

# **Grammatical properties of pronouns and their representation: An exposition**

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## **1 Overview**

This volume brings together a cross-section of recent research on the grammar and representation of pronouns, centering around the typology of pronominal paradigms, the generation of syntactic and semantic representations for constructions containing pronouns, and the neurological underpinnings for linguistic distinctions that are relevant for the production and interpretation of these constructions.

In this introductory chapter we first give an exposition of our topic (section 2). Taking the interpretation of pronouns as a starting point, we discuss the basic parameters of pronominal representations, and draw a general picture of how morphological, semantic, discourse-pragmatic and syntactic aspects come together.

In section 3, we sketch the different domains of research that are concerned with these phenomena, and the particular questions they are interested in, and show how the papers in the present volume fit into the picture.

Section 4 gives summaries of the individual papers, and a short synopsis of their main points of convergence.

## 2 Basic parameters of the grammar and representation of pronouns

One of the features that make pronouns a special class of linguistic items is the way in which they contribute to the meaning of sentences (or other constructions in which they occur). On the one hand, they can pick out the same kinds of objects as full lexical nominals when they enter interpretation. On the other hand, they lack a comparable descriptive content. This gives them a borderline status within the linguistic system, between lexical categories like nouns, and functional categories like complementisers. Nominals are like pronouns in that they identify objects, but unlike pronouns they do so based on their descriptive content. Complementisers are like pronouns in that they lack a descriptive content, but unlike pronouns they do not pick out objects in discourse.

Figure 1 illustrates this in-between status of pronouns:

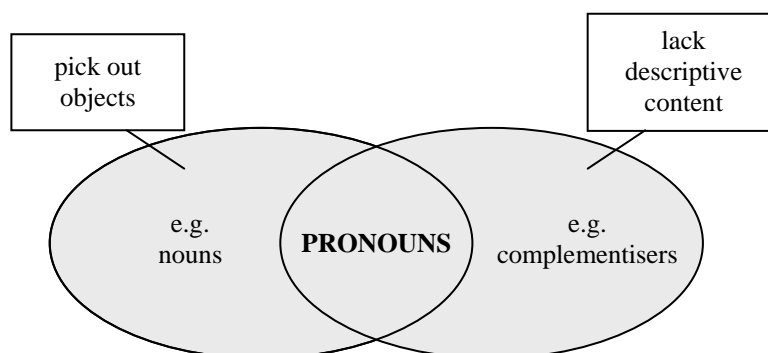


Figure 1: Pronouns as a borderline case

Take for instance a pronoun like *she*. In the context of an utterance, *she* can pick out the same individual as a nominal like *Mick's sister*, without contributing a predicate like 'sister of Mick' to support the task of identification. In order for this to work, the denotation of pronouns is crucially dependent on other elements in the discourse, drawing on the linguistic and the non-linguistic context.

Taking a general approach to this phenomenon, we can distinguish morpho-semantic, discourse-pragmatic, morpho-syntactic and syntactic means that serve to establish the link between a pronoun and an object. In the following paragraphs, we discuss some core examples from the pronominal domain in order to illustrate these different aspects and to show how they come together in the representation of pronouns.

Morpho-semantic means which support the interpretation of pronouns draw on features that are contributed by the pronoun itself. Pronouns are part of a paradigm whose positions are defined by a more or less elaborate system of morphological features.

These features can identify members out of a selected set of conceptual distinctions, for instance in English, 'number' as indicated by singular/plural distinctions, 'role in the speech act' (such as 'speaker', 'addressee', or 'other' i.e. non-speech-act-participant) as indicated by person distinctions, or classifications like 'male /

female / inanimate (or non-human)' as indicated by the distinctions realised in *he* vs. *she* vs. *it*.

From a cross-linguistic point of view, person and number seem to be the basic pronominal categories that are involved here. Universally, paradigms of personal pronouns seem to distinguish at least some speech act roles, and to give some indication at least whether one or more than one entity is involved. Many languages manifest further distinctions in their paradigms: most notably gender (correlated with sex or with other conceptual or non-conceptual classifications), but also distinctions according to, e.g., considerations of politeness ('respect pronouns').<sup>1</sup> In addition, pronominal paradigms in some languages make distinctions with respect to less wide-spread categorisations, such as 'protagonist status' (obviation; cf. for instance Mithun 1999: 3.1.3 on Algonquian languages), or 'generation of persons involved' (as in Lardil; cf. Hale).

In the utterance of a sentence like (1), number and person distinctions pick out the speaker as the object the pronoun identifies:

(1) Rose asked **me** about the movie.

In (2), the features that the pronoun contributes delimit the range of possible referents by excluding both speaker and addressee, and identifying a single male human (using 'single' in the sense of 'one' – versus many –, not in the sense of 'unmarried', of course ...). The identification of one particular person within this range can then be accomplished via discourse strategies, for in-

stance by interpreting an indicating act, like a gesture or certain eye movements, that might accompany the utterance in (2):

(2) Oh dear – look at **him**!

The pragmatic strategy necessary to interpret the pronoun in an utterance like (3) combines the interpretation of the linguistic context ('Elizabeth married') with general world knowledge (marrying is a ceremony between two persons). This way, from the range of possible objects that *he* identifies (i.e., male persons) we can single out Elizabeth's husband:

(3) Elizabeth married last Tuesday. **He** is Italian.

