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### The expression of modifiers and arguments in the noun phrase and beyond

*A typological study*

van Rijn, M.A.

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Marlou van Rijn

## The expression of modifiers and arguments in the noun phrase and beyond

A typological study

A major semantic distinction obtaining in phrases and clauses is that between modifiers and arguments. While arguments are inherent to the meaning of the head of the phrase or clause, modifiers merely supplement the head with additional information. Typical examples of argument-taking heads are verbs and adpositions, but also relational nouns such as kinship terms and body part terms. Typical examples of modifier-taking heads are non-relational nouns, such as those denoting concrete, inanimate objects, like 'pot' or 'pen'.

This dissertation investigates to what extent the modifier/argument opposition constrains the morphosyntactic expression of possessive NPs, adpositional phrases and verbal main clauses. Using data of 64 different languages from all over the world, it is shown that the modifier/argument distinction strongly correlates with four typological parameters: locus of marking, the referentiality of person marking, the formal bondedness of person marking, and identity of marking. The first three parameters apply to possessive NPs: it is shown that possessive modifiers, as functionally optional enrichments of the head, are more likely to be the locus of morphosyntactic marking than possessive arguments. Also, possessive modifiers tend to be expressed by more referential and more formally independent person markers than possessive arguments. The final parameter applies beyond the domain of the NP: it is shown that if a language uses the same morphosyntactic form to mark modifiers in phrases and arguments in clauses, it also uses this form to mark arguments in phrases. Together, these findings demonstrate the typological relevance of the semantic opposition between modifiers and arguments, in the possessive NP and beyond.

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Marlou van Rijn

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in the noun phrase and beyond



UNIVERSITY OF AMSTERDAM  
Amsterdam Center for Language and Communication

Marlou van Rijn

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The expression of modifiers and arguments  
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A typological study

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## List of abbreviations

1	first person	INDF	indefinite
2	second person	INS	instrumental
3	third person	IPFV	imperfective
A	actor	LOC	locative
ABL	ablative	M	masculine
ABS	absolutive	MIN	minimal number
ACC	accusative	N	neuter
ACT	active	NF	non-feminine
AL	alienable	NFOC	non-focus
ALL	allative	NFUT	non-future
ANTIP	antipassive	NOM	nominative
AOR	aorist tense	NPST	non-past
ART	article	NVIS	non-visual sensory evidence
ASS	associative	OBJ	object
ATTR	attributive marker	OBL	oblique
AUG	augmentative	OPOSTP	object of postposition
C	common	PART	partitive
CM	conjugation marker	PFV	perfective
COM	comitative	PL	plural
COMPL	completive	POSS	possessive
CONN	connective	POT	potential
DAT	dative	PRS	present
DECL	declarative	PST	past
DEF	definite	REC	recent
ERG	ergative	REL	relative
FIN	finite	REM	remote
FOC	focus	REP	reportative
FUT	future	REPV	reportative
GEN	genitive	SG	singular
HUM	human	SUP	superessive
INAL	inalienable	TR	transitive
INCL	inclusive	VIS	visible



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<http://www.lotpublications.nl/the-expression-of-modifiers-and-arguments-in-the-noun-phrase-and-beyond-a-typological-study>

- Appendix I: Overview of the data used in Chapter 2
- Appendix II: Additional data tables for Chapter 3
- Appendix III: List of the 877 unique alignment patterns used in Chapter 4
- Appendix IV: Overview of the data used in Chapter 4





# 1

## General introduction

A major semantic distinction pervading the core (morpho)syntactic units of language, i.e. the phrase and the clause, is that between arguments and modifiers. While arguments are inherently presupposed by the head of the phrase or clause, modifiers are mere optional additions. Heads that take arguments are semantically relational: they inherently require reference to another item – therefore considered the head’s argument. As such, the head determines the number and type of arguments to be expressed. Typical examples of head-argument relations are those between a verbal predicate and its core argument(s), an adposition and its argument, and a relational noun, such as a kinship term or a body part term, and its possessor. By contrast, modifiers are not part of the head’s lexical specification, but merely supplement it with additional semantic information. Typical examples of head-modifier relations are those between a noun and an attributive adjective, a verb and a (manner or degree) adverb, and a prototypical non-relational noun, such as a noun denoting a concrete inanimate object like ‘book’, ‘pot’ or ‘pen’, and its possessor.

The distinction between the two semantic types of dependency relation is made systematically in Functional Discourse Grammar (henceforth FDG; Hengeveld & Mackenzie 2008), a typologically-based theory of language structure developed on the basis of Dik’s Functional Grammar (1978). In FDG, head-modifier relations and head-argument relations are given a distinct semantic representation, comparable to the use of distinct formulae in predicate logic. The relationship between a relational noun and its possessor argument is represented in FDG as follows:<sup>1</sup>

- (1) *the boy’s father*  
 ( $x_i$ : [father<sub>N</sub> ( $x_i$ ) ( $x_j$ : boy<sub>N</sub> ( $x_j$ ))<sub>REF</sub>])

---

<sup>1</sup> Details of the representations that are not necessary for the analysis of the modifier/argument distinction are not provided here. For full notations of the relevant relations, see Hengeveld & Mackenzie (2008: 202–203, 243, 251).

## 2 The expression of modifiers and arguments in the noun phrase and beyond

The representation should be read as follows: the referent of the NP ( $x_i$ ) has a complex head, given between square brackets, which consists of the noun *father*, and the possessor argument *boy* ( $x_i$ ). The relationship between the two is semantically one of reference (REF), since it can be paraphrased as ‘an individual ( $x_i$ ) that is a father with reference to the boy ( $x_i$ )’.<sup>2</sup> Since relational nouns denote an inherent relationship between two entities, they behave semantically as two-participant predicates. As such, they resemble bivalent verbs, which are given a similar representation. In contradistinction, the relationship between a non-relational noun and its possessor modifier is given the following representation in FDG:

- (2) *the boy’s book*  
( $x_i$ : [book ( $x_i$ )] : [( $x_i$ : boy ( $x_i$ ))<sub>ASS</sub> ( $x_i$ )])

The noun *book* does not have a relational meaning, and therefore functions as the head of the NP ( $x_i$ ) on its own. It takes the noun *boy* ( $x_i$ ) as a modifier, as indicated by the colon.<sup>3</sup> Head-modifier relations are given the semantic function of ‘association’ (ASS), since the relationship can receive a range of, pragmatically determined, interpretations; the phrase in (2) may, for instance, refer to a book the boy wrote, a book he owns, one that he is using etc. Since the non-relational noun ‘book’ merely denotes the set of books, it behaves semantically as a one-participant predicate; the modifier further restricts the reference of the noun to a specific subset of items. In this thesis, I adopt the basic distinction between modifiers and arguments so carefully made in FDG, but without its representational formalisms, illustrated in (1) and (2), in order to enhance the accessibility of the present research for those unfamiliar with that framework.

The distinction between modifiers and arguments is well-established as pertaining to verbs: while modifiers (or adjuncts) just provide additional information about the state of affairs expressed by the verb, arguments are semantically entailed by the verbal predicate. However, the relevance of the distinction for nouns goes unnoticed in most current linguistic frameworks (Chomsky 1981, Van Valin & Foley 1980, Bresnan 2001). As shown above, FDG is an exception in this respect, as it recognizes that nouns, like verbs, show a semantic difference in argument structure (or ‘valency’). As such, it makes a

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<sup>2</sup> The fact that the properties of ‘fatherhood’ and ‘boyhood’ apply to the respective referents ( $x_i$ ) and ( $x_i$ ) is indicated by repeating the indexes ( $x_i$ ) and ( $x_i$ ) after the properties.

<sup>3</sup> The fact that the modifier *boy* ( $x_i$ ) applies to the referent *book* ( $x_i$ ) is shown by repeating the index ( $x_i$ ) after the modifier.

basic distinction between relational nouns, which take their possessor as an argument, and non-relational nouns, which take their possessor as a modifier.

The existence and nature of the modifier/argument distinction with nouns figures prominently in discussions on the semantics and morphosyntax of possessive NPs. However, most studies focus on the language-specific categorization of nouns, or constructions, as relational (i.e. modifier-taking) or non-relational (i.e. argument-taking) (e.g. Partee & Borschev 2003, Lehmann 2002, Von Prince 2016, Erguvanlı Taylan & Öztürk 2016). Many such studies focus on languages that differentiate formally between modifiers and arguments in possessive NPs, traditionally referred to as a distinction between ‘alienable’ and ‘inalienable possession’ (e.g. Chappell & McGregor 1996, Aikhenvald & McGregor 2013). Importantly, in this thesis, the modifier/argument distinction is approached as a universal, semantic opposition, which underlies patterns of morphosyntactic coding in individual languages. The way in which such patterns are affected by the modifier/argument distinction is the topic of this thesis.

The dependency relations investigated in this thesis have been previously investigated by Nichols (1986, 1988, 1992), but from a syntactic perspective. Syntactically, dependency relations consist of a head and a dependent; the head governs, or subcategorizes for, the dependent, and determines the syntactic category and distribution of the constituent as a whole (cf. e.g. Tesnière 1959, Mel’čuk 1988). This thesis, by contrast, relies not on a syntactic but on a semantic notion of dependency, characterized by a functional difference between modifier dependents and argument dependents. Moreover, it recognizes, unlike Nichols, that dependents need not take the form of words (i.e. lexical NPs), but may be represented by person affixes and clitics as well, as further discussed in the next subsection. Importantly, the modifier/argument distinction crosscuts the set of phrasal and clausal dependency relations investigated by Nichols, as it divides these relations into those containing modifiers and those containing arguments.

Although the syntactic distinction between heads and dependents is well-established, the semantic distinction within dependency relations between modifiers and arguments is not. As a result, the effect of the modifier/argument distinction on the formal realization of dependency relations has remained largely unknown. The present thesis aims to fill this gap, by investigating how this basic distinction in dependency relations affects the morphosyntactic expression of such relations, across the world’s languages. The way in which this question is addressed in the thesis is discussed in the next subsection.

## 1.1 Research topics and thesis outline

The thesis is organized as a collection of three articles, each corresponding to one chapter. Each article (chapter) contains a detailed description of the theoretical background and the relevant research questions. Therefore, in this section, I only give a brief overview of the topics addressed in the chapters to come. These topics are united by an overarching research question, namely: *To what extent does the modifier/argument opposition constrain the expression of dependency relations across the world's languages?*

This question is investigated from three different perspectives. In Chapter 2, I investigate the relevance of the modifier/argument distinction for locus of marking in possessive NPs. Locus of marking is an influential typological parameter that classifies constituents, as well as entire languages, in terms of the location of morphosyntactic marking of the dependency relation, i.e. the head, the dependent, both or neither. The parameter has gained widespread significance through work by Nichols (1986, 1988, 1992), who showed that it strongly correlates with a range of grammatical features, including the opposition between alienable and inalienable possession, studied in this chapter. In Chapter 3, I again study possessive NPs, but now focusing on person marking. Specifically, I investigate the effect of the modifier/argument distinction on the referentiality of person markers – their functional status as independent referential expressions or markers of agreement – and on their morpho-phonological realization – their formal status as words, clitics, affixes or fused forms. More generally, this chapter focuses on the grammaticalization of possessive person markers in terms of function and form, from a synchronic typological perspective. In Chapter 4, I expand my focus beyond possessive NPs, additionally covering adpositional phrases and one- and two-participant verbal main clauses. In this chapter, I investigate the degree to which languages use the same morphosyntactic forms to mark these phrasal and clausal dependency relations, and the extent to which the modifier/argument distinction constrains such formal identity. In sum, the respective chapters cover four dimensions of expression: (i) locus of marking, (ii) the referential potential of person marking, (iii) the formal realization of person marking, and (iv) identity of marking. Each chapter makes use of a genetically and areally balanced sample of languages, designed specifically for the hypotheses tested. The three language samples show some degree of overlap, such that a number of languages are found in two or all three samples used. In total, 64 unique languages are investigated in this thesis; the sources consulted for these languages are provided in a separate references section.

The first two articles (Chapter 2 and 3) focus specifically on possessive NPs. As shown above, this constituent type is the only domain of phrasal dependency where dependents function as modifiers or as arguments; other phrases have modifiers only, such as NPs containing attributive adjectives, or arguments only, such as adpositional phrases. Moreover, as noted above, while a distinction between modifiers and arguments is well-established for verbs, its existence with nouns is less widely acknowledged, apart from languages with an alienability split. Therefore, significant attention will be given to possessive NPs in this thesis. In Chapter 4, I additionally focus on other basic types of dependency relations: adpositional phrases and verbal main clauses. Like relational nouns, adpositions and verbs take their dependents as arguments. Moreover, each of these dependency relations may, in principle, be expressed with the same three types of coding strategies: flagging, person marking and the absence of both, i.e. zero-coding.<sup>4</sup> As such, they form an interesting testing ground for studying the impact of the modifier/argument distinction on morphosyntactic coding beyond the possessive NP. In the following, I will provide a short summary of each chapter and its main outcomes.

