTHOR – which straightforwardly picks out the utterance author *a*, as in (4a) – as well as other information available in the context, the ADDRESSEE feature serves to recover utterance addressees compositionally. The meaning of second person is relational, in other words, and in this sense recalls Rebuschi's (1994) and Charnavel's (2015) analyses of (some uses of) second-person pronouns.

Second person being a phrase which irreflexively dominates first person entails that the former can't exist without the latter. Hence the title of the dissertation: *You* Will Always Have *Me*.[1]

As I show in Chapters 2 and 3, the analytic fact that second person syntactically contains first provides an answer to a question posed by Zwicky (1977), namely: why is it that in languages without an inclusive pronoun, 'we and you' can always be paraphrased as 'we', but never as 'you'? The Centered Contexts Hypothesis and its downstream effects on the morphosyntax also provide answers to a broader set

[1]The title is also an homage to two papers which framed some of the thinking herein: Isabelle Charnavel's *Let 'You' Be Bound to 'Me'* (*and 'Me' to 'You'*) from 2015, and Stephen Wechsler's *What 'You' and 'I' Mean to Each Other* from 2010.

of related questions articulated by Harbour (2016), namely: why do the inventories of grammatical persons vary across languages in the ways that they do, why does each grammatical person means what it does, and why are some logically possible person systems not attested?

I show in later portions of the dissertation that the CCH also has implications for various phenomena related to person but not necessarily to its morpho-syntactic typology, among them bound variable readings, indexical shift, control, and impersonal uses of second-person pronouns.

LIST OF ABBREVIATIONS AND SYMBOLS

1	=	first person
1EX	=	exclusive first person
1IN	=	inclusive first person
2	=	second person
3	=	third person
a	=	author (variable)
ADDR	=	addressee (feature)
ANIM	=	animate
AUTH	=	author (feature)
c	=	context of evaluation
DIST	=	distal
FEM	=	feminine
h	=	hearer (variable)
INAN	=	inanimate
INCL	=	inclusive
j	=	index of evaluation
O	=	grammatical object
PL	=	plural
PROX	=	proximal
REL	=	relational
S	=	grammatical subject
SG	=	singular

$\exists$	$=$	existential quantification
$\forall$	$=$	universal quantification
$\triangle$	$=$	ellipsis site
$\wedge$	$=$	conjunction
$\oplus$	$=$	mereological sum
$\leq$	$=$	mereological parthood
$\lesssim$	$=$	entity-situation parthood

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CHAPTER 1

Morphological and semantic desiderata for a theory of person

1.1 Introduction

The study of person has proceeded along two main avenues in recent years. There are, on the one hand, approaches to person which are principally concerned with its morpho-syntactic typology (Zwicky 1977, Noyer 1992, Harley & Ritter 2002, Harbour 2016, *i.a.*). Generally speaking, these approaches aim to find a set of person features which are, by hypothesis, made available by Universal Grammar (UG), and which derive the range of variation in person inventories (*e.g.*, the fact that some but not all languages make an inclusive/exclusive distinction in first-person pronouns) as well as notable syntactic properties of person, such as person hierarchy effects.

On the other hand, there are approaches more concerned with how person is to be characterized semantically, where topics like indexicality (Kaplan 1977, Perry 1979, Nunberg 1993), indexical shift (see Schlenker 2003, Anand & Nevins 2004[1]) and bound variable readings (especially under focus; Partee 1989, Kratzer 1998, 2009, *i.a.*) play a larger role. This kind of work may be expressly typological (*e.g.*, Deal 2017, 2020 on indexical shift), but on the whole there seems to have been less attention paid to the question of what person features UG makes available. Granted,

[1]Though the phenomenon was noticed earlier by Hyman (1999) and Speas (1999).

it is not uncommon in these semantic approaches to decompose pronouns into their constituent features (including person features: Heim 2008, Kratzer 2009, Malamud 2012, Charnavel 2015), but that decomposition typically is not motivated by data from more than a few languages, or is not informed by the data that the first group of approaches are.

Thus, to the extent that these are distinct research programs, I believe they have not been as mutually informative as they could be. This dissertation aims toward bridging the gap. In terms of empirical coverage, the main project will be defined by what Harbour (2016) calls Zwicky's problem, stemming from a seminal 1977 paper by Arnold Zwicky. Zwicky was the first to concretely frame the questions: which person systems are attested, which ones aren't, and why? For example – why do only some languages contrast inclusive with exclusive first person? Why is it the case that in every language that *doesn't* contrast those two categories, 'we and you' can be paraphrased simply as 'we', but never as 'you'?

Ultimately these are questions about the relationship between the kinds of meanings that can be conveyed in natural languages on the one hand, and the way that those meanings are morphologically exponed on the other. The relationship is not one-to-one, and there are certain gaps and asymmetries in the mapping between the two which will guide the investigation along the way.

That is, I will not seek a solution to Zwicky's problem in the morphology alone. To a greater extent than Harbour's (2016) book *Impossible Persons*, which provides the only comprehensive solution to Zwicky's problem to date, I will aim to avail myself of the available insights about how the interpretation of person indexicals proceeds – again, with the goal of bringing together the morphological and semantic strands of the literature on person. In particular, in Chaper 2 I will propose a semantic-pragmatic hypothesis about the kind of content that is recoverable from utterance contexts (Kaplan 1977), and I will show how that hypothesis puts con-

straints on the kinds of morpho-syntactic features that are definable. A solution to Zwicky's problem will in turn follow from the kind of feature inventory which satisfies those constraints.

1.2 Local person ontology

For the purposes of this chapter and the next, I will restrict attention to the LOCAL persons. These are the persons for which, in order to formalize their meanings, one must make reference to the AUTHORS and HEARERS of linguistic utterances. (I will also use the terms SPEAKERS and ADDRESSEES.) The decision to focus initially on local persons is a natural one on the common – but not uncontroversial – view that third is best understood as a non-person (Benveniste 1966, Kayne 2000, *i.a.*). I will develop an account of third person and its relation to the local persons in Chapter 3.

I assume that the range of meanings that linguistic expressions can have is restricted by the ONTOLOGY of natural language, in Harbour's (2016) sense. The person ontology is what determines – among other things – the kinds of semantic objects that can be written into the denotation of a person feature. Put another way, it is a hypothesis about the cognitive representations that the grammar interfaces with.

What I'll call the STANDARD ontology, assumed in practically all work that deals with the relation between the grammar and ontological primitives,[2] posits the aforementioned kinds of discourse participants, utterance authors and their hearers, over which I will let a and h range as variables. I will motivate a departure from this ontology in Chapter 2 (in fact, one of the primary theses in this dissertation supplants it), but for the moment let's assume it to be on the right track.

For any theory of person, there are several related desiderata which either in-

[2]Silverstein (1976), Zwicky (1977), Cysouw (2003), Kratzer (2009), Charnavel (2015, 2019), and Harbour (2016), to name a few.

volve the ontology directly, or involve the relationship between the ontology and the grammar. The first desideratum is that the author *a* and hearer *h* are both unique in the ontology, and the second and third have to do with the ontology's relationship to morphological number and semantic plurality. I discuss these in turn in the following sections, and then move on to discuss a number of other desiderata.

1.3 Desideratum 1: Authors and addressees are unique

While many linguistic utterances obviously have a sole author, others intuitively seem to have multiple (*e.g.*, the verses performed by a choir, or a victorious soccer team's singing *We are the champions!*). It appears, however, that no language has a person system which tracks this distinction (Noyer 1992: 148, Bobaljik 2008, Cysouw 2003: 74, Harbour 2016: 67-71). For instance: if I, speaking alone, intend to communicate that my choir sounds off-key, the English sentence in (7) does the job.

(7) We are off-key.

Crucially, the person specification of the pronoun need not change for my choir, singing (7) in synchrony, to communicate the same meaning. Here the morphological number of the pronoun says something about the cardinality of its referent, but neither number nor person carries any information about how many authors the utterance has.

Moreover, while utterances can intuitively be directed at a single addressee or multiple, apparently no language makes a morpho-syntactic cut that tracks *this* contrast either. For instance, in a situation where a teacher is speaking to her class, we can observe that the person specification of the pronoun in (8) needn't change as a function of whether all students are present (independently of how many

students are in the class).

(8) Your homework is due tomorrow.

Plural morphological number on *your*, if present, tracks the cardinality of the referent, not the cardinality of hearers, and second person is licensed so long as *some* student is a part of that referent. So person *per se* simply does not care about the cardinality of the two kinds of discourse participant.

The supposition of author/hearer uniqueness allows us to define maximally three local persons, which are traditionally termed FIRST EXCLUSIVE (1EX), FIRST INCLUSIVE (1IN), and SECOND (2ND). When person plays a role in determining the referent of an expression (a free pronoun, *e.g.*), the relation between the person categories and the elements of the ontology (a, h) can be characterized as in (9), where the person categories are defined semantically by the mereological containment relation that holds between the discourse participants and the referent.

(9)

CATEGORY	REFERENT CONTAINS:
1EX	a, but not h
1IN	both a and h
2ND	h, but not a

We'll want our theory of person to deliver something like (9), since many languages morphologically contrast all three of those categories. (Not every language does, of course – which is also a fact which should inform the theory, and which I discuss in §1.7 below and in later chapters.) The uniqueness of authors and hearers is an easy way of guaranteeing that we get these three local person categories and no more.

And indeed we don't want any more. Consider the prediction that arises if we assume a different ontology, one with two hearers h_1 and h_2. (The reader may conduct a similar exercise to see the predictions of permitting multiple authors in the ontology.) Namely: some language should have a person system that makes the following contrasts.

(10)

CATEGORY	REFERENT CONTAINS:
1EX	a, but not h_1 or h_2
1IN	a, h_1, and h_2
1IN′	a and h_1, but not h_2
1IN″	a and h_2, but not h_1
2ND	h_1 and h_2, but not a
2ND′	h_1, but not a or h_2
2ND″	h_2, but not h_1 or a

No language is reported to have such a person system. Granted, we might expect 1IN′ to not be contrasted with 1IN″, nor 2ND′ with 2ND″. After all, how could interlocutors reliably distinguish which addressee is h_1 and which is h_2? But even if we allow for these distinctions to be done away with, the resulting theory of person still overgenerates in that it predicts two flavors of second person and two flavors of inclusive person.

Nor is there a person system whose description requires positing multiple authors in the ontology. These facts suggest that both authors and hearers should be ontologically unique, since under that assumption we derive no more than three local persons.

1.4 Desideratum 2: The associative plural generalization

It follows as a consequence of author-hearer uniqueness that when person interacts with grammatical number, as in the English first-person pronouns *I* and *we*, the plural form doesn't mean 'the plural individual whose atoms are each a speaker' – rather it means something more akin to 'the plural individual that contains the speaker'. Local pronouns thus contrast with other nominal expressions like *the cat*, whose plural variant *the cats* does not mean 'the plural individual that contains the cat'. Conversely to the pronoun, this means 'the plural individual whose atoms are each a cat'.

The kind of plural meaning associated with pronouns is termed an ASSOCIATIVE

meaning (Moravscik 1994, 2003, den Besten 1996 *et seq.*, Corbett & Mithun 1996, Corbett 2000). Just as Japanese *Tanaka-tachi* means roughly 'Tanaka and associates', English *we* means roughly 'the speaker and associates'. This is apparently a linguistic universal: plural local pronouns always have an associative semantics, and never a 'normal' nominal semantics (also known as an ADDITIVE semantics). Borrowing a term from Wechsler (2010), I'll call this the ASSOCIATIVE PLURAL GENERALIZATION.

Informally for now, a way of understanding why plural pronouns mean what they do is simply that the ontology doesn't permit there to *be* multiple authors and hearers – so there's simply no point in semantically pluralizing authorhood *per se* or addresseehood *per se*. As far as local pronouns are concerned, it's just the cardinality of the referent that grammatical plurality cares about – person's role is to enforce that the referents of local pronouns partonomically contain the unique author, the unique hearer, or both.

1.5 Desideratum 3: Person is number-indifferent

Some languages have inventories of pronouns or agreement which, while contrasting for person, do not morphologically contrast for number. In such languages, the pronouns' ability to refer is not restricted as a function of the referent's cardinality. In Imonda, for instance, the pronoun *ka* may refer to any individual (atomic or plural) that contains the utterance author, so long as it does not contain the hearer. *Mutatis mutandis*, the pronoun *pəl* refers to individuals that contain both the author and the hearer, while the pronoun *ne* refers to individuals that contain the hearer but not the author.

(11) *Imonda* (Border>Waris; Seiler 1985)

1EX	ka
1IN	pəl
2ND	ne

One can characterize the pronouns of Imonda in a way that does not invoke semantic number at all; rather, one need only consider whether *a* and *h* are a mereological part of the referent. The inclusive pronoun, of course, cannot refer to atoms, but this already follows from it referring to entities that contain both *a* and *h*.

This fact about Imonda generalizes fully: there appears to be no pronominal inventory whose members display no morphological number contrasts but can refer only to atoms (or dyads, in the case of inclusives). On the view that authors and hearers are unique, what this suggests is that grammar can only access these individuals in a way that is NUMBER-INDIFFERENT, to use Daniel's (2013) term.

The number-indifference of person is well-known, but is stipulated in almost all analyses (Kratzer 2009, Harbour 2016, *i.a.*). A notable exception is Wechsler (2010), who aims to derive it from the *de se* semantics of person indexicals – see §1.6 below.

Person's number-indifference will be a crucial ingredient in the proposal developed in Chapter 2. I will show that person being number-indifferent grants more than one local person the ability to refer to plural individuals which contain both the author and hearer. It is precisely this property that allows local persons to compete pragmatically under certain circumstances, and will be put to use in deriving a core part of the morphological typology of person.

1.6 Desideratum 4: Person invokes reference *de se*

Wechsler (2010) aimed to derive the associative plural generalization from the *de se* semantics of local person categories. The link between reference *de se* – which crucially involves SELF-ASCRIPTION of a belief or property – and first-person pronouns has been long observed (Castañeda 1977, Kaplan 1977, Perry 1979).

Taking a famous example from Kaplan (1977), consider John, who at a dim, smoky, busy club, mistakes his own reflection in the mirror for someone else. John notices that that person's pants are on fire ('Oh – his pants are on fire!'), only to

come to the realization – after feeling heat on his own legs – '*My* pants are on fire!'. The content of John's belief changes when he realizes that the person whose pants are on fire is himself; only the latter is a *de se* belief.

Another a famous illustration of how local pronouns are understood *de se* is due to Perry (1979: 3), whom I quote below. (The underlined sentence has been modified from the original for expositional purposes.)

> I once followed a trail of sugar on a supermarket floor, pushing my cart down the aisle on the side of a tall counter and back the aisle on the other, seeking the shopper with the torn sack to tell him he was making a mess. With each trip around the counter, the trail became thicker. But I seemed unable to catch up. Finally it dawned on me. I was the messy shopper.

The underlined sentence expresses, in part, John Perry's belief about John Perry. There are a variety of ways that Perry could report beliefs of this kind (Wechsler 2010: 342):

(12) a. I am the messy shopper.

b. The shopper with the torn sack is the messy shopper.

c. John Perry is the messy shopper.

d. (*Pointing to a reflection of himself in the mirror*) He is the messy shopper.

In each of the above examples, the pre-copular nominal picks out the same entity, namely John Perry. Only (12a), however, reports unambiguously that Perry's new belief is about the person *holding* that belief. Only (12a), in other words, unambiguously reports an attitude *de se*.

The other three sentences most readily admit non- *de se* readings. For instance, if Perry instead comes to believe that the person he sees in the mirror (who, unbeknownst to him, is in fact himself) is the messy shopper, then he could naturally report his new belief with (12d), but not with (12a).

The beliefs in (12b-12d) can have *de se* readings too, but only if Perry is aware of the fact that the grammatical subjects refer to himself *qua* belief holder. (12c) is a *de se* belief only if Perry assents to the proposition 'I am John Perry', for instance, and that proposition 'smuggles' the *de se* semantics of the local pronoun right back in (Wechsler 2010: 342-343).

The same holds for second-person pronouns. If Perry is making a mess with his torn bag of sugar, the only unambiguous way to communicate that fact to him is to use (13a).

(13) a. You are the messy shopper.

b. John Perry is the messy shopper.

Again, (13b) only invites a *de se* interpretation (or *de te*, as second-person self-ascription is often termed) to the extent that Perry would assent to my following up with '. . . and you are John Perry'.

Local pronouns thus seem to be intimately related to *de se* attitudes. I will suggest in Chapter 2 that this fact can be put to use in understanding why local pronouns only refer to entities whose atoms are animate. Consider (14).

(14) Oh no, we're running late!

Suppose (14) is spoken by only Zoë. That makes Zoë the atomic author of the utterance. When the sentence is presented out of the blue like this, we readers can't determine which plural individual *we* refers to. It may or may not contain her addressee(s), and it could be formed from two atoms, or five, or whatever. But one thing that must be the case is that each of those atoms are animate: *we* can't refer to the sum of Zoë and her car unless she intends to personify the car. This is so despite that fact that a variety of inanimate things can be late – qualifying papers, for instance.

1.7 Desideratum 5: The typology of local person contrasts

We turn now to the morphological typology of person, which is the central empirical desideratum of this thesis.

As mentioned above, the maximum number of local persons that can be contrasted is three. When a language has three local persons, they are always those that were given in (9), and that were exemplified transparently by the pronouns of Imonda, which are repeated below in (15).

Other languages, however, contrast fewer persons. Jarawa, for instance, has a pronoun *mi* which is used for first-person exclusive and first-person inclusive meanings alike (16). Like those of Imonda, the pronouns of Jarawa do not contrast for number or gender.

(15) *Imonda* (Waris; Seiler 1985)

1EX	ka
1IN	pəl
2ND	ne

(16) *Jarawa* (Ongan; Kumar 2012)

1EX	mi
1IN	
2ND	ŋi

Jarawa *mi* is a sometimes called a GENERALIZED first-person pronoun; it is generalized in the sense that it covers the range of meanings that Imonda inclusive and exclusive first-person pronouns collectively do. (English *we* is also generalized first person; it differs from the Jarawa pronoun in being marked for number.) We may understand the Jarawa paradigm in (16), then, as a less articulated version of the Imonda paradigm, where what are distinct categories in Imonda have fallen together. Put another way, the Jarawa pronominal paradigm is syncretic with respect to the Imonda one.

1.7.1 Partitions, not paradigms

Any theory of person should have something to say about the range of syncretisms which can overlay the three-person scaffold motivated by languages like Imonda.

But as shown by Harbour (2016: 8-17), paradigmatic syncretisms are not a good window into the typology of person contrasts, for two reasons.

First, every logically possible syncretic pattern over the three local persons is attested. So in addition to the 1EX/1IN syncretism found in the Jarawa pronominal inventory, Harbour points out that South Efate features 1EX/2ND syncretism in a subject agreement paradigm, Bilua presents 1IN/2ND syncretism in an object agreement paradigm, and Hocąk has a three-way syncretism of 1EX/1IN/2ND in its pronouns.

Second, Michael Cysouw's (2003, 2005, 2011) work, which investigates the relative frequencies of paradigmatic syncretisms, indicates that one cannot simply sort the marginal from the common patterns, because there is no obvious cut-off point between the two. Rather, there is gradual cline in frequency among paradigmatic syncretisms. If the goal is to build a theory of *n*-celled person paradigms, no route forward seems non-arbitrary.

The situation changes drastically for the better once paradigms are taken to not be the sole or even primary source of data on the typology of person inventories. As Harbour and others (McGinnis 2005, Sauerland & Bobaljik 2013, *e.g.*) have recognized, there are much more tangible typological generalizations about the number of person contrasts at the level of a language than there are about the number of contrasts in some paradigm that that language happens to employ. While the cells of any one paradigm might be subject to accidental homophony, one can generalize over a set of paradigms to discover the way that person is PARTITIONED in the language. A language's person partition can be thought of as an upper bound on the number of person contrasts internal to any individual paradigm.

The analyst uncovers a language's partition by superimposing person paradigms (Harbour 2016: 17-29); the following illustrates a way of implementing this idea. Start by collecting all the person paradigms a language has to offer (or a represen-

tative subset, as I do here for the purposes of exposition). Consider the following two Kiowa agreement paradigms (*ibid.*: 14); these are defined by argument status (cross-referencing subjects vs. objects) and by number.

(17) *Kiowa*
Object agreement (PL)

1EX	gyát-
1IN	gyát-
2ND	bát-

(18) *Kiowa*
Subject agreement (NSG)

1EX	e-
1IN	ba-
2ND	ba-

Neither of these paradigms contrasts all three local persons. Note that the *grammar* of Kiowa, however, simply must, as every person can be distinguished from every other in at least one of these paradigms.

We may use lowercase letters to represent which persons are morphologically contrasted in each of the above paradigms. We say that (17) has an 'aab' pattern to mean that 1IN and 1EX are associated with the same morphological form, but that 2ND is associated with a different one. (The order of the person cateogories – 1EX, 1IN, 2ND – is arbitrary but consistent throughout this thesis.) By contrast, (18) has an 'abb' pattern. These patterns are recorded in the left half of the table in (19). Restricting our attention to that left half, note that no two rows are identical – the first row (aa) is not the same as the second (ab), and neither is the same as the third (bb). Since each row is unique, we may associate each one with a distinct *uppercase* letter, as I do in the right half of the table.

(19)

	Paradigms (17)	Paradigms (18)		Partition
1EX	a	a	→	A
1IN	a	b	→	B
2ND	b	b	→	C

The rightmost column in (19), then, represents a generalization over the paradigmatic person contrasts. To say that Kiowa exemplifies an 'ABC' partition expresses that every local person can be distinguished from every other local person in at

least some paradigm. Thus we may conclude from just two paradigms, (17) and (18), that Kiowa has the same local persons that Imonda wears on its pronominal sleeve.

But superimposing person paradigms doesn't suffice to yield a three-way contrast between local persons in all languages. English, for instance, has an AAB person partition, since 1EX and 1IN are collapsed in every paradigm in which both are effable. It's important that both are effable – it would be wrong to conclude from the fact that the pronoun *I* can be exclusive but not inclusive that English has a clusivity contrast. Rather, the meaning of inclusive person is simply incompatible with the meaning of singular pronominal number, which the pronoun in question also bears. So, setting the singular pronouns aside for that reason, English uses the nominative plural pronoun *we* to convey exclusive and inclusive meanings alike, but uses a different form, namely *you*, for second person (aab). Plural agreement in the simple past tense does not contrast for person at all (aaa). So on and so forth – but no matter how many more paradigms of English one considers, those paradigms will converge on an AAB partition. 1IN and 1EX are contrasted nowhere in English pronominal and agreement paradigms. (The meanings may be distinguished periphrastically, of course: *you and us* versus *us, but not you*.)

1.7.2 Zwicky's puzzle

I mentioned above that the typology of partitions is a much more tangible problem for the theorist than the typology of paradigms is. This is because there are some logically possible partitions of person which are unattested (Zwicky 1977, Harbour 2016: 40). The absence of some partitions sets the stage for stronger theories of person, because now there are negative data to derive, data which didn't exist in the world of paradigms where everything is possible. So (in the interest of informing such a theory): which partitions are attested, and which aren't?

An exhaustive answer to this question is beyond the scope of this chapter. For now, I'll focus on a the subset of the typology that (20) represents, and will flesh out the full typology in subsequent chapters.

While partitions with three local persons are common, as are one kind of partition with two local persons (those with a generalized first person), a different kind of partition with two local persons is wholly unattested (Zwicky 1977, Harbour 2016: Ch. 2).

(20) Partitions over three local persons (not exhaustive)

	Three local persons (common)	**Two local persons** (common)	**Two local persons** (unattested)
1EX	A	A	A
1IN	B	A	B
2ND	C	B	B

Purely in light of the meanings that the local person categories seem to have (9), it's surprising that there are so many AAB partitions but no ABB partitions. Under an AAB partition, a language won't grammatically contrast individuals that contain the author a and those that contain the author-hearer sum $a \oplus h$. That is, (when used referentially) the generalized first person is used to refer to individuals that contain the author, *irrespective* of whether they contain the hearer.

The unattested ABB partition is the symmetric counterpart of the attested AAB partition: an ABB pattern would be a generalization about a grammar which doesn't distinguish individuals that contain h from those that contain $h \oplus a$ ($=a \oplus h$). This kind of system would have a generalized *second* person (because the form used for second person meanings is generalized to cover inclusive meanings), and that category would be used to refer to individuals that contain the hearer, irrespective of whether they contain the author. Despite its formal resemblance to the commonplace AAB partition, this kind of person system is not attested.

Authors, then, are grammatically privileged over their addressees, in the sense that author containment is more important than hearer containment when inclu-

sive meanings are morpho-syntactically encoded akin to some other local person category (i.e., in languages with two local persons). But when that obtains, why is it always the case that inclusive meanings are encoded akin to exclusive meanings – never akin to second-person meanings? That is, why does no language grammatically privilege *hearers*? This question was originally posed in Zwicky (1977);[3] I offer an adapted version of it below.

(21) **Zwicky's (1977) puzzle**:
Given that ABC and AAB partitions are common, why does no language have an ABB partition?

Note that there is nothing in the ontology that we've been working with thus far which sheds light on this puzzle, since exclusive meanings have the same relationship to inclusive meanings as second person meanings do ($a : a{\oplus}h :: h : a{\oplus}h$). Assuming the ontology itself is sound (for reasons given in §1.3), the typology of partitions needs to derive from something else. Person hierarchies (Zwicky 1977) and feature geometries (Harley & Ritter 2002) don't provide any real explanation, as they stipulate the solution outright (see Harbour 2016: 190-195).

1.7.3 Harbour's solution

A central insight of Harbour (2016) is that an answer to Zwicky's puzzle should derive from the way that person features encode the person ontology. His ontology admits *a*, *h*, and a countable number of *o*'s (which are animate 'others', *i.e.* atomic individuals that are not *a* or *h*.) But crucially, there are restrictions on which of those atomic individuals (and which sums of them) the person features can pick out. Harbour's proposal, in other words, has to do with how person features *interface* with the person ontology.

[3] Harbour calls the generalized form of the question (namely: which partitions are attested, which aren't, and why?) 'Zwicky's problem' for this reason.

To see why the relationship between the ontology and the grammar matters, consider the implications of the following idea about person features. Recalling that ABC person systems have three local persons – which are (at least partially) semantically defined by the containment relation that holds between the referent on the one hand, and the author or hearer on the other – we might imagine that there are two person features, AUTHOR and HEARER. The first of these (if present) determines that the author is a part of the target referent, while the second (if present) determines that the hearer is. Assuming that feature co-occurrence is commutative and interpreted as something like conjunction, we land on the following picture.

(22)

CATEGORY	REFERENT CONTAINS:	FEATURES:
1EX	*a*, but not *h*	AUTHOR
1IN	both *a* and *h*	AUTHOR, HEARER
2ND	*h*, but not *a*	HEARER

(22) says, for instance, that 1IN is specified for both person features, while 1EX and 2ND are specified only for one. This feature inventory correctly predicts that maximally three local persons can be contrasted, because there are only three ways of valuing a morpho-syntactic expression with at least one person feature. (Third person might be construed simply as the absence of both features.)