In all three cases, the pronoun itself determines a specific choice from (a restricted set of) conceptual distinctions. It selects members out of pairs of corresponding features, for instance 'one' (vs. 'many'), 'male' (vs. 'female') and 'human' (vs. 'non-human'). This gives us the basic parameters for a conceptual representation, for instance 'individual male person' in (2) and (3). In contrast to a nominal like *a man*, a pronoun like *he* does not provide such a conceptual representation by virtue of its descriptive content, but contributes the respective conceptual distinctions via grammatical features that draw on a morpho-semantic paradigm. These conceptual distinctions provide the mould into which a referent can then be fitted via pragmatic knowledge and general discourse strategies.

Whereas for a 1<sup>st</sup> person singular pronoun like *me* in (1), the bulk of the job is done by the pronoun – in an arbitrary utterance

the features contributed by *me* suffice to identify a particular person, namely the speaker –, the division of labour can also be the other way round. This is for instance the case in topic-drop languages, where a sentence-initial pronoun can be dropped if pragmatic reasoning allow us to pick out a referent without the support of an explicit pronoun – and hence without morphological devices that specify a value for ‘speech act role’ or ‘number’ as a starting point. (4) gives an example from German:

- (4) *Wo ist der Kuchen?* –  
 where is the cake  
 Where is the cake?  
  
 [Ø] *Hab ich aufgegessen*  
 [PRON] have I up.eaten  
 I have eaten it up.

Between the two extremes we illustrated in (1) and (4) are cases like (2) and (3), where the pronoun's morpho-semantic features interact with pragmatic reasoning in the fixing of reference.

Figure 2 brings together the different options we discussed so far: when identifying a discourse referent for a pronoun, one can rely on discourse-pragmatic strategies exclusively, or make use of morpho-semantic features of the pronoun that identify conceptual distinctions. These distinctions delineate the range of possible referents; discourse-pragmatic strategies then allow us to pick out one element from this range.

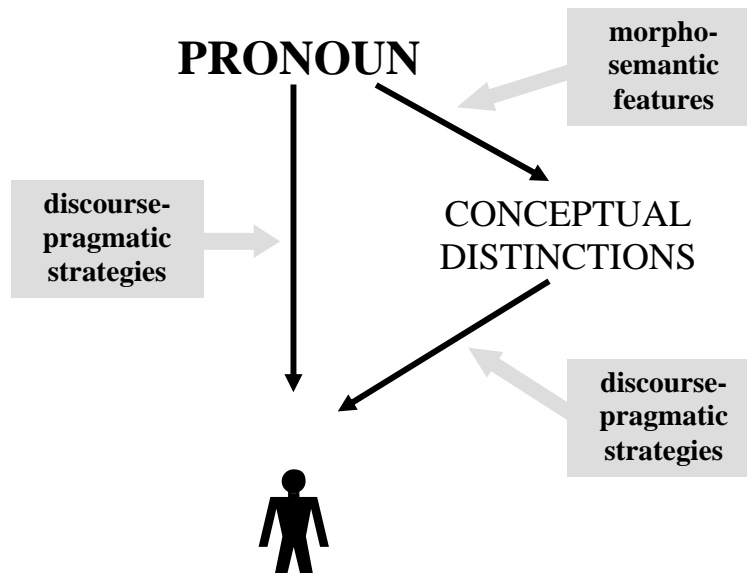


Figure 2: How to identify a discourse object for a pronoun

A speciality of 3<sup>rd</sup> person pronouns is the option to use them anaphorically. In anaphoric usage, pronouns identify an object indirectly, as illustrated in (5):

(5) Steve's aunt married last Tuesday. **She** is Italian.

In this case the pronoun, *she*, does not pick out a referent directly, but is linked up with another linguistic item: a nominal (*Steve's aunt*) that serves as its antecedent. It is via the link to this antecedent that the pronoun gets its meaning. The connection between a pronoun and its antecedent can be signalled by syntactic agreement based on the morphological distinctions that the pronoun contributes (e.g. in the example from (5): 3<sup>rd</sup> person, singular, feminine).

In addition, this link is supported by pragmatic strategies, as the example in (6) illustrates (coindexation marks the link between a pronoun and its preferred antecedent).

- (6) *Charles hat Himbeeressig<sub>i</sub> mitgebracht.* –  
 Charles has raspberry.vinegar.MASC with.brought  
 Charles has brought raspberry vinegar with him.
- Ich habe ihn<sub>i</sub> für den Salat benutzt.*  
 I have PRON.MASC for the salad used  
 I used {it / him} for the salad.

Based on syntactic agreement alone, both *Charles* and *Himbeeressig* make suitable antecedents for a 3<sup>rd</sup> person masculine singular pronoun like *ihn*. However, our world knowledge suggests that the vinegar, and not Charles, went into the salad, hence in the preferred reading of (6), *Himbeeressig* is the antecedent for *ihn* (that is, it would normally be ‘it’ in the English paraphrase).

The influence of pragmatic reasoning becomes even more obvious when one compares (6) to (7):

- (7) *Charles<sub>i</sub> hat Himbeeressig mitgebracht.* –  
 Charles has raspberry.vinegar.MASC with.brought  
 Charles has brought raspberry vinegar with him.
- Ich habe ihn<sub>i</sub> gefragt, was das soll.*  
 I have PRON.MASC asked what that shall  
 I asked {him / it} what that is supposed to be good for.