In Chapter 2, I investigate how the modifier/argument distinction impacts locus of marking in a sample of 37 languages with an alienability opposition in NPs with a nominal possessor. It is shown that in head-modifier relations, the possessor modifier tends to be marked – typically through flagging of the possessor nominal – while in head-argument relations, the possessum head tends to be marked – typically through person marking. These preferences yield two generalizations: (i) if in a language the possessum head is marked in head-modifier relations, it is also marked in head-argument relations and (ii) if in a language the possessor argument is marked, the possessor modifier is marked as well. These cross-linguistic tendencies follow from the semantic opposition in dependency relations: since modifiers are functionally marked in providing an optional specification of the head, they call more strongly for morphosyntactic marking than arguments, which are inherently presupposed by their head and are therefore in less need of possessive marking. An important feature of this study is a novel analysis of person markers in terms of locus, which departs from work by Nichols in making a systematic distinction between referential markers and agreement markers, irrespective of their free or bound realization.

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<sup>4</sup> The term *flagging* is used for case marking, adpositions and other invariant markers of the dependency relation, while *index(ing)* refers to the use of person markers – irrespective of their status as referential markers or agreement markers. These definitions will be repeated in the individual chapters.

While referential markers themselves represent the possessor, and thus the dependent, agreement markers merely signal the relationship between the possessor and the possessum. It is shown that the modifier/argument distinction not only correlates with locus of marking but also with this distinction between referential markers and agreement markers: across the sample languages, person markers in head-modifier relations are inherently more likely to be referential in nature than those in head-argument relations. This preference yields a third generalization: (iii) if in a language person marking in head-argument relations is referential in nature, person marking in head-modifier relations is referential in nature as well. This tendency can also be attributed to the fact that, as functionally marked optional additions, modifiers are in greater need of a referential expression than arguments. In relation to work by Nichols, the article questions the clear-cut distinction made between head-marking and dependent-marking, by showing that, from a semantic perspective, dependent-marking can also occur on heads. Chapter 2 appeared, with minor modifications, in *Folia Linguistica*.<sup>5</sup>

Chapter 3 provides a more detailed account of the effect of the modifier/argument distinction on the referentiality of possessive person marking. Specifically, I study both the referentiality (function) and the morpho-phonological realization (form) of possessive person markers in a sample of 39 languages with an alienability split in NPs with a nominal and/or pronominal possessor. Referentiality is measured independently of expression type by applying the typology of referential markers and agreement markers introduced in Chapter 2 to the data. It is shown that, in individual languages, person markers in head-argument relations are at least as referential and formally independent as person markers in head-modifier relations, and often less referential and less independent. This finding supports the widely held claim that possessive marking in inalienable (head-argument) relations tends to show a higher degree of grammaticalization than possessive marking in alienable (head-modifier) relations, but for function and form independently. This finding can again be explained by the functional markedness of modifiers compared to arguments, as a result of which the former are in greater need of a more referential and a more formally independent expression than the latter. Additionally, I show that referential potential strongly correlates with expression type, irrespective of the modifier/argument opposition: in individual languages, markers of a lower degree of referentiality never have a more

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<sup>5</sup> The full reference for the article is: Van Rijn, Marlou. 2016. Locus of marking typology in the possessive NP: A new approach. *Folia Linguistica* 50(1). 269–327.

independent expression form than markers of a higher degree of referentiality. This finding supports the unidirectionality of grammaticalization processes, since it suggests that a decrease in referential potential never goes hand in hand with an increase in formal independence. At the same time, I also show that a decrease in referential potential need not go paired with a decrease in formal independence either. Hence, the relationship between referentiality and formal expression type is relative, rather than absolute. From a diachronic perspective, this finding suggests that function and form develop in the same direction, but need not develop at the same pace. Notably, this is a much more specific relationship between function and form than is often presumed in the literature. On a more general level, this article shows that only when dimensions of grammaticalization are carefully separated in synchronic typological work can their precise diachronic interplay be revealed. Chapter 3 appeared, with minor modifications, in *Transactions of the Philological Society*.<sup>6</sup>

In Chapter 4, I focus not only on possessive NPs, but also on adpositional phrases and one- and two-participant verbal main clauses. The aim of this chapter is to determine to what extent the modifier/argument distinction impacts alignment, i.e. the identity of morphosyntactic coding, of these phrasal and clausal dependency relations. Although alignment is traditionally studied only as a clausal phenomenon, I argue that it applies to both clauses and phrases, since apart from being licensed by verbs, arguments are licensed by adpositions and relational nouns. Moreover, the coding of these dependency relations is often subject to the same referential properties of dependents, such as animacy, definiteness and (pro)nominality – a topic addressed in this study as well. Data from a 39-language sample show that alignment patterns are constrained by the modifier/argument distinction on the one hand, and by the phrasal vs. clausal nature of the dependency relation on the other. Specifically, I show that if, in a language, modifiers in (possessive) phrases receive the same morphosyntactic coding as arguments in (verbal main) clauses, arguments in (possessive and adpositional) phrases receive this means of coding as well. Arguments in phrases thus play a bridging role in terms of alignment, which can be attributed to the fact that they share the phrasal nature of the dependency relation with modifiers in phrases, and their argumenthood with arguments in clauses. In this study, I furthermore show that referential factors not only impact the coding of arguments in clauses, but also play an important – yet understudied – role in

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<sup>6</sup> The full reference for the article is: Van Rijn, Marlou. 2016. The grammaticalization of possessive person marking: A typological approach. *Transactions of the Philological Society* 114(2). 233–276.

phrases. Following much recent work in clausal alignment typology, I take into account language-internal variation in alignment conditioned by referential properties. Chapter 4 has been submitted for publication.

Finally, in Chapter 5, I summarize the main findings in light of the central research question: *To what extent does the modifier/argument opposition constrain the expression of dependency relations across the world's languages?* It is shown that the expression of dependency relations is highly sensitive to the modifier/argument distinction, in every perspective from which it is studied. This outcome provides strong support for this semantic opposition in dependency relations, and its importance in the expression of such relations across the world's languages.

## 1.2 Notational conventions and terminology

A few words on notational conventions and terminology: The numbering of sections, tables and examples in this thesis follows that of the articles as they were published. Each example language is presented together with the first-order subgroup to which it belongs and the country in which it is spoken, between brackets. This information stems from *The World Atlas of Language Structures* (henceforth *WALS*; Dryer & Haspelmath 2013), which follows the 14<sup>th</sup> edition of *Ethnologue* (Grimes 2000).

Terminology and definitions are kept stable across the three chapters, with two exceptions. First, what I refer to as 'referential markers' and 'agreement markers' in Chapter 2 are referred to as, respectively, 'appositional referential markers' and 'contextual agreement markers' in Chapter 3. This is because only in Chapter 3 are two additional types of referential/agreement markers relevant ('unique referential markers' and 'syntactic agreement markers'). The second difference in terminology is that in Chapter 4 the term 'flagging' refers to the use of case markers, adpositions and other invariant markers of the dependency relation, while in Chapter 2 this term is also used for the expression of possessor role information on referential markers. The term 'flagging' is not used in Chapter 3. Finally, person markers are only referred to as 'indexes' in Chapter 4, as in studies on clausal alignment. Definitions and usage of the relevant terms are further discussed in each chapter.



## 2

## Locus of marking typology in the possessive NP: A new approach<sup>1</sup>

### Abstract

This study takes a semantic approach to Nichols' influential locus of marking typology, as applied to the possessive noun phrase. In this approach, a careful distinction is made between two semantic types of dependency relations: those between inherently relational nouns and their argument possessors and those between inherently non-relational nouns and their modifier possessors. I furthermore propose an alternative analysis of possessive person markers in terms of locus, by distinguishing referential markers from agreement markers, depending on the distribution of grammatical feature information in the possessive NPs of individual languages. On the basis of a 37-language sample, I show that locus of marking follows two tendencies: marking the possessum in alienable possession implies marking the possessum in inalienable possession, and marking the possessor in inalienable possession implies marking the possessor in alienable possession. Moreover, I show that if inalienable person markers are referential, alienable person markers are referential as well. These tendencies reflect a greater need of alienable (modifier) possessors for expressive means of coding as compared to inalienable (argument) possessors. On a more general level, I argue against the traditional opposition between head-marking languages and dependent-marking languages, showing that, from a semantic perspective, dependent-marking may also occur on heads.

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<sup>1</sup> This chapter appeared in *Folia Linguistica*. The full reference for the article is: Van Rijn, Marlou. 2016. Locus of marking typology in the possessive NP: A new approach. *Folia Linguistica* 50(1). 269–327. A number of modifications have been made to the chapter relative to the published article. First, some possessor-marking strategies in Table 4 were wrongfully given in dark shading and some non-possessor-marking strategies were wrongfully given in light shading; this has been fixed. Second, the data contains not 5 but 6 instances of flagging of the possessum noun in alienable possession. This raises the total number of alienable marking strategies from 43 to 44, as shown in Table 5 (Section 2.5.3) and Table 7 (Section 2.5.5). Third, the data contains 6 'flagging & agreement marking' strategies and 11 'flagging & referential marking' strategies, rather than 7 and 10, respectively (cf. Table 7 in Section 2.5.5). Finally, not 12 but 11 sample languages employ agreement markers in inalienable possession, as pointed out in footnote 31. None of these modifications affect the results of the study.

## 2.1 Introduction

This paper presents a new approach to the typology of *locus of marking*, also known as ‘head/dependent marking’, for the possessive noun phrase. Locus of marking is an influential typological parameter that is concerned with the location of morphosyntactic marking reflecting the syntactic relations that obtain inside a clause or phrase. Within possessive NPs, marking may be located on the possessed noun (the head of the phrase), on the possessor NP (the dependent), on both, or on neither. This typological parameter became widely known through work by Nichols (1986, 1988, 1992; but see also Lehmann 1983, 1985), who showed that locus of marking strongly correlates with a range of grammatical categories, among which the distinction between alienable and inalienable possession is the most relevant to the present study.

In this paper, I take a semantic approach to locus of marking which has two main features, to be discussed in turn below. First, I show that head-dependent relations come in two semantic types, depending on the meaning of the head noun. On the one hand, there are heads that are inherently relational: they require reference to a dependent and bear meaning only in relation to this dependent, which may therefore be considered the head’s *argument*. Typical examples of argument-taking heads are adpositions and verbs, but also nouns such as body part terms and kinship terms. On the other hand, there are heads that do not inherently require reference to a dependent, yet may be accompanied by one. The dependent here merely provides a further semantic characterization of the head and thus behaves as a functionally optional *modifier*. Clear examples of such relations are those between a noun and an attributive adjective or a relative clause, or between a verb and a (manner) adverb. Within possessive NPs, head-modifier relations involve inherently non-relational nouns such as ‘book’ or ‘pot’ and their possessors. Languages that make a formal distinction between the adnominal possession of relational nouns and that of non-relational nouns (traditionally referred to as a distinction between alienable and inalienable possession) are the focus of this study.

The second feature of my approach to locus of marking is a systematic distinction in the domain of possessive person marking between *referential markers* and *agreement markers*. In many of the world’s languages, possessive relations are expressed via markers of person (and often of number and gender, too) of the possessor on, or adjacent to, the possessed item (henceforth *the*

*possessum*).<sup>2</sup> Following work by Hengeveld (2012), I argue that while in some languages such markers are themselves expressions referring to the possessor, in other languages they mark agreement. In the former case, they behave like anaphoric pronouns (e.g. English *his*); markers of this type have alternatively been referred to in the literature as ‘cross-reference markers’ (Bloomfield 1933: 193), ‘anaphoric agreement markers’ (Siewierska 2004: 126) or ‘bound/incorporated pronouns’ (when cliticized or affixed to the possessum; see Mithun 1991b; Bresnan 2001: 144; and Kibrik 2011: 92–104). In the latter case, the marker simply copies the relevant features from the possessor noun onto the possessum; for such markers alternative labels such as ‘person agreement markers’ and ‘grammatical agreement markers’ (Siewierska 2004: 126) have been used. Importantly, while agreement markers merely signal the relationship between a possessor and a possessum, referential markers actually represent the possessor, and thus the dependent, themselves. As such, referential markers are possible loci of marking, in that they may carry the marker(s) of the possessive dependency relation in the same way as nouns taking genitive case markers or adpositions. Although the distinction between referential markers and agreement markers has been the subject of extensive debate in the literature (e.g. Jelinek 1984; Bresnan & Mchombo 1987; Mithun 1991b; Austin & Bresnan 1996; Evans 1999, 2002; Siewierska 1999, 2001, 2004: 120–127; Baker 2001; Corbett 2003: 184–192; LeSourd 2006; Schultze-Berndt 2011; Croft 2013; Haspelmath 2013a), its relevance for locus of marking typology has so far gone unnoticed. This is because person markers are almost univocally treated as agreement markers, and therefore as head-marking, in traditional head/dependent-marking grammar. By making a systematic distinction between referential markers and agreement markers, this paper aims to integrate two important domains of typological research that have so far developed separately: locus of marking and the referential potential of person marking. Not only will this allow the corroboration of earlier generalizations put forward in the literature (most prominently by Nichols), but it also permits the discovery of other cross-linguistic patterns of possessive marking, more specifically in the domain of person marking, as will be further discussed below.

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<sup>2</sup> Person markers never show the inverse relation, i.e. indexing the possessum on or adjacent to the possessor. Moreover, markers expressing other features (such as number or gender) of the possessum on the possessor have not been found among languages with a formal alienability split (Lehmann 1983: 362; Evans & Fenwick 2013) and are therefore not relevant to this paper.