As Harbour notes, however, what this inventory does *not* offer is a solution to Zwicky's puzzle. To derive AAB partitions, we must adopt the view that one feature specification in the right-hand column of (22) can be conflated with another in some languages – specifically, we must allow for AUTHOR to be conflated with AUTHOR, HEARER to admit languages like Jarawa and English.

Herein lies the problem. No matter the mechanism by which we achieve that conflation (contextual neutralization of HEARER in the context of AUTHOR, *e.g.*), it's not possible to limit that process, except by stipulation, from allowing HEARER to be conflated with AUTHOR, HEARER – which erroneously derives the unattested ABB partition.

This isn't a problem unique to monovalent (privative) features, nor do the semantics of feature co-occurrence matter in any important way. The problem with the feature inventory in (22) is just the way those features' denotations interface with the ontology of person. AUTHOR and HEARER, whose denotations govern the mereological containment of *a* and *h* in the referent, put the two discourse participants on the same footing, grammatically speaking: the elements of the ontology (a, h) each correspond to a feature which determines their inclusion in the target referent.

What's needed is a feature inventory that doesn't put the speaker and hearer on grammatical par. This is precisely the kind of inventory that Harbour (2016) argues for in light of Zwicky's puzzle. The key element in his solution is virtuously simple: eschew HEARER. For Harbour, Universal Grammar simply offers no direct way to grammatically encode an addressee *per se*, nor the containment relation it may bear to a referent.

In lieu of HEARER, Harbour uses PARTICIPANT;[4] this feature governs whether both *a* and *h* are included in the referential target. His solution retains a correlate of the AUTHOR feature (which, as before, governs author inclusion). Now the features are no longer on par, in the sense that the set of things that PARTICIPANT associates with, namely $\{a, h\}$, is a proper superset of the set of things that AUTHOR does, namely $\{a\}$.

At this juncture one will likely wonder how Harbour's AUTHOR and PARTICIPANT actually derive ABC and AAB partitions without deriving ABB. Unfortunately, delving into the details of his proposal – which involves a lot of technical machinery not relevant to the point at hand – would take us very far afield.

In broad strokes for the interested reader, however, Harbour's systems works as follows. Personful expressions (which for him include local pronouns and some

[4]A two-feature system with PARTICIPANT and AUTHOR but not HEARER is not in itself original to Harbour: it has antecedents in Kerstens (1993) and Halle (1997). As these authors' reasons for adopting this inventory are not the same as Harbour's (for one thing, they are concerned with paradigmatic syncretisms, not partitions), I won't dwell on the specifics of their proposals.

third-person pronouns) form a natural class by virtue of containing a person head π. This head denotes a join-complete semi-lattice – essentially, a set closed under the join operation $\vee$, which for our purposes is equivalent to mereological summation – whose elements are (sums of) a, h, and the o's. These atomic or plural individuals are the things that can be referred to by a pronoun or other personful expression. The two aforementioned features, AUTHOR and PARTICIPANT, likewise denote join-complete semi-lattices, albeit much smaller ones. AUTHOR denotes the lattice whose sole element is the author, while PARTICIPANT denotes the lattice whose elements are the author a, the hearer h, and their join, which is the plural individual $a \oplus h$.

π is monovalent, but AUTHOR and PARTICIPANT come with binary values + and – . Semantically, these values denote two-place operations over lattices that can "add" or "subtract" – not in the arithmetic sense, and sometimes vacuously – elements of the latter two lattices to or from the π lattice, or to or from any lattice derived via prior operations on the π lattice. Having three basic lattices (π, AUTHOR, and PARTICIPANT) and two ways of putting lattices together (+ and –) yields various different sorts of derived lattices, and the elements of these lattices are, once again, the individuals to which the expressions that contain the lattice- and operation-denoting features and values can refer. [π +AUTHOR] indicates the (vacuous) "addition" of the author to the π lattice, for instance, while [π –PARTICIPANT] is the structured set of all individuals which don't contain a participant, since all the individuals in the PARTICIPANT lattice, as well as any individuals that mereologically contain them, have been "subtracted" out.

In Harbour's system, different person partitions come about because not all languages use $\pm$AUTHOR or $\pm$PARTICIPANT, or they don't use them in the same ways; the cross-linguistic variation is governed by three parameters. One parameter determines whether the $\pm$AUTHOR feature is utilized, the second determines whether $\pm$PARTICIPANT is. If both features are, the third feature governs whether, via the

two operations + and –, AUTHOR or PARTICIPANT composes with π first. (Order of composition matters once both features are used due to the fact that one operation, namely –, isn't commutative.)

The mechanics of lattice composition don't matter very much for our purposes. The point is that Harbour's solution to Zwicky's asymmetry derives ultimately from the choice of features and the lattices they denote. Though he has a unique *a* and a unique *h* in the ontology, a fact about how the grammar interfaces with that ontology – specifically, not having a $\pm$HEARER feature – means that there isn't a way to cook up a derived lattice whose elements are the individuals that contain the hearer. Of course, 'the individuals that contain a hearer' is just a way of describing what the empirically unattested generalized second person is, so the system works to derive the absence of *ABB partitions.[5]

The takeaway is that Harbour derives a gap (*viz.*, the unattested ABB) in the typology of person systems with an inventory of features that encode *a* and *h* asymmetrically. One feature has to do only with authors, while the other has to do with authors and hearers simultaneously.

(23) **Harbour's (2016) solution to Zwicky's puzzle**

Context authors and hearers are treated asymmetrically in their morpho-syntactic encoding. Something intrinsic to the inventory of person features privileges the encoding of context authors.

Abstracting away from the details of Harbour's proposal, why (23) matters is this: if the grammatical encoding of context authors is relatively direct, it's easy to concoct a pronoun which forms a natural class out of referents that contain the author. If the grammatical encoding of hearers is *less* direct, it's harder to form a

[5]Even though the only feature that "adds" and "subtracts" hearers is $\pm$PARTICIPANT, which brings authors along for the ride as well, Harbour still has a way of modeling second person. Second person in an AAB language like English, for instance, is a generalized participant pronoun in terms of its literal meaning. Its use, however, is restricted to second-person meanings by a pragmatic blocking principle.

natural class out of referents which contain a hearer. This is all as desired, since generalized first person is common, while generalized second person is unattested.

The proposal I develop in Chapter 2 is motivated in part by Harbour's insight (23) – though I go about eschewing the HEARER feature in a rather different way – and is motivated in part by the data discussed in the next section. The data to follow contrast with those discussed above in a weird (and illuminating) way: while Zwicky's puzzle suggests there is an asymmetry in how participants are encoded grammatically, second and generalized first person have a deeply symmetric relationship when it comes to bound variable readings.

1.8 Desideratum 6: Supersloppy readings of local pronouns

Rebuschi (1994, 1997) observed that the interpretation of singular first- and second-person pronouns in Romance languages involve a QUIRKY DEPENDENCE: they seem in some cases to be semantically defined in relation to one another. Later studies (Bevington 1998; Chung 2000; Charnavel 2015, 2019) have shown similar facts to hold in English. I will base the contents of this section on Charnavel's work, since her data set is the most empirically comprehensive (for English), and since her analysis is the least *ad hoc* – see Charnavel (2019: §2.2) for justification on this point.

Moreover, I will present mainly the contents of her earlier, 2015 paper. While the 2019 paper improves on the earlier one in empirical coverage (and the analyses concomitantly differ somewhat between the two), the earlier work presents a morpho-syntactic picture that is a bit more tangible for my purposes here, in that the featural contents of local pronouns are more explicit.

Now, quirky dependence can be observed under focus and under VP ellipsis (VPE); for reasons of space I'll restrict attention to the VPE cases here. The phenomenon can be seen in the context of VPE only when the elided expression and its antecedent are contributed by different discourse participants; this is illustrated

in the dialogues between Romeo and Juliet below. In (24a) Romeo provides the antecedent to Juliet's response (24b) which contains an ellipsis site (△). Her response is ambiguous between a strict reading and what Charnavel calls a SUPERSLOPPY reading. The structurally converse scenario – where the subject is second person and the object is first person – shows the same pattern and is exemplified by (25).

(24) (Charnavel 2015)
  a. ROMEO: I love you.
  b. JULIET: I do △ too.
    (24b) can mean 'Juliet loves Juliet too' (strict)
    (24b) can mean 'Juliet loves Romeo too' (supersloppy)

(25) (example mine)
  a. ROMEO: You bother me.
  b. JULIET: You do △ too.
    (25b) can mean: 'Romeo bothers Romeo too.' (strict)
    (25b) can mean: 'Romeo bothers Juliet too.' (supersloppy)

The supersloppy readings of Juliet's utterances are notable in that they do not follow from the usual theories of VP ellipsis if a naïve semantics for the singular first- and second-person pronouns of English is assumed – whereby the value of *I*/*me* is the context author and *you* their hearer.

By 'the usual theories' of VPE I mean those that aim to provide a unified analysis for the two readings of sentences like (26), which illustrates the classic strict/sloppy ambiguity, by appealing to the notion of INTERPRETATIONAL PARALLELISM (27).

(26) Amy loves her mother. Zoë does △ too.
  a. Amy loves Amy's mother. Zoë loves Amy's mother. (strict)
  b. Amy loves Amy's mother. Zoë loves Zoë's mother. (sloppy)

(27) **Parallelism requirement for elided DPs**:

A DP contained in an ellipsis site must be interpreted in parallel fashion to its structurally-defined correspondent in the antecedent.

(26) may satisfy (27) in two ways. One way to satisfy the parallelism require-

ment is for the elided possessor to adopt the extension of its correspondent in the antecedent. Since its structural correspondent is the overt *her*, and since that expression's extension is Amy, the elided possessor can adopt that extension too. In this way, the REFERENTIAL PARALLELISM that holds between *her* and the elided possessor derives the strict reading.

Alternatively, since *her* could well have been a variable (bound by *Amy*), the elided possessor can be interpreted as a variable too (but now necessarily bound by *Zoë*). This BINDING PARALLELISM derives the sloppy reading (26b).

It's easy to see how referential parallelism can derive strict readings of (24b) and (25b) above: the extension of Romeo's *you* in 24 is Juliet, and so the object DP in Juliet's ellipsis site can have that extension too; *mutatis mutandis* for (25).

The supersloppy readings, however, do not follow trivially from (27). In contrast to (26), where construing *her* as a bound variable derives the sloppy reading for the elided possessor, in (24) and (25) the overt object pronouns don't have a binder. Or do they?

There are two important restrictions on the availability of supersloppy readings that Charnavel (2015) calls attention to. These restrictions suggest the objects in (24) and (25) are indeed bound by those sentences' subjects: *I* can bind *you* and vice versa. Below, I introduce the relevant conditions on the availability of supersloppy readings, and then summarize Charnavel's analysis of supersloppiness.

1.8.1 Sensitivity to c-command implicates binding

Charnavel argues that for supersloppiness to obtain, it's necessary to have one local pronoun (first or second) c-command the other local pronoun (second or first) in both the antecedent utterance and the one that contains the ellipsis site. In (28) and (29), for example, where one of the pronouns is buried inside a relative clause, we observe that the supersloppy reading is no longer available.

(28) (Charnavel 2015)
  a. Romeo: The man [I hate] loves you.
  b. Juliet: The woman [I hate] does △ too.
     (28b) can mean: 'The woman Juliet hates loves Juliet, too.' (strict)
     (28b) **can't** mean: 'The woman Juliet hates loves Romeo, too.'

(29) (example mine)
  a. Romeo: The man [you hate] loves me.
  b. Juliet: The woman [you hate] does △ too.
     (29b) can mean: 'The woman Romeo hates loves Romeo, too.' (strict)
     (29b) **can't** mean: 'The woman Romeo hates loves Juliet, too.'

Given that c-command is a precondition for binding, Charnavel reasons, the fact that supersloppy readings disappear in its absence suggests that these readings are derived via binding parallelism. This is a natural move, given that the *other* kind of parallelism (namely: referential) already explains the *other* reading (namely: strict) that sentences like (24b) and (25b) have.

To that end, of course, first- and second-person pronouns must be able to act as bound variables. But binding must be restricted in a principled way, since supersloppiness obtains only when the binder is not a third-person expression, as I now show.

1.8.2 Local pronouns can have a relational semantics

The second restriction on the availability of supersloppy readings is that they come about only in cases where a local pronoun c-commands another local pronoun (one with a different person specification) in both the antecedent utterance and the utterance containing containing the ellipsis site. If one of the DPs is not specified for a local person, supersloppiness vanishes once again, as (30) illustrates.

(30) (Charnavel 2015; adapted)
a. *Romeo*: I love you.
b. *Juliet*: Count Paris does △ too.
(30b) can mean: 'Count Paris loves Juliet too.' (strict)
(30b) **can't** mean: 'Count Paris loves Romeo too.'
(30b) **can't** mean: 'Count Paris$_i$ loves his$_i$ addressee, too.'

That the supersloppy reading is anti-licensed when both local pronouns are not present suggests that there is something specific to the meaning of the local pronouns *I*/*me* and *you* which allows them to bind one another – but not to bind, or be bound by, third person DPs. With Rebuschi (1994, 1997), Charnavel argues that these pronouns' meanings are relational in the following sense: the value of *I*/*me* can be determined as a function of who the hearer is, and the value of *you* can be determined as a function of who the author is. I show in the next section how this intuition is cashed out formally.

1.8.3 Charnavel's account of supersloppiness

Charnavel's (2015) analysis of supersloppy readings has two components. The first is an inventory of local person features (specifically, one that allows for the relational semantics just discussed) which can be used to construct English first- and second-person singular pronouns. Her inventory is given in (31). I have bolded the features to distinguish them as expressions of the object language, and note that interpretation proceeds with respect to an author-hearer tuple $\langle a, h \rangle$.

(31) a. $[\![\mathbf{A}]\!]^{\langle a,h \rangle} = A = [\ \lambda x\ .\ \iota y : \langle x, y \rangle \in \{\langle a, h \rangle, \langle h, a \rangle\}\ ]$
b. $[\![\mathbf{a}]\!]^{\langle a,h \rangle} = a$
c. $[\![\mathbf{h}]\!]^{\langle a,h \rangle} = h$

The feature **A** in (31a) denotes an ADDRESSEEHOOD RELATION which holds symmetrically and irreflexively between the context author and hearer. The value of **a** is fixed by the author, and that of **h** by the hearer.

On Charnavel's account, the English pronouns *I* and *you* each contain two features drawn from the inventory in (31) when they are being interpreted in supersloppy fashion. Specifically: both pronouns contain **A**, and are distinguished from one another as a function of the other feature they contain (**a** or **h**). The denotations of the features a pronoun contains compose (via Function Application) in the following way.

(32) a. $[\![\text{ I/me }]\!]^{\langle a,h \rangle} = [\![\textbf{ A h }]\!]^{\langle a,h \rangle} = A(h) = a$
b. $[\![\text{ you }]\!]^{\langle a,h \rangle} = [\![\textbf{ A a }]\!]^{\langle a,h \rangle} = A(a) = h$

Note that because the relation A maps an individual to their discourse partner, the *first*-person pronoun contains a feature whose semantic value is determined by the *hearer* coordinate of the context tuple, while the *second*-person pronoun contains a feature whose value is determined by the *author* parameter. On Charnavel's account, then, the meaning of *I/me* can be akin to 'your addressee', while the meaning of *you* can be akin to 'my addressee'. This semantic interdependence plays an essential role in restricting supersloppy readings to configurations where one local pronoun binds another.

The second component of Charnavel's account is the binding mechanism – one which, in tandem with (32), allows these pronouns to bind each other, but not to bind, nor be bound by, non-local pronouns. To this end Charnavel adopts Cable's (2005) idea that Predicate Abstraction (PA) is sensitive to person. For the general case, Cable assumes the standard implementation of PA (Heim & Kratzer 1998) whereby (i) movement leaves a trace, (ii) the trace is interpreted as a variable, and (iii) argument movement (to Spec, TP) triggers the insertion of an abstraction operator below the landing site which binds that variable. He augments the standard implementation, however, by proposing that PA can proceed in a different way when the local pronouns move. When first-person pronouns move, they may trigger the insertion of a special abstraction operator relativized to first person,

which I'll call λ**a**; it serves to bind the variable *a* situated in the author coordinate of the context tuple $\langle a, h \rangle$. The movement of second-person pronouns optionally triggers the insertion of an operator relativized to second person, namely λ**h**; this allows the hearer coordinate to be recast as a bound variable. The mothers of λ**a** and λ**h** are interpreted via the monstrous (*i.e.*, context-overwriting) rules in (33).

(33) a. $[\![\widehat{\lambda\mathbf{a}\ \ \text{XP}}]\!]^{\langle a,h \rangle} = \quad \lambda x \,.\, [\![\text{XP}]\!]^{\langle x,h \rangle}$

b. $[\![\widehat{\lambda\mathbf{h}\ \ \text{XP}}]\!]^{\langle a,h \rangle} = \quad \lambda x \,.\, [\![\text{XP}]\!]^{\langle a,x \rangle}$

Charnavel assumes that the traces of first- and second-person pronouns are interpreted identically to their moved counterparts – that is, as relational nominals like (32). The relational semantics for pronouns and traces, in conjunction with Cable's person-sensitive predicate abstraction, suffices to capture supersloppiness.

Recall that when Romeo says *I love you*, Juliet's response (24b), namely *I do* △ *too*, can mean that Juliet loves Romeo. A derivation of Juliet's ellipsis site on this reading is given in (34). (I denote the trace of the pronoun *I*, which consists of the features **A** and **h**, with 't_I' and '$t_{\mathbf{Ah}}$'.)

(34) $[\![\text{VP(24b)}]\!]^{\langle \text{j,r} \rangle} =$

$[\![\lambda\mathbf{a} \,[\, t_I \text{ love you} \,]]\!]^{\langle \text{j,r} \rangle} =$ by (32)

$[\![\lambda\mathbf{a} \,[\, t_{\mathbf{Ah}} \text{ love } \mathbf{Aa} \,]]\!]^{\langle \text{j,r} \rangle} =$ by (33a)

$\lambda x \,.\, [\![t_{\mathbf{Ah}} \text{ love } \mathbf{Aa}]\!]^{\langle x,\text{r} \rangle} =$ by (31)

$\lambda x \,.\, A(\text{r})$ LOVES $A(x) =$ by (31)

$\lambda x \,.\, x$ LOVES $A(x)$

So Juliet's ellipsis site denotes the property of loving one's addressee. The direct object in the ellipsis site denotes $A(x)$, which contains a variable bound by λx. This property can take as argument the value of Juliet's *I* (namely j), and the resulting expression means that Juliet loves Juliet's addressee. Crucially, the expression in (34) could equally well apply to the value of Romeo's *I* (namely r), which would assert that Romeo loves Romeo's addressee – which is exactly what Romeo said.

For Charnavel, supersloppiness derives from binding parallelism, just as garden-variety sloppy readings do.

The same ingredients derive the supersloppy reading of Juliet's utterance in dialogue (25), the configuration where a second-person pronoun c-commands first, as shown below.

(35) $[\![\ \text{VP(25b)}\ ]\!]^{\langle \text{j,r} \rangle} =$
$[\![\ \lambda \mathbf{h}\ [\ \text{t}_{\text{you}}\ \text{bother me}\ ]\ ]\!]^{\langle \text{j,r} \rangle} =$ by (32)
$[\![\ \lambda \mathbf{h}\ [\ \text{t}_{\mathbf{Aa}}\ \text{bother}\ \mathbf{Ah}\ ]\ ]\!]^{\langle \text{j,r} \rangle} =$ by (33b)
$\lambda x\ .\ [\![\ \text{t}_{\mathbf{Aa}}\ \text{bother}\ \mathbf{Ah}\ ]\!]^{\langle \text{j},x \rangle} =$ by (31)
$\lambda x\ .\ A(\text{j})\ \textsc{bothers}\ A(x) =$ by (31)
$\lambda x\ .\ x\ \textsc{bothers}\ A(x)$

Juliet's VP denotes the property of bothering one's addressee; this property's argument is her overt *you*, the value of which is Romeo. Again, since Juliet's VP may as well have been Romeo's (*i.e.*, Romeo would've communicated the proposition that Juliet bothers Romeo if his VP denoted what Juliet's does), ellipsis is licensed by binding parallelism.

Moreover, per Charnavel's analysis supersloppy readings for (28b), (29b), and (30b) are correctly predicted to be unavailable, albeit by the stipulation that the movement of third-person nominals (*Count Paris*, *the woman*) cannot trigger the insertion of the abstraction operator that would be required for Juliet's VP to match Romeo's with respect to binding.

I have now illustrated in some detail how Charnavel's analysis works; I have done so principally because at later points in the dissertation, I will return to the idea that there is a relational feature which serves to map one kind of discourse participant to another.

1.9 Anti-desideratum: Descriptive readings of person indexicals

A non-trivial portion of the fine-grained investigation into the semantics of person indexicals has sourced evidence from what are termed DESCRIPTIVE uses of local pronouns (Recanati 1993, Nunberg 1993, 2004). One famous example from Nunberg (1993) is given in (36).

(36) *Spoken by a condemned prisoner:*
I am traditionally allowed to order whatever I want for my last meal.

The meaning the above sentence has can be paraphrased "A condemned prisoner is traditionally allowed to order whatever they want for their last meal." Clearly, even the matrix token of the pronoun *I* is not referential in nature, as the sentence can be true even if it is its speaker's first time in prison (and thus there is no prior tradition relevant to that individual to call on). As an informal characterization, we can say that the pronoun *I*, provided the right kind of intensional context, can range over individuals that aren't the literal speaker of the utterance. That reading is called 'descriptive' because the pronoun *I* is somehow acting as proxy for an indefinite or definite description (here, something like 'a condemned prisoner', or 'the condemned prisoner at any comparable situation').

In this section, I want only to point out that the meanings the pronouns in (36) have is not particularly remarkable with respect to definite descriptions in intensional contexts more generally, and that such meanings should be considered irrelevant to the study of person *per se*.

Now, the kind of interpretation that the pronouns in (36) have are indeed available to other local pronouns as well. For instance, any American alive today could truthfully utter (37), despite the fact they are not old enough to have participated in the Mexican-American war.

(37) We invaded Mexico in the 1840s.

What I take the pronoun *we* to be doing here is finding a past-time correlate of the group which the speaker is actually a part of at the utterance time. That group can be characterized by a particular kind of description: 'Americans'. It differs from (36) in not being caught up in intensional quantification, but the two interpretations are alike in that neither pronoun straightforwardly identifies an individual of which the speaker is a mereological part at the actual world and present time, and in that there is a proxy description which is applicable to both that individual as well as its correlate at another world or time.

Second-person pronouns license these readings too, as the reader may verify by substituting *you* for *we* in (37) and imagining it being spoken by a non-American to an American. So too do third-person pronouns, as the following example from Elbourne (2008)[6] illustrates:

(38) *Pointing to Pope Benedict XVI:*
He is usually an Italian.

Of course (38) doesn't mean that Benedict XVI is usually an Italian, it means that for most situations s, the pope in s is an Italian. 'The pope' is a description which happens to be true of Benedict XVI, the referent of *he*, and that description can be used to recover pope correlates of Benedict XVI at other times or situations.

1.9.1 Non-indexical nominals also admit descriptive readings

I consider descriptive readings an anti-desideratum (in the sense that they are something a theory of person *per se* needn't capture) simply because these readings are not unique to personal pronouns. Names and non-pronominal definite descriptions, too, seem to admit such readings in the right sorts of contexts. Consider the following example, which is from Bonomi (1995) and which is discussed in the context of descriptive indexicals by Sæbø (2015).

[6]This example is a variant of one given by Recanati (2005), credited to Geoffrey Nunberg.

(39) a. *Context:* Swann has come to the conclusion that his wife Odette has a lover, but he has no idea who his rival is . . . he decides to kill his wife's lover, and he confides his plans to his best friend, Theo . . .

Odette's lover is Forcheville, the chief of the army, and Theo is a member of the security staff which must protect Forcheville. During a meeting of this staff to draw up a list of the persons to keep under surveillance, Theo . . . says:

b. 'Swann wants to kill the chief of the army.'

Consider the possible meanings of this sentence with respect to how the underlined DP is interpreted. The *de dicto* reading would be one where in all the worlds of Swann's desires, he kills the chief of the army, whoever that may be. (39b) would be false on this reading – and it's obviously not what Theo meant, as he knows Swann's desire is instead to kill his wife's lover.

There are two other interpretations that *the chief of the army* can have, both of which are sometimes called *de re* readings. The so-called 'transparent' *de re* reading is one where this expression picks out an individual who fits the description *the chief of the army* in the evaluation world. That individual is Forcheville. Such a reading of (39b) is also false, since Theo knows the worlds of Swann's desires include worlds where his wife's lover is someone other than Forcheville. (After all, Swann doesn't know his wife's lover *is* Forcheville.)

What Theo meant in uttering this sentence is that in all the worlds of Swann's desires, Swann kills his wife's lover, whoever that may be. Sæbø (2015) terms this third reading '*de dicto* under substitution', since an adequate characterization of it relies on substituting *the chief of the army* for *Odette's lover* (read *de dicto*). The existence of such readings motivates a theory[7] of descriptions in the context of

[7]Such a theory has origins in Quine (1956), Kaplan (1968), Lewis (1979), and Cresswell & von Stechow (1982).

attitude verbs whereby descriptions like *the chief of the army* in (39b) are 'not strictly evaluated as they stand' (Sæbø 2015: 1113). Rather, they are substituted for other descriptions provided that there is a way of linking the entities or individual concepts that the descriptions denote; the link is that the two descriptions (here *the chief of the army* and *Odette's lover*) happen to pick out the same individual in the evaluation world.

Following Aloni (2005), Sæbø's way of analyzing the relevant reading is to posit an $\langle\langle s, e\rangle, \langle s, e\rangle\rangle$ SUBSTITUTION OPERATOR which can be syntactically realized as sister to a DP and which links two coextensional individual concepts; other work recruits similar operators termed CONCEPT GENERATORS (Percus & Sauerland 2003).

I refer the interested reader to those works for the formal details, but the takeaway is that since the relevant operator can apply to any kind of DP, indexical or non-indexical, the interpretations of the pronouns in (36-38) can be unified with that of (39). When a prisoner utters 'I am traditionally allowed to order whatever I want for my last meal,' a substitution operator can map the first-person pronoun to a different kind of description ('the condemned prisoner'), since both pick out the same individual in the evaluation world; within the scope of the adverb 'traditionally', however, that description can range over individuals that aren't the speaker.

The upshot is that there isn't good reason to think the so-called descriptive interpretations are unique to person or indexical expressions more broadly. Accordingly, the theory of person developed in Chapter 2 will not be built to handle the kinds of interpretations that (36-38) have, as there are independent mechanisms available to derive these readings.

1.10 A tension

As a conclusion to this chapter, I want to highlight a tension between two of the desiderata discussed above. Harbour's insight about Zwicky's puzzle (§1.7.2-1.7.3)

was that the author and the hearer of an utterance are cashed out morpho-syntactically in a fundamentally asymmetric fashion. Working with a different set of data, Charnavel gets empirical mileage out of Rebuschi's idea that there's a semantic object which invokes a relation between the author and hearer.