Up to the pronoun, the context is here the same as in (6), but then the sentence goes on with a verb *gefragt* (‘asked’), which suggests that Charles, rather than the vinegar is the recipient, since our experience is such that one does not talk much to vinegar. Accord-



ingly, in the preferred reading of (7), *Charles*, and not *Himbeeresig*, is the antecedent for *ihn* (and accordingly, it would be ‘him’ in the English paraphrase).

Apart from pragmatic strategies, the syntactic configuration may be relevant for determining an antecedent, as illustrated by the different binding restrictions for the reflexive and the personal pronoun in (8a) vs. (8b):<sup>2</sup>

(8) a. Karen<sub>i</sub> read a letter to **herself<sub>i</sub>**.

b. Karen<sub>i</sub> read a letter to **her<sub>j/\*i</sub>**.

The link is here established via agreement features plus the syntactic configuration, leading to the identification of *Karen* as the antecedent of the reflexive pronoun in (8a) and to the rejection of *Karen* as an antecedent for the personal pronoun in (8b). In this case, the syntactic structure can suggest a certain reading independently of our world knowledge. This means that we can get counter-intuitive interpretations as in (9):

(9) Rose told me that Karen<sub>i</sub> is going to visit **herself<sub>i</sub>**.

In this sentence, *Karen* is identified as the antecedent of *herself*, while *Rose* is excluded – even though based on pragmatic reasoning *Rose* would be a much better candidate, since our world knowledge suggests that it is anyone but *Karen* that *Karen* would visit.

Figure 3 includes the link to an antecedent into our picture of pronominal representation and the (grammatical and pragmatic) sources it draws on. Dotted lines indicate additional information (in

particular, conceptual distinctions that draw on morpho-semantic paradigms) that can enter the computation and support the identification of a discourse referent, in accordance with Figure 2 above.

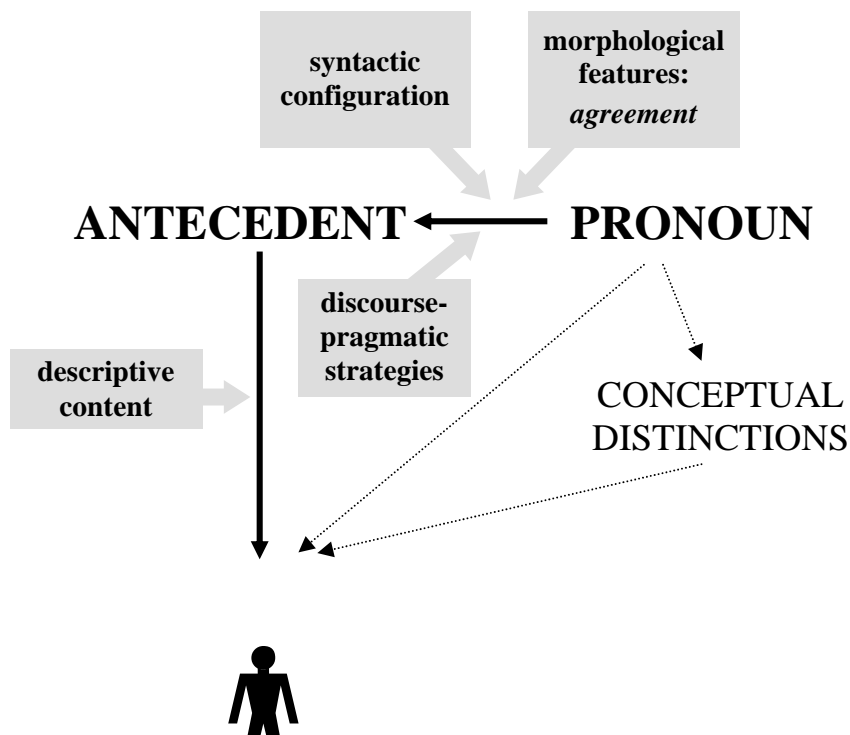


Figure 3: How to identify a discourse object via an antecedent

As the case of relative clauses shows, the syntactic structure can also support a link between an antecedent and a phonologically empty position, i.e. without the additional support of the agreement features of an overt pronoun, a phenomenon parallel to the topic-drop case in (4) above. (10) gives an example of a phonologically empty position in an English relative clause (represented as

[PRON<sub>i</sub>]; this is an empty position or a trace, depending on the syntactic analysis one assumes for *that*-relative clauses in English). (11) gives two examples from Persian. In (11a), an overt resumptive pronoun may optionally appear, while in (11b) the resumptive pronoun is obligatorily overt:

(10) the book<sub>i</sub> that Karen bought [PRON<sub>i</sub>]

(11)a. *zan-ī<sub>i</sub> ke (u<sub>i</sub>) mīraqsad*  
 woman-SPEC COMP PRON danced.3SG  
 the woman that danced

b. *zan-ī<sub>i</sub> ke u-rā<sub>i</sub> dīdam*  
 woman-SPEC COMP PRON-ACC saw.1SG  
 the woman that I saw

In our overview so far, we have not yet discussed a class of words that are traditionally included as a pronominal subclass, too, namely *wh*-words like *who* or *what*. How do they fit into the picture?

(12) **Who** is this?

(13) **What** is this?

In (12) and (13), the *wh*-words occur in an interrogative context; they mark that constituent that is asked for. However, *wh*-words are not confined to interrogative clauses, but appear in a wide range of sentence types. They occur systematically in exclamative and declarative contexts, and introduce clausal attributes (relative clauses) and complements (that is, embedded clauses that constitute interrogative, exclamative, and declarative contexts). (14) through (17) illustrate some of these contexts:

(14) **What** a nice day it was! [Exclamative]

(15) *Anna hört wen.* [Declarative; German]

Anna hears whom

Anna hears someone.