The aim of this paper is twofold. First, I investigate to what extent the semantic opposition between inherently relational nouns (and their argument possessors) and inherently non-relational nouns (and their modifier possessors) constrains cross-linguistic patterns of locus of marking. Using data from a worldwide sample of 37 languages, I identify two cross-linguistic tendencies: (i) if in a language possessive marking is located on non-relational nouns, it is also located on relational nouns, and (ii) if in a language possessive marking is located on argument possessors, it is also located on modifier possessors. These tendencies reflect a preference of relational nouns for possessum-marking, and a preference of non-relational nouns for possessor-marking. Both preferences can be explained by the opposition between arguments and modifiers: since the presence of a dependency relation is already built into the meaning of the relational noun, possessors of relational nouns are less in need of means of possessive marking than possessors of non-relational nouns. To put it the other way around, since modifier possessors are not inherently presupposed by their possessum noun and are thus functionally marked as optional enrichments of their heads, they call more strongly for a means of possessive marking than argument possessors. As a result, non-relational nouns exhibit possessor-marking more often than relational nouns, and relational nouns more often show marking of the possessum, or no marking at all, when compared to non-relational nouns.

The second aim of this study is to determine whether there is a relationship between the referential potential of possessive person markers, following the distinction between referential markers and agreement markers introduced above, and the semantic relationality vs. non-relationality of the possessum noun. This investigation yields a third cross-linguistic tendency: (iii) if relational nouns take referential markers, non-relational nouns take referential markers as well. This tendency demonstrates that person markers used in the possession of relational nouns are inherently less likely to be referential in nature (and thus more likely to be markers of agreement) than those used in the possession of non-relational nouns. This asymmetry can also be explained by the modifier/argument opposition: given that argument possessors are an automatic consequence of the semantics of a relational noun, these types of possessors are in less need of a referential expression than modifier possessors. In sum, modifier possessors thus demonstrate more expressive means of coding than argument possessors, both in terms of locus of marking and in terms of the referential potential of person marking.

The paper is structured as follows. Section 2.2 provides the necessary theoretical background for the study. First, I briefly discuss the notion of

dependency adopted in the present paper (Section 2.2.1). I then discuss the opposition drawn between modifiers and arguments in possessive NPs (Section 2.2.2). The distinction between referential markers and agreement markers is discussed in a third subsection (2.2.3). A final subsection (2.2.4) presents the locus of marking typology applied in this paper, which integrates the typology of referential/agreement markers discussed in the previous subsection. The three hypotheses investigated in this study are formulated in Section 2.3. Section 2.4 presents the language samples on which these hypotheses were tested, as well as some important methodological preliminaries. In Section 2.5, the results of the study are presented and discussed. Section 2.6 then compares these results to those obtained in earlier work, most prominently that by Nichols (1986, 1988, 1992). Finally, Section 2.7 rounds the paper off with some concluding remarks and directions for further research.

## 2.2 Theoretical background

### 2.2.1 The notion of dependency

According to the notion of *dependency* adopted in this paper, a head is a lexical item that determines the syntactic category (and distribution) of the word or phrase it is part of, while all other lexical and/or referential elements of that word or phrase are dependents.<sup>3</sup> Under this view, possessive relationships are dependency relations, since the possessum noun determines the nominal category of the entire word or phrase. As this definition makes clear, dependency relations may be identified not only at the level of the phrase, but also at the level of the word. This means that possible heads not only include noun words, but also noun stems. When a noun word is accompanied by a lexical possessor or an independent pronoun, the resulting construction is a noun phrase. Similarly, the combination of a noun stem and a person affix results in a noun word, whereby the category of the noun stem thus determines the category of the noun word. Accordingly, the dependent need not be a noun or an independent pronoun, but may take the form of a person affix as well. The dependency relation may thus obtain between a noun stem and a (referential) person affix. (Person forms that represent the dependent are referred to using the neutral term ‘referential marker’ in this paper, and are further discussed in

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<sup>3</sup> A head may also determine the syntactic category and distribution of a clause, as in the case of verbal heads.

Section 2.2.3). This definition of dependency is more specific than Nichols', who applies the definition to phrases only when stating that "the head ... determines the category of its phrase" (Nichols 1986: 57). As a result, person affixes are not possible dependents in Nichols' locus of marking typology.

When taking a semantic approach to dependency, a careful distinction must be drawn between the two types of dependency relations defined above: those between a head and an argument, and those between a head and a modifier. Within possessive NPs, this involves inherently relational nouns and their (argument) possessors, and inherently non-relational nouns and their (modifier) possessors, respectively. This opposition is the topic of the next subsection. Section 2.2.3, in turn, will show how person markers representing the dependent (i.e. referential markers) can be distinguished from person markers that do not represent the dependent (i.e. agreement markers).

## 2.2.2 Modifiers vs. arguments in possessive NPs

It is widely known that nouns functioning as possessed items in possessive constructions encode concepts of two types: concepts that are inherently relational and concepts that are not (see, for instance, Seiler 1983a; Lehmann 1985; Partee 1997; and Partee & Borschev 2003). Nouns encoding concepts of the former type inherently presuppose a relationship to a possessor and are therefore often regarded as taking their possessor as an argument. Typical nouns fitting this semantic profile are kinship terms and body part terms. Part of the meaning of nouns such as 'father' or 'leg', for instance, is their relationship to another entity. Moreover, while a phrase such as *John's father* is normally interpreted as involving an inherent relationship between two individuals, a phrase such as *John's leg* is normally interpreted as denoting the inherent part of the possessor's body.<sup>4</sup> Both the presence and the semantic interpretation of the possessive relationship are thus inherent to the meaning of the relational noun (see Barker 1995 and Taylor 1996).

Given their inherent relationality, nouns denoting kinship terms and body parts are often likened to verbs and adpositions as items with an argument structure (or valency): each may be conceived of as opening up a semantic

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<sup>4</sup> In principle, a phrase such as *John's leg* could alternatively be interpreted as referring to somebody else's leg, e.g. that of an animal that John is eating or of one that John has caught. In practice, however, such interpretations are constrained to pragmatically special contexts and arise rather infrequently (see the discussion of the study by Lichtenberk et al. 2011 below).

argument position and determining the semantic (and syntactic) relationship with the items filling this position (e.g. Seiler 1983a: 11–13). In many languages, this semantic parallel between nouns, verbs, and adpositions is reflected morphosyntactically. Cross-linguistically common are formal correspondences between bound person markers (Siewierska 1998). A case in point is Katukina-Kanamari (Katukinan, Brazil), in which relational items receive a single set of person prefixes, be they nominal (1a), verbal (1b), or adpositional (1c):

- (3) a. *ha-tyo*                    *Tikon*.  
       3SG-daughter    *Tikon*  
       ‘Tikon is his daughter.’  
   b. *ha-ti:*        *pi:da*.  
       3SG-kill    *jaguar*  
       ‘He killed the jaguar.’  
   c. *ha-katu*    *Tirin*.  
       3SG-with   *Tirin*  
       ‘Tirin is with him/her.’ (Dos Anjos 2011: 224–225)

Interestingly, the language also employs an ergative/genitive case marker that is used on nominal arguments (2a), verbal arguments (2b), and postpositional arguments (2c):

- (2) a. *Pityira-na*    *tyo*        *Tikon*.  
       *Pityira*-GEN    daughter   *Tikon*  
       ‘Tikon is Pityira’s daughter.’  
   b. *Kopa-na*        *ti:*            *pi:da*.  
       *Kopa*-ERG    killed        *jaguar*  
       ‘Kopa killed a jaguar.’  
   c. *Pioru-na*            *katu*    *Tirin*.  
       *Pioru*-OPOSTP    COM    *Tirin*  
       ‘Tirin is with Pioru.’ (Dos Anjos 2011: 221–222)

These examples show that in Katukina-Kanamari not only person marking but also case marking is formally sensitive to the similarities in the semantic relationality of nouns, verbs, and adpositions.

Nouns encoding non-relational concepts do not semantically entail the presence of a possessor and therefore lack an inherently relational meaning; in such nouns, the possessive relationship must be established via the presence of a possessor (Seiler 1983a: 62). This possessor merely provides an additional

characterization of the possessum, restricting the reference of the possessum to a specific (subset of) item(s). Clear examples of inherently non-relational concepts are concrete (inanimate), countable objects, such as ‘book’, ‘chair’, ‘basket’ and ‘pot’. Unlike relational nouns, nouns denoting non-relational concepts do not provide a determinate specification of the relationship to their possessor, which, as a result, admits a range of freely available interpretations. Examples include legal ownership (*John’s car*, the car that John owns), but also control (*Mary’s employees*, the employees Mary is responsible for) and location (*the house’s garden*, the garden near the house) (see Seiler 1983a: 40–41 and Koptjevskaja-Tamm 2004). This semantic behavior parallels that of attributive adjectives, relative clauses, and other noun modifiers. Possessors of inherently non-relational nouns may therefore also be regarded as modifiers.

In many languages, the functional similarity between various types of modifiers is formally reflected in their identical encoding (Gil 2013; Nikolaeva & Spencer 2013). This is, for instance, the case in Lango (Eastern Sudanic, Uganda), where the marker *à* is used with modifiers of three types: possessors (3a), attributive adjectives (4b), and relative clauses (4c):

- (3) a. *gwôkk à lócà*  
       dog       ATTR man  
       ‘the man’s dog’
- b. *rwòtt à ràc*  
       king       ATTR bad  
       ‘the bad king’
- c. *lócà à=mê rwòt òmìò lyèc*  
       man ATTR=REL king 3SG.give.PFV elephant  
       ‘the man that the king gave the elephant to’  
       (Noonan 1992: 154, 218, 215)

Modifier marking of this kind often involves *flagging*, a term coined by Haspelmath (2013a: 217) for case/adpositional marking of dependent nouns. In this paper, I also use this label for other invariant markers, such as the Lango attributive marker in (3), which signal the dependency relation on or adjacent to the possessor or the possessum. Hence, in using ‘flagging’ for invariant markers



of a dependency relation, irrespective of their locus, I use the term in a broader sense than Haspelmath.<sup>5</sup>

Languages that differentiate formally between head-argument relations and head-modifier relations in possessive NPs are traditionally referred to as implementing a distinction between alienable and inalienable possession. Importantly, however, the modifier/argument opposition is logically independent of whether or not a language employs a formal alienability split. Cognitive evidence in support of this point is provided by Lichtenberk et al. (2011); this study shows that the interpretation of possessive NPs by speakers of English – a language without a formal alienability split – strongly depends on whether or not the possessum noun encodes an inherently relational concept. Phrases headed by inherently relational nouns, such as ‘my child’, tend to yield the interpretation inherent to the meaning of the noun, i.e. the possessor’s own child, not someone else’s child. Phrases headed by non-relational nouns, however, are open to various interpretations, including legal ownership, location, and control, as exemplified above. These findings clearly demonstrate the cognitive reality of the modifier/argument opposition and its cross-linguistic relevance, even in languages where the opposition is not formally reflected in the domain of adnominal possession.

This paper focuses on languages with a formal alienability split in possessive NPs with a nominal possessor. Two languages that meet this requirement are exemplified below. In Amele (Trans-New Guinea, Papua New Guinea), inalienable possession is marked by means of a person marker on the possessum noun, as shown in (4a), while alienable possession is marked by means of flagging, more specifically by a possessive postposition, as shown in (4b):

- (4) a. *Naus mela-h-ul*  
       Naus son-3SG-PL  
       ‘Naus’s sons’

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<sup>5</sup> This approach is supported by the fact that in clausal dependency relations, invariant means of coding may also be located on the head, i.e. the verbal predicate, rather than on the dependent. In Chickasaw, for instance, the presence of a comitative or locative argument is expressed by corresponding markers on the verb that do not inflect for person (or number/gender) (Munro & Gordon 1982: 110; see also Hengeveld 2012: 476). Means of flagging (under the broader definition applied in this paper) may thus take dependents as well as heads as their locus, not only in phrases but also in clauses.

- b. *Naus na joo*  
 Naus POSS house  
 'Naus's house' (Roberts 1987: 139)

In Nyangumarda (Pama-Nyungan, Australia), inalienable possession remains unmarked, as shown in (5a), while alienable possession is marked by flagging the possessor noun with a genitive case suffix, as shown in (5b):

- (5) a. *muruntu jina*  
 goanna foot  
 'a goanna track'  
 b. *mirtawa-mili yukurru*  
 girl-GEN dog  
 the girl's dog' (Sharp 2004: 312, 313)

As is widely known, languages vary extensively in the types of nouns that participate in alienable and inalienable possession (Chappell & McGregor 1996: 9; Heine 1997: 174; Stolz et al. 2008: 38–40). Inalienable nouns typically form a closed class, which consists not only of kinship and/or body part terms but additionally often includes spatial terms, other parts of wholes, culturally basic items, and property nouns such as 'beauty' or 'strength' (see Nichols 1988: 572; Nichols & Bickel 2013b). Moreover, languages vary as to which items of a given semantic type are treated as alienable or inalienable.<sup>6</sup> As a result, there is no one-to-one relationship between the semantic opposition between relational and non-relational nouns described above, and the alienable or inalienable treatment of such nouns in possessive NPs in individual languages. In order to control for this asymmetry, I will focus on two sets of nouns in this paper: kinship terms and/or body part terms, which are taken to be representative of relational nouns, and concrete, inanimate, countable items, which are taken to be representative of non-relational nouns. Not only are such nouns the clearest instances of relational and non-relational nouns with regard to their inherent semantic properties, they are the most likely to receive inalienable and alienable coding respectively in individual languages; in fact, a set of kinship and/or body part terms is always part of any inalienable class, while a set of concrete, inanimate, and countable items is always part of any alienable class (see Haiman 1985: 136; Chappell & McGregor 1989: 26). Focusing on these two sets of nouns thus maximizes the

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<sup>6</sup> Examples of such languages and their methodological treatment in this paper are discussed in Section 2.4.2.

likelihood of finding nouns that universally take the inalienable and alienable marking strategy, respectively. The relationship between kinship/body part nouns and their argument possessors is henceforth to be referred to as *inalienable (possession)*, and the relationship between concrete, inanimate, count nouns and their modifier possessors as *alienable (possession)*. Not only are these labels in keeping with traditional terminology, they avoid the difficulty that the terms ‘modifier’ and ‘argument’ have connotations that do not relate to the topic of this paper. Both labels are thus used in a purely semantic sense, independent of the formal expression of the relationship in individual languages.