To the extent that an isomorphism between morpho-syntax and semantics is to be maintained, the two proposals seem somewhat at odds. Charnavel's idea about the feature contents of first- and second-person pronouns invokes a fundamental symmetry in how authors and hearers are syntactically encoded: in the relevant contexts, the first-person pronoun consists of the features **A** and **h**, while the second-person pronoun consists of **A** and **a**. Crucially, nothing internal to this feature inventory grammatically privileges one discourse participant over another in a way that would give us a handle on Zwicky's puzzle.

Reconciliation might be possible, however. In my view, the first step toward marrying these ideas is to recognize that while an author-hearer encoding asymmetry provides an answer to Zwicky's puzzle (Harbour 2016) and a relational semantics is at play in the interpretation of at least some local pronouns (Rebuschi 1994, Charnavel 2015), that the feature whose denotation calls on that relation need not be carried by both first and second persons in languages with an AAB partition. In the next chapter, I will claim that the relational feature is always found inside second-person pronouns, but never inside generalized first-person pronouns, and moreover that whether this feature is present is the *only* thing that distinguishes the two. This will be shown in Chapters 2-3 to derive a new solution to Zwicky's puzzle and the typology of person contrasts more generally, and it will also suggest a particular kind of analysis for supersloppy readings, one which I explore (but do not fully deliver on) in Chapter 4.

CHAPTER 2

The local persons: first, second, and inclusive

2.1 Introduction

This chapter develops a theory of local person features. The main empirical goal is to capture the typology of person contrasts (as was exemplified by Zwicky's puzzle in the last chapter), but each of the desiderata introduced there informs the theory in some way. Likewise informative is the theory of indexicals developed by Elbourne (2005, 2008), which will be introduced below in §2.2.

2.1.1 The semantic framework

I will assume that the meanings of linguistic expressions are determined by an interpretation function which is relativized to a context of utterance c, an index of evaluation j, and an assignment function g – though I will often refrain from writing the latter two when they are not relevant to the point at hand. The context records information surrounding the actual speech event, while the index of evaluation records information that allows the extensions of expressions to be recovered from their intensions (Kaplan 1977). The assignment is a partial function from the domain of natural numbers onto the domain of entities (à la Heim & Kratzer 1998). I assume moreover that the interpretation of morphologically or syntactically complex expressions proceeds via Function Application (following Heim & Kratzer

1998: 44 and ultimately Frege 1891).

(40) **Interpretation**

a. The interpretation function is relativized to a context c, an index of evaluation j, and an assignment g. Notationally: $[\![\cdot]\!]^{c,j,g}$

b. *Function Application*

If γ is a branching node, $\{\alpha, \beta\}$ is the set of γ's daughters, and $[\![\alpha]\!]^{c,j,g}$ is a function whose domain contains $[\![\beta]\!]^{c,j,g}$, then $[\![\gamma]\!]^{c,j,g} = [\![\alpha]\!]^{c,j,g}([\![\beta]\!]^{c,j,g})$

The domain of the interpretation function consists of linguistic expressions, for which I will adopt the recursive definition in (41).

(41) **Linguistic expressions**

a. If α is a syntactic feature, then it is a linguistic expression.

b. If α and β are linguistic expressions,

then the phrase $\overset{\frown}{\alpha\ \beta}$ is a linguistic expression.

In other words, I am assuming that interpretation is compositional at all scales, even below the level of the word or morph. Features are ordinary syntactic objects which Merge to form phrases. The interpretation of a syntactic phrase (independent of how it is exponed morpho-phonologically) is determined by the interpretation of its parts. Despite 'compositionality all the way down' being the null hypothesis given what's known about about how phrases large enough to be associated with words behave, it has been explored relatively little in prior work. The next section offers some further comments on this methodological point.

2.1.2 Turtles

This thesis has the broad goal of providing a general compositional semantics for a set of morphologically-motivated person features. Various parts of this goal have precedent, but they have not been tackled in tandem.

Harbour's (2016) work is morphologically motivated and offers an explicit compositional semantics for person features, for instance. But it's not a *general* semantics. By that I mean that the kinds of semantic operations he recruits are tailored to explaining the referential uses of personful expressions. Outside the world of person, these operations either are not defined or seem not to have much use. Kratzer (2009) likewise assumes a person-specific semantics to some degree.

Then there's a body of work on personal pronouns which *does* use a general semantics, but doesn't decompose them fully into their constituent parts (Partee 1989, Kratzer 1998, Cable 2005, Sudo 2012, *i.a.*). This is no fault of these authors, of course; they simply have different empirical goals. But decomposition seems necessary if we want to understand Zwicky's puzzle, since there's something that inclusive and exclusive first person meanings have in common that inclusive and second person meanings don't.

Charnavel's (2015, 2019) work recruits a general semantics too, and is compositional at the sub-word level to boot, but it does not interface well with the morphology. When presenting her 2015 analysis of supersloppy readings in the last chapter, I said that *you* in English may consist of two features: **A** and **a**, whose denotations compose to mean something like 'my addressee'. It needn't, however: nothing in her system prevents the feature **h** from picking out the hearer when supersloppy readings are not at play. The puzzle from a morphological perspective is how one could ensure that **h** and [**A a**] are both pronounced as *you*, given that these two syntactic objects share no features. Similar issues arise for first person meanings (which could come about either via **a** or via [**A h**]), and for the feature inventory proposed in the 2019 paper.

Elbourne's (2005, 2008) work, which I discuss in greater detail below, has a good deal in common with the proposal given below methodologically, in that it features a standard compositional semantics (binary branching, Function Applica-

tion, lambda calculus) at the sub-word level, and in that it interfaces more neatly with the morphology. He is concerned primarily with demonstratives, however, and less so the local persons (except so far as 'descriptive' readings are concerned – but in §1.9 we saw a reason to think that these readings do not inform the study of person *per se*).

Likewise methodologically similar is a paper by Sophia Malamud (2012), who in the interest of exploring impersonal readings of second-person pronouns, provides a hypothesis about their constituent features, endows those features with denotations, and has them compose in a semantically ordinary way. The thrust of this work is toward capturing impersonal readings of second-person pronouns (*you*) as well as dedicated impersonal pronouns (*one*), however, not person more generally.

So to reiterate, I am striving for a theory of person with the following properties. It must decompose personful expressions into their atomic parts; these parts are syntactic features. Expressions formed from those features must be able to be spelled out in a consistent way morphologically. The features must have denotations, and those denotations must compose in a general fashion.

Now, as something of an aside – on the face of it, semantically ordinary feature composition obfuscates the notion of a syntactic head, since a featurally complex head can just be called a phrase, and a featurally simplex head can just be called a feature. Without augmenting (41) by deriving or stipulating the existence of heads, some syntactic problems arise – for instance, how to distinguish head movement from phrasal movement. These problems won't be relevant for my purposes, so I won't dwell on them much, except to say the following.

On the standard view, a head is notionally a syntactic atom, regardless of how many features it carries. This has one of two consequences, depending on whether, when several features are carried by a single head, those features are understood

to be hierarchically structured with respect to one another. If heads have internal structure, something beyond the syntactic component needs to imbue them with it. Harley & Ritter (2002), for instance, who in light of cross-linguistic evidence argue that 'bundles' of φ-features are in fact internally structured, gave this job to the morphological component. By contrast, if heads do *not* have internal structure, a combinatoric semantic operation beyond Function Application is needed to cover the cases when a head carries three or more semantically interpretable features. (Function Application is strictly binary, so in cases of ternary branching, a special rule is needed to tell the function which of its arguments it should compose with first.) Kratzer (2009: 220-221) goes this route in her analysis of person features.

I don't know how to derive heads, but the reader who is uncomfortable with stipulating them in light of (40) and (41) may take some solace in the fact that the account presented below avoids both problems. A structure-building operation beyond Merge is not required, and neither is a special operation for dealing with the interpretation of ternary (or n-ary) branching nodes.

The rest of this chapter is organized as follows. I will contextualize my account of pronominal person features (whose *raison d'être*, recall, is to derive the typology of person partitions) by summarizing Elbourne's (2008) analysis of English demonstratives. The goal there is to introduce a way of thinking about how the different components of meaning that indexical words contain can be put together compositionally, and Elbourne's template will guide the analysis of local pronouns that I develop in §2.3. In that section, I introduce a conjecture regarding the way utterance contexts are structured formally, and show how the structure of those contexts bears on what kinds of person features we should expect to find. The inventory of features I propose yields a set of pronouns which are predicted to compete pragmatically with one another under certain conditions. That competition between pronominal forms is what will derive Zwicky's asymmetry.

2.2 Indices, indexicals, and deferred reference

Local persons and local pronouns belong to the larger class of indexical expressions (Perry 1979). I use the term INDEX as Nunberg (1993) does, to refer both to "the contextual element picked out by the linguistic meaning of an indexical expression like *you*, as well as [to] the thing picked out by a demonstration associated with the use of a word like *that*" (p. 4). He is careful here to not equate indices with the referents of indexical expressions, the reason being that index and referent are teased apart in cases of DEFERRED REFERENCE.[1] Nunberg illustrates the distinctness of indices and referents with the following example (*ibid.*: 24).

> . . . suppose I point in sequence at two sample plates in my china shop, the first sitting in front of me, the second on a table across the room. I say:
>
> (42) *These* are over at the warehouse, but *those* I have in stock here.
>
> If I had "really" been pointing at the referents of the terms, it would have made more sense to have reversed *these* and *those*.

In (42), sets of plates are being referred to, but reference is 'deferred' in the sense that it's not those *sets* of plates that are being pointed at, but rather the individual sample plates that serve as the indices (*i.e.*, the entities used to *recover* the referent).

Note that the proximate/distal contrast in (42) does not track the proximity of the referent, but rather the proximity of the index. Interestingly and by contrast, grammatical number tracks the cardinality of the referent, not that of the index – the words used weren't *this* and *that* despite the sample plates being atoms. This shows that the paradigmatic contrasts between an indexical expression like *those* and the expressions with which it alternates may come in different flavors.

[1] Also known by Quine's original term, DEFERRED OSTENSION.

(43)

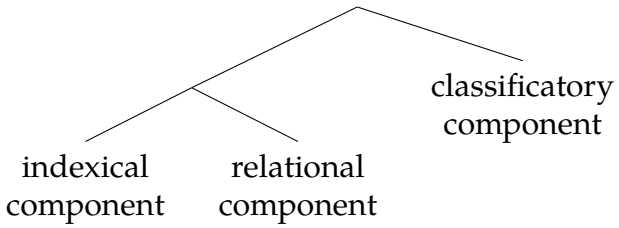
		referent	
		SG	PL
index	PROX	this	these
	DIST	that	those

The takeaway is that while some paradigmatic contrasts relay information about the index itself, others relay information about the referent that the index is used to recover. The former kind of contrast has to do with what Nunberg calls the INDEXICAL COMPONENT of a demonstrative (or an indexical expression more generally). This component introduces the index to the semantic derivation, and may also introduce features which assert or presuppose certain things about that index – *e.g.*, that the index is distal to the speaker in the case of *that* and *those*. The latter kind of contrast belongs to the CLASSIFICATORY COMPONENT, which deals in the characterization of the referents of (nominal) indexical words, and to which the contrasts in grammatical number in (43) belong.

There is a third component to indexical expressions, namely the RELATIONAL COMPONENT, which determines how indices and the referents they aid in recovering relate to one another. For the china shop example, this relation would be the one a display plate bears to the corresponding sets for sale.

Elbourne (2005, 2008), building in part on Nunberg's work, put forward an idea about how these components are syntactically arranged within indexical expressions. That idea is illustrated in (44).

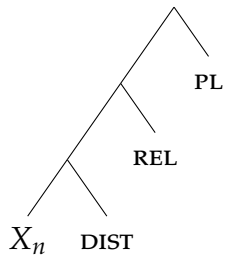
(44) A template for indexicals, à la Elbourne



The components are arranged such that that the relational component, which Elbourne understands to introduce a function from indices to referents determined

contextually, is situated between the two: indices are introduced, are (potentially) modified in certain ways, and then mapped to a referent, at which point the classificatory component can modify that referent. By way of illustration, the demonstrative *those* can be decomposed along the lines of (45), where X_n is a feature that introduces a variable over numerals (numeric indices, in a different sense of 'index'), whose values are fixed by a contextually-given assignment function, and where REL denotes a function from indices to referents.

(45) *those*, à la Elbourne



Here the indexical component consists of the smallest phrase containing the numeric index X_n and the distal feature DIST. We could imagine that the English DIST feature denotes an identity function over entities, one whose output is defined only for entities distal to the speaker.

(46) a. $[\![X_n]\!]^{c,g} = \quad g(n)$

b. $[\![\text{DIST}]\!]^{c,g} = \quad \lambda x_e \,.\, x$, only if x is distal to a

c. $\left[\!\!\left[\begin{array}{c} \diagup\diagdown \\ X_n \quad \text{DIST} \end{array} \right]\!\!\right]^{c,g} = \quad g(n)$, only if $g(n)$ is distal to a

REL stands in for the relational component, and can for the moment be valued by the reader's favorite pragmatic mechanism. The indexical component $[\, X_n \,\text{DIST}\,]$ and the relational component REL come together to form the phrase $[\,[\, X_n \,\text{DIST}\,]\,\text{REL}\,]$, which by Function Application denotes the referent. The plural feature, which constitutes the classificatory component, rounds off the demonstrative by contributing the assertion or presupposition that the referent is a plural individual (again, by the reader's favorite mechanism).

In (45) there is a single instance of a component-internal phrase, namely [X_n DIST], but other components could contain multiple features in principle. The western Romance languages, for instance, which have two forms of *those* as a function of grammatical gender, show that another feature (*e.g.*, FEM) can join PL in the classificatory component. My picture in (44) seems to indicate that FEM and PL would have to form a constituent, but this isn't necessary – a feminine feature could Merge with the top node of the graph in (45) to give us the Spanish demonstrative *esas* 'those.FEM', for instance.

Elbourne's treatment of English demonstratives is notable not only in that it features binary branching and is semantically compositional throughout. It is, in addition, a proof of concept that a single Nunbergian component (indexical, relational, or classificatory) may, in principle, contain multiple features which *themselves* are situated under binary-branching nodes that Function Application can use as fodder. I adopt this approach to morphological decomposition in the next section, which returns to the topic of person.

2.3 Local pronouns from the ground up

The task now is to find a set of features (some indexical, some relational, and some classificatory – because as we will see, personal pronouns consist of the very same components) which interact compositionally and which do not over-generate the typology of person contrasts. The indexical component will be tackled first, and I will begin by offering a hypothesis about what utterance contexts are.

2.3.1 Utterance contexts are centered situations

The central thesis of this dissertation is that the source of Zwicky's asymmetry lies ultimately in the way utterance contexts are structured. I will define a context of

utterance as a special kind of CENTERED SITUATION. Situations are parts of worlds (Barwise & Perry 1981, Kratzer 1989), and they may be centered on an entity just like worlds can be (Lewis 1979).[2]

Before introducing the definition for centered situations that I will adopt, I need to make one notational point and one point of terminology. The notational point is that I will use the symbol '$\lesssim$' to denote the parthood relation that an entity bears to a situation. That is, $x \lesssim s$ holds if and only if x is a part of s. ('$\leq$' will be reserved for the parthood relation an entity bears to an entity.)

As for the point of terminology, recall from §1.6 that there is a kind of semantic animacy effect in the interpretations of local pronouns: *we* cannot refer to the sum of the speaker and their car, and you can't address an object with *you* without personifying it. Since I would like to distinguish this effect from the morphological animacy contrasts one finds in gender systems, I will often avoid the term 'animacy' and refer to the atomic parts of the referent of a local pronoun as COGNITIVE AGENTS. For my purposes, cognitive agents are coextensive with entities that hold a *de se* belief (Castañeda 1966, Lewis 1979), as the equivalence in (47) shows.

(47) λx_e . COGNITIVE.AGENT$(x) = \lambda x_e$. x holds a *de se* belief

With that said, the definition for centered situations I'll use is given in (48).

(48) **Centered situations**

The tuple $\langle x, s \rangle$ is a centered situation *iff* $x \lesssim s \wedge$ COGNITIVE.AGENT(x) .

x is termed the CENTER of the situation it is a part of. Note that the cognitive agency condition entails that centers are atomic (at least given certain facts about the world, like that a single mind can't experience another mind's mental state). A person simply can't *self*-ascribe a property to a plurality, since the plurality extends beyond the self.

[2] 'Entity' because I will want many of my semantic objects to be of type e for simplicity, but these could equally well be intensional individuals if the semantics were set up differently.

This definition for centered situations is stipulated, as it is in all proposals I'm aware of. The center is privileged in the sense that it is formally distinguished from all other entities in the situation, and that privileging is linked to the center's ability to hold a *de se* attitude, recalling the discussion in Liao (2012: 16-17) that

> [...] although there remains something mysterious about what centers are [...] , this mystery is to be expected given the main lesson from the problem of essential indexicals: the *de se* cannot be reduced to the *de dicto*. There is something special about learning who oneself is that cannot be captured in learning about what [properties] one possesses, even if that list of [properties] is exhaustive. There seems to be a fundamental conceptual distinction between ascribing properties to oneself and ascribing properties to an individual possessing a unique and exhaustive list of nontrivial properties. Hence, the mysteriousness involved in the primitive identification [of centers] is in fact necessary to respect the main lesson from the problem of essential indexicals.

The notion that centers are *de se* attitude holders is likely familiar to the reader from analyses of attitude verbs like *want* and their relationship with control constructions (Fodor 1975, Chierchia 1984, 1989). 'Paolo Rosen wants to dance' is true *iff* in all the worlds of Paolo's desires, which are centered on him, that center dances (it is false if Paolo thinks he is Charlemagne and wants Paolo Rosen to dance).

Now as just mentioned, my claim is that utterance contexts are a kind of centered situation. That is, an utterance context c will take the form of a entity-situation tuple and meet the criteria for centered situations given in (48).

I will suggest that there are, however, a few further restrictions on utterance contexts. A context is not just any centered situation, it is a centered situation of a particular kind. What characterizes that kind are certain restrictions on the values that x (the variable over centers) and s (the variable over situations) can take.

The nature of those restrictions is in turn informed by a fundamental fact about person indexicality. This fact is actually so fundamental that it has mostly escaped notice in the person literature. The fact is this: an utterance's speaker is the sole decider of what the indexical expressions in that utterance refer to. It's easy to think (especially in light of Rebuschi's quirky dependence) that contexts are these temporally extended things that arise between the participants in the midst of conversational turn-taking, and that each kind of participant (speaker or hearer) has equal footing with respect to that context.

But consider the following scenario. I am at a supermarket, and I notice a stranger (who happens to be John Perry) obliviously spilling sugar all over the place. He's doubly oblivious in that he does not notice me. To begin to inform him of his predicament, I shout out 'Hey, you!'. Here I made an utterance that contained a second-person indexical. That indexical necessarily picks out John Perry, without him consenting to be a part of the conversation, and even without him being aware of my existence. I alone, the speaker, determined who *you* referred to. And Perry simply cannot negotiate what the referent of my pronoun was. He may not have heard me, or he may have thought I was talking to someone else, but as soon as those sorts of mishearings or misunderstandings are cleared up, it is the case that my utterance of *you* could have only picked out Perry. The referent is determined solely by virtue of my (the speaker's) intention.

The referents of first-person pronouns, too, are determined by speakers. An addressee might misunderstand who I was referring to when I used the pronoun *we*, but it's exactly that: a misunderstanding. It's not that the referent of *we* is negotiable or non-specific, nor that its meaning is vague at that context. Rather, the speaker had a particular referent in mind, and the hearer can either understand or misunderstand. (A different way of making the same point is to consider utterances without any addressees. After making a silly mistake, for instance, I could say to

myself 'Oh, I'm so stupid!'. No addressee need even be present for the value of the indexical expression to be fixed.)

The upshot is that speakers have a monopoly on how person indexicals are supposed to be interpreted. In other words, there is no person indexical that is free from the influence of the speaker's perspective.

A related point is that the speaker need not know precisely which individuals are the addressees of her utterance. Professional comics are often in this situation: they regularly address a large group of people – *e.g.*, 'You didn't laugh at that one!' – with blinding stage lights in their face making the particular addressees indiscernible. What they *do* know is something about the kind of situation their utterances are taking place in.

So the speaker has a monopoly on the value of person indexicals, doesn't necessarily know who her particular addressees are, but knows something about the utterance situation. The way I propose to model these facts in light of the template in (48) is to suppose that in root clauses, the variables in the $\langle x, s \rangle$ tuple are valued by the author (variable: a) and the UTTERANCE SITUATION (variable: $s\star$) respectively. The utterance situation is defined as the minimal situation which contains not only a itself (which is already enforced by the definition of centered situations), but contains also every cognitive agent (*de se* attitude holder) with which a intends to communicate. In more familiar and intuitive terms, $s\star$ is the smallest situation which contains all the (author-determined) participants of an utterance.

So utterance contexts must meet the criteria to be centered situations (48), and must also meet the following criteria.

(49) **Criteria specific to utterance contexts**

a. The utterance author a is the center of an utterance context.

b. $s\star$ is the smallest situation which contains a and which contains all the cognitive agents with whom a intends to communicate.

Now, the component parts of a context (here, a and $s\star$) are often termed COORDINATES of that context. An interesting consequence of the definition for centered situations (48) and the subsequent claims about the values of the variables therein (49) is that utterance contexts cannot contain a hearer coordinate. A context's entity coordinate is valued by the author, and its situation coordinate is determined by author intentions. There is simply no space for a second entity coordinate valued by a hearer h, since that would prevent the utterance situation from having a unique center, a violation of (48).[3]

I will refer to these ideas about the structure of utterance contexts and the restrictions on the values of the variables they contain as the CENTERED CONTEXTS HYPOTHESIS (CCH).

(50) **The Centered Contexts Hypothesis**

a. Utterance contexts are centered situations (48). Their center is the author a; there is no hearer coordinate. The entities in the utterance situation exhaustively consist of a and the cognitive agents with which a intends to communicate (49).

b. $c = \langle a, s\star \rangle$

c. $c \neq \langle a, h, s\star \rangle$

I will show in the remainder of this chapter how the CCH and its morphosyntactic corollaries derives a new kind of solution to Zwicky's puzzle. At certain points in Chapters 3 and 4, I'll give a couple of additional reasons to think that this ontology is correct.

[3]Nothing important hinges on whether locations or times constitute independent coordinates, or whether $s\star$ determines them. The important thing for our purposes is that there is a unique *entity* that the situation is centered on.

2.3.2 Second-person indices are derived compositionally

The main morpho-syntactic consequence of the Centered Contexts Hypothesis is that while the author index can be introduced into a semantic derivation by a single feature (AUTH below), the addressee index cannot be – at least not in a comparably direct fashion. The *a priori* sensible feature HEARER as defined in (51b), for instance, can't be recruited, since its denotation h is a free variable – it is not valued by any context that conforms to the CCH.

(51) a. AUTH is a **possible** feature.

$[\![\text{AUTH}]\!]^c = \quad [\![\text{AUTH}]\!]^{\langle a, s\star \rangle} = \quad a$

b. HEARER is an **defunct** feature; h cannot be valued by the context.

$[\![\text{HEARER}]\!]^c = \quad h$

Empirically, of course, second person has a very real morpho-syntactic and semantic life, so it must be resurrected in a way consistent with the CCH. It is at this juncture that we can borrow Rebuschi's (1994) idea – picked up in Charnavel's (2015) work discussed in the last chapter – that there exists a relation which can map one kind of discourse participant to another. With such a semantic object at our disposal, we will be able to derive second person compositionally by applying it to the denotation of AUTH.

My own version of the relation in question will be introduced into the semantic derivation by a feature termed ADDR, whose denotation is of type $\langle e, e \rangle$. Informally, we can think of ADDR's job as being to map authors to their addressees. However, it is important to keep in mind that in the present system, addresseehood is not a primitive: being an addressee just means being a non-author cognitive agent within an utterance situation.

So what the ADDR feature will actually do – less informally – is map the utterance situation's *default* center (namely a) to a *distinct* center of that same situation. The

notion of a distinct center – to be formalized in a moment – is equivalent to the informal notion 'addressee' only because centers are by definition cognitive agents, and since the utterance situation by definition includes (besides a) only those cognitive agents with whom the author intends to communicate.

Now (52), which defines an irreflexive *distinct-centers* relation, formalizes what it means for two centered situations to have distinct centers.

(52) **The *distinct-centers* relation**

For all x, y, and s, *distinct-centers*$(\langle x, s\rangle, \langle y, s\rangle)$ holds whenever $\langle x, s\rangle$ and $\langle y, s\rangle$ are well-defined centered situations and $\langle x, s\rangle \neq \langle y, s\rangle$.

$\langle x, s\rangle$ and $\langle y, s\rangle$ being well-defined hinges only on x and y being valid centers (*i.e.*, they must be atoms with *de se* attitudes and they must both a part of s). The two tuples being distinct hinges only on the entities x and y being distinct, since the situation variables they contain are identified.

This relation checks whether two centered situations have the same situation variable but distinct centers, and it plays a crucial role in the denotation of the ADDR feature, which is given below in (53). Essentially, the feature uses *distinct-centers* to collect the set of distinct centers y within the utterance situation $s\star$, and subsequently applies a choice function f to that set, outputting one of them.

(53) $[\![\textsc{addr}]\!]^c = \quad \lambda x_{\mathrm{e}} \,.\, f(\{y_{\mathrm{e}} : \textit{distinct-centers}(\langle x, s\star\rangle, \langle y, s\star\rangle)\})$

$\{y_{\mathrm{e}} : \textit{distinct-centers}(\langle x, s\star\rangle, \langle y, s\star\rangle)\}$ is just the set S of individuals that are x's atomic co-participants, so once a value for f is fixed, $f(S)$ will identify some atom in $s\star$ that is not x.

The indexical component of a second-person pronoun can be derived compositionally when AUTH and ADDR constitute a phrase, as in (54b). This a non-simplex indexical component, just as (*à la* Elbourne 2008) the indexical component of *those*

is. And consistently with Rebuschi and Charnavel, one of the components here is a relation that maps one kind of discourse participant to another. [4]

(54) a. **The (generalized and exclusive) first person index**

$[\![\textsc{auth}]\!]^c = \quad a$

b. **The second-person index**

$$\left[\!\!\left[\begin{array}{c} \diagup\diagdown \\ \textsc{addr} \quad \textsc{auth} \end{array} \right]\!\!\right]^c = \qquad \text{by Function Application}$$

$$[\![\textsc{addr}]\!]^c([\![\textsc{auth}]\!]^c) = \qquad \text{by (51a), (53)}$$

$$[\lambda x_{\mathrm{e}} \,.\, f(\{y_{\mathrm{e}} : \textit{distinct-centers}(\langle x, s\star\rangle, \langle y, s\star\rangle)\})](a) = \qquad \beta\text{-reduction}$$

$$f(\{y_{\mathrm{e}} : \textit{distinct-centers}(\langle a, s\star\rangle, \langle y, s\star\rangle)\})$$

When composed with AUTH in this way, ADDR serves to identify a disjoint atomic co-participant of a (*i.e.*, an addressee) within the utterance situation. The particular addressee atom that is picked out depends on which choice function values f.