(16) the woman **who** called [Relative clause]

(17) She told him **who** called. [Embedded clause: declarative]

As argued in Wiese (2002), the different usages can be captured by a unified semantic representation of *wh*-words as lexically underspecified elements, which do not gain interrogative, exclamative or indefinite-referential force before they enter interpretation.<sup>3</sup>

What is crucial for our discussion here is that in all these cases, the *wh*-word does not introduce a referent into the interpretation via a descriptive content, but can contribute conceptual distinctions via morpho-semantic features, along the lines we sketched above (for instance, English *who* vs. *what* in (12) and (13) support the distinction [ $\pm$  human]).

Based on syntactic and discourse-pragmatic devices, these distinctions can then provide the basis for the pronoun's denotation. The entity that is picked out can be left unspecific (as in (15), similar to indefinite pronouns); it can be identified via an antecedent (as for the relative pronoun in (16)); it can be marked as a degree above a (contextual) norm (as in the exclamative context in (14)), or it can be left open (as in the interrogative contexts in (12) and (13)), signalling the addressee to identify an entity that fits into the

conceptual distinctions the pronoun provides and which satisfies the context set up by the interrogative.

Let us sum up our exposition. We started from the observation that in the case of pronouns, one faces the task of identifying an object in the absence of a descriptive content. Two options are available: a pronoun can pick out an object directly (no linguistic antecedent), or indirectly (the pronoun is linked to a linguistic antecedent). The interpretation can draw on the following means:

- Morpho-semantic devices: Via morphological paradigms, pronouns can determine choices within a restricted set of conceptual distinctions (e.g., speech act role, ‘one’ vs. ‘many’, ‘human’ vs. ‘non-human’), which limit the range of possible referents or possible antecedents.
- Discourse-pragmatic devices: The discourse context and world knowledge contribute to the identification of a referent or of an antecedent.
- Morpho-syntactic devices: The link between a pronoun and its antecedent can be supported by morpho-syntactic agreement (with respect to e.g. person, number, gender).
- Syntactic devices: The syntactic structure can identify (or exclude) possible antecedents.

This outlines the basic parameters relevant for our topic, and makes clear how the different aspects in the grammar and representation of pronouns are related. In the following section, we illustrate the different kinds of research questions that evolve from this, within typology, formal syntax and semantics, and psycho- and neurolinguistics, and show how the contributions for the present volume fit into the picture. The final section then provides individual summaries of the papers.

### **3 Research questions**

Pronouns are relatively easy to identify cross-linguistically, which makes them an ideal candidate for typological investigations. Hence it is probably no accident that one of the first books to discuss a grammatical category in a genuinely typological way, Forchheimer (1953), focused on pronouns.

Typological approaches to pronouns frequently deal with the grammatical categories that organise pronominal paradigms and with the factors that govern their development over time. As we have illustrated above, these paradigms can play a role both for the identification of conceptual distinctions and for the morpho-syntactic agreement that supports the link between a pronoun and its antecedent. Typological approaches contribute to our understanding of the basic pattern underlying such paradigms, making clear which properties are chosen for grammaticalisation from a potentially infinite pool of conceptual features, i.e. which are the

distinctions that languages employ to pick out a referent in the interpretation of pronouns.

Four contributions to the present volume – by **Harley & Ritter**, **Cysouw**, **Chandrasena Premawardhena**, and **Weiß** – are concerned with pronominal paradigms, the features organising them, and the way they contribute to the interpretation of pronouns (cross-linguistically or in a particular language). The issues they deal with can be subsumed under the following questions:

- How are pronominal paradigms structured, and which constraints govern their organisation?
- Which grammatical categories are involved, and how do they split up into different features?
- How do these categories interact? Are there possible neutralisations in certain grammatical environments? What is the influence of extra-grammatical parameters?

Semantic and syntactic analyses aim to account for the way pronouns enter hierarchical structures, and how this integration affects their interpretation. Much of semantic research has centered on elaborations of the somewhat simplified picture we sketched above, discussing amendments necessary to account for more complex relationships between a pronoun and its antecedent;<sup>4</sup> most notably in cases where a pronoun has a quantifier expression as its

antecedent, or where the pronoun can have an interpretation as in the ‘sloppy identity’ reading illustrated in (18):<sup>5</sup>

(18) Only Karen takes **her** cat to the beer garden.

A major line of research on the semantics-syntax interface that is of direct relevance for our topic focuses on two pronominal subclasses, 3<sup>rd</sup> person pronouns and reflexive pronouns, and the way they are related to an antecedent. While the binding principles aiming to account for these relationships were originally formulated as syntactic constraints on the placement of pronouns vs. reflexives, later versions approached the problem from the point of view of the interpretational rules that access syntactic structures.<sup>6</sup> In some recent approaches, the rules system is reduced to pragmatic principles.<sup>7</sup>

Other questions pertaining to our topic concern the categorial status of pronouns and their projections (e.g., Are pronouns lexical or functional elements?), and the way we can account for the correlation between different linear and hierarchical structures in the generation of sentences containing pronouns (Do we have to assume movement and traces to account for the syntactic behaviour of pronouns? If so, should we provide counterparts for syntactic traces in our semantic representations?).