### 2.2.3 Referential markers and agreement markers

In this section, I discuss the second feature of the locus of marking typology applied in this paper, namely the distinction in the domain of person marking between referential markers and agreement markers. In order to establish the locus of marking in a possessive NP, we first need to consider which unit(s) may function as the possessor, i.e. as the dependent. This is a straightforward matter in languages where the possessive relationship remains unmarked or is marked by means of flagging, as in Nyangumarda, illustrated in (5a) and (5b); in such languages, there is only one available candidate for the possessor role: the possessor nominal itself. In languages where the possessive relationship is marked by means of person marking, however, the issue is not so straightforward, as demonstrated below with respect to Nyulnyul (Australian, Australia). In Nyulnyul, as in many of the world’s languages, a possessor nominal is indexed by a person marker on the possessum noun, as shown in (6a). However, as shown in (6b), the possessor nominal may be dropped if retrievable from the preceding discourse, and then the prefix occurs on its own:<sup>7</sup>

- (6) a. *bin wamb ni-mal*  
       this man 3MIN.POSS-hand  
       ‘this man’s hand’  
    b. *ni-mal*  
       3MIN.POSS-hand  
       ‘his hand’ (McGregor 2012: 422, 116)

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<sup>7</sup> The construction may be additionally accompanied by an oblique pronoun, which is optional in inalienable possession (but obligatory in alienable possession; McGregor 2012: 422, p.c.). Since the focus here is on the possessive prefix, this pronoun is not given in the examples below. Note that only body part nouns are prefixed in Nyulnyul.

Person markers of the type exemplified here for Nyulnyul have received a number of different labels in the literature, including that of ‘pronominal affix’ (e.g. Corbett 2003, 2006), ‘ambiguous agreement marker’ (Siewierska 2004: 126), and ‘cross-index’ (Haspelmath 2013a: 207). The problem with such markers is that it is not immediately clear how they should be analyzed, i.e. as markers of agreement, in which case they simply copy the relevant features from the possessor noun onto the possessum, or as referential expressions in their own right, in which case the possessor is referred to twice in the same NP. Example (6a) suggests the former analysis, as the marker here behaves like a canonical agreement marker – much like the English suffix *-s* on verbal predicates – in being accompanied by a corresponding nominal inside the same possessive NP.<sup>8</sup> Example (6b), however, argues for the latter analysis, since here the marker functions like an anaphoric pronoun – though, unlike English *his*, a bound rather than a free one – since it expresses the possessor on its own, without a corresponding nominal.<sup>9</sup>

Because of their dual nature, a question that has led to extensive debate in the literature is how person markers that optionally co-occur with a nominal, as in Nyulnyul, should be analyzed. The answer to this question is crucial to the analysis of person markers in terms of locus, since only referential markers – but not agreement markers – instantiate the dependent possessor and are therefore possible loci of marking. In other words, while agreement markers merely signal the dependency relation between head and dependent, referential markers represent the dependent themselves. As such, they may carry the marker(s) of the possessive dependency relation in a manner similar to the flagging of other dependents, namely, the possessor noun. Three types of approaches to person markers as in (6) have been provided in the literature, each of which will be briefly discussed below. After this brief discussion, I will present the approach to be taken to such markers in the present paper.

First, in much generative work (e.g. Jelinek 1984; Baker 1996), the person marker is considered to be an agreement marker, irrespective of whether the corresponding nominal is expressed or not. When the nominal is not expressed, as in (6b), the marker is considered to agree with an underspecified possessor,

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<sup>8</sup> Person markers that co-occur obligatorily with a corresponding NP are not attested in possessive NPs; the few attested cases are found for subjects in main clauses, and are largely restricted to Western Europe (Siewierska 1999: 238, 2004: 268–273).

<sup>9</sup> Clear instances of referential markers, like the English pronouns *he* or *his*, may only combine with a possessor referent outside the phrase boundaries, for instance as a left-dislocated topic (as in *John, his suitcase got stolen*) or in the preceding discourse.

called ‘pro’. This analysis is also adopted for bound person forms in traditional head/dependent marking grammar (Nichols 1992: 59). In many functional frameworks (e.g. Dik 1997; Hengeveld & Mackenzie 2008), however, the marker is considered to be a referential marker, irrespective of whether the nominal is expressed or not. When the nominal is expressed, the marker and the nominal are in an appositional relation, such that the possessor is referred to twice.<sup>10</sup> Finally, a third analysis is defended by Siewierska (1999, 2004: 120–127), who simply regards the marker as a case of agreement when the nominal is expressed, but as referential when the nominal is dropped. Nichols (1992: 79–80) adopts this analysis for freestanding person markers (examples of such markers will be provided below).

In this paper, an alternative approach is adopted for person markers that optionally co-occur with a possessor nominal, following recent work by Hengeveld (2012). This approach combines the generative and functional approaches given above, but does not assume that both apply in parallel, as in the third approach by Siewierska. Rather, the claim is that in some languages the marker is referential in nature while in others it is a marker of agreement. Moreover, even in one and the same language, some markers may be referential, while others may express agreement. The referential potential of a possessive person marker is thus determined on a language-specific as well as a construction-specific basis. A referential marker represents the possessor on its own and may have a nominal expression of the possessor in apposition. An agreement marker, by contrast, is merely the outcome of a copying procedure, and agrees with a possessor nominal that is overtly expressed or that is present only in the discourse context. By adopting such a language-specific and construction-specific approach to cross-reference/agreement, we can investigate the referential potential of person markers in different grammatical constructions, such as alienable and inalienable possessive constructions, which is one of the goals of this paper (see Section 2.3).

The approach to possessive person markers set out in the preceding paragraph is warranted by the fact that languages may allow the possessor nominal to remain unexpressed for two different reasons. On the one hand, it

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<sup>10</sup> A possible objection to this analysis is the fact that the possessor is referred to twice, which violates a theoretical principle known as the bi-uniqueness constraint (Bresnan 2001: 145, 158) or the theta-criterion (Jelinek 1984; Speas 1990). However, as pointed out by Haspelmath (2013a: 212, p.c.) and Croft (2013: 96), combinations of referential markers and (possessor) nominals do not express two distinct referents, but a single referent that is distributed over two formal entities. Such distributed expression of meaning is not uncommon cross-linguistically.

may remain unexpressed because the marker itself provides sufficient reference to the possessor. This is the case in English, where the anaphoric pronoun *his* is referential on its own and therefore need not be expressed lexically. On the other hand, languages may leave the possessor nominal unexpressed because it is retrievable from the discourse context. A case in point is Tidore (West Papuan, Indonesia), where possessors (as well as verbal arguments<sup>11</sup>) tend to remain unexpressed when the context provides sufficient information. As a result, possessive NPs (as well as entire clauses) often lack any overt specification of the possessor, as illustrated in (7):

- (7) *Dadi towaro papa la ngone fo-wako*  
 So take.leave father so 1PL.INCL 1PL.INCL.A-return  
 'So take leave of (your) father so that we go home.' (Van Staden 2000: 404)

From facts like these we may conclude, as mentioned above, that a distinction has to be made between possessor nominals that are not expressed because the person marker is referential on its own and those that are not expressed because the language concerned has a low referential density. In the latter case, the person marker is an agreement marker, despite the absence of the possessor nominal, and agreement occurs with the possessor in the discourse context.

In order to determine whether a possessive person marker is referential on its own or agrees with a possessor in the discourse context, a simple test may be applied. As mentioned above, I here assume an analysis in which agreement is a matter of copying grammatical feature information from the possessor nominal to the possessum (following Corbett's 2006 notion of canonical agreement; see also Lehmann 1982a: 203 and Bickel & Nichols 2007: 229). In such an analysis, only those features can be copied that can be retrieved from the possessor nominal. This means that if a person marker is richer in terms of grammatical features than the possessor nominal itself, it cannot be an agreement marker but must be a referential marker instead. This is illustrated by the examples in (8) from Nyulnyul (Australian, Australia), partially repeated from (6) above, and the isolate Burushaski (Pakistan) in (9). In these examples, the optionality of the possessor nominal is indicated by means of parentheses, and the expression of possessor role information by the possessive person marker is abbreviated as 'POSS' in the gloss:

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<sup>11</sup> The degree to which arguments of verbs are actually expressed has been typologized by Bickel (2003) under the name of *referential density*. Interestingly, this typological parameter also applies to possessive NPs.

- (8) a. (*bin wamb ni-mal*)  
 this man 3MIN.POSS-hand  
 ‘this man’s hand’
- b. (*wamb-in i-n-dam-Ø yiil jan*)  
 man-ERG 3.NOM-CM-hit-3MIN.ACC dog 1MIN.OBL  
 ‘The man hit my dog.’ (McGregor 2012: 585)
- (9) a. (*hir-e í-yas*)  
 man-GEN 3SG.HUM.M-sister  
 ‘the man’s sister’
- b. (*hir í-phús-im-i*)  
 man.ABS 3SG.HUM.M-bound-AOR-3SG.HUM.M.A  
 ‘He tied the man up.’ (Berger 1998: 117; Grune 1998, p.c.)

Example (8a) shows that the possessive person marker *ni-* expresses person and possessor role information (and number, but as I will explain below, number could not be taken into account in this study), while only the person information can be copied from the possessor nominal, which lacks possessor role information. The person marker is thus richer in terms of the grammatical features expressed than the possessor nominal and for that reason must be referential in nature. Example (8b) shows that the person marker in (8a) indeed carries possessor role information, since subjects, such as *wamb* ‘man’ in (8b), require a different person marker, *i-* in this example. The marker *ni-* in (8a) is thus unique to possessive constructions and as such overtly marks its possessor role.

Example (9a) shows that the possessive person marker *í-* expresses person, number, and (human male) gender, grammatical features that are also encoded by the possessor nominal, which furthermore encodes possessor role information by means of a genitive case affix. In this case, an agreement analysis is warranted, as the relevant features to be copied to the person marker are indeed available from the possessor nominal. The fact that the marker *í-* in (9a) does not carry possessor role information is demonstrated in example (9b), which shows that the marker is used for non-actors, such as *hir* ‘man’, in general.<sup>12</sup> Hence, the possessive person marker is not unique to possessive constructions and as such does not uniquely identify its possessor role.

<sup>12</sup> Suffixes such as *-i* in (9b) index the actor.

Another possibility is for the possessive person marker and the possessor nominal to express the same amount of feature information. In this case, an agreement analysis of the person marker is also warranted, since the marker can copy all of the relevant information from the possessor nominal. A case in point is Koasati (Muskogean, United States), exemplified in (10):

- (10) a. (*jhociím*) *im-laykí*  
           star      3-dung  
           ‘a meteor’ (lit. ‘star’s dung’)
- b. (*nitá*) *im-walí:ka-t*  
           bear   3-run-PST  
           ‘(He) ran away from the bear.’ (Kimball 1991: 433, 131)

Example (10a) shows that the possessive person marker *im-* expresses the same person information as provided by the possessor nominal. Like the possessor nominal, the marker does not carry role information, since it also marks a range of other roles in main clauses, including malefactive, such as *nitá* ‘bear’ in (10b). This means that the relevant information, in this case just person information, can be readily copied from the possessor nominal and the marker is correspondingly analyzed as an agreement marker.<sup>13</sup>

To sum up, agreement and reference are two different strategies of person marking, which can be distinguished by considering the distribution of grammatical feature information between the possessor nominal on the one hand and the possessive person marker on the other.<sup>14</sup> While referential markers expand on the feature information provided by the possessor nominal, agreement markers can only express those features provided by the possessor nominal, as they are mere copies of this nominal and have no independent

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<sup>13</sup> This analysis also applies to languages in which both the possessor nominal and the possessive person marker carry role information. For instance, if the person marker were to provide role information in Burushaski (9a), this would still warrant an agreement analysis, since this information can be readily copied from the possessor nominal. In Nyulnyul (8a), by contrast, the possessor nominal does not carry role information, and thus cannot be the source of this information on the possessive person marker. Therefore, the marker must be analyzed as referential instead.