Incidentally, note that strictly type-wise, $[\![\textsc{addr}]\!]^c$ is free to compose with any expression of type e (*i.e.*, no selectional requirements are stipulated). However, its denotation requires that its argument be a part of the utterance situation. This means that expressions like $[\![\textsc{addr}]\!]^c([\![\textit{Andreas}]\!]^c)$ will be undefined even when $[\![\textit{Andreas}]\!]^c$ is of type e if whoever *Andreas* refers to is not a part of $s\star$. Thus, relativizing the relation of addresseehood to the utterance situation mitigates to some extent a kind of overgeneration resulting from ADDR's sister being anything other than AUTH.

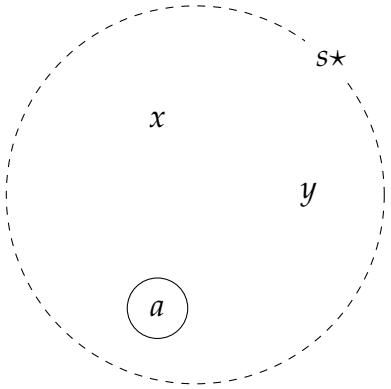
Now, as just mentioned, which addressee the phrase [ADDR AUTH] denotes depends only on the value of the choice function variable in (54b). That choice

[4] My proposal is consistent specifically the idea that there *exists* a relation between different pre-theoretic kinds of participants. When it comes to the *nature* of that relation, there are some major differences between these earlier proposals and mine. One difference is that my ADDR doesn't offer a symmetric author-addressee mapping: since (51b) is a defunct feature in the system I'm arguing for, ADDR's denotation won't be able to apply to a variable over utterance hearers. Another difference is that on my proposal ADDR is always found inside second-person pronouns, whereas Charnavel's relational feature **A** is optionally present therein.

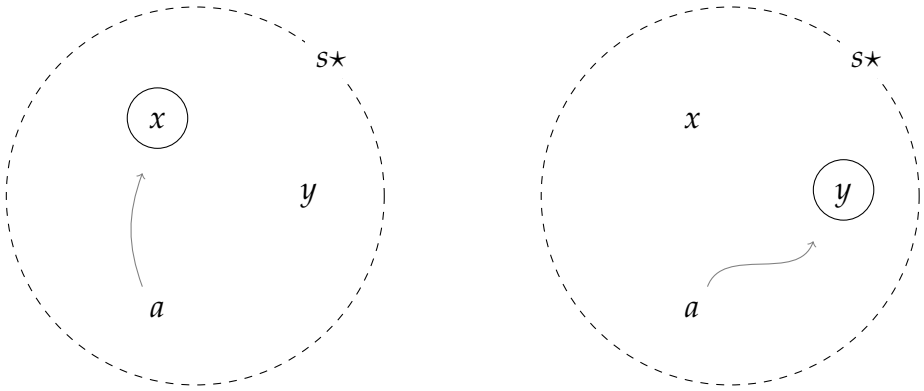
function applies to a set of atoms. This means at an utterance context with multiple addressees, exactly one addressee atom will constitute the second-person index. The choice-functional indeterminacy of the denotation of [ADDR AUTH] – indeterminacy in the sense that the atomic addressee index is determined by a choice function – is a feature of this system, not a bug. If an index that consisted of a *specific* atomic addressee were possible, there should be a way of distinguishing between that specific addressee and a different one. But as we saw in §1.3, a system that can distinguish between addressee atoms overgenerates the typology of person contrasts.

These ideas about first- and second-person indices are illustrated graphically in the pictures below, where the arrows in the latter two indicate the semantic work that ADDR is doing within the utterance situation.

(55) Possible value (circled) for $[\![\text{AUTH}]\!]^c$ at a three-participant utterance situation



(56) Possible values (circled) for $[\![\overset{\text{ADDR}}{\frown}{}_{\text{AUTH}}]\!]^c$ at a three-participant utterance situation



There are now two person-specific indexical components in our arsenal: AUTH and [ADDR AUTH]. The former picks out the author; the latter picks out some addressee by applying a choice function to the set of other potential centers for $s\star$. These entities are all atomic by virtue of the condition that they are *de se* attitude holders.

Before moving on to look at the relational component, I want to highlight two things. First: this inventory of first- and second-person indices is how Harbour's insight into Zwicky's puzzle – that there is an an asymmetry in how first and second person are grammatically encoded – is cashed out under the current proposal. Second-person indices syntactically contain first-person indices, but not vice versa.

Second: at the end of Chapter 1, I contrasted that morpho-syntactic asymmetry with the symmetric semantic behavior of first and second in the context of supersloppy readings. That symmetry will not be dealt with in this chapter (but see §4.1). For the moment, observe just that the ADDR feature resembles Rebuschi and Charnavel's addresseehood relation in that it is responsible for constructing second-person meanings out of first-person meanings.

2.3.3 A closer look at the relational component

In order to set up the solution to Zwicky's puzzle, it'll be necessary to have a more concrete understanding of the relational component of indexical expressions. It's worth flagging at the outset that the way in which a referent is be recovered from an index has not been remotely settled in prior work. Likely this is not due to oversight but rather the incorporeal nature of the relational component itself: it seems to be heavily dependent on world knowledge and on opaque metaphysical links between entities. (The latter are not even consistent across different kinds of examples, as I hope to illustrate to the reader in the next few pages.)

My own contributions to the investigation of the relational component are consequently quite limited, and at the end of this section some non-trivial problems will remain. That said, I think that it's possible to identify two ways in which the index and the referent *may* be related in the general case, and in which (I'll need to stipulate) they *are* related as far as local pronouns are concerned. These are that the index and the referent share a property, and that they are related by mereological parthood.

2.3.3.1 The index and referent share a property

The relational component of indexical expressions can relate the index to the referent by ensuring that the two entities share a property. Consider the following first-pass definition for REL, the feature which constitutes the relational component.

$$(57) \quad [\![\textsc{rel}]\!]^c = \quad \lambda x_{\mathrm{e}} \,.\, f(\, \{ y_{\mathrm{e}} : \exists P_{\langle \mathrm{e,t} \rangle} : P(x) \wedge P(y) \}\,) \qquad \text{(to be revised)}$$

This feature takes an entity x and (once again, with the help of a choice function) returns a potentially disjoint entity y such that some property P is true of both x and y.

P can by default take quite a range of values, which I'll illustrate with three

examples involving demonstratives. (However, I'll argue below that its values are restricted by contextual allosemy in certain cases, like when it holds of a local person index.)

For the first example, recall Nunberg's china shop example from the last section, where *these* has a proximal index and refers to a plurality of plates that are in some way related to that index. The property that the index and referent share here is that their atoms all exemplify the same KIND of plate (in the sense of Carlson 1977). Let's call this kind K. Then the shared property which relates index and referent of *these* via (57) would look something like the following, where '$\cup$' maps a kind to its corresponding property (Chierchia 1984, 1998).

(58) $\mathrm{P}_{\textsc{plate}} = \quad \lambda x_{\mathrm{e}} \,.\, \forall y_{\mathrm{e}} : [\textsc{atom}(y) \wedge y \leq x] \rightarrow [\cup \mathrm{K}](y)$

This property holds of entities whose atoms are a particular kind of plate, and of course both the index and the referent of *these* are such entities. The value of P that REL provides for the other indexical in the china shop example – namely *those* – would be the same, modulo that K is replaced with K$'$, a different kind of plate.

For the second illustration, consider the following variant of the china shop example. Suppose my china shop has no warehouse, and it is organized such that the group of plates each sample plate corresponds to is situated in a clear glass cabinet below the sample. Suppose also that one of the sample plates is missing from its stand. A customer can point to the *set* of plates below the empty stand and felicitously ask:

(59) What happened to that sample plate?

The index here is the group of plates visible through the glass; the referent is the missing plate. The relational component once again consists of (57), and P can be valued by (58) just as before. What this example teaches us is that indices can be

plural entities, and that the relational component can map a plural index to an atomic referent.

For the third illustration, consider the following scenario, which I quote from Elbourne (2008: 431):

> Immediately in front of us is Field A, and beyond it, at some considerable distance, is Field B. We know that one donkey is kept in A and another donkey is kept in B, but it so happens that neither donkey is in its field today. Perhaps they are at the vet. Nevertheless, despite the total absence of donkeys, I can point at Fields A and B in turn and say (60):
>
> (60) This donkey (*gesture at Field A*) is healthier than that donkey (*gesture at Field B*).

The index of *this* is Field A, yet the referent of *this donkey* is one of the donkeys (specifically, the one that is kept in Field A). So a plausible candidate for P here is just the property of being associated with the same location.

(61) $\mathrm{P}_{\textsc{location}} = \quad \lambda x_{\mathrm{e}} \,.\, \exists l : x$ is generally at l

Being 'generally at' a location is a fluffy notion, but it needn't be made more concrete for our purposes – the point is just that something like (61) holds of both Field A and exactly one of the donkeys, so the REL feature can map the former to the latter. The purpose of this example is to show the value of P in (57) is relatively more flexible than the previous examples would indicate: it needn't have to do with atoms exemplifying kinds as it did in the china shop examples.

In all of the above examples, though, the index and referent seem to be related by a shared property – the property of instantiating the same kind of plate, for the

first two, and the property of being associated with a particular location for the last one.

A different way of looking at this is to say that the meaning of REL (in particular, the property variable it contains) is restricted by the properties of its complement. When the denotation of X_n is Field A, for instance, only the properties of Field A can be used to recover the referent. As was shown, one can use Field A as the index of *this donkey* because the preceding context told us that the field and the donkey typically share a location. Even out of the blue, I could point at Field A and Field B respectively and say '*This* grass grows better than *that* grass', since everyone knows that grass grows in fields. What I *cannot* do is point to the two fields and say 'This president had more liberal social policies than that president', unless you believe that the presidents live in the fields (or that they are actual donkeys).

Turning back to person indexicals, I will assume for parsimony that local pronouns contain the very same REL feature that demonstratives are hypothesized to. Likewise, I'll assume that the range of values the *P* variable can take is restricted by the properties of its complement, and I'll show shortly how this might buy us the animacy condition on local pronouns that was introduced in §1.6.

It's worth emphasizing at the outset that REL will, however, be doing qualitatively different semantic work when it is a part of a local person indexical than it is when it's a part of a demonstrative (or third-person expression, as I'll discuss in the next chapter); I will assume the difference is due to contextual allosemy. In its personful guise, REL will put two conditions on the relation between the index and referent. It will require that the index and referent share a *particular* property – the property of having only cognitive agents as constituent atoms. It will moreover require that the index is a reflexive mereological part of the referent. (The first of these conditions will be discussed below within this section, and the second will be discussed in the next.)

Both of these conditions need to be enforced somehow, simply for reasons of empirical coverage. We saw in §1.6 that all the atomic parts of the referent of a local pronoun are subject to an animacy condition (which I later cashed out as 'cognitive agency'). And we saw in §1.5 that in the absence of morphological number marking, referential pronouns may freely denote either atoms or pluralities. The two indices in our toolkit thus far, however, denote atoms – so something must allow an atomic index to be mapped to a number-indifferent referent.

Since the cognitive agency and parthood conditions are logically independent, it is by no means an analytic necessity that both are introduced by a single feature. However, since both appear to be universal properties of local pronouns, it just so happens that they always travel together. It makes at least some sense, then, to have them introduced by one feature (which I take to be the *same* feature that figured into the earlier discussion of demonstratives, namely REL), since this ensures the two conditions won't vary independently of one another.

With that said, we can take a closer look at the property-sharing condition that REL puts on indices and referents. There are two differences between how this feature behaved above with demonstratives and how it behaves with local person indexicals. The first difference is that in an exclusive first- or second-person pronoun, the complement of REL always denotes an atom. As mentioned above, this is simply because only atoms can be situation centers. So we shouldn't expect to find REL mapping plural indices to atomic referents, as we saw in the variant of the china shop example where a set of plates is used as the index for the missing atom. (At least, not so far as first- and second-person indices are concerned – inclusive indices are apparent counterexamples to this, but they'll turn out to not be problematic.) Nor should we expect to find plural indices being mapped to plural referents. We *should*, however, expect to find REL mapping atomic indices to either atoms or pluralities. And we do find that, of course – this relates directly to the number-indifference

desideratum discussed in §1.5.

The second difference is deeper, and has to do with the constancy of the properties that REL's complement denotes. Consider demonstratives: whatever the value of $g(n)$, the denotation of X_n has no INHERENT properties. By that I mean it has no properties that are held constant across the various values that c, j, and g (the context, index of evaluation, and assignment) may take. For instance, under one value of g, $g(4)$ picks out a plate in a china shop, under another value for g it picks out a field, and under a third it picks out five penguins. Those entities have little in common, and the problem only compounds as we consider other values of g.

In a local person indexical by contrast, the complement of REL has an inherent property. Imagine we are dealing with an (exclusive) first-person indexical specifically: independently of any particular entity which values the a variable, a has the property of being a cognitively agentive center. That property follows directly from the CCH (50). Same goes for second-person pronouns, since their indices are potential centers for $s\star$.

I will need to stipulate that REL (and in particular the range of values assumed by the P variable it contains) is sensitive to this inherent property of its complement. In particular, REL's denotation will be restricted by contextual allosemy when its complement is AUTH or [ADDR AUTH], such that for example the phrase [AUTH REL] picks out an individual whose atoms are *de se* attitude holders.

Here's what that stipulation buys us. Recall (14), repeated below as (62), which illustrates the animacy desideratum from the last chapter.

(62) Oh no, we're running late!

If (62) is spoken by only Zoë, then she is coextensive with a. She is an atom, yet *we* must refer to a plural individual. (The fact that the referent is plural is enforced by the classificatory component, which contains a PL feature.)

But *we* does not simply pick out *any* plural individual with which Zoë shares

a property: as discussed in the last chapter, *we* cannot refer to the sum of Zoë and her car unless the car is personified (despite the fact that they currently share a location, and perhaps other properties). The same is true for the other plural local pronoun in English: *you* can refer to pluralities only if all the atoms are construed as animate. And in fact this animacy condition is not remotely restricted to English; it appears to be a universal property of local pronouns.

The animacy condition on the atoms of a pronominal referent is linked, I suggest, to the aforementioned supposition that the range of values that P can take is sensitive to the sort of individual that REL's complement denotes. For *we* in (62), since the complement of REL denotes a, which by definition is a cognitive agent, the property that a shares with the referent must also have to do with cognitive agency. Since cognitive agency can only hold of atoms, it'll have to distribute over the atoms of the index and the referent. Then in sentence (62), P would take on the following value, termed P_{CA} (CA stands for 'cognitive agency').

$$(63) \quad \mathrm{P}_{\mathrm{CA}} = \quad \lambda x_{\mathrm{e}} \,.\, \forall y_{\mathrm{e}} : [\textsc{atom}(y) \wedge y \leq x] \rightarrow \textsc{cognitive.agent}(y)$$

Cognitive agency distributes over the atoms of P's argument here, just as instantiating a particular kind of plate distributed over the atoms of P's argument in the two china shop examples.

When the indexical and relational components of *we* come together as in (64), P is valued by (63), and thus the referent (64) must be an individual whose atoms are cognitive agents, *i.e.* individuals with an attitude *de se*.

$$(64) \quad \left[\!\!\left[\begin{array}{c} \diagup\!\diagdown \\ \textsc{auth} \quad \textsc{rel} \end{array} \right]\!\!\right]^{c} = \quad f(\ \{y_{\mathrm{e}} : \mathrm{P}_{\mathrm{CA}}(a) \wedge \mathrm{P}_{\mathrm{CA}}(y)\}\ )$$

Thus *we* can only include Zoë's car if the car is being construed as a cognitive agent. So the idea that REL is allosemic in a way determined by its complement, in conjunction with the fact that cars don't have self-attitudes, can explain why *we* can't pick out the Zoë-car sum.

2.3.3.2 Person indices are related to referents via parthood

(63) and (64) offer too weak a meaning for the (non-classificatory portion of) the pronoun *we*. This pronoun doesn't just pick out *any* entity whose atoms are cognitive agents, it needs to include the author as well. (At least when used extensionally – descriptive uses of person indexicals are an apparent counterexample; but see §1.9.) Same goes for second-person pronouns, where an addressee must be included in the referent, and for inclusive pronouns, where an author and addressee must both be.

The allosemic denotation of REL in the context of person indices, then, will have to look something more like (65), where '$\leq$' denotes mereological parthood.

(65) $[\![\text{REL}]\!]^c = \quad \lambda x_e \,.\, f(\, \{ y_e : [\, \mathrm{P}_{\mathrm{CA}}(x) \wedge \mathrm{P}_{\mathrm{CA}}(y) \,] \wedge [\, x \leq y \,] \,\}\,)$ (final version)

In the domain of first- and second-person pronouns, (65) will serve to map an index to an entity (i) whose atoms share the index's inherent property of cognitive agency, and (ii) that it is a reflexive mereological part of.

I don't know of any evidence for the existence of the second conjunct in (65) outside the domain of pronouns. In fact, its clear that in many cases involving demonstratives parthood isn't relevant at all, for example when I point to a painting in a museum and say 'I like this artist'. There's some causal connection between the artist and the existence of the painting, but no connection via parthood. Worse, any property they share – being associated with the artist herself? – seems somewhat analytically contrived.

So the precise semantic endowment of the relational component, if consistent across person indexicals and demonstratives, remains mysterious and out-of-reach. For demonstratives, property-sharing certainly seems relevant in linking indices to referents (perhaps it's even sufficient, but it's not necessary). For person, property-sharing takes on a particular flavor (namely having cognitive agent atoms) and is

obligatory, which I deem to be a consequence of the inherent property of person indices. But the role of other relations like parthood and causality is not clear in the general case.

Regardless, once the CCH (50) and the idea that person indices are reduced to cognitive agents (and are thus atomic) are adopted, it is simply necessary to build parthood into the relational component in order to capture the fact that local pronouns can refer to plural individuals. The benefits of assuming the CCH – which include providing a natural explanation for the behavior of impersonal second-person pronouns and (partially) controlled PRO, and making strong predictions about indexical shift, as I show in later sections and chapters – will themselves provide support for the otherwise stipulative denotation in (65).

Besides, given what *is* known about the relational component, there's no reason to be surprised that it relates indices to referents in the way that it does. One of the basic facts we observed above with the two china shop examples is that REL is number-agnostic: semantically atomic indices can map to plural referents, and plural indices can map to atomic referents. The relational component demonstrably *does not care* about semantic number; all of the action involving number comes later once the classificatory component enters the picture. Thus, the fact that first- and second- person indices (which are necessarily atomic by virtue of being cognitive agents) can map to plural referents is not at all unexpected, and the '$x \leq y$' condition of (65) is what analytically allows for such a mapping.

2.3.4 Pragmatic competition between pronouns

Now that the mapping from indices to pronominal referents (65) is more concrete, we can turn back to pronominal reference and Zwicky's puzzle. I will start with the local pronouns of Jarawa to develop the reasoning within this section, since their lack of classificatory features (number and gender, *e.g.*) makes things exposition-

ally simpler. For now, nothing crucial hinges on the inclusion or exclusion of these features.

2.3.4.1 The reference potential of first- and second-person pronouns

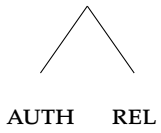
Recall that Jarawa has the same local persons as English (second and generalized first). This is the common AAB pattern. Recall also that the crux of Zwicky's puzzle is why the ABB pattern is never found, where inclusive meanings are communicated with the same pronoun as second-person meanings are.

(66) *Jarawa* (Ongan; Kumar 2012)

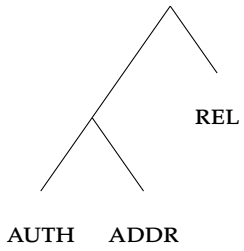
1EX	mi
1IN	
2ND	ŋi

Given that second-person meanings are derived compositionally from the first-person index (*via* ADDR), *mi* and *ŋi* will be the ways that the phrases in (67) and (68), respectively, are pronounced by Jarawa speakers.

(67)



(68)



These phrases have the meanings given in (69) and (70).

(69) $[\![(67)]\!]^c = f(\ \{y_e : [\ \mathrm{P}_{\mathrm{CA}}(a) \wedge \mathrm{P}_{\mathrm{CA}}(y)\ ] \wedge [\ a \leq y\ ]\}\ )$

(70) $[\![(68)]\!]^c = f(\ \{y_e : [\ \mathrm{P}_{\mathrm{CA}}(f'(\{z_e : \textit{distinct-centers}(\langle a, s\star\rangle, \langle z, s\star\rangle)\})) \wedge$
$\mathrm{P}_{\mathrm{CA}}(y)\ ] \wedge [\ f'(\{z_e : \textit{distinct-centers}(\langle a, s\star\rangle, \langle z, s\star\rangle)\}) \leq y\ ]\}\ )$

The second denotation looks rather complicated, but it's identical to the first save that the term a, a variable over authors, has been replaced with $f'(\{z_e : \textit{distinct-centers}(\langle a, s\star\rangle, \langle z, s\star\rangle)\})$, which just denotes some atomic addressee.

So assuming allosemy of REL as argued for above, such that the shared property is that of having cognitive agent atoms and there is an additional parthood condition, (69) will pick out a potentially plural individual y such that (i) a and y's atoms share the property of cognitive agency and (ii) a is a part of y. (70), by contrast, will pick out a potentially plural individual y such that (i) the atoms of y share the property of cognitive agency with a non-default center z of $s\star$ and (ii) z is a part of y.

Put more succinctly, these pronouns refer to potentially plural individuals (all of whose atoms are cognitive agents and thus animate) which mereologically contain, respectively, the author or some addressee.

A crucial point about (69) and (70) is that in terms of their literal (*i.e.*, non-enriched) meanings, the set of individuals they can refer to are not disjoint for any value of c (modulo there being no addressees at all). This is because *both* pronouns provide truth-conditionally valid ways to refer to individuals that reflexively contain an author-addressee sum.

For that reason, I will say that there is an overlap in the REFERENCE POTENTIAL of the two pronouns; there is overlap precisely in the space of inclusive meanings. Recall from Chapter 1 that we needed something to ensure that in languages with two local pronouns, the ways in which inclusive and exclusive meanings are encoded pattern akin to each other, but unlike the way second-person meanings are encoded. As it stands, we don't yet have a handle on this fact. Things look awfully symmetric: first-person pronouns are to be used for exclusive meanings, and second-person pronouns are to be used for second-person meanings – but both pronouns can be used for inclusive meanings. The next section derives the needed asymmetry from something independent.

2.3.4.2 Asymmetric encoding and complex definite descriptions

Observe that the two pronouns given above are asymmetric morpho-syntactically, in the sense that first person (67/69) derives from a less complex phrase than second person (68/70) does. The former kind of pronoun requires two features, while the latter requires three. I will claim that the syntactic parsimony of first person (a natural consequence of contexts being author-centric) is the reason that in languages with two local pronouns, only the first-person one can be generalized to cover inclusive meanings.

There is in fact independent reason to think that the more syntactically parsimonious of two competing definite descriptions is preferred when both have the same value. I illustrate this with (71), which is from Marty (2017: 157), and with (72). Each (a) example is judged to be less acceptable than its (b) counterpart.

(71) Context: *It is presupposed that the person named 'Mary' married her childhood sweetheart. The speaker wants to express the thought that she is about to leave.*

a. # The wife of Mary's childhood sweetheart is about to leave.

b. Mary is about to leave.

(72) Context: *Scarecrow and Dorothy are sitting with Dorothy's only dog, whose coat happens to be brown. Scarecrow wants to tell Dorothy that the dog is well-behaved. He says:*

a. # Your brown dog is so well-behaved!

b. Your dog is so well-behaved!

The wife of Mary's childhood sweetheart in (71a) can't refer to Mary, even though the context provided biases us toward this interpretation. Likewise, relative to the context provided, *your brown dog* is not a good way of referring to Dorothy's only dog if *brown* is being interpreted intersectively.

To be clear: there are ways in which the badness of the (a) examples can be overcome. (72a), for instance, stripped of the context provided, could involve felicitous reference to Dorothy's dog in two different ways. For one, if Dorothy were to have a black dog around in addition to the brown one, then *brown* (again, interpreted intersectively) would play a crucial role in disambiguating which dog is being talked about. Another way that (72a) could be felicitous is if *brown* is contributing some (non-intersective) pragmatic content having to do with a speaker attitude.[5] The sentence might convey Scarecrow's surprise that dogs with brown coats can be well-behaved, for instance. I want to set these two ways of ameliorating the badness of (72a) aside. The point is that, relative to the contexts provided, there's something wrong with the (a) examples.

An intuition about the their deviance is that the underlined expressions therein are somehow too roundabout a way of referring to the individuals that the underlined expressions in the (b) examples successfully do. The (a) examples do not fail because their truth-conditional meaning prevents them from picking out the referent, though. Rather, they seem to fail because there are more parsimonious alternatives available, namely the (b) examples. Following Schlenker (2005), Katzir (2007), and Marty (2017), I'll cash out the relevant notion of parsimony syntactically, specifically with (73).

[5]See Schlenker (2005 for extensive discussion of these kinds of cases.

(73) ***Minimize Definite Descriptions!***

Let α and β be any syntactic constituents. β is a deviant way of referring to what α refers to at c, j if all three of the following hold:

a. α and β can both be spelled out morpho-phonologically, and the morpho-phonological reflexes of these expressions are non-identical

b. α can be derived from β by a finite number of deletions within β of referentially relevant expressions

c. The set of possible referents for $[\![\beta]\!]^{c,j}$ is not a proper subset of the set of possible referents for $[\![\alpha]\!]^{c,j}$ when both are well-defined

If all of these conditions hold, I'll say that α and β are competitors, and that α is the parsimonious alternative. I define a 'referentially relevant expression' negatively, as anything that does not serve to convey speaker attitudes of the sort mentioned above.

For the purposes of illustrating how (73) works, consider again the contrast between (72a) and (72b). The phrase spelled out as *your brown dog* is ill-formed because all three conditions are met. What satisfies (a) is that the morpho-phonological strings *your brown dog* and *your dog* are distinct. (b) is satisfied because the phrase spelled out as *your dog* can be derived from the one spelled out as *your brown dog* by deleting the Adjective node, and moreover, relative to the context given, *brown* is a referentially relevant expression. (It's referentially relevant because, as per the provided context, Scarecrow only intends to communicate that the dog is well-behaved; he does *not* wish to convey surprise at brown dogs being well-behaved.) Condition (c) is satisfied because the set of possible referents for the latter phrase is not a proper subset of the set of possible referents for the former: at the context c and index j of evaluation, there is only one dog that's Dorothy's. Both *your dog* and *your brown dog* can refer to only that dog, in other words, and there is no proper subset relation between the sets of referents the two competitors pick out.

Put more succinctly: *your brown dog* brings with it additional syntactic material (and, incidentally, additional morpho-phonological material) – but that material, which is referentially *relevant*, doesn't actually *do* anything to restrict the range of referents that the expression might pick out. *Brown* needs to be jettisoned for that reason.

Let's return to the cases where the sentence in (72a) becomes felicitous. The sentence is totally well-formed if, at the context and index of evaluation, Dorothy has two dogs and only one is brown. In such a context it *is* the case that the referent set for the phrase pronounced as *your brown dog* is a proper subset of the referent set for phrase pronounced as *your dog* (assuming the latter is defined), the two phrases are not competitors, and the speaker is free to use the more syntactically complex expression. (Even if *your dog* is not well-defined – perhaps due a uniqueness presupposition – then it can't be a competitor, and *your brown dog* is predicted to be felicitous anyway.)