Results from these research areas contribute to our understanding of how the syntactic structure is organised that is involved in the derivation of interpretations for pronouns, how pronominal



paradigms provide a basis for morpho-syntactic agreement, and how on the other hand the semantic side of such paradigms is realised, and what pronouns contribute to the interpretation of sentences.

Within the present volume, five papers – by **von Heusinger**, **Kempson & Meyer-Viol**, **Naudé**, **Panagiotidis**, **Müller** – present semantic and/or syntactic analyses for pronouns. The following list summarises the main questions they address:

- How can we define semantic representations for the lexical entries of pronouns? How is reference constituted, and which pragmatic strategies are involved?
- How do syntactic and semantic phenomena interact for the interpretation of pronominals? How do pronouns contribute to the representation of sentences?
- What are the specific syntactic features of pronouns, and what distinguishes pronominal subclasses? What is their status within hierarchical syntactic structures?

Psycho- and neurolinguistic approaches to pronouns investigate, among others, the psychological reality of representations assumed for pronouns and their neurological implementation. In particular the fact that the link between a pronoun and its antecedent can be based on a certain kind of syntactic configuration, makes

pronouns a promising topic for investigations concerned with the impairments that are involved in Broca's aphasia.

In the last decades, at least three features that are relevant for our topic have been discussed as characteristic for the performance of patients suffering from Broca's aphasia: (i) the omission of functional elements, (ii) problems with certain syntactic configurations that might be related to a deficit in the representation of syntactic traces (cf. Swinney et al. 1996), and (iii) problems with the interpretation of bound pronouns (cf. Grodzinsky 1990). In particular the latter two phenomena have been interpreted as an indication that Broca's area is crucially involved in the task of constructing syntactic dependencies in the normal time-course (e.g. Zurif et al. 1993).

The investigation of Broca's patients' performance might hence help us to identify dissociable aspects relevant in the processing and interpretation of pronouns, and in particular, it can support the distinction of syntax- versus discourse-based strategies. In the present volume, two papers – by **Piñango** and **de Roo** – present neurolinguistic approaches to pronouns, which pertain to the following research questions:

- What is the nature of the impairments in the comprehension and production of pronouns in Broca's aphasia? What kind of deficits can be observed?
- Which linguistic systems or subsystems are involved?

- What can the deficits observed in aphasia tell us about the organisation of the unimpaired system?

## 4 The papers

In the remainder of this chapter, we present an overview of the contributions to this volume and illustrate their interrelations. We first provide summaries of individual papers in the order they appear in the book; on this basis we briefly point out the major areas of convergence in the final subsection.

### 4.1 *Summaries of the individual papers*

**Heidi Harley** and **Elizabeth Ritter** present a generalised pattern for the paradigms of personal pronouns in the languages of the world. Inspired by phonological theories that employ a geometric arrangement of features, they propose a hierarchically organised geometry of morphological features, in conjunction with the notion of underspecification and the assignment of default values. Subtrees of the geometry represent the grammaticalisation of natural cognitive categories. Features are organised into three main groups: PARTICIPANT, INDIVIDUATION, and CLASS, accounting for person, number, and classifications like gender (and other class information), respectively.

Although Harley and Ritter adduce additional evidence from first language acquisition, their main concern is the fact that different languages may vary enormously, yet systematically, in the

make-up of their pronominal paradigms. They make explicit how their proposal can capture the most elaborate person-number-paradigms by fully exploiting the array of features available in Universal Grammar, as well as paradigms where only a small fraction of the features is active.

They characterise the features *and* their geometric arrangement as innate. That is, these patterns are assumed to be provided by Universal Grammar. Accordingly, this approach makes strong predictions about possible pronominal paradigms. This means that in contrast to a lot of previous studies its claims are falsifiable and can therefore serve as a starting point for further investigations.

**Michael Cysouw** investigates implicational relations between different properties of pronominal paradigms, drawing on a sample of more than 230 genetically and areally diverse languages. While he takes into account inflectional paradigms as well as those manifested by independent pronouns, he restricts his analysis to ‘simple’ person-number-paradigms, leaving aside those which employ additional categories such as gender or paradigms with special values for the number category (for instance, trials and some duals).

Cysouw starts off from maximally eight possible distinctions, based on different combinations of values for ‘number’ and ‘person’. Since only a few paradigms seem to exploit the full range of possible distinctions, he investigates which neutralisations occur in

his sample. A major point concerns paradigms with an inclusive-exclusive differentiation, which Cysouw dubs paradigms with ‘pure person’ marking. He shows that these paradigms never neutralise ‘person’ in the singular, but always distinguish the roles of ‘speaker’, ‘addressee’ and ‘other’. Pure person paradigms also tend to keep apart the reference to groups including the speaker and to groups without the speaker. In contrast to that, there seems to be no (positive or negative) correlation between pure person marking and the neutralisation of number.

Cysouw proposes an explicitness hierarchy that orders pronominal paradigms with respect to the number of distinctions they neutralise. He shows that the more explicit ones tend to consist of independent pronouns, whereas neutralisations seem to occur more often in inflectional paradigms. Cysouw explains this correlation in terms of different degrees of linguistic awareness speakers have with regard to free morphemes and affixes.

The study presented by **Neelakshi Chandrasena Premawardhena** can be seen as complementary to the first two contributions: She provides an in-depth study of a single language displaying the full range of options that are available for a speaker when s/he wants to refer to some non-speech-act-participant. Her object of study, the Indo-Aryan language Sinhala, is particularly interesting in this context since it is spoken in a sociolinguistically complex situation in

Sri Lanka involving a high degree of diglossia (she concentrates on the spoken variety).