<sup>14</sup> Another diagnostic to determine whether indexes are referential or not that has been proposed in the literature (Austin & Bresnan 1996; Evans 1999, 2002) can only be applied at the clausal level and is not well suitable for possessive NPs, as it relies on differences in the specificity and definiteness of the co-occurring nominal. Since possessors are typically definite and specific, this diagnostic is hard to apply within the possessive NP.



semantic contribution to make to the utterance. It is important to point out that in this paper I focus solely on the distribution of (possessor) role information, not on that of other features such as number or gender. This has two main reasons. The first is that such features are absent from many of the world's languages.<sup>15</sup> The second is that the comparison of nouns and person forms in terms of the distribution of these features is less than straightforward. As noted above, set nouns and person forms express two different types of features (nominal aspect vs. number), which significantly complicates their comparison in terms of the distribution of information. Gender is a problematic feature in that the gender of a noun usually depends on (person) forms occurring outside the NP itself and thus cannot be determined independently.

Importantly, the functions carried out by the bound possessive person forms in examples (8) to (10) above could just as well have been carried out by free possessive person forms. This is demonstrated in example (11) from Ungarinyin (Australian, Australia) and example (12) from Tiwi (Australian, Australia):

- (11) a. (*Gádbuŋu*)    *anàŋga*        *dámbun*  
           *Gadbuŋu*    3SG.M.POSS    country  
           'Gadbungu's country'
- b. *ada*    *ŋima*        *djiri-guḍe*  
           sit    I.will.do    3SG.M-COM  
           'I will sit down with him.' (Rumsey 1982: 70, 74)

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<sup>15</sup> With respect to number, Haspelmath (2013b) for instance demonstrates that over 30% of the 291 languages in his sample completely lack plural marking for (a set of) nouns. Moreover, as demonstrated by Rijkhoff (2002: 38–41, 104–117), many languages, including Nyulnyul and Koasati exemplified above, lack a nominal number feature due to the presence of so-called 'set nouns' (i.e. nouns that do not inherently refer to a single item, like regular count nouns in English, but rather denote a set of items, which may be a singleton set or a collective set). Such nouns do not express number but may express a feature Rijkhoff refers to as 'nominal aspect', i.e. the kind of set involved. This appeals to markers that express plural (or, less commonly, singular) number in other languages. The absence of a nominal gender feature is cross-linguistically also common: more than half of the 257 languages in Corbett's (2013) sample have no nominal gender, and almost 70% of the 378 languages in Siewierska's (2013a) sample do not distinguish gender in independent person forms.

- (12) a. (*Purukuparli*) *ηara mɔani*  
 Purukuparli 3SG.M son  
 ‘Purukuparli’s son’  
 b. *ηara jiiɔimi jikwani*  
 3SG.M he.made fire  
 ‘He made fire.’ (Osborne 1974: 74, 61)

The examples in (11) and (12) are functionally completely parallel to (8) and (10). In (11a), it is shown that the free possessive person marker *anàŋga* carries possessor role information while the nominal does not. The fact that the possessive person marker carries possessor role information is demonstrated in example (11b), where another set of free person forms is used outside the domain of possessive constructions, for instance for comitatives in main clauses. The possessive person marker thus expands on the role information provided by the possessor nominal and must therefore be referential in nature, just like the bound person marker in Nyulnyul (8a). In (12a), by contrast, neither the free person marker *ηara* nor the possessor nominal carries role information. As shown in (12b), the marker is not unique to possessive constructions, since it also marks actors in main clauses, among other roles. Hence, the marker does not expand on the role information provided by the possessor nominal, in which case an agreement analysis is warranted, just as with the bound person form in Koasati (10a).

Importantly, the examples above demonstrate that possessor role information is not only conveyed by independent person markers, as in Ungarinyin (11a), it can also be conveyed by person markers that are cliticized or affixed to the possessum, as in Nyulnyul (8a). Both free and bound person markers resemble nominals in that they have a unique form when used in possessive constructions, as in Nyulnyul (8a) and Ungarinyin (11a), or a form that is also used in other constructions, e.g. for various types of verbal arguments, as in Burushaski (9a), Koasati (10a), and Tiwi (12a).<sup>16</sup> The capacity of independent referential expressions, i.e. pronouns (in traditional terminology) and nouns, to have a unique possessive form is generally referred to as ‘the genitive case’ or, more generally, as ‘flagging’ (which includes the use of

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<sup>16</sup> I consider a set of possessive person markers to be dedicated to the possessive NP when it differs in at least one form from another set. Partial correspondences between sets of person markers are common cross-linguistically, but not easily classified in a systematic way (see Siewierska 1998 for an attempt regarding verbal person markers). As a result, these have not been taken into consideration in this study.

adpositions, see Haspelmath 2013a). Strikingly, however, no accepted terminology exists for the same function of bound person forms; this shows that the phenomenon has long gone unnoticed, not least in traditional head/dependent-marking grammar, where, as mentioned previously, all bound person forms are considered to be agreement markers, irrespective of the distribution of role information in the phrase. In the absence of an established term, I refer to the expression of possessor role information by bound referential markers as ‘flagging’, on a par with the same function of independent referential markers (i.e. pronouns) and nouns.

In sum, this section has introduced a novel typology of person markers, distinguishing referential markers and agreement markers for possessive NPs with a nominal possessor. In this typology, person markers are given a unified analysis as referential markers or as markers of agreement, depending on the distribution of possessor role information in the language and the (possessive) construction in question. Importantly, only referential markers (but not agreement markers) instantiate the dependent possessor and are therefore possible loci of marking or, more specifically, of flagging. As a result, referential markers and agreement markers differ in locus; this is further discussed in the next subsection, where I present the locus of marking typology applied to the data.

## 2.2.4 A semantic locus of marking typology

The locus of marking typology applied in this paper considers the location of morphosyntactic marking of dependency relations in possessive NPs. In any NP, marking may have four different locations, or *loci*: the possessor (which may take the form of a referential person marker or a nominal), the possessum, both, or neither. These four loci may take the following types of marking strategy: flagging, referential marking, and agreement marking. As in traditional head/dependent-marking grammar, I will not consider other NP-internal marking strategies, such as constituent order. Referential markers occupy a special position in the typology: not only do they mark the relationship between possessor and possessum, but they themselves instantiate the dependent possessor (see the previous subsection). As such, they are both possible loci of marking and a possible marking strategy. This dual functioning is reflected in locus of marking, as further discussed below.

The locus of marking typology applied to the data is presented in Table 1 below. The table presents the four different loci (in the first column), the item(s) that represent(s) each locus (in the second column), the type of marking strategy

of each locus (in the third column), and the languages exemplifying the respective patterns discussed in this and previous sections (in the fourth column).

Table 1: A semantic typology of locus of marking

Locus	Representation	Marking strategy	Exemplar language
<b>Possessor</b>	Noun	Flagging	Amele (4b), Nyangumarda (5b)
	Referential marker	Flagging	Ungarinyin (11a/13)
<b>Possessum</b>	Noun	Flagging	Macushi (14)
		Agreement marker	Amele (4a), Koasati (10a), Tiwi (12a/16)
<b>Possessor &amp; possessum</b>	Noun <sub>(psr)</sub> & Noun <sub>(psm)</sub>	Flagging <sub>(psr)</sub> & agreement marker <sub>(psm)</sub>	Burushaski (9a)
	Referential marker <sub>(psr)</sub> & noun <sub>(psm)</sub>	Flagging <sub>(psr)</sub> & referential marker <sub>(psm)</sub>	Nyulnyul (8a/16)
	–	irrelevant	Nyangumarda (5a)

*Notes:* The locus type ‘possessor & possessum’ specifies – between brackets – the items representing each locus (in the second column) and the marking strategy that each item takes between brackets (in the third column). The abbreviations ‘psr’ and ‘psm’ refer to the possessor and the possessum, respectively.

The table requires some clarification. First, the possessum is never instantiated by a referential marker (e.g. [man its dog] ‘the man its dog’ in pseudo-English), since there is no language in which person markers index features of the possessum on the possessor (instead, person markers may index the possessor on the possessum; see also footnote 2). Second, the table only presents those locus of marking types that are attested in the languages studied for this paper (see Section 2.4). The fact that person markers never index the possessum excludes the use of person markers on or adjacent to possessors. A number of additional types are rarely (if ever) attested among the world’s languages, such as the marking of both the possessor noun and the possessum by means of flagging (e.g. [man-POSS dog-POSS] ‘the man’s dog’s’ in pseudo-English) or the use of an independent person marker in combination with flagging of the possessum (e.g. [man his dog-POSS] ‘the man his dog’s’ in pseudo-English). Each locus of marking type in the table is briefly illustrated and discussed below.

As pointed out in the previous subsection, the possessor in any possessive NP can be instantiated by two types of items: by a nominal, or by a referential marker that may occur in apposition to the nominal in the NP. Both types of referential expressions may carry the marker(s) of the possessive dependency relation, a property referred to as ‘flagging’ in the present study. For possessor nouns, flagging usually takes the form of an adposition, as in Amele (4b), or of a genitive case marker, as in Nyangumarda (5b), each exemplified in Section 2.2.2. A language in which flagging takes the form of role marking on the referential marker is Ungarinyin (11a), repeated as (13) for convenience:

- (13) (*Gádbuŋu*)    *anàŋga*        *dámbun*  
 Gadbuŋu    3SG.M.POSS    country  
 ‘Gadbungu’s country’

As discussed in Section 2.2.3, referential markers like *anàŋga* are referential expressions of the possessor that overtly encode the possessor role. The marker in (13) is unique to possessive constructions, and thus carries such role information. Hence, the information on the possessive nature of the dependency relation is on the possessor – by virtue of the referential marker – and the NP in (13) is correspondingly analyzed as possessor-marked.

The dependency relationship may alternatively be marked on the possessum. Possessum-marking comes in two types. On the one hand, it may involve flagging, whereby markers of the possessive dependency relation are located on or adjacent to the possessum noun. In Macushi, for instance, the possessum noun takes the suffix *-ri* (Cariban; Brazil, Guyana, Venezuela), given in (14):

- (14) *Leandro wa’ka-ri*  
 Leandro    axe-POSS  
 ‘Leandro’s axe’ (Abbott 1991: 62)

Other well-known cases of possessum-marking via flagging are so-called ‘ezafe’ markers, known mainly from Iranian languages, and possessums taking the ‘construct’ form, which typically involves phonological shortening and is characteristic of Semitic and other Afro-Asiatic languages.

Possessum-marking may alternatively take the form of person marking expressing agreement of the possessor nominal with the possessum. Agreement markers are often affixes or clitics, as in Amele, exemplified in (4a) in Section 2.2.2, but they may also be free forms, as in Tiwi (12), repeated as (15):

- (15) (*Purukupali*)    *ɲara mɔɔani*  
 Purukupali    3SG.M son  
 ‘Purukuparli’s son’

Since agreement is a matter of ‘displaced’ information, in that one entity (the possessor nominal in this case) determines the grammatical features of another entity (the possessum in this case), agreement markers are by definition syntactically associated with the possessum, irrespective of their formal realization (see Corbett 2006: 20). In Tiwi, the locus of the agreement marker is, furthermore, apparent from its positioning within the NP: the marker always precedes the possessum, even when the order of possessor nominal and possessum is reversed (Osborne 1974: 74–75). Note that, in addition to their formal status, the locus of agreement markers is also insensitive to whether or not they express role information. Agreement markers may copy such information from the possessor nominal, but since they are themselves not referential expressions of the possessor, they are not possible loci of marking.

A third option is the marking of both possessor and possessum. In languages where the possessor is solely expressed by a nominal, this involves flagging (typically case marking) of the nominal as well as the use of an agreement marker (typically a bound one) on the possessum. This locus of marking type was exemplified for Burushaski in (9a). In other languages, the possessor is expressed by a referential marker on the possessum, as exemplified for Nyulnyul in (8a), and repeated here as (16):

- (16) (*bin wamb*)    *ni-mal*  
 this    man    3MIN.POSS-hand  
 ‘this man’s hand’

Like the person marker in Ungarinyin (13), the marker in Nyulnyul is a referential expression of the possessor carrying the (possessor) role information. As such, the NP is possessor-marking. However, unlike the marker in Ungarinyin, the marker in Nyulnyul is affixed to the possessum, which means that it is also possessum-marking. Hence, as noted above, referential markers have a dual status, which is reflected in their locus of marking: semantically, the marker in Nyulnyul is possessor-marking, as the information on the possessive nature of the relation is on the referential marker, but syntactically the marker is possessum-marking, since it is affixed to the head. In this sense, bound referential markers perform the same two functions as the combination of the

flagging of nouns and the agreement marking of possessums in languages such as Burushaski: they express the possessive relationship in the NP (as does the flagging of possessor nominals) but also take the possessum as their (syntactic) locus (like agreement markers).