(72a) is also predicted to be felicitous by (73) if Scarecrow intends to convey his surprise that brown dogs can be well-behaved. In this case, *your dog* can't be derived from *your brown dog* by deleting referentially relevant nodes, (as *brown* is not referentially relevant here), the two expressions are not competitors, and the speaker is free to use the more complex one.

2.3.4.3 Zwicky's puzzle resolved

Imagine that you are a Jarawa speaker, and that you want to refer to an individual that contains yourself (the author) but not any addressee. In terms of the literal meanings of the pronouns in your linguistic toolkit, only *mi* could be used. (Using a second-person pronoun would force the referent to include an addressee). *Mutatis mutandis* for second-person meanings and *ŋi*. What should you do to communicate an inclusive meaning?

There's no inclusive pronoun in Jarawa, but in terms of their literal interpretations, either *mi* or *ŋi* could do the trick. But now *Minimize Definite Descriptions!* kicks in. The two pronouns at your disposal have distinct morphological exponents, one can be derived from the other via node deletion (of ADDR), and the latter's reference potential is not subsumed by that of the former (while both can achieve inclusive meanings, only *ŋi* could refer to a hearer atom). Consequently, the second person pronoun *ŋ*i (68) is deemed deviant by *Minimize Definite Descriptions!* where inclusive meanings are concerned.

Rephrased in slightly more general terms: a first-person pronoun and a second-person pronoun can *both* refer to inclusive referents in terms of their truth-conditional content, and thus (in principle!) *either* could be generalized to cover inclusive meanings. (73) pits the two pronouns against one another in the space of inclusive meanings, however, and the parsimonious alternative – the first-person pronoun – wins out. The solution to Zwicky's puzzle thus stems from the asymmetry in the complexity of the pronouns that could *potentially* communicate inclusive meanings.

This calculus applies not only to number-neutral pronoun series like that of Jarawa, but generally extends to number-contrasting series as well. So long as the features in the classificatory component are held constant across competitors, they simply do not affect the way that *Minimize Definite Descriptions!* proceeds. By way of illustration, consider the Finnish pronominal paradigm in (147).

(74) *Finnish*

	SG	**PL**
1EX **1IN**	minä	me
2ND	sinä	te

Let's assume for concreteness that the classificatory component of these pronouns contains exactly one of two features, SG or PL, and that these features denote ⟨e, e⟩ identity functions that are defined only if the referent is atomic or plural, respec-

tively.

To use a local pronoun to refer to a plural individual, then, one will simply have to use either *me* or *te*; the singular pronouns' meanings are undefined, and any expression that contains them will not have a truth value. The set of referents for *te* is not a proper subset of that of *me*, as only only *te* can refer to those individuals that include a hearer but not the author. In addition to its reference potential not being stronger, *te* is also more syntactically complex, and therefore it is ruled out by *Minimize Definite Descriptions!* whenever the intended referent has an inclusive meaning. Same goes for *minä* and *sinä*: both can refer only to atoms, so the reference potential of *sinä* is not subsumed by that of *minä*, and there exists likewise a complexity asymmetry in morpho-syntactic encoding.

2.3.5 Inclusive indices and inclusive pronouns

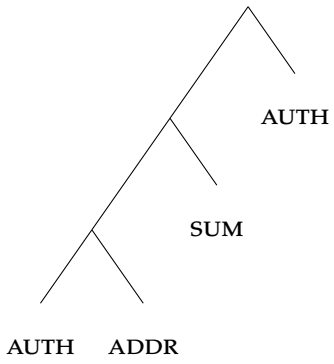
If inclusive person is to pattern like first person and second person semantically, then the possibilities regarding the morpho-syntactic makeup of inclusive indices turn out to be rather limited in light of the claims I am making about the nature of utterance contexts and their morpho-syntactic corollaries, in particular the claims (i) that the utterance situation $s\star$ is centered on the author, (ii) that only the author is grammatically accessible by way of a single feature, hearers needing to be derived from authors via an addressee function.

Intuitively, an inclusive index is an author-addressee sum. We already built author indices and addressee indices in the last section. Under the decompositional approach I am adopting, the most natural idea about inclusive indices is that they are author-addressee sums in terms of their morpho-syntax also. We only need one additional feature to achieve this, one that's responsible for mereological summation. I'll call this feature SUM; its denotation is given in (75).

(75) $[\![\textsc{sum}]\!]^c = \quad \lambda x_e \,.\, \lambda y_e \,.\, x \oplus y$

SUM may not be an indexical person feature specifically; some analyses of conjunction recruit a semantically similar object. With SUM in hand, an inclusive index could be constructed as follows.

(76)



(77) $[\![(76)]\!]^{c,j} = \quad [\, f(\{y_e : \textit{distinct-centers}(\langle a, s\star\rangle, \langle y, s\star\rangle)\})\,] \quad \oplus \quad a$

The idea that inclusive indices are phrases that consist of author and addressee indices has precedent in the semantic literature (Kratzer 2009, *e.g.*). A variant of this idea is also implicit in all of the morpho-syntactic work on person which uses two bivalent person features ±AUTHOR and ±HEARER (Silverstein 1976, Halle & Marantz 1997, *i.a*), where +AUTHOR and +HEARER conjunctively define inclusivity (though, granted, these approaches are not generally semantically decompositional).

There is also morphological evidence for the conception of inclusive indices as composite: the inclusive pronoun in some languages is transparently composed of the exclusive and second-person forms. Tok Pisin, for example, has the pronominal roots *yumi-* for 1IN, *yu-* for 2ND, and *mi-* for 1EX.

(78) *Tok Pisin* (Creole; Foley 1986)
1EX *mi-*
1IN *yumi-*
2ND *yu-*

In addition to the related language Bislama showing the same kind of pattern (Crowley 2004, Harbour 2016: 104), there are multiple other unrelated languages where inclusive person is, in the domain of pronouns, agreement, or both, transparently

composed of exclusive first and second – among them Kiowa (Watkins 1984, Harbour 2007), Nishnaabemwin (Valentine 2001), and !Ora (Meinhof 1930, Güldeman 2002); see Harbour (2016: 103-106) for data and discussion.

2.3.5.1 Alternative feature inventories

Given the existence of paradigms like that of Tok Pisin, it would be unappealing to posit that the syntactic makeup of inclusive pronouns could just be a single feature. To get the meaning of inclusive pronouns right, that feature – let's call it INCL – would have to have the same denotation as (77), namely (79):

(79) $[\![\textsc{incl}]\!]^{c,j} = \quad [\, f(\{y_e : \textit{distinct-centers}(\langle a, s\star\rangle, \langle y, s\star\rangle)\})\,] \quad \oplus \quad a$

Not only would this feature make Tok Pisin *yumi-* morpho-phonologically resemble the concatenation of the exclusive and second-person forms by total accident, it would be anti-decompositional in the sense that the components of meaning which are already present in the theory would not be utilized to construct the more complex meanings.

Incidentally, the same reasoning applies to second person. It's not impossible to define a HEARER feature in a way that's consistent with the CCH, of course. The following denotation, for instance, is certainly well-defined under the current assumptions about utterance contexts:

(80) $[\![\textsc{hearer}]\!]^{c} = \quad f(\{y_e : \textit{distinct-centers}(\langle a, s\star\rangle, \langle y, s\star\rangle)\})$

This feature just directly picks out a participant in the utterance situation, and it does so without using the problematic unvalued h variable that was present in (51b). Picking out a participant atom is exactly what (54b) does with two features – and in fact the denotations of (54b) and (80) are identical. So HEARER's denotation is, in principle, a possible one under current assumptions, but it goes against the decompositional spirit in that the ontologically more accessible variable a is not

introduced by its own feature, despite the fact that that already happens with the generalized/exclusive pronoun.

2.3.5.2 Inclusive competitions

Zwicky's puzzle is now resolved in the sense that we have an answer to the AAB/*ABB asymmetry, *i.e.* why, in a language with two local pronouns, only first person can generalize to cover inclusive meanings. Next, we need to ensure that the proposed inclusive index (76) and its interpretation (77) play nicely with *Minimize Definite Descriptions!* In particular, we need to ensure that inclusive pronouns are not prevented from communicating inclusive meanings due to their syntactic complexity (in the way that second-person pronouns were).

What's notable about (77) in relation to, say, a first-person index, is that while a pronoun containing the latter index characterizes individuals that necessarily contain the author but may or may not contain an addressee, a pronoun with the former index characterizes individuals which in addition to the author *necessarily* contain an addressee. This matters a great deal for how *Minimize Definite Descriptions!* evaluates whether expressions are deviant. Since the reference potential of inclusive pronouns is strictly stronger than either first- or second-person pronouns, inclusives will simply not be deemed deviant with respect to them. Put another way, the referential specificity that inclusive pronouns bring along allows their syntactic complexity to be ignored as far as *Minimize Definite Descriptions!* is concerned.

So this explains why inclusive pronouns are *possible*. But they are not yet obligatory as far as communicating inclusive meanings are concerned. This is not as desired, since in languages with three local pronouns, the first person (*i.e.* exclusive) form usually cannot pick out inclusive referents. So what actually would *require* a speaker to use an inclusive pronoun (rather than, say, a first-person pronoun) to communicate an inclusive meaning? I'd like to claim that it is the very same

fact that allowed inclusive pronouns to skirt *Minimize Definite Descriptions!*: the fact that inclusive pronouns have a strictly stronger meaning (in terms of reference potential) than generalized/exclusive first-person pronouns do.

A way of thinking about what's going on is that one form (the exclusive) is associated with a meaning (author inclusion) that wholly subsumes that of the other (author-addressee inclusion), though as they're actually used by speakers the forms are associated with disjoint interpretations. That is, in terms of their literal meanings, one form has GENERAL applicability while the other is more SPECIFIC. And since Pāṇini, the following sort of relation between the general and the specific has been observed: in contexts where both the specific and general forms should be applicable, by some mechanism the specific one appears to BLOCK the general one, such that the specific form must be used in that context, not the general one. The corollary is that the general form is used only when the specific one doesn't apply. I capture blocking with (81).[6]

(81) ***Be Specific!***

Don't use a definite description α if there's a grammatical alternative β such that the set of potential referents given by $[\![\beta]\!]^{c,j}$ is a proper subset of the potential referents given by $[\![\alpha]\!]^{c,j}$

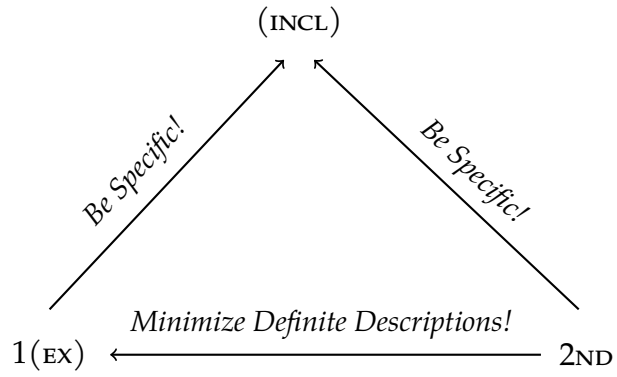
In AAB languages like Jarawa, *Be Specific!* won't ever adjudicate between the second-person pronoun and the generalized first-person pronoun. This is because at any index of evaluation, and at any context that includes at least one addressee, neither of the set of referents these pronouns determine is a subset of the other. (Only the first-person pronoun can be used to refer to the atomic author, and only the second-person pronoun can be used to refer to an atomic addressee.) But in languages like Imonda that *do* have an inclusive form, *Be Specific!* will force that

[6] A different version of this blocking principle, under the guise of 'Lexical Complementarity', also plays a crucial role in Harbour (2016) in determining pronominal reference.

pronoun to be used for inclusive meanings, even though the (exclusive) first-person pronoun and the second-person pronoun would be valid ways of picking out such referents in terms of their literal meanings.

The work that *Minimize Definite Descriptions!* and *Be Specific!* conjunctively do is represented in (82). The three nodes are identified with three kinds of pronoun: the bottom left node with a first-person pronoun (67), the bottom right with a second-person pronoun (68), and the top node with the inclusive pronoun whose indexical component looks like (76). The arrows point to the winners of the pairwise competitions between two pronouns which can, in terms of their truth-conditional meanings, refer to the same referent.

(82) **Competitions between pronominal definite descriptions**



INCL is in parentheses because not all languages make use of this pronoun, while EX is in parentheses because this first-person pronoun only gets restricted (by *Be Specific!*) to exclusive meanings when there's an inclusive pronoun in the same language.

I've now shown that three features internal to the indexical component (AUTH, ADDR, and SUM) are sufficient to build the indexical component of each of the three kinds of local pronouns. Depending on whether SUM is recruited, from these one can concoct either a pronominal system like that of Jarawa (generalized first vs. second) or a system like Imonda's (exclusive first vs. inclusive vs. second, where

exclusive first is syntactically identical to Jawara's generalized first). Under either kind of person partition, pragmatic constraints partially determine which kinds of syntactic phrases can be used to refer to which individuals.

And as desired, there is simply no way to get ABB partitions in this system. The only local person indices are ⟦AUTH⟧, ⟦[ADDR AUTH]⟧, and their sum, and the pronouns these indices partially constitute necessarily compete along the lines of (82).

2.3.6 Interrim summary

Let's take stock. There are two features internal to the indexical component of local pronouns, AUTH and ADDR, which in conjunction with SUM, can generate the three kinds of indices that are needed. First-person indices consist of AUTH, second-person indices consist of [ADDR AUTH], and inclusive indices consist of both expressions coordinated by SUM. The pronouns that these indices anchor all overlap to some degree in terms of their truth-conditional reference potential, but independently-motivated pragmatic competitions allot each pronoun disjoint referents.

Specifically, in languages with only first- and second-person indices, the second-person index is prevented from building inclusive meanings because it's a more syntactically parsimonious (and a no less referentially specific) way of building those meanings. This derives the AAB pattern, and is shown in (83). (For convenience I'll use *h* here as variable over non-author participants, *i.e.* addressees, despite the fact that their status as such is not an ontological primitive.)

(83) In languages **without** index-internal SUM:

a. Index to referent mappings (literal meanings)

Referent contains		*Type of pronominal index*
a, but not *h*	←	first
a and *h*	←	first, second
h, but not *a*	←	second

b. Index to referent mappings (enriched meanings)

Referent contains		*Type of pronominal index*
a, but not *h*	←	first
a and *h*	←	first, ~~second~~
h, but not *a*	←	second

When a composite author-participant index is added to the mix, due to the referential specificity it brings along it is not deemed overly complex, and thus it can communicate inclusive meanings. A general blocking principle prevents first- and second-person indices from doing so. This derives the ABC pattern.

(84) In languages **with** index-internal SUM:

a. Index to referent mappings (literal meanings)

Referent contains		*Type of pronominal index*
a, but not *h*	←	first
a and *h*	←	first, second, inclusive
h, but not *a*	←	second

b. Index to referent mappings (enriched meanings)

Referent contains		*Type of pronominal index*
a, but not *h*	←	first
a and *h*	←	~~first~~, ~~second~~, inclusive
h, but not *a*	←	second

A more complete account of what Harbour (2016) calls Zwicky's problem (namely: which partitions are attested, which aren't, and why?), which is the generalized form of what I've been calling Zwicky's puzzle, will have to wait until the next chapter, since third person plays a crucial role in distinguishing some partitions whose local person inventories appear identical otherwise.

In the next section, I'll develop an extension of the proposal having to do with generic uses of second-person pronouns like *you*.

2.4 Impersonal *you*

Second person can have an IMPERSONAL interpretation,[7] as the sentence below illustrates.

(85) When you're in Finland, you can easily find saunas.

This sentence has two readings. The less natural reading can be roughly paraphrased as 'When you, my addressee, are in Finland, you (my addressee) can easily find saunas'. That reading is unsurprising given the meaning for second-person pronouns developed earlier.

The more natural reading, and the one we're interested in here, is more akin to 'In Finland, one can easily find saunas.' This is a non-referential use of *you*, in the sense that it does not identify a specific individual; rather it says something about how easy it is for an arbitrary person to find a sauna there.

Impersonal uses of second person are by no means restricted to English; in fact the phenomenon is found in a variety of unrelated or distantly-related languages, among them Mandarin, Gulf Arabic, Hindi, Italian (Kitagawa & Lehrer 1990), Swedish (Egerland 2003) and Finnish. What is it about second person that makes it a good fit for impersonal readings? Why can't (86), for instance, have such a reading? That sentence is only an assertion about my sauna-finding abilities; it can't be a claim about how easily one can find saunas in Finland.

(86) When I'm in Finland, I can easily find saunas.

[7] Sometimes called a GENERIC interpretation – but I reserve the term 'generic' to describe a particular kind of interpretation for sentences rather than pronouns.

I'd like to claim that the person feature denotations that the CCH determines provide a natural answer to this question. In order to illustrate why that's the case, I'll need to make some assumptions about how the interpretation of generic sentences proceeds, which I provide in the next section.

2.4.1 Genericity

(85) has a GENERIC interpretation (Carlson 1977). Generic sentences are those which express intensional generalizations, but do so without universal quantificational force. (87a) on its generic reading does not entail (87b), for example.

(87) a. A lion has four legs.

b. Every lion has four legs.

Intuitively, (87a) expresses something about what a 'normal' lion is like, or what lions are like in 'normal' situations. But it does not assert that every lion has four legs; it remains true if there is a three-legged lion somewhere.

A popular approach to modeling the meaning that sentences like (85) and (87a) have is to posit that their LFs include a generic operator GEN (Farkas & Sugioka 1983, Farkas 1985, Wilkinson 1990, 1991). The semantic endowment of GEN (and what exactly it means to be a 'normal' entity or situation) has not been settled, and the choices here are mostly orthogonal to the point at hand anyway. For concreteness, I'll assume that GEN's quantificational force is somewhat like that of *most*, and that it quantifies over entity-situation tuples.

(88) $\text{GEN} = \quad \lambda R_{\langle e\langle st\rangle\rangle}\, \lambda S_{\langle e\langle st\rangle\rangle}\, .\, \textsc{most}\langle x, s\rangle\, .\, R(x)(s) : S(x)(s)$

R is the restrictor to the GEN operator, while S is its scope. (88) says that for most tuples $\langle x, s\rangle$ such that R holds of x in s, S holds of x in s. I'll make use of the hypothesis from Krifka *et al.* (1995) that R includes – in addition to any overt linguistic material that serves to restrict the quantifier, like 'when you're in Finland' in (85) –

the information that the situations quantified over are 'normal' with respect to the denotation of the VP specifically. (That way, it needn't be generally the case that an arbitrary individual in Finland finds saunas easily, rather only those looking for them will find them.)

For (85), then, R will have the value in (89a), where the first conjunct is determined by the overt linguistic restrictor and second conjunct reflects the Krifka *et al.* hypothesis. The value of S is determined by the main clause, and is given in (89b).

(89) a. $\lambda x \lambda s$. [$[\![\text{you}]\!]^c$ are in Finland in s] $\wedge$ [s is normal *w.r.t.* finding saunas]

b. $\lambda x \lambda s$. [$[\![\text{you}]\!]^c$ find saunas easily in s]

Obviously I haven't applied the interpretation function to *you* yet. The next section develops an appropriate impersonal meaning for this pronoun, one that's intimately related to the referential meaning.

2.4.2 ADDR can map to an utterance-external index

I'll assume that the impersonal second-person pronoun has the same syntax as its referential counterpart. It will consist of a second-person indexical component [ADDR AUTH], a relational component REL, and (depending on one's theoretical commitments about such things) perhaps a singular feature too. Referential and impersonal *you* having the same syntax ensures that they'll be morphologically exponed the same way.

It is only the interpretations of the referential and impersonal second-person pronouns that differ – and even then, they need differ only slightly. If the *distinct-centers* relation and the denotation for ADDR given earlier are modified in a minor way (but in a way consistent with their original spirit), then impersonal uses of second person will follow directly. Recall what we were working with earlier:

(90) **The *distinct-centers* relation**

For all x, y, and s, *distinct-centers*$(\langle x, s\rangle, \langle y, s\rangle)$ holds whenever $\langle x, s\rangle$ and $\langle y, s\rangle$ are well-defined centered situations and $\langle x, s\rangle \neq \langle y, s\rangle$.

(91) $[\![\textsc{addr}]\!]^c = \quad \lambda x_e \,.\, f(\{y_e : \textit{distinct-centers}(\langle x, s\star\rangle, \langle y, s\star\rangle)\})$

Note that in (90), the tuples that stand in the *distinct-centers* relation contain the same situation variable. Note also that what (91) did in the referential cases considered above was find a cognitively agentive center within the centered situation $\langle a, s\star\rangle$ that a defines by their utterance and communicative intentions. It's always $s\star$ that values both situation variables in the tuples that *distinct-centers* relates, in other words, so second-person indices are necessarily restricted to the confines of the actual utterance situation.

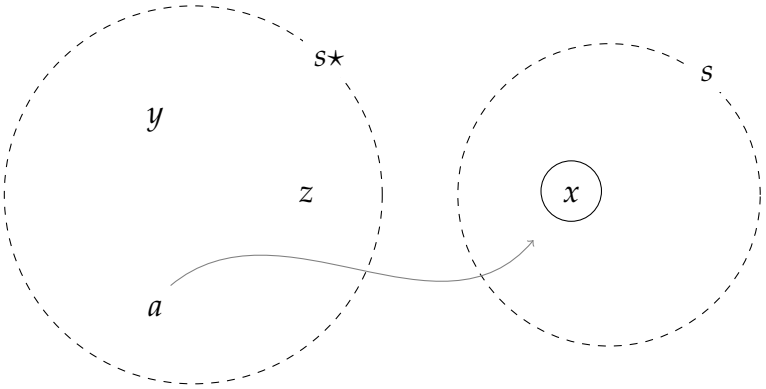
To move toward an analysis of impersonal uses of *you*, we can make a slight modification to the definition of the *distinct-centers* relation; in particular, we can let the situation variables inside the two tuples be distinct.

(92) **The *distinct-centers* relation (alternate version)**

For all x, y, s, and s', *distinct-centers*$(\langle x, s\rangle, \langle y, s'\rangle)$ holds whenever $\langle x, s\rangle$ and $\langle y, s'\rangle$ are well-defined centered situations and $\langle x, s\rangle \neq \langle y, s'\rangle$.

This will ultimately allow the semantic value of a second-person index to not be confined to the actual utterance situation $s\star$ but instead escape it, as the situation variable in one tuple can be distinct from that in the other. We're aiming for (93), in which the author index has been mapped to the center of $\langle x, s\rangle$, a centered situation which GEN (88) will be able to quantify over.

(93) Escaping $s\star$



To actually achieve what (93) illustrates, we'll need to revisit the meaning of ADDR. Below, I give a denotation identical to the one given in (91), save that one of the situation variables has been abstracted out; it is an intensional counterpart (or rather, a *more* intensional counterpart) of the earlier denotation.

(94) $[\![\textsc{addr}]\!]^c = \quad \lambda s \lambda x_e \,.\, f(\{y_e : \textit{distinct-centers}(\langle x, s\star\rangle, \langle y, s\rangle)\})$

Intensionalizing ADDR will necessarily bring about certain modifications to the mostly extensional framework I've been assuming. There are a variety of ways to make the resulting system consistent with this change. One route, for example, would be to revise many of the denotations already introduced (by way of intensionalizing them), and to recruit a rule like Intensional Function Application to handle the compositional semantics.

An expositionally simpler route, and the one I'll take up here, is to suppose that we can freely insert situation variables in our LFs (principally to satisfy ADDR's new situation argument), and to suppose that these variables can later be bound by lambda abstractors; the abstractors too may be freely inserted. (We could alternatively assume that the variables and binders are introduced syntactically; nothing important hinges on this choice.)

On referential uses of second-person pronouns (which are the cases already tackled above), that situation argument could just be $s\star$, like so:

(95) $[\ \lambda s \lambda x_{\mathrm{e}}\ .\ f(\{y_{\mathrm{e}} : \textit{distinct-centers}(\langle x, s\star\rangle, \langle y, s\rangle)\})\ ](s\star) \quad = \quad$ (by FA)
$[\ \lambda x_{\mathrm{e}}\ .\ f(\{y_{\mathrm{e}} : \textit{distinct-centers}(\langle x, s\star\rangle, \langle y, s\star\rangle)\})\ ]$

The second line of (95) ends up having the same value as (91), our earlier denotation for ADDR. So we haven't lost a handle on the referential uses of second-person pronouns.

But note that we also could have fed (94) a different situation variable – call it s' – as exemplified below.[8] Locally, s' will have the status of a free variable. (Alternatively it could be referential, having been introduced by a situation pronoun. The choice doesn't matter, as it will soon be bound anyway.)

(96) $[\ \lambda s \lambda x_{\mathrm{e}}\ .\ f(\{y_{\mathrm{e}} : \textit{distinct-centers}(\langle x, s\star\rangle, \langle y, s\rangle)\})\ ](s') \quad = \quad$ (by FA)
$[\ \lambda x_{\mathrm{e}}\ .\ f(\{y_{\mathrm{e}} : \textit{distinct-centers}(\langle x, s\star\rangle, \langle y, s'\rangle)\})\ ]$

Applying (96) – which is just $[\![\ \textsc{addr}\ ]\!]^c$ plus a situation variable – to $[\![\ \textsc{auth}\ ]\!]^c$ yields (97), which picks out a center of some situation s'.

(97) $f(\{y_{\mathrm{e}} : \textit{distinct-centers}(\langle a, s\star\rangle, \langle y, s'\rangle)\})$

So because *distinct-centers* can now hold between tuples with different situation variables, and because one of those situation variables has been abstracted out, we effectively allow ADDR to map the context author to the center of a different centered situation. That is, the second-person index is no longer restricted to denoting centers within $s\star$.

Let's now revisit (85) and the meanings of its restrictor and scope that were introduced earlier. These are repeated below.

(98) When you're in Finland, you can easily find saunas.

[8] This idea that a second-person pronoun can get an impersonal interpretation by manipulating the situation variable it makes reference to has been explored in earlier work by Alonso-Ovalle (2002).

(99) a. $\lambda x \lambda s$. [$[\![\text{you}]\!]^c$ are in Finland in s] $\wedge$ [s is normal *w.r.t.* finding saunas]

b. $\lambda x \lambda s$. [$[\![\text{you}]\!]^c$ find saunas easily in s]

With (97) in mind, it's possible to write out the meaning of *you* in such a way that the entity variable its index denotes is captured by the entity-type binder in the restrictor and scope, and in such a way that the associated situation variable is captured by the situation-type binder. This requires only alphabetic variance of the binder variables with respect to (99).

(100) a. $\lambda y \lambda s'$. [$[\![\textsc{rel}]\!]^c(f(\{y_e : \textit{distinct-centers}(\langle a, s\star\rangle, \langle y, s'\rangle)\}))$ is in Finland in s'] $\wedge$ [s' is normal *w.r.t.* finding saunas]

b. $\lambda y \lambda s'$. [$[\![\textsc{rel}]\!]^c(f(\{y_e : \textit{distinct-centers}(\langle a, s\star\rangle, \langle y, s'\rangle)\}))$ finds saunas easily in s']

I've not interpreted REL here (and ignored number completely), for reasons of space and because their meanings simply amount to identity over the index: the pronoun is singular and its index is atomic (so the parthood relation is reflexive), and the cognitive agency condition holds trivially of both the index and referent.