Her major findings concern the fact that the choice of a reference device in Spoken Sinhala is not only determined by categorial distinctions like [ $\pm$  human], but also by considerations of sociolinguistic appropriateness. When it comes to pronominal forms, speakers select one of a list of items according to morphosemantic features. In addition to 3<sup>rd</sup> person pronouns, speakers can choose to employ a nominal element (a noun such as a kinship term or a professional title) or use no overt expression at all (zero anaphora). Crucially, however, not all speakers have access to the same inventory of forms. In particular, Chandrasena Premawardhena shows that there is a difference in the way the gender systems subdivide the pronominal paradigms used by different social groups (defined by educational level, sometimes correlated with sex). This has the effect that for instance the same lexical form is classified as [- human, + animate] in one social group and only as [+ animate] in the other group, due to neutralisation of the [ $\pm$  human] feature. Hence, depending on sociological parameters of the discourse, certain pronouns might or might not be understood as [- human], and accordingly take on a pejorative meaning when used for a person.

**Helmut Weiß** discusses weak indefinite pronouns like *someone*, *something*, or *no-one*, with a focus on negative forms, ‘n-

indefinites'. He defines *n*-indefinites as elements which either incorporate a morpheme which is synchronically or diachronically related to a negative expression (*nobody*, *no-one*), or which are suppletive forms that substituted such indefinites diachronically. Weiß distinguishes 'NC (Negative Concord) languages' and 'Non-NC-languages', depending on whether *n*-indefinites are used in the scope of negation or not, and investigates the occurrence of different forms of indefinites in three kinds of contexts: normal negation (NEG), negative polarity (NPI), and positive polarity (PPI).

Based on a cross-linguistic sample, he argues for the following distribution: if a language distinguishes only two kinds of indefinites, then in NC-languages, indefinites in PPI-contexts pattern with those in NPI-contexts (and are distinct from those in NEG contexts), whereas in Non-NC-languages, indefinites in NPI- and NEG-contexts are the same, and are distinct from those in PPI-contexts.

Discussing the status of the negative morpheme in *n*-indefinites, Weiß points out that the semantic import of *n*-indefinites is the same as that of non-negated existentials in Non-NC-languages. He suggests a semantic analysis of *n*-indefinites as elements that do not contribute negation, but carry only a formal, uninterpretable Neg-feature. According to this analysis, negation is contributed by the head of NegP, while the negative morpheme

marks the *n*-indefinite as belonging to the scope of negation, but does not carry any negative force by itself.

**Klaus von Heusinger** discusses the contribution of 3<sup>rd</sup> person pronouns to the semantic representation of sentences. Based on an overview of philosophical and linguistic approaches to the semantics of these pronouns, von Heusinger argues for a unified analysis that allows us to assume one lexical entry for 3<sup>rd</sup> person pronouns in different usages. His analysis is based on the notion of a salience hierarchy; objects of different kinds get their positions in this hierarchy with respect to their contextual prominence. Choice functions identify for each set of entities its most salient element in a given context (for instance for the set of women, a choice function would identify the contextually most salient woman).

Drawing on these notions of salience hierarchy and choice function, von Heusinger puts forward an analysis of 3<sup>rd</sup> person pronouns as terms that refer to the most salient entity with a particular property *P*. The predicate *P* is for instance identified as ‘female’ for a pronoun like English *she*, or as ‘male’ for *he*. Hence, we can regard this predicate as the semantic part of the morpho-semantic features underlying pronominal paradigms; *P* is the form in which these features enter semantic representations.

According to this analysis, the relevant salience hierarchy for a pronoun like *she* is that for female persons. An antecedent like



*Rose* could contribute to this hierarchy, updating the respective choice functions so that they will yield Rose as the most salient woman in the given context. In non-anaphoric usages of pronouns, only non-linguistic factors contribute to the salience hierarchy, for instance, the most salient female person could be a woman that was just pointed out.

**Ruth Kempson** and **Wilfried Meyer-Viol** present an analysis of anaphoric personal pronouns and relative pronouns that accounts for the derivation of the semantic and syntactic representations for the constructions these pronouns enter, and the way these representations establish a link between a pronoun and its antecedent. Their analysis is situated in their framework of ‘Dynamic Syntax’, which accounts for natural language understanding as a process of building up an interpretation (formalised within a typed lambda-calculus) based on tree structures that are updated in a way that follows the sequence of words in an utterance. Hence, this model combines syntax and semantics in one structural component, as the dynamic projection of progressively enriched (partial) trees.

Within this approach, nodes in a tree can be initially unfixed (e.g. in instances of left dislocation), and bring with them requirements that can be fulfilled later. Among others, this means that the model does not require any traces for the representation of relative pronouns. Kempson and Meyer-Viol account for the referential de-

pendency of anaphors and relative pronouns by introducing pronouns as underspecified elements that contribute a meta-variable to the semantic representation. In the process of tree growth, this variable is substituted by a copy of a selected term, the antecedent.

Crucially this substitution is a pragmatic process, restricted only by syntactic locality considerations that rule out certain formulae as possible copies. Such a fixing of nodes could hence be supported by salience hierarchies as assumed by von Heusinger. Discussing data from English, Arabic and Hebrew, Kempson and Meyer-Viol show how phenomena like resumptive pronouns and cross-over in relative clauses can be accounted for within this approach.