The fourth and last locus in Table 1 is the total absence of possessive marking. This involves possessors and possessums that are juxtaposed or compounded. An example of the former was given for Nyangumarda in (5a) in Section 2.2.2.<sup>17</sup>

Finally, in about one third of the languages studied, more than one marking strategy is used for alienable possession, inalienable possession, or for both. Each strategy is taken into account in this study in order to display the full range of cross-linguistic variation in (in)alienable possessive marking. In most sample languages, the same locus is marked twice, as in Slave (Na-Dene, Canada), where possessums in inalienable possession take a tonal and/or suffixal possessive marker as well as a prefix that agrees with the possessor in person and number. This is exemplified in (17):

- (17) (*chia*) *be-kw'en-é*  
 bird 3SG-leg-POSS  
 'the bird's wing' (Rice 1989: 228)

In other sample languages, however, the different marking options are in complementary distribution, their use being governed by a number of factors. One such factor is the opposition between proper nouns and common nouns, which plays a role in Ungarinyin (Rumsey 1982: 70–71): only proper noun possessors are marked by means of a free referential marker, as shown in (12) above, while common noun possessors take a genitive case marker. Another factor that involves properties of the possessor nominal is number. In Dogon (Niger-Congo, Mali; Heath 2008: 234–235), for instance, singular (alienable) possessors take the possessive marker *mà*, which is absent with possessors

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<sup>17</sup> Nichols additionally identifies a fifth locus type, called 'floating (or free/detached) marking', involving means of flagging that do not belong to the possessor nominal or to the possessum but are positioned relative to the phrase boundaries (Nichols 1992: 55–56; Nichols & Bickel 2013a). The only language in the sample with such a marker is Lango (Noonan 1992: 154; Bickel p.c.).

ending in a plural morpheme.<sup>18</sup> Interestingly, the same types of factors play an important role in the morphosyntactic coding of other types of dependents, with the arguments of verbal predicates having received the most attention to date (see, e.g., Siewierska 2004: 149–162; Bickel 2010; Witzlack-Makarevich 2011; Van Lier & Van Rijn 2013 for an investigation of nominalizations).

Another source of differential patterns of possessive marking concerns properties of the possessum. A common factor is the division of possessums into lexical subclasses. Diegueño (Hokan; Mexico, United States; Miller 2001: 146), for instance, employs two sets of referential markers: one for kinship nouns, and one for all other types of inalienable nouns, including body parts. In Paumari (Arauan, Brazil; Chapman and Derbyshire 1991: 254), a small class of alienable nouns (without a common semantic denominator) selects a possessive prefix *ka-* instead of the set of person markers reserved for most other alienable nouns. Finally, in addition to a set of agreement markers, Slave uses different means of flagging the inalienable possessum in the form of a tonal marker, a suffixal marker, or both. An example of the latter was provided in (17). Only possessive marking that differs in declension class is treated as a single marking strategy.

To summarize, this paper applies a semantic typology of locus of marking which makes a clear distinction between the locus of referential markers and that of agreement markers. Nouns and referential markers are possible loci of marking – more specifically, of flagging; agreement markers, on the other hand, are not. In light of this new locus of marking typology, as well as the semantic opposition in dependency relations discussed in Section 2.2.2, I will now turn to the three hypotheses which are presented in the following section.

## 2.3 Hypotheses

The aim of this paper is to determine to what extent the semantic opposition between inalienable possession (the relation between inherently relational nouns and their argument possessors) and alienable possession (the relation between inherently non-relational nouns and their modifier possessors) constrains cross-linguistic patterns of locus of marking, on the one hand, and the referential potential of possessive person markers, on the other. As discussed in Section

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<sup>18</sup> Other relevant factors are anaphoricity, i.e. the nominal or pronominal character of the possessor, and person (cf. Siewierska 1998: 145, 152–153 and Chapters 3 and 4 of this thesis). Since I focus solely on nominal possessors, these factors are not relevant to the marking patterns in the languages investigated.



2.2.2, the two types of relations can be distinguished on the basis of the inherent semantic properties of the possessum noun: while possessums in inalienable possession presuppose a relationship to a possessor, which therefore behaves as an argument, possessums in alienable possession do not presuppose a relationship to a possessor, which therefore behaves as a modifier. In other words, while the relationship between a possessor and a possessum in inalienable possession is inherent to the latter, that between a possessor and a possessum in alienable possession is external to both. I expect this semantic asymmetry to be reflected both in the locus of possessive marking as well as in the type of possessive marking, i.e. the use of referential markers vs. that of agreement markers in the languages of the sample.

Focusing first on locus of marking, I test two predictions. On the one hand, possessors in alienable possession are expected to be in greater need of possessive marking than possessors in inalienable possession. This prediction is motivated by the fact that the presence of a possessor in alienable possession is less predictable to the language user than that of a possessor in inalienable possession, given that a possessor in alienable possession is not inherently presupposed by its possessum noun and is thus a functionally marked optional enrichment of its head. As a result, I expect that in alienable possession the possessor is more likely to be the locus of possessive marking than in inalienable possession. On the other hand, since possessors in inalienable possession are expected to be less in need of possessive marking than possessors in alienable possession, I expect that in inalienable possession the possessum is more likely to be the locus of possessive marking, or that it more often lacks possessive marking, when compared to alienable possession. Together, these predictions yield the following set of hypotheses, formulated in (i) and (ii) below:

- (i) If in a language the possessum in alienable possession is marked, the possessum in inalienable possession is marked as well.
- (ii) If in a language the possessor in inalienable possession is marked, the possessor in alienable possession is marked as well.

Note that languages marking both the possessor and the possessum participate in both hypotheses.

The third hypothesis tested in this study investigates the relationship between the referential potential of possessive person markers, i.e. the use of referential markers vs. that of agreement markers, and the type of possession in which they are used, i.e. alienable vs. inalienable possession. I predict that, since

possessors in alienable possession are not inherent to their possessum noun, and thus function as mere optional enrichments of their head, person markers in this type of possession are inherently more likely to be referential in nature than person markers in inalienable possession. To put it the other way around, since possessors in inalienable possession are inherent to the semantics of their possessum noun, and thus behave as arguments, they are expected to be in far less need of a referential expression than possessors in alienable possession. As a result, I expect that markers of inalienable possession are inherently less likely to be referential in nature (and thus inherently more likely to be markers of agreement) than markers of alienable possession. This prediction is further motivated by the fact that, as demonstrated in Section 2.2.3, referential markers are by definition always semantically richer than the possessor nominal in expressing possessor role information, while agreement markers often do not express role information, or, if they do, copy this information from the possessor nominal. Crucially, the need for marking role information is expected to be greater in alienable possession than in inalienable possession, as pointed out above. The corresponding hypothesis is formulated in (iii) below:

- (iii) If in a language person markers of inalienable possession are referential markers, person markers of alienable possession are referential markers as well.

The next section presents the language samples used to test the three hypotheses (Section 2.4.1), and delimits the set of possessive NPs investigated (Section 2.4.2). Each hypothesis will be addressed in turn in Section 2.5.

## 2.4 Methodological preliminaries

### 2.4.1 The language sample

The sample used in this study has been created in such a way that it reflects the highest possible degree of genetic and geographical diversity. The genetic criterion is met by adopting the sampling method of Rijkhoff et al. (1993) and Rijkhoff and Bakker (1998), which is applied to Ruhlen's classification of the

world's languages.<sup>19</sup> This sampling technique makes use of so-called 'Diversity Values' (henceforth DV). These values determine the number of languages to be selected from each family and subfamily in a language family tree based on the internal complexity of that (sub)family, given a particular sample size. More internally complex (sub)families have a higher DV than less internally complex (sub)families, and are therefore represented by a higher number of languages in the sample. Isolates are, by definition, part of any sample. The genetic criterion is furthermore combined with a geographical one: where possible, the languages selected on the basis of the genetic criterion are spoken in non-contiguous areas.

For this study, I used as a starting point an initial sample of 62 languages.<sup>20</sup> Twenty-two (sub)families, including six isolates, were removed from this sample, since they do not contain languages with an adnominal alienability split. These (sub)families are mostly situated in Eurasia and South-East Asia. Within the restrictions of the genetic and geographical criteria, the sample thus satisfies a third, typological criterion set by the hypotheses tested in this study: it consists solely of languages with an adnominal alienability split. Furthermore, the languages Etruscan, Hurrian, and Meroitic selected by the sampling method were removed from the sample due to insufficient data. The result of this procedure is a sample with an actual number of 37 languages, which is presented in Table 2 below.

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<sup>19</sup> Note that I am not in any sense committed to Ruhlen's classification, which is controversial, mainly because it posits some large, poorly supported language families, such as the Amerindian and Australian families (e.g. Kaufman 1990; Nichols 1990; Campbell & Poser 2008). However, Rijkhoff et al. (1993) use this classification in their sampling technique, which is one of the few formalized methods of creating representative samples and which I therefore prefer to use. In any case, note that the sampling technique compensates for the use of Ruhlen's classification by requiring the selection of a larger number of languages from the postulated language families that are more internally complex. The classification of the sample languages according to the WALS, which follows the 14th edition of the Ethnologue (Grimes 2000), is much more accurate and widely accepted, and is therefore also provided in Table 2 below.

<sup>20</sup> The number of languages to be selected from each (sub)family in a sample counting 60 languages is specified in Rijkhoff et al. (1993: 186). However, Rijkhoff et al. (1993) make use of the first edition of Ruhlen's classification (Ruhlen 1987); in the second edition (Ruhlen 1991), which I use in this study, two additional first-order language families are distinguished: Korean-Japanese-Ainu and Kartvelian. Each requires representation by a single language. This brings the initial sample size to 62 languages.

Table 2: The 37-language sample

Language family (Ruhlen 1991)	Subfamilies	Language selected	Language family (WALS)	
Afro-Asiatic (3/3)	Chadic (1/1)	Gude	Afro-Asiatic	
	Berber (1/1)	Tamashek	Afro-Asiatic	
	Semitic (1/1)	Maltese	Afro-Asiatic	
Altaic (1/1)		<b>Udihe</b>	Altaic	
Amerind (8/9) (2/2)	Northern Penutian (1/1)	<b>Koasati</b>	Muskogean	
	Hokan (1/1)	<b>Diegueño</b>	Hokan	
	Andean (1/1)	Urarina	isolate	
	Eq.-Tucanoan (2/2)	<b>Paumarí</b>	Arauan	
	M.-Tucanoan (1/1)	Hup	Nadahup	
	Ge-Pano-Carib (2/2)	Macushi	Cariban	
	Ge-Pano (1/1)	<b>Bororo</b>	Bororoan	
	Centr. Amerind (0/1)	–	–	
	Chib.-Paezan (1/1)	Sanuma	Yanomam	
Australian (4/4)	Nyulnyulan (1/1)	<b>Nyulnyul</b>	Nyulnyulan	
	Worrorran (1/1)	<b>Ungarinyin</b>	Worrorran	
	Pama-Nyungan (1/1)	Nyangu-marda	Pama-Nyungan	
	Other (1/1)	<b>Mangarayi</b>	Mangarrayi-Maran	
Austic (3/7)	Austro-Tai (2/5)	Daic (0/1)	–	
		Austro-Malayo-Pol. (1/1)	Drehu	
		Austronesian (2/4)	–	Austronesian
		Atayalic (0/1)	–	–
	Paiwanic (1/1)	<b>Puyuma</b>	Austronesian	
	Tsouic (0/1)	–	–	

Table 2: The 37-language sample

Language family (Ruhlen 1991)	Subfamilies					Language selected	Language family (WALS)
	Austroasiatic (1/1)					Kharia	Austro-Asiatic
	Miao-Yao (0/1)					–	–
Basque (LI)						–	isolate
Burushaski (LI)						Burushaski	isolate
	Caucasian (0/1)					–	–
	Chukchi-Kamchatkan (0/1)					–	–
	Elamo-Dravidian (0/1)					–	–
	Eskimo-Aleut (1/1)					<b>West Greenlandic</b>	Eskimo-Aleut
Etruscan (LI)						–	–
Hurrian (LI)						–	–
Indo-Hittite (2/2)	Indo-European (1/1)					Icelandic	Indo-European
	Anatolian (1/1)					Hittite	–
Indo-Pacific (4/7)	Trans New Guinea (1/1)					Inanwatan	Marind
	Sko (1/1)					<b>Skou</b>	Skou
	E. Papuan (1/1)					<b>Nasioi</b>	East Bougainville
	W. Papuan (1/1)					<b>Tidore</b>	West Papuan
	Other subfamilies (0/3)					–	–
	Kartvelian (0/1)					–	–
Ket (LI)						–	isolate
	Khoisan (0/1)					–	–
	Korean-Japanese-Ainu (0/1)					–	–
	Meroitic (LI)					–	–
	Na-Dene (1/1)					Slave	Na-Dene
	Nahali (LI)					–	isolate
Niger-Kordofanian (5/5)	Niger-Congo (4/4)	N.-C. Proper (3/3)	Central N.-C. (2/2)	North Centr. N.-C. (1/1)	Dogon	Dogon	
				South	Ewe	Niger-Congo	

Table 2: The 37-language sample

Language family (Ruhlen 1991)	Subfamilies	Language selected	Language family (WALS)
		Centr. N.-C. (1/1)	
	West Atlantic (1/1)	Nigerian Fula	Niger-Congo
	Mande (1/1)	Bambara	Mande
	Kordofanian (1/1)	Krongo	Kadu
Nilo-Saharan (3/3)	East Sudanic (1/1)	Lango	Eastern Sudanic
	Centr. Sudanic (1/1)	Ngiti	Central Sudanic
	Kunama (1/1)	Kunama	isolate
Nivkh (LI)		–	isolate
Pidgins and Creoles (0/1)		–	–
Sino-Tibetan (1/2)	Sinitic (1/1)	Mandarin Chinese	Sino-Tibetan
	Tibeto-Karen (0/1)	–	–
Sumerian (LI)		–	isolate
Uralic-Yukaghir (0/1)		–	–

*Notes:* The first five columns contain the classification of the sample languages according to Ruhlen (1991); the final column contains their highest-order family in the WALS (2013). The language (sub)families excluded from the sample appear in dark shading; the absence of languages sampled is indicated with a dash. The number of languages selected from each (sub)family is given between brackets before the slash, followed by the number of languages originally required by the sampling method. For instance, only three of the seven Austric language groups contain a language that displays an adnominal alienability split. Therefore, only three Austric languages are part of the sample. Language isolates are abbreviated as ‘LI’; Burushaski is the only isolate included in this study. The languages used to test hypothesis (iii) are given in bold.