For sentence (98), then, (100a) and (100b) will be the restrictor and scope respectively of the GEN operator, whose meaning is repeated in (101). The compositional result is given in (102).

(101) $\text{GEN} = \quad \lambda R_{\langle e\langle st\rangle\rangle}\, \lambda S_{\langle e\langle st\rangle\rangle}$. $\textsc{most}\langle x, s\rangle$. $R(x)(s) : S(x)(s)$

(102) $[\![(98)]\!]^c =$ $\textsc{most}\langle x, s\rangle$.
[$[\![\textsc{rel}]\!]^c(f(\{x_e : \textit{distinct-centers}(\langle a, s\star\rangle, \langle x, s'\rangle)\}))$ is in Finland in s] $\wedge$ [s is normal *w.r.t.* finding saunas] : [$[\![\textsc{rel}]\!]^c(f(\{x_e : \textit{distinct-centers}(\langle a, s\star\rangle, \langle x, s\rangle)\}))$ finds saunas easily in s]

This says that for most entity-situation tuples $\langle x, s\rangle$, the referent that x serves to recover (which is x, given that the non-indexical components are identity functions

in this instance) finds saunas easily in s, provided that x is in Finland in s and that s is a normal sauna-finding situation. That's the meaning we want to get from this sentence, and more generally the kind of meaning we want to get out of generic sentences with impersonal *you*.

The upshot is that by intensionalizing ADDR and allowing the *distinct-centers* relation it calls on to relate the utterance situation to other kinds of situations, impersonal meanings naturally follow from second-person pronouns. Since the first-person index AUTH by contrast simply denotes a, the default center, and thus has no means to escape the utterance situation in a similar fashion, it follows too that first-person pronouns are not expected to have impersonal readings.

CHAPTER 3

Beyond the local persons: third person and PRO

3.1 Introduction

With regard to the typology of person contrasts, the last chapter was concerned with Zwicky's asymmetry and thus only the local persons – those I termed first, second, and inclusive. The goal of this chapter is to flesh out the system by bringing third person into the mix. I will go about this in a strictly additive way: we will not need to revise or abandon any of the contents of the previous chapter.

In addition to the fact that third person pronouns and agreement form natural classes with local pronouns and agreement in many languages, third is relevant for our purposes because some languages partition third together with a local person category – thus the proposal developed in the previous chapter bears directly on a theory of third person, and vice versa.

As an example of such a language, consider Sanapaná, which is exemplary of the whole Mascoian family in lacking a contrast between second and third (Gomes 2013).

(103) *Sanapaná* (Mascoian; Gomes 2013)

a. Hawe ko'o as-melaja.
NEG 1SG 1SG-slow
'I am not slow.'

b. Ta'asek akjehlna **ap**-ta-o **hlejap**?
which fruit **2/3**-eat-Q **2SG/3SG.M**
'Which fruit did you eat?'

c. **Hlejap** metko patakon **ap**-angok.
2SG/3SG.M NEG money **2/3**-POSS
'He doesn't have money.'

The pronoun *hlejap* and the agreement prefix *ap-* function like second person in (103b), but the same morphemes in (103c) convey a third-person meaning. I have preserved Gomes' translations as originally reported, but from the surrounding discussion (and as indicated by the gloss) it is expected that both (103b) and (103c) are ambiguous, such that they can also mean 'Which fruit did he eat?' and 'You don't have money' respectively.

Sanapaná does not have an inclusive pronoun, and is in this sense like many well-studied European languages. But unlike (for instance) English with an AABC pattern ('...BC' because second and third are distinguished), Sanapaná and Mascoian more generally do not contrast third from second and thus have an AABB pattern. Something that needs to be understood is how this second-*cum*-third category, exemplified here by *hlejap* and *ap-*, relate to the second- and third-person pronouns and agreement of a language that does contrast them.

There are several possibilities *a priori*. One is that the pronouns and agreement of Mascoian-type languages actually differ across examples like (103b) and (103c) under the hood – that is to say, syntactically – but that the two person categories simply happen to be associated with the same morphological forms. This position is that *hlejap* in (103b) is the way of pronouncing the pronoun that in English is pronounced as *you*, and that a syntactically distinct pronoun in (103c) is pronounced the same way. For the reason given in Noyer (1992) and Harbour (2016) – namely that explanations from accidental homophony aren't really explanations – I will not pursue this line of reasoning here.

Another, more interesting possibility is that the Mascoian-type second-*cum*-third category is uniform, such that Sanapaná *hlejap* has the same syntactic and semantic character across (103b) and (103c). This is what will be explored in this chapter.

3.1.1 Partitions with third person

Harbour (2016) concluded that the following five partitions exhaust the typology of attested person contrasts in natural languages.

(104) Attested partitions over four persons, per Harbour (2016)

	Type I	**Type II**	**Type III**	**Type IV**	**Type V**
1EX	A	A	A	A	A
1IN	B	A	A	A	A
2ND	C	B	B	A	A
3RD	D	C	B	B	A

Note that types II and III were not distinguished in the last chapter, since they simply *can't* be if only local persons are considered. Likewise types IV and V weren't, and for the same reason. The distinctness of these partitions hinges on whether there is a third-person category that can be teased apart from second.

The first claim of this chapter is that Type III languages like Sanapaná deploy something syntactically identical to the third-person pronoun of Type II languages in order to cover both third-person and second-person meanings. What sets Mascoian-type, AABB languages apart from English-type, AABC languages, I will argue, is that the former kind of language simply lacks the feature ADDR, which entails that a specialized second person cannot be constructed. This in turn entails that a specialized inclusive person cannot be constructed either (since, after all, its index is the mereological sum of the first- and second-person indices). This part of the account thus predicts – correctly – that ABCC partitions (distinguishing first, inclusive, and second-*cum*-third) are unattested. These claims will be explicated below in §3.2 as I lay the syntactico-semantic groundwork for my treatment of third-person

indexicals.

In §3.3, I show that the semantics I assume for third person introduces a complication with respect to how the pragmatic competitions introduced in the last chapter (*Be Specific!* and *Minimize Definite Descriptions!*) are evaluated, and I formalize a third pragmatic principle that ameliorates the issue and has, in addition, more general applicability and certain consequences for how numeric indices are deployed in a theory of syntax.

3.2 Third-person pronouns and AABB/AABC partitions

As with my analysis of local pronouns, I will adopt here a treatment of third person pronouns which is largely in the spirit of Nunberg (1993) and Elbourne (2005, 2008). That is to say, I will assume third-person pronouns consist of indexical, relational, and classificatory components, with the relational component serving to relate the index to the referent and with the classificatory component serving to convey information about that referent.

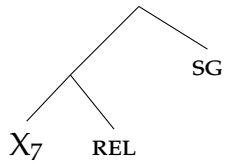
The indexical component will consist of at least a numeric index. I will notate index features 'X_n', with n a variable over natural numbers. The numeral subscript corresponds to the argument given to the assignment function g in all cases.

(105) The interpretation of the index feature X_7.

$$[\![\mathrm{X}_7]\!]^g = g(7)$$

Since the denotation of X_n is of type e, it can compose with the $\langle \mathrm{e}, \mathrm{e} \rangle$ relational feature REL that was introduced in the preceding chapter. Subsequently that constituent, which denotes the referent, may get together with the classificatory features of number, animacy, and gender. A third-person singular pronoun unmarked for gender and animacy, then, would look like (106).

(106) A third-person singular pronoun.



3.2.1 AABB languages lack ADDR

Since AABB languages like Sanapaná have generalized first-person pronouns, I will assume that these languages make use of AUTH, just as English and Jarawa do; what sets AABB languages apart from languages of the latter kind is just that second and third person are not contrasted. Assuming that the systematic second-third syncretism is a result of underlying syntactic uniformity (and not accidental homophony), we can ask whether a 2/3 pronoun (like Sanapaná *hlejap*, say) more resembles a second-person pronoun or a third-person one under the hood.

The original denotation for ADDR that was proposed in the last chapter bears on this question. ADDR, recall, is the feature required to build second person, and was initially defined this way:

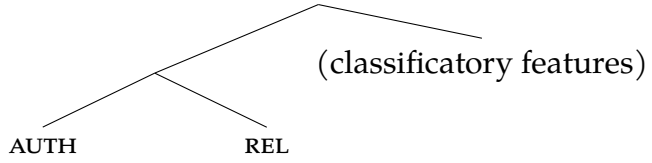
(107) $[\![\textsc{addr}]\!]^c = \quad \lambda x_e \,.\, f(\{y_e : \textit{distinct-centers}(\langle x, s\star\rangle, \langle y, s\star\rangle)\})$

As mentioned when it was introduced, this feature will not return anything semantically well-defined whenever its sister denotes an entity that is not a part of the utterance situation $s\star$. Moreover, whenever the sister *does* denote an entity in $s\star$, ADDR will return an addressee of the utterance. What this means is that (107) can't be used to cook up an indexical component that denotes an entity outside of the utterance situation (*i.e.* the smallest situation that contains all discourse participants) – but this is exactly what's needed for third-person meanings. Since third-person meanings would be excluded when ADDR is involved, we can conclude that the Mascoian-type second-cum-third category is not syntactically identical to the

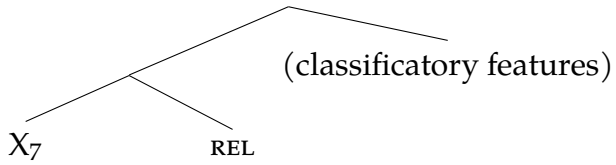
second person of a language like English. (Though see §3.5 for a prediction that the intensionalized variant of ADDR that was proposed to model second-person impersonal readings could be used to get at some third-person meanings.)

This leaves the other possibility: that the second-*cum*-third category, under the hood, is syntactically identified with the third person of languages that contrast the two. Languages like Sanapaná, then, have only two kinds of indexical component as far as person is concerned; one consists only of AUTH, and the other consists only of X_n. The feature ADDR, while presumably made available by UG, is simply not utilized in such languages. The two kinds of pronoun AABB languages allow for are shown in (108-109).

(108) A first-person pronoun; this covers inclusive and exclusive meanings.



(109) A third-person pronoun; this covers second- and third-person meanings.



A syntactically third-person pronoun, on this view, has a plastic enough meaning to handle second-person referents in the absence of a second-person pronoun, just as (as we saw in the previous chapter) the pronoun that is reserved for exclusive meanings in one language may, in another language, be semantically widened to cover inclusive meanings in the absence of a designated inclusive pronoun.

3.2.2 Feature contingency and the full person typology

The ADDR feature is CONTINGENT on the AUTH feature, in the following sense: a phrase containing ADDR has a semantically well-defined output only if its sister is AUTH. (Granted, it will also have a well-defined output if its sister is X_n and the assignment maps n to the author. This can be safely ignored for now, since an [X_n ADDR] indexical component will be shown below to be ruled out for other reasons.) *Mutatis mutandis*, SUM – at least in its index-internal guise – is contingent on ADDR. This is ultimately due to the interaction between *Minimize Definite Descriptions!* and the idempotence of SUM. In the absence of ADDR, the only things that could be summed internally to the indexical component are two instances of AUTH – but because the denotation of [[AUTH SUM] AUTH] will always be same as that of AUTH alone (as mereological summation is idempotent), *Minimize Definite Descriptions!* will rule out the former expression.

Thus, there's an implicational hierarchy whereby ADDR is contingent on AUTH, and (index-internal) SUM is contingent on ADDR. This hierarchy plays a critical role in determining what kinds of partitions are predicted to exist. A specialized second person category can't exist without AUTH being available as an index, which means that within a language, the existence of second person asymmetrically entails that of generalized or exclusive first person. Moreover inclusive person can't exist without SUM, and since this feature's arguments need to be distinct, inclusive person in a language entails both a specialized second person and an exclusive first. These contingencies are summarized in (110), where a designation of 'n/a' means that the feature at the top of the column cannot exist due to an '✗' designation in some cell to its left.

(110) **Predicted partitions (exhaustive) as a function of feature inventory**

Does the language recruit…

…AUTH?	…ADDR?	…index-internal SUM?	Predicted partition:
✓	✓	✓	ABCD
✓	✓	✗	AABC
✓	✗	n/a	AABB
✗	n/a	n/a	AAAA (*i.e.*, no person contrasts)

I will assume that every kind of language avails numeric indices, which is what allows D to being distinguished from C in the first row, and C from B in the second. Numeral index features moreover constitute the indexical component of the B category in the third row, and the A category in the fourth row. The syntactic makeup of pronouns for each of the four kinds of person system are thus as follows.

ABC partitions over the local persons were discussed fully in the last chapter, and these are naturally extended to ABCD partitions that now that third-person indexical components headed by X_n are involved. Under this partition, the exclusive first person derives from an indexical component consisting only of AUTH, the inclusive person from an [[AUTH SUM] [ADDR AUTH]] index, the second person from an [ADDR AUTH] index, and the third person from an X_n index. AABC partitions, which arise in languages that do not recruit index-internal SUM, have all but the second of these indices, with the AUTH index being the only one that may bleach semantically to cover inclusive meanings (for reasons given in the previous chapter). AABB partitions come about when the choice of indices is between only AUTH and X_n, with the latter feature bleaching likewise to cover second-person meanings.

AAAA partitions (so-called 'monopartitions') can only come about when X_n is the sole person index available; these languages must eschew even AUTH. This state of affairs is simply a consequence of the denotations of AUTH and REL, and it's quite simple to illustrate why. If there were a language with only one person index – which is what's required of any monopartition, so as to ensure no person-internal contrasts – and that index *were* AUTH, then the relational component would

force every pronominal referent to contain the author. By definition, this would not be an AAAA monopartition, since pronouns with the AUTH index cannot be used for second- or third-person meanings. Since ADDR and SUM are unidirectionally contingent on AUTH, then these can't be a language's sole person index either. X_n is the only possibility remaining.

Thus (110) contains all and only the partitions that are predicted to obtain with the four indexical features at our disposal (AUTH, ADDR, SUM, and X_n). The predictions match Harbour's (2016) findings exactly – cf. (104) – with one exception. A person system that cannot come about on the present proposal, contra the findings of Harbour's study, is AAAB: a person system where the only contrast is between local and non-local. AAAB is ruled out since none of the four features picks out a discourse participant *qua* discourse participant. AUTH associates only with authors, and is thus inappropriate to cover second-person meanings, while [ADDR AUTH] associates only with addressees and so is inappropriate to cover first-person meanings. This mutual incompatibility precludes the 'AAA' part of an AAAB partition – no one syntactically uniform indexical component can underlie both first- and second-person meanings (regardless of whether first is generalized or divvied up into inclusive and exclusive varieties).

3.2.3 *AAAB and participant agreement

What, then, is the source of the mismatch between Harbour's claim that AAAB partitions are attested on the one hand, and the fact that AAAB are predicted to be impossible in the current system?

The first thing to note is that the prevalence of 'aaab' paradigms differs drastically depending on whether one is considering pronouns or agreement. Pronominal 'aaab' paradigms are practically non-existent, while 'aaab' agreement paradigms are fairly common – especially in the context of plural number. (This is revealing

itself: if AAAB partitions were deep generalizations about the way languages could use person, we might expect them to be more commonly reflected in pronominal systems.) In this section, I'll argue that AAAB is not an available person partition, but will show how the common 'aaab' agreement pattern is actually expected under the current account.

In Harbour's 2016 study (and in Harbour 2014), Hocąk is the sole language whose pronoun series conforms to an AAAB partition; he determines it to be "seemingly unique" in this respect. Cysouw's (2003) survey doesn't report any such languages.[1]

(111) Hocąk pronouns (Siouan; Lipkind 1945, Noyer 1992)

1EX	
1IN	ne
2ND	
3RD	e

There's at least one good reason, albeit a theory-dependent one, to think that the paradigm above is due to accidental homophony: Hocąk agreement contrasts four persons.

(112) *Hocąk* (Siouan; Lipkind 1945, Harbour 2014)

a. **Ne**-śən **ha**-ji-wi.
1/2-only **1EX.S**-come-AUG
'We$_{\text{EXCL}}$ only came.'

b. **Ne** **nĩ**-ře.
1/2 **2.O**-be
'It is you.'

In (112a), while the pronoun *ne* could in principle refer to any entity that contains a participant, the agreement prefix *ha-*, which is specified for 1EX, restricts (at least pretheoretically) the range of referents this pronoun can have. Likewise for

[1]There are several unrelated languages, however, where second- and third-person pronouns are not distinguished in the plural, but remain distinct in the singular. Among these are Slave (Na-Dene; Rice 1989), Awa (Papuan; Loving 1973) and Southern Haitian Creole (Holm 1988: 204).

(112b): *nĩ-* is the exponent associated with second-person object agreement, and that disambiguates the pronoun.

To the extent that the agreement exponents in (112) reflect agreement with the corresponding local pronouns (this is the theory-dependent part), then those pronouns simply can't be syntactically uniform. There needs to be different stuff inside the inclusive, exclusive, and second-person pronouns in order for an agreement probe to end up being exponed differently in each case. I'll conclude, for that reason, that pronouns like Hocąk *ne* are syntactically heterogeneous.

In the domain of agreement, however, the literature provides no shortage of 'aaab' paradigms. Two examples are given below.

(113) Upper Bal suffixal agreement, imperfective aspect (Caucasian; Tuite 1997)

	SG	PL
1EX		
1IN	-äs	-ad
2ND		
3RD	-a	

(114) Waskia agreement, past tense (Papuan; Ross & Paol 1978: 67-68)

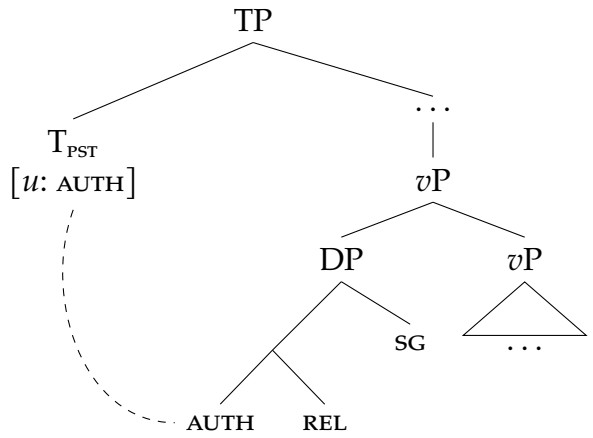
	SG	PL
1EX		
1IN	-em	-man
2ND		
3RD	-am	-un

In these cases, there's a (number-conditioned) exponent of agreement that appears whenever a local person – no matter *which* local person – is being agreed with, and a different exponent that appears otherwise. But the commonness of this kind of paradigm is not evidence for AAAB partitions on the current account, because it already follows from something internal to it: whether or not the goal contains AUTH. Recall that each local person contains this feature, and third person doesn't. So all that's needed here is to assume the existence of a probe which is exponed a particular way when it agrees with nominals that contain AUTH.

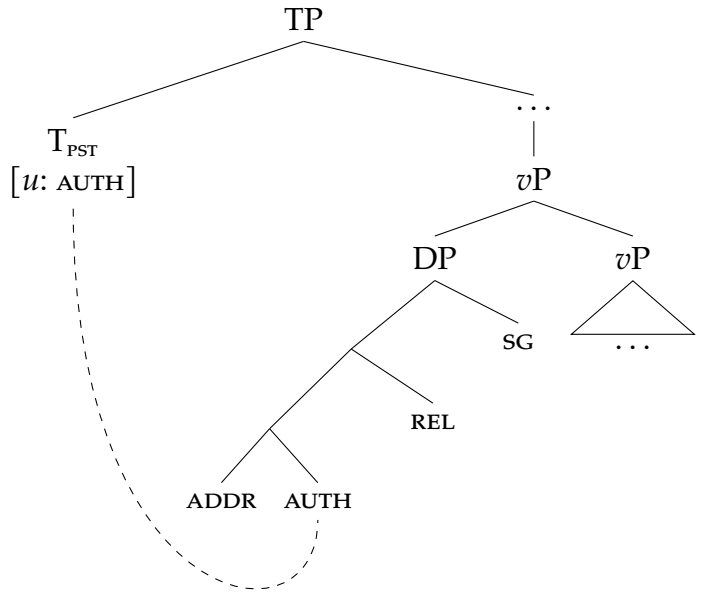
Assume for concreteness a scenario where a past tense T head with an unvalued

AUTH feature (notationally: [*u*: AUTH]) probes downward to find an external argument in the specifier of *v*P, and assume that that external argument is a singular pronoun. If the goal contains AUTH, as in (115-116), then this probe can get its unvalued feature checked, the derivation will succeed, and the T head can be exponed by the morphological component in a language-specific way – for example, as *-em* in Waskia; cf. (114).

(115) Probing for AUTH inside a (generalized/exclusive) first-person pronoun.



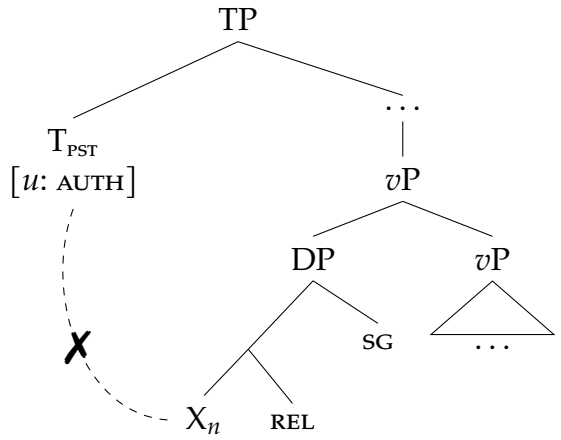
(116) Probing for AUTH inside a second-person pronoun.



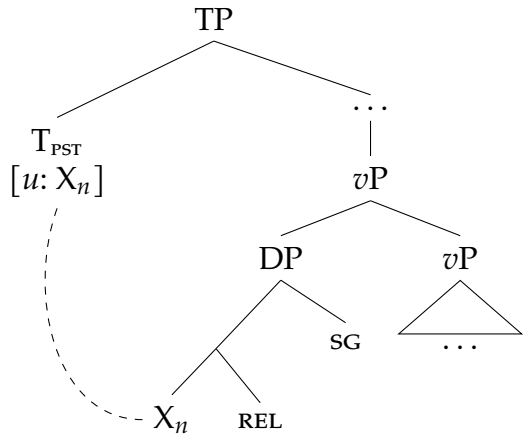
The same goes for inclusive pronouns, the only difference being that these contain two instances of AUTH (and thus in principle the probe may agree with either of them, or even both, depending on one's theory of Agree).

However, if the goal contains no AUTH feature, as in (117), then this T head will not get [*u*: AUTH] valued, and the derivation will crash. A different probe will need to be used instead, one we could imagine that is unvalued for X_n, as I illustrate in (118). This alternate probe may, of course, be morphologically exponed in a different fashion than the first probe – as *-am* in Waskia, perhaps; cf. (114).

(117) A failure to agree.



(118) Probing for X_n inside a third-person pronoun.



The upshot is that all local pronouns contain AUTH, so an AUTH-relativized probe

can be posited which will agree with all and only such pronouns. This straightforwardly explains why 'aaab' agreement paradigms are *possible* in light of the analytic fact that 'aaab' pronominal paradigms cannot exist except by accidental homophony (as in Hocąk).

A slightly different question is why 'aaab' agreement paradigms are considerably more *common* than the corresponding pronominal paradigms. If accidental homophony can occur in either kind of paradigm, whence the asymmetry in attestedness? Ultimately, the answer comes down to the mechanics of Agree, specifically the fact that (under basically any theory of agreement) probes can be relativized to a proper subset of the features the nominals they agree with carry. In a language without an inclusive pronoun (for example), a local pronoun goal will, by virtue of having to communicate a particular meaning, either have to be specified for AUTH or [ADDR AUTH]. But the probe will underspecify that contrast if it is relativized only to AUTH, since both the first- and second-person pronouns contain that feature. On the assumption that only that feature will be copied back to the probe either way,[2] and the portion of the morphological component responsible for exponence will not be able to distinguish a probe that agrees with a first-person pronoun from one that agrees with a second-person pronoun. *Voilà* – there is syncretism on the agreement probe in the absence of pronominal syncretism.

More generally, the point is that no matter what a language's pronominal inventory is, the agreement probes may be underspecified with respect to the pronominal features that are availed. The ensuing prediction is that agreement paradigms should be more syncretic on average than pronominal paradigms are; this is certainly the case for 'aaab' patterns.

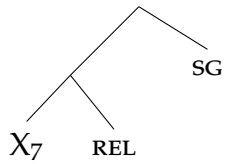
[2]Granted, this assumption is controversial. It is not compatible with Feature Maximality (also known as Multitasking or the Free Rider Condition; Chomsky 1995, Pesetsky & Torrego 2001, Rezac 2013, which dictates that an Agree relationship between a probe specified for a feature will, upon finding a suitable goal XP specified for that feature, will copy back all the features of the XP.

3.3 Assignment function underspecification

Having covered the generalized version of Zwicky's puzzle, we turn now to the interpretation of pronouns across the various kinds of partitions. I'll first show that the introduction of third-person pronouns introduces a complication with regard to how the pragmatic competitions from the last chapter are evaluated.

Recall (106), the third-person singular pronoun introduced above and repeated here as (119).

(119) A third-person singular pronoun.



The numeric index feature may freely denote any entity, no matter whether that entity is atomic or plural, and no matter whether it contains the author or an addressee of the utterance. A consequence of this state of affairs is that truth-conditionally speaking, (119) could be used to mean what *I* does in English, for example if the assignment maps 7 to the utterance author, and if the REL's meaning reduces to identity (which is always an option, since every entity trivially shares a property with itself, and since every entity is a reflexive part of itself.) This result is pathological – third person pronouns are not generally used to refer to oneself when there is a first-person pronoun available, nor are third-person pronouns used in place of second-person or inclusive pronouns when *they* are available in the language.[3]

The competitions introduced in the last chapter won't help us here. *Be Specific!*, for instance, will not adjudicate between the use of (119) and, say, a first-person

[3]They can, however, be used mostly interchangeably with local pronouns in certain binding configurations that arise under focus (Partee 1989): *I'm the only student who did {my, his} homework.*

singular pronoun. These two pronouns are on par with respect to their reference potential so long as the numeric index of the third-person pronoun picks out the same entity as the author indexical feature does. This is just because the two pronouns' indices (AUTH and X_n) would have the same extension, and nothing else differs between between the pronouns themselves (they have the same relational and classificatory components). So from an empirical standpoint, what's needed at this juncture is a way of ensuring that the use of local pronouns over third is forced when local person meanings are at play.

The intuition I will pursue to this end is that a cooperative speaker should rely on the assignment function as little as possible, given the sentence or proposition she wants to convey. The idea is that using a singular first-person pronoun like *I* (which, in all extensional and in most intensional contexts, straightforwardly picks out the speaker of the utterance[4]) to refer the self is a more deterministic way of doing so than relying on the assignment function to fix the reference of a pronoun like *he* to the speaker, since all addressees will have to guess at the value of that assignment.