**Jacobus A. Naudé** discusses an unusual construction which exists in a number of Semitic languages: some clauses lack a verb, but have a (seemingly pleonastic) 3<sup>rd</sup> person pronoun in addition to the subject. (19) gives an illustration from Qumran Hebrew (Naudé's example (5b)):

(19) *hqryh hy' yrwšlm.*  
 the.city she Jerusalem  
 The city is Jerusalem.

Naudé investigates the status of the pronoun in such constructions in Qumran Hebrew. He provides evidence suggesting that in Qumran Hebrew this pronoun is not generated freely, but is obligatory in verbless sentences with a definite or 'specificational' NP in

predicate position. He argues that the pronoun is neither a suppletive form of the copula nor a resumptive pronoun, and suggests an analysis of pronouns in these constructions as subject clitics that support agreement features and thus yield grammatical (verbless) clauses.

In particular, he argues that the pronoun insertion in these cases is a last resort strategy necessary to prevent the sentence from being ill-formed. According to this analysis, the pronoun marks the sentence as specificational, thereby indicating that there is a relation between two argument positions; this triggers the generation of a well-formed predicate-argument structure necessary for the interpretation of the sentence.

Such an analysis, then, suggests an extreme case of lexical reduction for pronouns: in verbless clauses of the kind Naudé discusses, pronouns seem not to pick out a referent anymore, but are reduced to the function of mere sign posts that indicate the presence of well-formed argument positions.

**Phoevos Panagiotidis** is concerned with the syntactic categorisation of personal pronouns. He argues against an account of personal pronouns as intransitive determiners, drawing on two kinds of evidence. Firstly he points out, with the example of Thai and Japanese, that pronouns in some languages do not form a closed class and, like nouns, can be modified and can be the complement of a demonstrative pronoun. Drawing on German and French evidence, he

secondly emphasises that gender features are not contributed by determiners, but by nouns, and are realised on a determiner via agreement.

Based on this discussion, Panagiotidis suggests a unified account of pronouns and articles as transitive determiners with a nominal complement. According to this analysis, the complement of pronouns is an ‘elementary noun’ that does not denote a concept, but contributes a categorial feature N and morpho-semantic features like gender or politeness. In languages like English and German, this elementary noun is usually phonetically null (however, it can be overtly realised as *one* in English); in languages like Thai and Japanese the pronoun itself is analysed as the elementary noun, while the determiner can be phonetically null.

**Gereon Müller** examines personal pronouns in German, distinguishing ‘strong’, ‘unstressed’, ‘weak’ and ‘reduced’ pronouns. While the elements of the four subclasses can be characterised by different phonological and semantic properties (namely, [ $\pm$  stress], [ $\pm$  reduced], and [ $\pm$  animate]), Müller shows that the relevant classification can also be achieved on purely syntactic grounds. He argues that the classes form a hierarchy of strength that allows implicational generalisations: if a given pronoun has a particular syntactic property (namely, ‘must undergo Wackernagel movement’, ‘permits R-pronoun formation’, ‘cannot undergo coordination’,

‘cannot undergo topicalisation’), then all weaker pronouns share this property, too. Müller gives an account for the syntactic properties of the different pronominal subclasses within the framework of Optimality Theory, based on a ranking of constraints that relates to this hierarchy.

Figure 4 contrasts the semantic and phonological properties of pronominal subclasses with the syntactic characterisation Müller suggests (subclasses are ordered from left to right with respect to strength according to the hierarchy he assumes; ‘RPF’ stands for ‘R-pronoun formation’):<sup>8</sup>

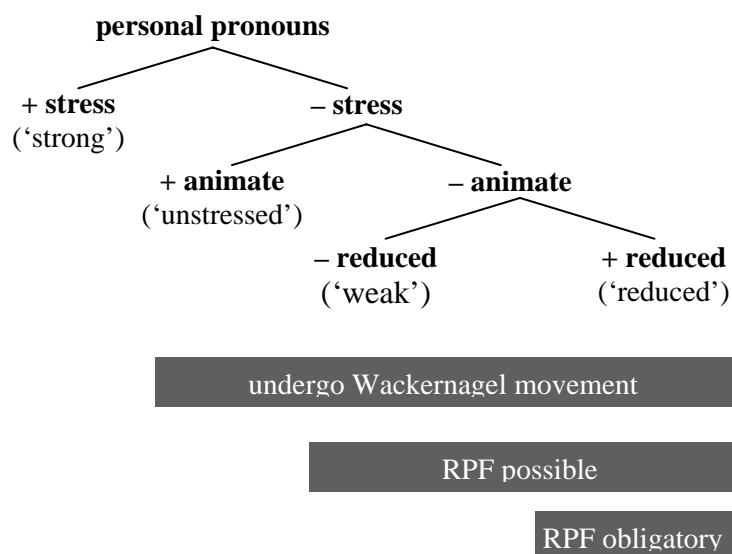


Figure 4: Characterisation of pronouns via semantic and phonological vs. syntactic properties

**Maria Mercedes Piñango** analyses the mechanisms linking a pronoun with its antecedent in view of their neurological underpinnings, drawing on experimental evidence from on-line and off-line studies on the interpretation of 3<sup>rd</sup> person pronouns and reflexives in Broca's aphasia. She argues that the performance of patients suffering from Broca's aphasia supports the distinction of *coindexation* as a syntactic process based on binding relations, and *coreference* as a discourse-level process. While both mechanisms can establish the link between a pronoun and its antecedent, coindexation is obligatory for reflexives, whereas personal pronouns can undergo either coindexation or coreference.