The 37-language sample in Table 2 has been used to test hypotheses (i) and (ii), formulated in the previous section. Only a subset of these 37 languages uses person markers in both alienable and inalienable possession in NPs with a possessor nominal and can therefore be used to test hypothesis (iii). This

subsample comprises 13 languages, marked in bold in the table. Interestingly, this subsample contains languages from only a few major areas (and language families): the Americas (the Amerind and Eskimo-Aleut family), the Pacific (the Austric and Indo-Pacific families), and Australia (the Australian family). The use of possessive person markers with nominal possessors and for both ends of the alienability split is especially rare in Africa (the Afro-Asiatic family, and presumably non-existent in the Niger-Kongo and Nilo-Saharan families) as well as in Eurasia (Indo-Hittite and Sino-Tibetan). Languages spoken in these areas tend to mark the distinction between alienable and inalienable possession, if at all, by flagging the possessor nominal – that is, by dependent-marking in Nichols’ terms. This is demonstrated by Nichols & Bickel (2013a), as well as by the results of this study.

## 2.4.2 Delineating the constructions investigated

This study solely investigates possessive NPs that consist of a nominal possessor and a non-derived possessum. This means that deverbal nouns, although clearly relational, are not part of this study, nor are NPs that are morphosyntactically complex (e.g. NPs containing additional attributive modifiers or possessums embedded in possessor chains).

As pointed out in Section 2.2.2, languages vary extensively in the types of nouns that receive alienable or inalienable coding in possessive NPs. As a result, there is no one-to-one relationship between the inherent relationality or non-relationality of a noun and its formal treatment in possessive NPs in individual languages. I accommodate this discrepancy by focusing only on those nouns that are the most prototypical instances of relational and non-relational nouns, both in terms of their lexical semantics and in terms of their formal treatment in possessive NPs in individual languages. As discussed in Section 2.2.2, these are kinship and/or body part terms on the one hand, and concrete, inanimate and countable items on the other. The adnominal possession of such nouns is referred to as inalienable possession and alienable possession, respectively; the formal expression of the two types of possession in the languages of the sample is the focus of the present study, and is discussed in the next subsection. Note that none of the marking possibilities for other nouns that often participate in the alienable construction, such as ‘house’ and ‘dog’, or in the inalienable construction, such as parts of wholes and spatial terms, contradict the findings of this study. Such nouns are nevertheless used incidentally in the examples in the text (see Krongo (21b) and Mangarayi (25b) in the next section) when examples containing the nouns investigated were not available.

In a number of sample languages, only a subset of kinship terms and/or body part terms are treated as inalienable items. In Puyuma (Austronesian, Taiwan), for instance, only older generation kinship terms, such as ‘mother’, ‘father’, and ‘grandparent’, participate in the inalienable construction, while younger generation kinship terms, as well as body parts, are found only in the alienable construction (Teng 2008: 97). Similarly, in Nyulnyul only a small proportion of body part nouns, such as *-mal* ‘arm/hand’ exemplified in (8a) (as well as some personal attributes, such as ‘shadow’ and ‘name’, and some items of clothing), take the inalienable prefix-set (McGregor 1996: 257–263 and McGregor 2012: 117–122). In such cases, I focus solely on those items that take inalienable coding in the language in question, since these are generally also the items that are conceived of in that language as the most prototypically relational – and thus as inherently and inseparably related to the possessor (see Chappell & McGregor 1996; Heine 1997: 174; Stolz et al. 2008: 38–40).<sup>21</sup> In Nyulnyul, for instance, only those body part nouns are prefixed that are conceived of as most important, most visible, and most central to the possessor, which include external body parts like *-mal* ‘arm/hand’. In contrast, those body parts considered more peripheral to the possessor, such as internal organs and bodily products, are formally treated as alienable nouns (McGregor 1996: 257–264). This means that only body part nouns from the former class are taken as being representative of inalienable nouns for Nyulnyul. Conversely, the same approach is adopted for concrete (inanimate), countable objects: when treated as inalienable rather than as alienable nouns in a given language, I have focused solely on those nouns that receive alienable coding – and that are thus conceived of as possessed in a temporary, non-inherent manner – in that language. With respect to Nyulnyul, this means that personal attributes and the items of clothing in the inalienable class are not taken as representative of alienable nouns in this language.

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<sup>21</sup> This observation is supported by Bally (1996), who points out that only those items are generally treated inalienably in a given language that are conceived of as belonging to a human being’s personal sphere, which means that they are viewed as “associated with a person in an habitual, intimate or organic way” (Bally 1996: 33).



## 2.5 Results

This section presents the findings of this study. In the first subsection, I discuss the relationship between alienable and inalienable possession in terms of possessum-marking, as addressed in hypothesis (i). The second subsection focuses on the relationship between alienable and inalienable possession in terms of possessor-marking, as addressed in hypothesis (ii). In the third subsection, I present the overall preferences for locus of marking in alienable and inalienable possession in the sample, combining the results from the previous two subsections. The relationship between referential marking and agreement marking in languages with a formal alienability split, as addressed in hypothesis (iii), is discussed in the fourth subsection. A final subsection focuses on the relationship between the locus of possessive marking and the type of marking strategy used by presenting the distribution of the different types of marking strategies in terms of locus in the sample. An overview of the data can be found in Appendix I.

### 2.5.1 Hypothesis (i): possessum-marking in alienable and inalienable possession

Table 3 below presents the distribution of the different loci of marking over alienable and inalienable possession (in the columns) in possessive NPs of the 37 sample languages (in the rows). Note that this table does not specify which item(s) represent(s) each locus (i.e. a noun or a referential marker) nor the type of marking strategy of each locus (flagging, referential marking, or agreement marking); this is discussed in Section 2.5.5.

Table 3: The locus of alienable and inalienable possessive marking for hypothesis (i)

Language	Alienable possession	Inalienable possession
Bororo	PSM+PSR	PSM
Diegueño	PSM / PSM+PSR	PSM+PSR / PSM+PSR
Koasati	PSM	PSM
Mangarayi	PSM+PSR	PSM+PSR
Paumari	PSM / PSM+PSR	PSM
Puyuma	PSM+PSR	PSM+PSR
Skou	PSM+PSR	PSM / PSM+PSR / PSM+PSR
Slave	PSM / Ø	PSM / PSM / PSM / PSM

Table 3: The locus of alienable and inalienable possessive marking for hypothesis (i)

Language	Alienable possession	Inalienable possession
Tidore	PSM+PSR	PSM+PSR / PSM
Udihe	PSM / PSM	PSM
West Greenlandic	PSM / PSM+PSR	PSM+PSR
Burushaski	PSR	PSM+PSR
Dogon	PSR / Ø	PSM
Gude	PSR	PSM
Hittite	PSR	PSM+PSR
Inanwatan	PSR	PSM+PSR
Kharia	PSR	PSM+PSR / PSM+PSR
Maltese	PSR	PSM
Nasioi	PSR	PSM+PSR
Nigerian Fula	Ø	PSM / Ø
Nyulnyul	PSR	PSM+PSR / PSR
Tamashek	PSR	PSM+PSR
Ungarinyin	PSR / PSR	PSM / PSM+PSR
Bambara	PSR	Ø
Drehu	PSR	Ø
Ewe	PSR	Ø
Hup	PSR	Ø
Icelandic	PSR	PSR
Krongo	PSR	PSR
Kunama	PSR	Ø
Lango	FLT	Ø
Mandarin Chinese <sup>22</sup>	PSR	Ø

<sup>22</sup> The presence of a formal alienability split in Mandarin Chinese is a debated issue, since the particle *de* (located with the possessor) can in principle be used for both alienable and inalienable possession. Following many other scholars (e.g. Dragunov 1960; Li & Thompson 1981; Egerod 1985; Tjee 1986), I have nevertheless treated Mandarin as a language with a formal distinction between alienable and inalienable possession, since the use of *de* correlates strongly with the lexical semantics of the possessum: while kinship terms, among other relational nouns, tend to occur without *de*, and almost never occur with *de* in combination with a first- or second- person possessor, concrete inanimate nouns such as *bèi* 'blanket' or *jìsuànjī* 'computer' clearly prefer the use of *de* (Chappell & Thompson 1992).

Table 3: The locus of alienable and inalienable possessive marking for hypothesis (i)

Language	Alienable possession	Inalienable possession
Ngiti	PSR	∅
Nyangumarda	PSR	∅
Sanuma	PSR / ∅	–
Urarina	PSR	∅
Macushi	PSM	∅

Notes: PSR = possessor-marking, PSM = possessum-marking, PSM+PSR = marking of both possessum and possessor, ∅ = no possessive marking, and FLT = a floating marker. A slash separates the use of multiple marking strategies and a dash indicates that sufficient data is lacking. Strategies that are (minimally) possessum-marking are given in light shading, while strategies that are not (minimally) possessum-marking are given in darker shading. A double line separates the lighter and darker shaded strategies.

The table confirms hypothesis (i): languages in which alienable possession (minimally) marks the possessum ('PSM' or 'PSM+PSR'), inalienable possession (minimally) marks the possessum as well.<sup>23</sup> This finding is represented in the table by means of the thick double line separating the lightly shaded loci of marking, which contain markers that (minimally) mark the possessum, from the darkly shaded types, which contain markers of other loci.

Macushi, given in the bottom row of Table 3, provides the sole counterexample to the generalization in (i). Alienable possession, as in (18a) (repeated from (14)), is marked by means of flagging the possessum, whereas inalienable possession, as in (18b), remains unmarked:

- (18) a. *Leandro wa'ka-ri*  
 Leandro axe-POSS  
 'Leandro's axe'

<sup>23</sup> Distributional patterns have been tested for statistical significance using Fisher's Exact test ( $p < 0.05$ ). In order to control for the relatively small sample size, a Contingency Coefficient (CC) was also computed, which indicates the strength of a statistically significant correlation irrespective of sample size. The coefficient ranges from 0 to 1, with 0.10 indicating a weak correlation and  $0.45 \leq$  indicating a strong correlation (Everitt 1977). The relationship between possessum-marking in alienable and in inalienable possession is statistically significant ( $p = 0.013$ ) and moderately strong ( $CC = 0.388$ ).

- b. *kaikusi no'pî*  
 jaguar wife  
 'the jaguar's wife' (Abbott 1991: 62)

Note, however, that this pattern only applies to contexts where the possessum is possessed at the moment of speaking (so-called 'present possession', see Aikhenvald 2012: 162). Expressions which convey termination of possession as in 'Leandro's former axe', do not constitute a counterexample, as possessums here are univocally marked with the 'past possession' marker *-rî'pî* (Abbott 1991: 85). Moreover, note that, despite being a counterexample to the generalization in (i), the marking pattern demonstrated by Macushi conforms to the well-known cross-linguistic generalization that languages tend to use overt coding for alienable possession and zero-coding for inalienable possession, but usually not the other way around (see, e.g., Haiman 1983; Haiman 1985: 130–136; Haspelmath 2006, 2008a).

An additional observation with respect to the pattern demonstrated by Macushi (18) is that the possessum is marked by means of flagging rather than by means of person marking. Interestingly, the use of flagging rather than of person marking also characterizes the only other known exception to the generalization in (i), the Omotic language Dizi (Nichols 1992: 119). In this language, alienable possession is signaled by tone sandhi that affects both the possessor noun and the possessum, while inalienable possession is marked by an invariant possessive suffix *-kî* on the possessor noun (Allan 1976: 382). I know of no language that poses a counterexample to (i) by using person markers in alienable possession, but not in inalienable possession. This interesting observation is supported by work by Lehmann (1983: 365) and Siewierska (2004: 138), who show that if a language uses bound person markers on alienable nouns, it also uses bound person markers on inalienable nouns, but not vice versa. Crucially, these findings suggest that there is a more specific version of the generalization in (i) which has no known counterexamples: if in a language alienable possession is marked by means of person markers, inalienable possession is marked by means of person markers as well. My data additionally shows that this generalization not only applies to bound person forms but to free person forms as well. In Ungarinyin, for instance, a free (referential) marker is used in alienable possession, as shown in (19a), repeated from (13) above, while a bound (agreement) marker is used in inalienable possession, as shown in (19b). The inverse is not attested among the languages in my sample.