I'll cash out this intuition initially with a preliminary version of the constraint I have in mind.

(120) ***Underspecify Assignments!*** (preliminary version)

Let α_n be a pronoun that contains a numeric index X_n. $[\![\alpha_n]\!]^g$ is ill-formed if there exists a pronoun β which does not contain a numeric index whenever $[\![\beta]\!]^g = [\![\alpha_n]\!]^g$.

This condition stipulates directly that pronouns which contain numeric indices (*i.e.*, third-person pronouns) are ill-formed when they have the same meaning as an available pronoun without a numeric index (*i.e.*, a local pronoun). To illustrate

[4] I say 'most intensional contexts' here because of the descriptive readings of person indexicals that were discussed in §1.9.

how this works, suppose I want to communicate the proposition that I dance. In principle I (=$\mathbf{k}$) could say $[\![$ I dance $]\!]^{c,g}$, where $c = \langle \mathbf{k}, s\star \rangle$. Alternatively I could say $[\![$ He$_4$ dances $]\!]^{c,g}$, so long as $g(4) = \mathbf{k}$. (120) simply says that the $[\![$ he $]\!]^{c,g}$ part of the second sentence is ill-formed, because I could've gotten at the same extension by using a pronoun without a numeric index.

Underspecify Assignments! will likewise rule out third-person pronouns being used for inclusive or second-person meanings in languages that have dedicated inclusive or second-person pronouns. It will not, however, prevent Mascoian-type AABB languages from deploying syntactically third-person pronouns for second-person meanings, since there is no pronoun β without a numeric index that can *have* second-person meanings in these languages (after all, the only other pronoun is the first-person pronoun, and that requires the referent to include the author).

(120) has the desired effect of gating the use of third-person pronouns, but it just redescribes the facts. It would be good to have the desired effect derive from a more general condition whose predicted empirical effects can be tested in other domains. I will propose a revised version of *Underspecify Assignments!* that covers not only the inter-pronominal competitions at issue, but also bears on questions like whether free, non-pronominal R-expressions contain numeric indices.

For the revised version of *Underspecify Assignments!* to have the desired effect, I need to slightly modify Heim & Kratzer's (H&K; 1998) definition of a modified variable assignment; a modified assignment is called on in their definition of Predicate Abstraction (p. 186). The change I will make is a harmless one, and does not forbode any significant departure from the H&K system. Their definition (p. 112) for a modified assignment is given in (121).

(121) **Modified variable assignments** (H&K's version)

Let g be an assignment, $i \in \mathbb{N}$, and $x \in D$. Then $g^{x/i}$ (read: "g modified so as to assign x to i") is the unique assignment which fulfills the following conditions:

i. $dom(g^{x/i}) = dom(g) \cup \{i\}$,

ii. $g^{x/i}(i) = x$, and

iii. for every $j \in dom(g^{x/i})$ such that $j \neq i$: $g^{x/i}(j) = g(j)$.

(122) **Predicate Abstraction**

Let α be a branching node with daughters β and γ, where β dominates only a numerical index i. Then, for any variable assignment g, $[\![\alpha]\!]^g = \lambda x \in D . [\![\gamma]\!]^{g^{x/i}}$.

Consider how (121-122) are applied to the analysis of a sentence like *John likes his dog*, on a bound reading of the possessive pronoun. The complement of the subject, interpreted under standard H&K assumptions, will look something like the following.

(123) $[\![2\ [t_2 \text{ likes his}_2 \text{ dog}]]\!]^g = \lambda x \in D . [\![t_2 \text{ likes his}_2 \text{ dog}]\!]^{g^{x/2}}$

Condition i. of (121) requires that the domain of $g^{x/2}$ contain 2. But H&K's definition is agnostic as to whether the index i is included in the domain of g, the non-modified assignment. As they note in prose (pp. 112-113): "If $dom(g)$ contains i already, then $dom(g) = dom(g^{x/i})$. Otherwise, the index i has to be added." That is, g's domain may simply lack 2 (in which case the set union in condition i. is actually doing some work), or it may include 2, mapping it to a potentially different entity than that which β-reduces into the trace and possessor positions. Either way, condition ii. guarantees $g(2)$ its new value, x.

The revised version of *Underspecify Assignments!* that I will soon propose will rely on there being a way of comparing the cardinalities of candidate assignment

functions' domains, as the constraint will force cooperative speakers to use the assignment with the smallest domain. In order to ensure that this doesn't prevent binding from *ever* happening, I'll need to amend the first of the three conditions by forcing the domain of the modified variable assignment $g^{x/i}$ to have the same cardinality as the domain of the non-modified assignment g. A way of ensuring these have the same cardinality is to equate them, as I do in (124), where the change relative to (121) is underlined.

(124) **Modified variable assignments** (amended version)

Let g be an assignment, $i \in \mathbb{N}$, and $x \in D$. Then $g^{x/i}$ (read: "g modified so as to assign x to i") is the unique assignment which fulfills the following conditions:

i. $\underline{dom(g^{x/i}) = dom(g)}$,

ii. $g^{x/i}(i) = x$, and

iii. for every $j \in dom(g^{x/i})$ such that $j \neq i$: $g^{x/i}(j) = g(j)$.

With this minor and empirically harmless change, we're in a position to define the more general version of *Underspecify Assignments!*, which is given in (125).

(125) ***Underspecify Assignments!*** (final version)

$[\![\alpha]\!]^g$ is a semantically ill-formed utterance if $\exists g' :$

$[\{x : x \in dom(g')\} \subset \{x : x \in dom(g)\}] \wedge$

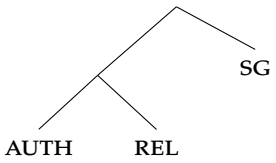
$[\exists \beta : \lambda s.[\![\beta]\!]^{g'}(s) = \lambda s.[\![\alpha]\!]^g(s)]$

For the moment, by 'utterance' I mean the maximal linguistic expression contributed by a sole discourse participant. If a speaker contributes a word, a sentence, or a monologue, that's an utterance. (125) says that an utterance α evaluated with respect to an assignment g is ill-formed if there exists an alternative assignment g' with a strictly smaller domain than g, and there exists a potentially different utterance β that communicates the same intensional content with respect to g' as α does

with respect to g.

To see the main effect of this condition (for our purposes), let's consider a case where a context author a wants to refer to herself. Assume she has at least two pronouns available to her: a singular first-person pronoun (126) in addition to the singular third-person pronoun given above in (119).

(126) A first-person singular pronoun.



To evaluate this referential third-person pronoun, which contains the numeric index feature X_7, she will need to use an assignment g such that $g(7) = a$. Thus g must have at least 7 in its domain, and at least a in its co-domain. The smallest possible set that satisfies $\{x : x \in \text{dom}(g)\}$ here is $\{7\}$, then. She needn't invoke the assignment to evaluate the index inside the first-person pronoun, however: the smallest possible set that satisfies $\{x : x \in \text{dom}(g')\}$ is the empty set. Local person indices in this system are totally outside the purview of the assignment function, so local pronouns provide an alternate route for author- or addressee-reference, one that conforms with (125). QED: the choice of local persons over third is forced by *Underspecify Assignments!*

Unsurprisingly the less stipulative, generalized version of *Underspecify Assignments!* has a relatively broad purview, so in the following sections I'll discuss its effects in a few different corners of grammar, beginning with perhaps the least desirable result and moving toward the more welcome ones.

3.3.1 No indices on free nominals

Underspecify Assignments! does not allow for indices on free nominals. Consider the two sentences below.

(127) a. Jonathan lauged.

b. Jonathan$_7$ laughed.

'Jonathan$_7$' should be understood as a DP which contains the proper name and also the numeric index feature X_7. Because I've given that feature the semantic type e, it's not obvious how it could semantically compose with the name, but let's imagine for sake of argument that by some mechanism, it indeed can. X_n could type-shift, for instance, or there could be another feature involved that takes the index feature and the name as its two arguments.

Whatever the case, (127b) is going to violate *Underspecify Assignments!* Interpreting that utterance requires an assignment whose domain is minimally {7}, and there exists an alternative way of expressing the same proposition, namely (127a), whose assignment is less specified in that it has a null domain.

Nothing about this is restricted to proper names; *Underspecify Assignments!* will dictate that in fact all free nominals lack numeric indices. This in itself is not a good result. To see why, consider the pair of examples below. On at least one kind of analysis, the pronoun in (128b) is free. But not only is that example not worse than (128a), it's vastly more acceptable than it.

(128) a. Jonathan walked down the street. # Jonathan laughed.

b. Jonathan walked down the street. He$_7$ laughed.

So *Underspecify Assignments!* will need to be violable in order for (128b) to be possible, and something else will need to make (128b) preferable to (128a). There does seem to be an independent constraint against repeating names (and more generally non-pronominal definite descriptions) within a discourse – at least provided

that certain structural conditions on the anaphor and antecedent are met, like if both are sentential subjects, as in the example above. This effect has gone under the guise of the Repeated Name Penalty in the psycho-linguistic literature since Gordon *et al.* (1993). If the Repeated Name Penalty is a phenomenon which can't be reduced to any of the constraints discussed so far, then the contrast between (128b) and (128a) is not necessarily a fatal one for *Underspecify Assignments!*; rather, it simply remains to be understood why the former constraint takes preference over the latter.

3.3.2 Binding over coreference

Underspecify Assignments! also has the effect of forcing binding configurations over accidental co-reference when the meaning that would result from the two options is the same (cf. Grodzinsky & Reinhart 1993). By way of example, recall (123/129), the predicate of *John likes his dog* on its bound variable reading.

(129) $[\![\ 2\ [\mathrm{t}_2\ \text{likes his}_2\ \text{dog}]\ ]\!]^{g} \quad = \quad \lambda x \in D\ .\ [\![\ \mathrm{t}_2\ \text{likes his}_2\ \text{dog}\ ]\!]^{g^{x/2}}$

This requires the assignment g to include 2 in its domain. There's another syntax that communicates the same proposition, though; one can instead use a free occurrence of the possessive pronoun, so long as that accidentally co-refers with John.

(130) $[\![\ 2\ [\mathrm{t}_2\ \text{likes his}_2\ \text{dog}]\ ]\!]^{g'} \quad = \quad \lambda x \in D\ .\ [\![\ \mathrm{t}_2\ \text{likes his}_3\ \text{dog}\ ]\!]^{g'^{x/2}}$

The domain of the assignment g' in (130) must include the index 3. And given the amended definition of a modified variable assignment (124) which I am assuming, it must also include 2. The domain of g' is minimally {2,3}, then. By (125), an utterance that contains the expression in (130) will be ill-formed, since there's an alternative assignment, namely g in (129), which can be used to communicate the same proposition while being less specified. Generally what this means is that accidentally co-referential pronouns will be ruled out whenever there is a poten-

tial binder available, since the binding configuration allows for an underspecified variable assignment.

3.3.3 Strict and sloppy readings

Another consequence of *Underspecify Assignments!* is that indices will need to be re-used across clauses under VP ellipsis. Consider two potential ways of assigning indices to the discourse in (131), assuming that *his* is bound and that the elided pronoun is sloppy.

(131) John likes his dog. Mary does too.

(132) a. John [2 [t_2 likes his_2 dog]. Mary [3 does [t_3 like 3's dog]] too.

b. John [2 [t_2 likes his_2 dog]. Mary [2 does [t_2 like 2's dog]] too.

Since *Underspecify Assignments!* evaluates the relative specificity of assignments at the level of the utterance, which is defined so as to include both sentences in (131), the two ways of assigning indices given in (132a-132b) – which, crucially, convey the same propositional content – will be pitted against one another, and (132a) will be deemed semantically ill-formed upon interpretation. Once again, that's because (132a) requires an assignment with two numerals in its domain, while (132b) gets away with an less specified assignment. In this way *Underspecify Assignments!* forces binder-bindee indices to be reused, provided they can be in light of the intensional content of the utterance. So sloppy readings follow, but only when indices are recycled.

Strict interpretations are predicted to follow from this system as well. Consider (133), which represents one way of assigning indices to get the strict reading.

(133) John [2 [t_2 likes his_5 dog]. Mary [2 does [t_2 like 5's dog]] too.

The binder-bindee index 2 needs to be reused across clauses for the reason just mentioned. The possessor pronouns are free to take on a different index, however,

even though doing so will force the assignment to have a larger domain than the sloppy reading would require. This is because there is no possible way of communicating the propositional content that the strict reading has without doing so; there is no alternative utterance with the same meaning that could be made with less than two numeric indices.

This concludes the exploration of the effects of *Underspecify Assignments!* Some of its consequences may be less welcome than others, but something like it is needed in the present system in order to prevent third-person pronouns from being used for local person meanings, given that they provide a syntactically parsimonious *and* referentially specific way of achieving reference.

3.4 PRO is a person-like indexical

A central theme of this chapter has been the exploration of links between the theory of local person developed in Chapter 2 on the one hand, and topics adjacent to that of the local persons (*e.g.*, third person) on the other. The purpose of this section is to show how the Elbourne-style compositional semantics for pronouns I've argued for extends to another person-adjacent topic as well: control. In particular, I'll show that the pretheoretically bipartite semantics of PRO – 'bipartite' meaning PRO can be exhaustively or partially controlled – falls out for free from the semantics of REL that I introduced in the last chapter.

3.4.1 Partial and exhaustive control

Control constructions are those where the interpretation of an unpronounced pronoun (dubbed PRO) co-varies with a clause-external and c-commanding expression. Two examples are given below along with an indication of their syntax.

(134) a. John wants to sneeze.

b. John wants [PRO to sneeze]

(135) a. John wants to meet outside.

b. John wants [PRO to meet outside]

There's a contrast between the typical interpretations of (134) and (135), one that hinges on the reflexivity of the parthood relation that holds between the matrix attitude holder (John) and the embedded PRO. (134)'s most natural interpretation can be paraphrased 'John wants John to sneeze', where the relationship between the interpretations of *John* and PRO is one of identity. This exemplifies EXHAUSTIVE CONTROL, where the set of atoms denoted by the attitude holder and by PRO are co-extensive.

The interpretation of (135) is different. *Meet* is a collective predicate, so it can't be satisfied by a single atomic argument (cf. **John met*). Accordingly the relationship between *John* and PRO is necessarily one of irreflexive parthood, such that PRO denotes a group consisting of John and at least one other individual. This exemplifies PARTIAL CONTROL, since the controller *John* denotes a proper part of what PRO does.

3.4.2 REL's parthood condition is a window into control

The apparently bipartite nature of PRO across the two sorts of control – partial and exhaustive – falls out for free from the semantics of REL that was proposed in the last chapter, in particular the analytic fact that REL requires a *reflexive* parthood relation to hold between the pronoun's index and its ultimate value. Reflexive parthood is just the disjunction of identity (which characterizes exhaustive control) and irreflexive parthood (which characterizes partial control).

Recall that REL was argued to take on a contextually allosemic denotation when sister to a personful index:

(136) $[\![\textsc{rel}]\!]^c = \quad \lambda x_e \,.\, f(\, \{ y_e : [\, \mathrm{P}_{\textsc{ca}}(x) \wedge \mathrm{P}_{\textsc{ca}}(y) \,] \wedge [\, x \leq y \,] \,\} \,)$

The meaning that (136) has is eerily well-suited to an analysis of the semantics of PRO. Suppose we articulate the syntax of (134a) and (135a) a bit more, in particular by adding a lambda binder under the matrix subject, and by supposing that PRO consists of exactly two features, X_n and REL:

(137) a. John wants to sneeze.

b. John $\lambda 1$ wants [[X_n REL] to sneeze]

(138) a. John wants to meet outside.

b. John $\lambda 1$ wants [[X_n REL] to meet outside]

In the semantic component, the [X_n REL] phrase in (137b) and (138b) would, by Function Application, get the following interpretation.

(139) $f(\, \{ y_e : [\, \mathrm{P}_{\textsc{ca}}(a) \wedge \mathrm{P}_{\textsc{ca}}(y) \,] \wedge [\, g(1) \leq y \,] \,\} \,)$

The higher lambda binder will subsequently assign 1 to John, so (139) will end up picking out some individual that either contains John reflexively – as on the more natural, exhaustive control interpretation for (137a) – or contains him as a proper subpart, as on the only interpretation for (138a).

So REL offers a window into why exhaustive and partial control are both possible, and unifies the syntactic constitution of PRO across the two cases. Of course, so far I've assumed without justification that we're deploying the allosemic denotation of REL, which I claimed in Chapter 2 comes to the fore when its complement denotes a cognitive agent (as local person indices inherently do). Cognitive agents, recall, are defined as individuals with self-ascription potential – *i.e.*, are *de se* attitude holders.

So why is the allosemic denotation for REL being invoked here? It's probably not accidental that the embedding verbs implicated in control constructions tend to be attitude predicates (see Pearson 2016 for an overview); these constructions

thus relate a cognitive agent argument in the matrix clause to the embedded null pronoun. In the way I sketched it in (137-138), the two expressions are related via binding. Thus, there is a binding-mediated link between a bona fide cognitive agent (the matrix argument of the embedding verb) on the one hand, and the index which constitutes REL's complement on the other. That seems to offer at least some insight into, but does not fully explain, why the relational component is acting in its allosemic guise, classing with local pronouns by requiring the referent consist of cognitively agentive atoms.

Now, the reader might notice something of a puzzle regarding morphological exponence here, stemming from the fact that the (non-classificatory) [X_n REL] syntax underlies both PRO and third-person pronouns. In the languages that are most well-represented in the control literature, PRO is never overt. In many of these languages moreover, *pro* is absent and referential pronouns are *always* overt, as is the case in English. From a morphological angle, a legitimate worry is that if the syntax for PRO proposed here is correct, then there is nothing feature-wise that can distinguish PRO from a referential third-person pronoun in a way that would allow one to be exponed as a phonologically contentful morph and the other to be exponed null.

Two observations serve to alleviate that concern. The first observation is that English-like languages can be assumed to distinguish PRO from referential third as a function of the contents of the classificatory component. Pronouns like *he*, *she*, *it*, and *they* contain gender and number features in the classificatory component. I know of no evidence, however, that English null PRO contains classificatory features at all. If it doesn't, then the morphological component would free to make one-to-one associations between pronominal syntax and exponence, along the lines of (140).

(140) One possible analysis of English pronominal exponence

Syntactic phrase		*Exponent*
[[[X_n REL] SG] FEM]	→	/ʃi/
[[X_n REL] PL]	→	/ðej/
...		...
[X_n REL]	→	∅

The second observation is that PRO does seem to be exposed overtly in some languages (Polinsky & Potsdam 2006, Ostrove 2023) – and moreover can be exposed identically to a referential pronoun. Ostrove (2023), for instance, makes the case that San Martín Peras Mixtec has *bona fide* control configurations in which PRO cannot be exposed null. One example is given below.

(141) *San Martín Peras Mixtec* (Oto-Manguean; Ostrove 2023)

Ntùkú Juân$_i$ [ka'ani *(**=rà**$_{i,*j}$) iin ntsìbá'yi] .
try.COMP Juan [kill.IRR **=he** one coyote]
'Juan tried to kill a coyote.'

He shows that sentences like (141) exemplify Landau's (2013) Obligatory Control Signature: the embedded pronominal element is necessarily interpreted as a bound variable (as evidenced in part by VP ellipsis), and the controller is an argument or adjunct of a predicate to which the embedded clause likewise relates as an argument or an adjunct.

Although the post-verbal clitic *=rà* is glossed as 'he' in (141) – Ostrove follows the language's descriptive tradition in this respect – this pronominal element is in fact number-neutral. Now, 3MASC *=rà* functions also as an ordinary referential pronoun. The second sentence in the example below illustrates this.

(142) *San Martín Peras Mixtec* (Oto-Manguean; Ostrove 2023)

Kôni =ì tát =ì. David náni *(**=rà**).
lovt.CONT =I father =my David be.called.CONT **=he**
'I love my father. He is called David.'

We can moreover be relatively confident that the bolded subject clitics in (141-142) do not resemble one another purely by accidental homophony. The language has a rich pronominal system (distinguishing six genders among third person), and how PRO is exponed co-varies with the gender of its controller.

Ostrove's way of understanding the San Martín Peras Mixtec control system is to treat PRO (or rather, the multiple PROs) as nothing more than ordinary bound pronouns. Languages in which PRO is covert, by contrast, are taken to have rules of morphological exponence that are sensitive to the syntactic context in which they occur: the pronoun in the subject position of a control clause can be exponed differently than a *syntactically identical* pronoun in a different structural position. This is just syntactically-conditioned contextual allomorphy – and similar analyses have been put forward to handle the variation in how other kinds of non-referential pronouns (reflexives, for instance) are morpho-phonologically expressed.

So under either possibility just mentioned – that PRO simply has different features than referential pronouns and can accordingly be exponed in distinct fashion, or that some languages deploy rules of contextual allomorphy which render PRO phonologically null – the morpho-syntactic identity between the non-classificatory components of PRO and referential pronouns does not guarantee they'll be exponed alike, as desired.

3.5 An alternative route to third person

Recall from §3.2.1 that the original version of ADDR's denotation I offered cannot be used to construct third person meanings.

(143) $[\![\textsc{addr}]\!]^c = \quad \lambda x_e \,.\, f(\, \{ y_e : \textit{re-center}(\langle x, s\star \rangle, \langle y, s\star \rangle) \}\,)$

Regardless of what the complement of this feature denotes, the index that results from the semantic composition will have to be an entity within $s\star$, given that $\langle y, s\star \rangle$

is only well-defined when that obtains. For that reason (143) simply can't be used to refer to an entity that doesn't reflexively contain a discourse participant.

However, the more intensional variant of ADDR, which I proposed in §2.4 as a way of modeling second-person impersonal readings, does in fact offer an avenue toward a particular kind of third-person reference. That variant is repeated below.

(144) $[\![\textsc{addr}]\!]^c = \quad \lambda s \lambda x_{\mathrm{e}} \,.\, f(\ \{y_{\mathrm{e}} : \textit{re-center}(\langle x, s\star\rangle, \langle y, s\rangle)\}\ )$

As I showed in §2.4, because one of the situation variables has been abstracted out, (144) can return an entity y which is the center of a situation that may be distinct from the utterance situation. Impersonal readings can come about when both y and whatever situation that is the first argument to this function are quantified over by a generic operator. In the absence of an operator (or overt adverb) doing that kind of work, (144) can be put to use in constructing an ordinary referential pronoun.

But it can also derive a referential *third*-person pronoun, with one caveat: that the atoms that constitute the referent are all animate. To illustrate: let's suppose that the first argument to (144) is a freely-inserted situation pronoun s', and that its second argument is given by the denotation of AUTH. That will give us the following semantic value as the pronominal index.

(145) $f(\ \{y_{\mathrm{e}} : \textit{re-center}(\langle a, s\star\rangle, \langle y, \mathrm{s}'\rangle)\}\ )$

This denotes some entity y that is the center of the situation s'. Since s' can be *any* situation, the value of y can vary quite a lot. However, it cannot vary indefinitely: the definition of a centered situation I am adopting requires that the entity-type center be a cognitive agent, *i.e.* an atom with a *de se* attitude.

The [ADDR AUTH] phrase, then, when bolstered with a situation pronoun given at LF, can constitute a third-person index so long as that index denotes a cognitive agent. Once its denotation is composed with that of the relational feature REL, a

third-person pronoun comes about. If the claim from §2.3.3 that animate indices trigger a particular kind of contextual polysemy on REL is correct, then this feature's denotation will enforce two things about the referent: that it inherits the index's property of cognitive agency, and that it mereologically contains the index itself. Ultimately, the denotation of such a pronoun would look like (146).

(146) $f(\ \{\ x_{\mathrm{e}} : [\ \mathrm{P}_{\textsc{ca}}(\ f'(\{y_{\mathrm{e}} : \textit{re-center}(\langle a, s\star\rangle, \langle y, \mathrm{s}'\rangle)\})\ ) \wedge \mathrm{P}_{\textsc{ca}}(y)\ ] \wedge$
$[\ f'(\{y_{\mathrm{e}} : \textit{re-center}(\langle a, s\star\rangle, \langle y, \mathrm{s}'\rangle)\}) \leq x\ ]\ \}\ )$

Given the flexibility that the situation s' affords, this is the denotation of a pronoun which can – by its literal meaning – refer to any entity so long as its atoms are cognitively agentive. So the denotation in (144) offers not only a way to get an impersonal second-person pronoun, but also a way to get what can be semantically characterized as an ANIMATE PRONOUN – but keep in mind that from a morpho-syntactic angle, this pronoun has just the same features as an ordinary second-person pronoun.

Adding an animate pronoun into the mix predicts a variety of other kinds of pronominal systems, whose exposition is complicated somewhat by the fact that the enriched meaning of this pronoun will vary as a function of what other pronouns are in the language.

As a starting point, let's consider the partition which most closely resembles the ordinary AABC partition. Recall that in the ordinary AABC partition, the first-person pronoun (index: AUTH) covers exclusive and inclusive meanings, the second-person pronoun (index: [ADDR AUTH]) covers second-person meanings, and the third-person pronoun (index: X_n) covers third-person meanings. The relationship between the morpho-syntactic pronouns and their interpretations falls out in the way that it does because (143) is assumed to constitute the interpretation of the ADDR feature that is contained in the second-person morpho-syntactic index.

But if the interpretation of ADDR is free to proceed along the lines of (144), even

when part of a referential (rather than impersonal) pronoun, a different kind of AABC partition results – one that makes a three-way contrast between inclusive and exclusive first-person meanings (via the ordinary first-person pronoun, whose index is AUTH), animate second-*cum*-third-person meanings (via a 'second-person' pronoun, whose index is [ADDR AUTH]), and inanimate third-person meanings (via the pronoun whose index is X_n).

The enriched meanings fall out in the way that they do as a function of the competitions laid out in the last chapter. *Be Specific!* is doing most of the relevant work. One is forced to use the first-person pronoun for an exclusive meaning, for instance – rather than, say, the animate pronoun – since *both* pronouns require all their atoms to be animate anyway, and the only difference is that the first-person *also* requires author containment. In other words, the animate pronoun can refer to everything the first-person pronoun can, but not vice versa. Thus, the two pronouns are in a proper subset relation with regard to their reference potential, and the usual blocking calculus applies. In similar fashion, the animate pronoun is stronger than the so-called 'inanimate' one (which in fact has nothing in its literal meaning that has to do with animacy whatsoever) because there is a proper subset relation between the two pronouns' sets of potential referents.

It's worth emphasizing that this kind of person system comes about only if the two meanings in (143) and (144) are polysemous variants *of the same feature*. If each of the interpretations is available for referential purposes and they're carried by *different* features, we might naturally expect morphological exponence to distinguish the two, overall resulting in a four-way contrast between first, second, animate third, and inanimate third. (The first- and second-person pronouns are truth-conditionally suited only for their respective meanings, and both of those meanings are referentially stronger than the animate pronoun, which restricts the latter to third-person animate meanings. That animate pronoun is, in turn, stronger than

the usual third-person pronoun, which gets restricted to third-person inanimate meanings accordingly.)

Person systems of the latter kind are not uncommon. Standard (*i.e.*, non-colloquial) Finnish, for instance, shows this pattern. In addition to the four local pronouns introduced in Chapter 2, there are four referential third-person pronouns that contrast for number and animacy.