Piñango shows that coindexation relies crucially on the integrity of Broca's area, while coreference is unimpaired in Broca's aphasia, suggesting that this second mechanism is not syntactically governed, but belongs to an independent module that is presumably part of the discourse level. She gives a unified account of the patterns observed in Broca's aphasics in terms of a slowed-down syntactic processor that prevents the construction of syntactic structure within the normal time-course (Slow Syntax Hypothesis).

According to this account, Broca's patients base their interpretation of personal pronouns on coreference, even in constructions where coindexation should take place, while in the case of reflexive pronouns (where coreference is not an option), the system waits for the slow syntactic tree to emerge, accounting for the dif-

ference in on- and off-line performance for reflexives (but not personal pronouns).

While Piñango discusses the distinction of discourse processes and syntactic processes in the *interpretation* of pronouns, **Esterella de Roo** presents evidence for a similar distinction in the *production* of pronouns. In particular, she argues that pronoun omission in agrammatic aphasia does not result from a specific syntactic impairment, but reflects the overuse of a pragmatically driven option that is also available in normal grammar.

She bases her argument on an investigation of German and Dutch aphasic speech, by Broca's patients that were diagnosed as agrammatic. De Roo's analysis of the production data suggests that the pronoun omission in the speech of these patients follows a similar pattern as that in non-impaired speech, where in certain contexts pronouns can be dropped if the interpretation can be discourse-based (this is illustrated, for instance, in (4) above).

De Roo argues that in agrammatic speech, this option is overused in order to reduce the processing load of an utterance. According to this account, the impairment observed in agrammatic aphasia is not due to a lack of syntactic knowledge, but to a limitation in the capacity to process syntactic information. As a result, agrammatic patients rely on non-syntactic, discourse information in their production of pronouns more than non-aphasic speakers. This

overuse of discourse strategies in agrammatic speech emphasises the availability of these strategies (in addition to syntactic strategies) in the unimpaired linguistic system.

#### **4.2 *Synopsis of major points of convergence***

The papers in this volume offer a kaleidoscope of studies united by the common topic of pronouns, as a domain of language that exemplarily shows the interaction of different components responsible for computational (syntactic and semantic), lexical, and discourse-pragmatic processes. The different contributions converge on (at least) two major points, one concerning patterns in the make-up of morphological paradigms, the other touching upon the relationship between syntax and semantics/pragmatics.

A common concern of the typologically oriented contributions are the implicational relations that hold within morphological paradigms (Harley & Ritter: relations between nodes in a hierarchically organised feature geometry; Cysouw: impact of inclusive/exclusive distinction on person or number (non-)neutralisations; Weiß: possible polarity contexts for indefinites and *n*-indefinites).

Several of the papers emphasise the role of discourse-pragmatic (and semantic) strategies that complement syntactic processes. This concerns, for instance, the introduction or omission of pronouns (Kempson & Meyer-Viol: resumptive pronouns in relative clauses; de Roo: phenomena like topic drop); the way a link



between a pronoun and its antecedent is established (Kempson & Meyer-Viol: fixing of syntactico-semantic tree nodes; von Heusinger: recourse to updated salience hierarchies; Piñango: coreference vs. coindexation under binding conditions), and the way a pronoun picks out an entity (von Heusinger: choice functions; Chandrasena Premawardhena: sociolinguistic factors).

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<sup>1</sup> Discussing the emergence of the grammatical category 'respect' in the German pronominal paradigm, Simon (2002) analyses the status of this category and its relation to person, number, and gender.

<sup>2</sup> Cf. also the contributions in Frajzyngier and Curl (2000) for a cross-linguistic overview over phenomena pertinent to constructions with reflexive pronouns.

<sup>3</sup> Cf. also Bhat (2000) for cross-linguistic evidence from interrogative and indefinite pronominal contexts supporting this analysis.

<sup>4</sup> Cf. Reinhart (1991) for an introduction.

<sup>5</sup> Under a strict reading of the pronoun, Karen is the only person who takes Karen's cat to the beer garden; under a sloppy reading, nobody takes their respective cats to beer gardens, except for Karen.

<sup>6</sup> Cf. Chomsky (1981) vs. Chomsky (1995). Cf. also Jackendoff (1992) for a rejection of a syntactocentric view of binding; Reuland (2001) for a recent discussion of syntactic and semantic issues involved in binding.

<sup>7</sup> Levinson (2000: ch.4), Huang (2000).

<sup>8</sup> An interesting side aspect here is the status of the semantic feature [ $\pm$  animate] that distinguishes 'unstressed' pronouns, which cannot undergo R-pronoun formation, from 'weak' pronouns, which optionally undergo R-pronoun formation.

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In German, pronouns are not lexically specified for [ $\pm$  animate], the way for instance English third person pronouns are specified for the [ $\pm$  human] feature (*he/she* vs. *it*); the interpretation is context-dependent. Accordingly, the same pronoun can count as [+animate] or [-animate], depending on the object it picks out. For instance, *er* ('he') in our salad examples (6) and (7) above counts as [-animate] with an antecedent *Himbeeressig* ('raspberry vinegar') in (6), but as [+animate] in the preferred reading of (7), where *Charles* is its antecedent. As Müller's discussion illustrates, these contextually given, interpretational differences of pronouns can go together with the (non-)availability of syntactic operations.