(147) *Finnish*

	SG	PL
1EX **1IN**	minä	me
2ND	sinä	te
3RD.ANIM	hän	he
3RD.INAN	se	ne

However, I am not aware of any languages of the former kind, which would in principle contrast first person, animate second-*cum*-third, and inanimate third. This might be due to the general rarity of person systems which conflate any second- and third-person meanings at all (languages like Sanapaná with an AABB partition are in a small minority), or it might just be the case that ADDR cannot have the more- and less-intensional variants in the way I've described.

CHAPTER 4

Extensions and summary

In this chapter, I explore two topics related to the central proposals of Chapter 2 – that utterance contexts are centered on a unique author, and that concomitantly first person is more grammatically accessible than second, the latter needing to be derived in the compositional semantics. The first section returns to the supersloppy readings of local pronouns, and I sketch (but do not fully deliver on) how an analysis of such readings might proceed in light of the pronominal syntax I proposed. The second section introduces a strong prediction made by the account: that first- and second-person indexical shift cannot occur independently of one another.

4.1 Supersloppiness, revisited

Rebuschi's idea that local persons can at least sometimes be semantically relational was introduced in Chapter 1 as independent motivation for the pronominal syntax I argued for in Chapter 2. With that having been developed, we're in a position to revisit supersloppy readings.

A full analysis of these readings is beyond the scope of this section and indeed this thesis; my only aim here is to draw a parallel between supersloppy readings and another kind of sentence (the 'Tanglewood sentence') discussed by Kratzer (1991). That sentence remains poorly understood, but given the formal similarity

between it and the supersloppy cases, the hope is that an eventual solution for one will be the solution for the other.

Recall from Chapter 1 (§1.8) that supersloppy readings are available when both the anaphoric clause and its antecedent have local pronouns in structurally parallel positions (148), but are not available when one of the DPs is not specified for a local person (149):

(148) (Charnavel 2015)
  a. Romeo: I love you.
  b. Juliet: I do △ too.
    (148b) can mean 'Juliet loves Juliet too' (strict)
    (148b) can mean 'Juliet loves Romeo too' (supersloppy)

(149) (Charnavel 2015; adapted)
  a. *Romeo*: I love you.
  b. *Juliet*: Count Paris does △ too.
    (149b) can mean: 'Count Paris loves Juliet too.' (strict)
    (149b) **can't** mean: 'Count Paris loves Romeo too.'

On the proposal developed in Chapter 2, all local pronouns contain – by which I mean reflexively dominate – at least one instance of the indexical feature AUTH, and the extension to third-person expressions in Chapter 3 held that those kinds of expressions don't contain this feature. I'd like to suggest that that state of affairs offers an analytical window into the contrast between (148) and (149).

Imagine that the interpretational parallelism requirement on VP ellipsis requires the relation between (150a) and (150b) to hold in order for supersloppy readings to be available. The *v*P in grey is what's elided.

(150) **Structural match in the location of AUTH**

  a. *Antecedent clause:*

    DP1[. . . Auth . . .] $_{v}$P[. . . V . . . DP2[. . . Auth . . .]]

  b. *Clause containing the ellipsis site:*

    DP3[. . . Auth . . .] $_{v}$P[. . . V . . . DP4[. . . Auth . . .]]

Note that there's an instance of AUTH both outside and inside the ellipsis site, and the locations of these features match across the antecedent and elliptical utterances. If this sort of match in (150) is necessary for supersloppiness, then the direct object in the ellipsis site in (149b) would fail to pick out Romeo because *Count Paris* does not contain an instance of AUTH in one place Romeo's utterance does, namely in the subject pronoun *I*.

In §4.1.2 below, I will show that a different phenomenon supports the idea the structural match between (150a) and (150b) as far as the location of AUTH is concerned is part of what's responsible for licensing supersloppiness. Before doing so, however, I want to point out something that *needn't* be responsible: c-command.

4.1.1 Supersloppy readings without c-command

In (150), the AUTH features contained in the subjects do not themselves c-command into their respective *v*Ps. This is simply because given the Elbourne-style pronominal syntax I am assuming, indexical features are buried under the relational and classificatory components within their host pronoun. So whatever the relation between the two instances of AUTH in (150a) and in (150b), c-command is implicated only indirectly (in that the subject pronoun *containing* AUTH is what c-commands the other instance of AUTH).

Now, in Chapter 2 I recounted Charnavel's (2015) reason for thinking that c-command is a necessary condition for supersloppiness to obtain under VPE. Charnavel (2019) takes the same stance, as her experimental results show that examples structurally similar to (28), repeated below as (151), are significantly degraded relative to cases where c-command does obtain between the local pronouns.

(151) (Charnavel 2015)

a. Romeo: The man [I hate] loves you.

b. Juliet: The woman [I hate] does △ too.

(151b) can mean: 'The woman Juliet hates loves Juliet, too.' (strict)

(151b) **can't** mean: 'The woman Juliet hates loves Romeo, too.'

There may be reason to think that c-command need not hold even between supersloppy pronouns, however – let alone the indexical features they contain. While it's true that c-command doesn't obtain in (151), and that the supersloppy reading is unavailable here, there are other kinds of examples involving possessive and coordinate subjects which seem to admit a supersloppy reading. These cases were not tested experimentally in Charnavel (2019).

Given a child's utterance of 'Mommy and I love you' to their father, for example, the father's response of 'Mommy and I do too' seems to at least marginally admit a supersloppy reading. So too does Bevington's (1998: 93) example where 'My heart is yours' can be to responded to with 'Mine is, too'. On the basis of the latter kind of example, Bevington argued that c-command is in fact not necessary for supersloppiness. Charnavel (2019: fn. 23) responds to this by suggesting that for the latter case, the possessor might raise to a position where it does in fact c-command *yours*. But raising couldn't be extended to the coordinated subject case, since extraction of *I* would violate the Coordinate Structure Constraint (Ross 1967).

So there's reason to think the c-command condition on supersloppy pronouns isn't completely robust; some other factor (lack of clausemateness, *e.g.*) might be what's responsible for ruling out the supersloppy reading of (151b). And if c-command between the pronouns isn't necessary, then there isn't any reason to think that AUTH itself should need to c-command into the *v*P.

4.1.2 The Tanglewood puzzle

I don't know why the structural match condition illustrated in (150) should be necessary. But perhaps not coincidentally, the pattern resembles Kratzer's (1991) 'Tanglewood' example, a variant of which is given in (152) below.

(152) a. Speaker A:

(What a copy-cat you are!) You went to Block Island because I did △. You went to Elk Lake Lodge because I did △. And you went to Tanglewood because I did △.

b. Speaker B:

(No, you're exaggerating!) I only went to *Tanglewood* because you did △.

By uttering (152b), Speaker B is denying that exactly two properties hold of her: going to Block Island because A went to Block island, and going to Elk Lake Lodge because A went to Elk Lake Lodge. So we want our theory of focus to return something like the following list of properties as focus alternatives to the matrix verb phrase; with the help of *only*, the first of these will be self-ascribed by B while the others are rejected.

(153) λx_{e} . x went to Tanglewood because A went to Tanglewood

λx_{e} . x went to Block Island because A went to Block Island

λx_{e} . x went to Elk Lake Lodge because A went to Elk Lake Lodge

What's notable about (153) is that both place names in each property vary with respect to the names in the other properties, and more specifically the two names in each property *co*-vary: when *Tanglewood* is the prepositional object in the matrix clause, it is the prepositional object in the subordinate one, and when the prepositional object is *Elk Lake Lodge* in the matrix clause it's *Elk Lake Lodge* in the subor-

dinate one as well. In a sense, the elided *Tanglewood* in (152b) is being interpreted 'sloppily'.

Kratzer presented the Tanglewood sentence as a challenge to Rooth's (1985) theory of focus, which always allows focused proper names to be interpreted *in situ*, even when elided, and for that reason over-generates focus alternatives for the verb phrase in (152b). The focus structure that Rooth's theory would give to (152b) is given in (154).

(154) I only went to $[\text{Tanglewood}]_{\text{F}}$ because you did $_{v\text{P}}[\text{go to } [\text{Tanglewood}]_{\text{F}}\ ]$

Observe in passing the resemblance that (154) bears to (150) – in each case, there are two instances of an expression of entity type (*Tanglewood* or AUTH); one instance occurs outside the ellipsis site, and the other occurs within it. Moreover, each instance has a structurally-defined counterpart in the antecedent utterance.

On Rooth's theory the focus alternatives of each proper name are calculated independently from (154); nothing forces the two names to co-vary. This results in nine combinations of proper names, and thus nine focus alternatives for the matrix verb phrase (155). These focus alternatives are represented schematically in (156).

(155) λx_{e} . x went to Tanglewood because A went to Tanglewood
λx_{e} . x went to Tanglewood because A went to Block Island
λx_{e} . x went to Tanglewood because A went to Elk Lake Lodge
λx_{e} . x went to Block Island because A went to Block Island
λx_{e} . x went to Block Island because A went to Elk Lake Lodge
λx_{e} . x went to Block Island because A went to Tanglewood
λx_{e} . x went to Elk Lake Lodge because A went to Elk Lake Lodge
λx_{e} . x went to Elk Lake Lodge because A went to Block Island
λx_{e} . x went to Elk Lake Lodge because A went to Tanglewood

(156) λx_e . x went to l because A went to m
(where l, $m \in$ {Tanglewood, Block Island, Elk Lake Lodge})

There's no reading of (152b) where all but the first of the properties in (155) is denied by Speaker B, though, so co-variance of the proper names needs to be imposed somehow. In other words, we need to find a way of winnowing (156) to (157).

(157) λx_e . x went to l because A went to l
(where $l \in$ {Tanglewood, Block Island, Elk Lake Lodge})

Crucially, in (157) we have two things of entity type – one overt, one elided – being converted to the *same* variable.

4.1.3 Indexical covariance in supersloppy readings

There are a couple of ways to guarantee that the meaning of (152b) could be determined by the properties in (153) rather than by those in (155). What I will do here is, I think, faithful to the spirit of Kratzer's proposal, but departs from it in its technical implementation.[1]

Suppose that in saying (152a), Speaker A puts the property in (157), as well as the set of things l ranges over ({Tanglewood, Block Island, Elk Lake Lodge}) in the interlocutors' common ground. Suppose further that Speaker B can use (157) *itself*, and not any particular clause of (152a), as the antecedent to her elliptical utterance. This would ensure that the proper name outside the ellipsis site matches the one

[1]Kratzer gets (153) by assuming that in (152b), *Tanglewood* is subject to Across-the-Board movement at LF. It ends up position where it c-commands into both VPs, leaving behind two empty categories with which it is co-indexed:

(i) I PST only [Tanglewood$_1$]$_F$ [$_{VP}$ [$_{VP}$ go to e$_1$] because you did [$_{VP}$ go to e$_1$]].

The focus alternatives for the matrix verb phrase are now determined a single F-marked expression. Any element of the set of focus alternates for *Tanglewood* (namely {Tanglewood, Block Island, Elk Lake Lodge}) that is chosen will reconstruct into both prepositional complement positions, and this ensures covariance.

inside, since both are represented by the same (contextually-valued) variable in the antecedent.

This idea can be grafted on onto the supersloppy cases in the following way. Assuming the feature inventory argued for above (but ignoring the classificatory features for simplicity), Romeo and Juliet's dialogue in (148) would look morpho-syntactically like this:

(158) a. ROMEO: [AUTH REL] $_{v}$P[love [[ADDR AUTH] REL]]

b. JULIET: [AUTH REL] do $_{v}$P[love [[ADDR AUTH] REL]] , too

Just as Speaker B in (152b) is using the template in (157) as the antecedent for their elliptical utterance, we may understand Juliet to be using (159) as hers, where the two instances of AUTH have been replaced with the same variable, a', in the course of interpretation. (ADDR need not be converted to a variable in the way that AUTH is, since the $s\star$ variable its denotation contains is held constant across the two utterances.)

(159) $[a' \; [\![\text{REL}]\!]^c]$ LOVES $[[[\![\text{ADDR}]\!]^c \; a'] \; [\![\text{REL}]\!]^c]$
(where $a' \in \{\text{r}, \text{j}\}$)

The set {r, j} contains two individuals, Romeo and Juliet. Just as Speaker A listing locations in (152a) makes available the set of those locations, whose elements can value the variable l in (157), we might imagine that the use of person indexicals makes available the set of interlocutors (*i.e.* the set of potential context centers, whose elements can value the author index). So the Romeo-Juliet dialogue provides just this two-element set, and in this way (159) ensures that the antecedent conditions on ellipsis are met when Juliet responds *I do* $\triangle$, *too*. And Juliet cannot respond with *Count Paris does* $\triangle$, *too* to get a supersloppy reading of the elided pronoun, as the proper name doesn't introduce any instance of a' that would allow her response to match (159).

Now, as mentioned above, this is by no means a complete analysis of super-sloppy readings (nor of the Tanglewood sentence, for that matter). For instance: nothing I've said here explains why Romeo's utterance determines (159) as Juliet's antecedent, rather than something that doesn't have co-varying variables. The point is just that some mechanism is independently needed to ensure that two instances of entity-denoting expressions are translated to the same variable in order to get the Tanglewood sentence, and if that mechanism – whatever it is – applies to AUTH in the case of the Romeo-Juliet dialogue, supersloppiness should follow from the syntax of pronouns that I proposed Chapter 2.

4.2 Indexical shift

The claim that utterance contexts are uniquely centered makes strong predictions about indexical shift within and across languages. In particular, since there is only one person coordinate in the context, any monster (*i.e.*, any operator capable of modifying how the complement of a speech or attitude verb reads variables from the utterance context) will have only one entity variable to overwrite. Since all local persons are interpreted with respect to that variable, all local persons in an embedded clause will have to shift in tandem.

4.2.1 Shifty indexicality illustrated

One famous example of indexical shift comes from Zazaki (Indo-Iranian) via Anand & Nevins (2004), and is given in (160).

(160) Hɛseni va kɛ ɛz dɛwletia.
Hesen said that I rich.be-PRES
'Hesen said that I am rich.'
'Hesen$_i$ said that he$_i$ is rich.'

This sentence can have the meaning its morphological counterpart in English does,

one where the embedded pronoun ɛz 'I' refers to the speaker of the overall utterance. Unlike in English, however, that pronoun can be understood as being coreferential with the subject of the matrix speech verb.

So far as is currently known (see Deal 2020 for a recent overview), indexical shift obtains only in the complement of speech and attitude verbs. It is often optional within a language – even when the particular embedding verb is held constant, as in (160) – and its occurrence is often attributed to the presence of a shifty operator in the left periphery of the embedded clause (Anand & Nevins 2004, Anand 2006), a flavor of analysis I will assume in this section. An example of such an operator from (Deal 2020, Ch. 2) is given in (161).

(161) $[\![\text{OP}_{author}]\!]^{c,j} = \lambda p \in D_{\langle \kappa, \kappa \text{t} \rangle} \cdot p(j)(c^{author(j)/author}) = 1$

The argument to this operator is the denotation of the embedded clause, a proposition p of type $\langle \kappa, \kappa \text{t} \rangle$, where κ is the semantic type of both contexts c and indices j of evaluation. p is specifically a function from indices to a function from contexts to truth values. What the operator does is modify the content of the context that its complement is evaluated with respect to. It does this by overwriting the default author of the context, denoted *author*, with the author of the index, denoted $author(j)$. I will not dive into the formal details of how the embedding verb composes with its complement, but suffice it to say that the content of the index j is linked to the saying event, such that the value of $author(j)$ is identified with the author of that event – not the overall utterance itself.

On the first reading of (160), then, the OP_{author} operator, which sits at the left periphery of the embedded clause, serves to overwrite the variable identified with the overall speaker of the utterance with a variable identified with the author of the saying event.[2] Since Hesen is the author of that event, it is Hesen, not (160)'s actual

[2]Since Zazaki indexical shift under *va* 'say' applies also to second-person and locative indexicals, Deal (*ibid.*: 67) analyzes the embedded clause here as containing two other operators, $\text{OP}_{addressee}$ and

speaker, that will value $author(j)$. When the embedded indexical ɛz 'I' is interpreted with respect to that modified context, it will denote Hesen.

4.2.2 Two predictions

The way contexts are structured in accord with the Centered Contexts hypothesis makes two predictions in the domain of indexical shift. The first is that if at least one local person shifts within the scope of a shifty operator, then all persons that *are* shiftable *will* in fact shift therein. (The second prediction will involve *which* persons are shiftable.)

This first prediction stems from the fact that all local persons find their value by way of the same indexical feature, AUTH. Thus, if an operator overwrites the author coordinate a – with respect to which all shiftable person indexicals in its complement XP are valued – each of those person indexicals should undergo shift.

This prediction is most likely a good one. That person indexicals tend to shift together within a given attitude complement was noticed early on in the literature on indexical shift, and it informed, for example, Anand's (2006) *Shift Together* constraint: "all shiftable indexicals within an attitude-context domain must pick up reference from the same context" (p. 100). That constraint turned out to be too strong: Deal's (2017, 2020) surveys indicate there are a number of languages where person indexicals but not locative indexicals shift in the complement of some attitude verb, for instance. So, as a function of indexical type, partial indexical shift seems to be possible. Granted, even supposing there's a person-specific version of *Shift Together* (where the constraint is that only all person indexicals in a monster's scope must shift together), there may still be a few counterexamples. Some indexicals have been argued to escape shift by raising high enough within the embedded clause to outscope the monster (Sudo 2012, Shklovsky & Sudo 2014), for instance,

$OP_{location}$, which overwrite the addressee and location coordinates of the context respectively. I leave these aside here for simplicity, but see below for remarks on $OP_{addressee}$.

and Akkuş (2018) argues in favor of *un*shifty operators, which undo the effects of a higher monster. But these analyses of partial indexical shift are structural in nature, having to do with the relative syntactic positions of the shifty operators and indexicals. Thus, these analyses are not in conflict with the first prediction of the CCH regarding indexical shift – that within a shifty domain, all shiftable persons must shift if at least one does – since what's at issue is just the nature of the *domain* as determined by the operators.

The second prediction for indexical shift is that every local person in the scope of a monster will shift if at least one local person does. Like the first, this second prediction stems from the fact that all local persons are valued by way of the author coordinate: in my system, indexical shift simply cannot be relativized to one local person but not another, since there is only one person coordinate that a monster could overwrite. Whether this prediction is a good one is less clear. At the very least, it is not obviously wrong.

Now, it has indeed been argued that (some attitude complements in) some languages appear to exemplify a scenario where first person may or must shift while second cannot, even when both persons presumably would fall in the scope of the shifty operator – the languages in which this kind of shift has been claimed to hold number just three, to my knowledge: Slave (Na-Dene; Rice 1986, 1989), Tamil (Sundaresan 2011, 2012: 264-271), and Malayalam (Anand 2006).

Sundaresan (2011, 2012) argues that first person can shift alone in Tamil. A broad characterization of Sundaresan's take on the facts is that the relevant attitude complements feature an overt logophor, overt first-person agreement, but no overt non-logophoric first-person pronoun. While she argues that these embedded clauses indeed contain a shifted first-person *pro* (which controls the agreement and binds the logophor), that sort of analysis has been challenged in other work (Deal 2018, Spadine 2020).

Deal analyzes a broader suite of cases where there is no obvious controller of embedded first-person agreement. She argues, following Anand (2006), that the presence of first-person agreement in attitude complements is not a reliable diagnostic for the existence of a shifted *pro* therein, and that there is a third class of expressions – distinct from both shifted indexicals and logophors – which she terms INDEXIPHORS. Indexiphors pattern like indexicals in their ability to control local person agreement, but pattern like logophors in other ways (in that they must be bound, *e.g.*). If the Tamil agreement controller is indeed an indexiphor (or a logophor, for that matter), then the data do not bear on the question at hand.

Spadine (2020: 88-92) concurs with the general point that shifty first *sans* shifty second is not clearly attested in Malayalam or Tamil, noting that "various factors make the existence of indexical shift languages that allow only first person shifting somewhat unclear" (p. 91), and in an appendix gives an alternative to Anand's (2006) analysis of Malayalam *taan* as a first-person shifted indexical.

The most promising candidate for a language which can have first-person indexical shift without second-person indexical shift under some speech or attitude verb is Slave (Rice 1986, 1989, Deal 2020). It is reported to shift first but not second under two verbs: *ndi/hadi* 'say' and *yenı̨wę/hudeli* 'want, think'. (Under other verbs, either both first and second shift, or neither do.) The sentences below from Rice (1986: 53, 1989: 1279) illustrate with *ndi/hadi*.

(162) Simon [rásereyineht'u] hadi.
Simon [2SG.hit.1SG] 3.say
'Simon said that you hit him.'

(163) William [neghǫʔeníetǫ] hadi.
William [1SG.have.love.for.2SG] 3.say
'William said he loves you.'

The sentence in (162) is claimed in Deal (2020) to contain an unshifted second-person indexical despite the shifted first, such that 2SG tracks the addressee of the

utterance author, not the addressee of the speech event being reported. That take is likely due to Rice's own characterization of the facts, namely that in the complement of these verbs, second person is "interpreted from the point of view of the speaker rather than from the point of view of the subject [of the embedding verb]," in contrast to the embedded first person (Rice 1989: 1279).

Accordingly, Deal's (2020) theory of indexical shift is set up so as to be able to model two kinds of attitude complements cross-linguistically: those in which first shifts without second, and those in which first and second shift together. In her system, in addition to the OP_{author} operator responsible that was introduced above to achieve author indexical shift, there exists also an $\text{OP}_{addressee}$ operator whose job is to overwrite the addressee coordinate. (Of course, she assumes the standard person ontology whereby 'addressee' is primitive and there is a variable over addressees in the context.)

(164) $[\![\text{OP}_{addressee}]\!]^{c,j} = \lambda p \in D_{\langle \kappa, \kappa t \rangle} \, . \, p(j)(c^{addressee(j)/addressee}) = 1$

This operator overwrites the context's addressee coordinate (*addressee*) with the addressee of the speech event that *hadi* 'say' introduces (*addressee*(j)).

To get a handle on the asymmetry between first- and second-person indexical shift (*i.e.*, that first can shift without second doing so, but not vice versa), Deal argues that OP_{author} and $\text{OP}_{addressee}$ have fixed positions in the spine of the left periphery. Extending Rizzi's (2005) observation that clause size variation is monotonic (in the sense that, for example, while T heads select for AspPs, Asp heads select for vPs, and v heads select for VPs, T heads don't seem to 'skip' the Asp and v projections and directly select for VPs; the presence of a higher head entails the presence of every lower one in the functional sequence), Deal posits that $\text{OP}_{addressee}$ c-commands OP_{author} in the clausal spine. This means that any embedded clause that contains $\text{OP}_{addressee}$ will also contain OP_{author} (just as one that contains a T contains a v), but that an embedded clause containing OP_{author} needn't contain

$OP_{addressee}$ (just as not every v entails the existence of a T). Different attitude verbs may select for different sizes of complements, and on Deal's analysis the Slave verb *hadi* above selects the smaller of the two phrases containing a shifty operator (namely the one that contains OP_{author} but not $OP_{addressee}$). Within such a phrase, first-person indexicals are shifted, but second-person indexicals are not. (Other verbs may select the larger kind of complement, which contains both operators, in which case first and second would both shift.)

The full scope of Deal's analysis works to explain her interpretation of the Slave data.[3] I want to to point out, however, that the data (162-163) are insufficient to establish the claim that first can shift without second doing so. So too are the rest of the data reported in Rice (1986, 1989) that involve indexical shift. To see why, note that if Simon's addressee and the overall utterance's addressee happen to be the same individual, then the truth conditions of (162) wouldn't change as a function of whether the second-person indexical has shifted. To establish that sentences like that do *not* contain shifted second, it needs to be paired with a context that makes clear that the addressees of the overall utterance and Simon's speech event are distinct. Such contexts aren't provided in Rice (1986, 1989) for the relevant examples, nor are negative data given on this point.

So there is not yet reason to think that this prediction is a fatal one. Whether or not it is will hinge on the inclusion of other languages in studies of indexical shift, and on whether the contexts surrounding examples like (162) and (163) are controlled so as to distinguish the utterance addressee from the addressee of the

[3] I doesn't provide a principled explanation why the functional sequence of shifty operators occurs in the order that it does, however, other than the fact that it derives the data at hand. Arguably, this contrasts with other sorts of functional sequences. There is some hope that the [T > Asp > v > V] sequence, for instance, derives from the semantic selectional requirements of the heads themselves. The denotation of T is compatible with its complement having the kind of semantics that characterizes AspP denotations, for instance, but not with its complement having a denotation that a VP would have. But there is no comparable (*i.e.* semantically-motivated) reason why $OP_{addressee}$ should necessarily c-command OP_{author} when both are present in the same clause; in principle, either could select for the clause headed by the other.

speech event contributed by the embedding verb.

4.3 Summary of the dissertation

This dissertation aimed to provide a compositional theory of person features. The analysis was motivated mainly by the morphological typology of person contrasts on the one hand, and by the meanings of personal pronouns (especially local pronouns) on their ordinary referential uses on the other.

Chapter 2 showed how a particular way of thinking about what kind of content is recoverable from utterance contexts has implications for the kinds of morpho-syntactic features that are readily definable. In particular, the lack of a hearer coordinate rules out a feature can directly introduces a hearer variable into semantic derivations – utterance authors, however, can straightforwardly be introduced by one feature, AUTH. Since addresseehood is not an ontological primitive baked into the context, it needs to be derived from something else. I suggested that a way of understanding addressees is as potential centers of the utterance situation that are not the author. In the spirit of Rebuschi (1994), I defined a relational feature (ADDR) which maps the author to such a center.

The result of this move from a morpho-syntactic angle is that second person is more syntactically complex than first person. That complexity difference, I argued, is picked up on by a pragmatic principle which evaluates the relative acceptability of two referential competitors. Though both first- and second-person pronouns can literally cover inclusive meanings, only first-person pronouns provide a syntactically parsimonious way of doing so. This derives a solution to Zwicky's (1977) puzzle: why do many languages have a generalized first person, but no language has a generalized second person? I then argued for a conception of inclusive pronouns whereby their indexical components are the coordination of first- and second-person indices. The referential specificity inclusive pronouns bring along

allows them to skirt the syntactic parsimony principle despite their syntactic complexity.

In Chapter 3 I extended the system to include third-person pronouns; the addition of a numeric index feature (X_n) provided a way to model third-person pronominal meanings. The full set of features, their denotations, and the pragmatic principles that govern their felicitous use were shown to be able to derive four of the five person partitions that Harbour (2016) found to be attested, and no others.

At various points in the dissertation I showed how my conception of utterance contexts, the definition proposed for REL (the feature which I assumed relates pronominal indices to their referents), and the addresseehood relation that ADDR carries bear on several phenomena beyond ordinary referential uses of personal pronouns. At the end of Chapter 2, I showed how my cashing out of the addresseehood relation could be extended to model impersonal uses of second-person pronouns. At the end of Chapter 3, I made the case that the property-sharing and parthood conditions that hold between the indices of pronouns and their referents are at play also in the interpretation of PRO. Earlier in this chapter I illustrated what the general sort of analysis of supersloppy readings would need to look like in the system I developed, and pointed out two predictions that are made in the domain of indexical shift.

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