- (19) a. (*Gádbuŋu*) *anàŋga* *dám̄bun*  
 Gadbuŋu 3SG.M.POSS country  
 ‘Gadbungu’s country’  
 b. (*ari*) *amarlarr*  
 (man) 3SG.M.forehead  
 ‘the man’s forehead’ (Rumsey 1982: 70, 43)

## 2.5.2 Hypothesis (ii): possessor-marking in alienable and inalienable possession

This section discusses the relationship between alienable and inalienable possession in terms of possessor-marking. Like Table 3, Table 4 below shows how the different loci of marking, following the typology presented in Section 2.2.4, are distributed among the sample languages. Since hypothesis (ii) predicts that the marking of inalienable possession has a bearing on that of alienable possession (rather than the inverse, as in hypothesis (i)), the column with the loci of marking in inalienable possession is given first, followed by the column with the loci of marking in alienable possession. Other notational conventions are given in the legend below the table.

Table 4: The locus of alienable and inalienable possessive marking for hypothesis (ii)

Language	Inalienable possession	Alienable possession
Burushaski	PSR+PSM	PSR
Diegueño	PSR+PSM / PSR+PSM	PSR+PSM / PSM
Hittite	PSR+PSM	PSR
Icelandic	PSR	PSR
Inanwatan	PSR+PSM	PSR
Kharia	PSR+PSM / PSR+PSM	PSR
Krongo	PSR	PSR
Mangarayi	PSR+PSM	PSR+PSM
Nasioi	PSR+PSM	PSR
Nyulnyul	PSR+PSM / PSR	PSR
Puyuma	PSR+PSM	PSR+PSM
Skou	PSR+PSM / PSR+PSM / PSM	PSR+PSM
Tamashek	PSR+PSM	PSR
Tidore	PSR+PSM / PSM	PSR+PSM
Ungarinyin	PSR+PSM / PSM	PSR / PSR

Table 4: The locus of alienable and inalienable possessive marking for hypothesis (ii)

Language	Inalienable possession	Alienable possession
West Greenlandic	PSR+PSM	PSR+PSM / PSM
Bambara	∅	PSR
Bororo	PSM	PSR+PSM
Dogon	PSM	PSR / ∅
Drehu	∅	PSR
Ewe	∅	PSR
Gude	PSM	PSR
Hup	∅	PSR
Kunama	∅	PSR
Maltese	PSM	PSR
Mandarin Chinese <sup>24</sup>	∅	PSR
Ngiti	∅	PSR
Nyangumarda	∅	PSR
Paumarí	PSM	PSR+PSM / PSM
Sanuma	–	PSR / ∅
Urarina	∅	PSR
Koasati	PSM	PSM
Lango	∅	FLT
Macushi	∅	PSM
Nigerian Fula	PSM / ∅	∅
Slave	PSM / PSM / PSM / PSM	PSM / ∅
Udihe	PSM	PSM / PSM

Notes: PSR = possessor-marking, PSM = possessum-marking, PSR+PSM = marking of both possessor and possessum (in order to visually enhance the identifiability of possessor-marking, the order of possessor and possessum is also reversed), ∅ = no

<sup>24</sup> The presence of a formal alienability split in Mandarin Chinese is a debated issue, since the particle *de* (located with the possessor) can in principle be used for both alienable and inalienable possession. Following many other scholars (e.g. Dragunov 1960; Li & Thompson 1981; Egerod 1985; Tjee 1986), I have nevertheless treated Mandarin as a language with a formal distinction between alienable and inalienable possession, since the use of *de* correlates strongly with the lexical semantics of the possessum: while kinship terms, among other relational nouns, tend to occur without *de*, and almost never occur with *de* in combination with a first- or second- person possessor, concrete inanimate nouns such as *bèi* 'blanket' or *jìsuànjī* 'computer' clearly prefer the use of *de* (Chappell & Thompson 1992).

possessive marking, and FLT = floating-marking. A slash separates the use of multiple marking strategies and a dash indicates that sufficient data is lacking. Strategies that are (minimally) possessor-marking are given in light shading, while the strategies that are not (minimally) possessor-marking are given in darker shading. A double line separates the lighter and darker shaded strategies.

As can be seen from Table 4, my data confirms hypothesis (ii): languages that (minimally) mark the possessor in inalienable possession ('PSR' or 'PSR+PSM'), also (minimally) mark the possessor in alienable possession.<sup>25</sup> This outcome is visualized in Table 4 in the same manner as in Table 3: a thick double line separates the lightly shaded locus types, involving marking of the possessor, from the darkly shaded types, involving other loci of marking. Note that there are two languages, Diegueño and West Greenlandic, which mark the possessor in inalienable possession, but the possessum in alienable possession. These two languages could therefore be taken as counterexamples to the generalization in (ii): however, as Table 4 demonstrates, they additionally mark the possessor in alienable possession and thus confirm the generalization that if inalienable possession marks the possessor, alienable possession never marks only the possessum but always marks the possessor as well.

Interestingly, like the generalization in (i) (see Section 2.5.1), the generalization in (ii) also has a more specific counterpart: if in a language the possessor nominal in inalienable possession is marked by flagging (such as case markers or adpositions), the possessor nominal in alienable possession is marked by flagging as well. No language I know of uses, for instance, a genitive case marker on the possessor noun in inalienable possession, but not on the possessor noun in alienable possession. The inverse, however, happens quite commonly, as demonstrated by Amele (4) and Nyangumarda (5) in Section 2.2.2. Note, however, that most of the languages supporting this generalization additionally use an agreement marker (typically a bound one) on the inalienable possessum; as a result, both the possessor and the possessum are marked (Burushaski, Hittite, Kharia, Tamashek, Ungarinyin, and West Greenlandic in my sample). An example from Burushaski is provided in (23) in the next subsection. The flagging of an inalienable possessor nominal in the absence of person marking is cross-linguistically very rare. In addition to the sample languages Icelandic and Krongo, the few other languages with this type of marking outside the sample are Old French, spoken Faroese, Khinalug, Northern

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<sup>25</sup> This relation is statistically significant ( $p=0.027$ ) and moderately strong ( $CC=0.358$ ).

Pomo, and Polynesian languages such as Maori and Hawaiian (Nichols 1988: 577; Koptjevskaja-Tamm 2003; Stolz et al. 2008: 501–508).<sup>26</sup>

The marking of alienable and inalienable possession in Icelandic and Krongo is exemplified below. Icelandic (Indo-European, Iceland) employs a genitive case marker for alienable possession, as in (20a), but uses a preposition *á* plus a dative case marker for inalienable possession, as in (20b):

- (20) a. *álit barn-a-nn-a*  
 opinion child-GEN.PL-DEF-GEN.PL  
 ‘the children’s opinion’  
 b. *andlit-ið á Jón-i Bjarn-a*  
 face-DEF.N on Jón-DAT Bjarni-DAT  
 ‘Jón Bjarni’s face’ (Stolz et al. 2008: 145, 143)

Krongo (Kadugli, Sudan) uses two distinct possessive prefixes, the ‘possessive’ case marker *kà-* for alienable possession, as shown in (21a), and the ‘genitive’ case marker *mó-* for inalienable possession, as shown in (21b):

- (21) a. *còrì kà-káaw y-óǒǒŋ*  
 house POSS-person M-this  
 ‘this man’s house’  
 b. *nìinò mó-còrì*  
 mouth GEN-house  
 ‘the door/opening of the house’ (Reh 1985: 154, 315)

### 2.5.3. Locus of marking preferences in alienable and inalienable possession

The present section combines the results from Sections 2.5.1 and 2.5.2 in order to determine the overall locus of marking preferences in alienable and inalienable

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<sup>26</sup> Apart from Krongo and Icelandic, Nyulnyul is the only other sample language with possessor-marking in inalienable possession. However, in Nyulnyul, it involves the use of a free referential marker, i.e. an oblique pronoun (see footnote 7). Interestingly, Nyulnyul is the only sample language with a free person form in inalienable possession; most sample languages employ person markers that are bound to the inalienable possessum (see Section 2.5.5). A likely motivation for the absence of such markers in inalienable possession is the grammaticalization of free person forms into bound forms, a diachronic process termed ‘headward migration’ in Nichols (1986: 84–86; see also the next chapter of this thesis).



possession. The data presented in Tables 3 and 4 exhibit a number of common patterns in the locus of possessive marking. The first pattern involves the marking of (minimally) the possessor in alienable possession but of only the possessum in inalienable possession. Consider example (22) from Bororo (Bororoan, Brazil), where alienable possession (22a) is marked by a referential marker that cliticizes to the possessum, while inalienable possession (22b) is marked by an agreement marker affixed to the possessum:

- (22) a. (*Barae*)      *eno=moto*  
          Brazilians    3PL.POSS=land  
          ‘Brazil’ (lit. ‘Brazilians’ land’)
- b. (*Kuruiedi*)    *u-mana*  
          Kurueidi      3SG-older.brother  
          ‘Kurueidi’s older brother’ (Crowell 1979: 197, 215)

A second frequent pattern marks only the possessor in alienable possession but both the possessor and the possessum in inalienable possession. In Burushaski, for instance, possessors receive a genitive case suffix in alienable possession, as in (23a), while an additional agreement prefix appears in inalienable possession, as in (23b), repeated from (9a):

- (23) a. *Habaš-e*            *padša*  
          Abyssinia-GEN    king  
          ‘the king of Abyssinia’
- b. (*hir-e*)      *í-yas*  
          man-GEN 3SG.HUM.M-sister  
          ‘the man’s sister’ (Lorimer 1935: 69; Grune 1998: 5, p.c.)

Third, alienable possession may mark only the possessor while inalienable possession receives no possessive marking. For example, in Bambara (Western Mande, Mali) alienable possessors take a possessive postposition, as in (24a), which is absent in inalienable possession, as in (24b):

- (24) a. *mùso*      *ká*      *liburu*  
          woman    POSS    book  
          ‘the woman’s book’
- b. *mùso*      *fâ*  
          woman    father  
          ‘the woman’s father’ (Hewson 2014: 6)

Together, these patterns confirm the predictions, formulated in Section 2.3, that in alienable possession the possessor is more likely to be the locus of possessive marking than in inalienable possession, while in inalienable possession the possessum is more likely to be the locus of possessive marking, and that it more often lacks possessive marking when compared to alienable possession. This can be more clearly demonstrated on the basis of Table 5 below, which presents the distribution of the different locus of marking types (in the rows) over alienable and inalienable possession (in the columns) in the 37-language sample.

Table 5: Counts of locus of marking types in the 37-language sample

<b>Locus</b>	<b>Alienable possession</b>	<b>Inalienable possession</b>
<b>Possessor</b>	24	3
<b>Possessum</b>	8	15
<b>Possessor &amp; possessum</b>	8	17
<b>Neither psr nor psm</b>	4	12
<b>Total</b>	<b>44</b>	<b>47</b>

*Notes:* The abbreviations ‘psr’ and ‘psm’ refer to the possessor and the possessum, respectively. The totals are greater than 37 because some languages use more than one marking strategy for alienable and/or inalienable possession. This table thus presents counts of locus types in languages, not counts of languages per se. The floating marker in Lango is not taken into account in this table.

As Table 5 shows, the possessor in alienable possession is inherently more likely to be marked than the possessor in inalienable possession (32 of the 44 instances, i.e. 73%, and 20 of the 47 instances, i.e. 43%, respectively). Conversely, the possessum in inalienable possession is inherently more likely to be marked than the possessum in alienable possession (32 of the 47 instances, i.e. 68%, and 16 of the 44 instances, i.e. 36%, respectively).<sup>27</sup> Moreover, inalienable possession is more likely to lack possessive marking altogether when compared to alienable possession (12 of the 47 instances, i.e. 26%, and 4 of the 44 instances, i.e. 9%, respectively).<sup>28</sup> These asymmetries follow from the fact that possessors in alienable possession are not inherently presupposed by their possessum noun

<sup>27</sup> Both distributional patterns are statistically significant ( $p=0.006$  and  $p=0.003$ , respectively) and moderately strong ( $CC=0.291$  and  $CC=0.303$ , respectively).

<sup>28</sup> This pattern is not statistically significant, due to the fact that the absence of possessive marking is relatively uncommon in both types of possession compared to the use of overt means of possessive marking.

and, being functionally marked optional enrichments of their heads, are in greater need of possessive marking than inalienable possessors.

A closer look at the distribution of locus of marking types in Table 5 reveals an even stronger asymmetry between alienable and inalienable possession. Within the category of alienable possession, the preferred locus of marking is minimally the possessor. In fact, marking of the possessor only is by far the most common locus of marking strategy in alienable possession (24 instances). This is in line with the fact that alienable possessors are functionally marked optional additions to their head, which need to be identified as such and therefore attract possessive marking. By contrast, within the category of inalienable possession the preferred locus of marking is minimally the possessum. In this case, we do not find a clear preference for marking the possessum only: in fact, marking both the possessor and the possessum is slightly more common than marking the possessum only (17 vs. 15 instances, respectively). The fact that marking of possessor and possessum is commonly attested in inalienable possession is most notably due to the frequent use of a specific type of marking strategy, namely person markers that are referential on their own and are cliticized or affixed to the possessum noun. As demonstrated in Section 2.2.4, markers of this type index the possessum – and are therefore possessum-marking – but are also referential expressions of the possessor that carry the possessor role information – and are therefore possessor-marking.

### **2.5.4 Hypothesis (iii): the referential potential of (in)alienable possessive person marking**

In this section, I investigate the relationship between the referential potential of possessive person markers and the opposition between alienable and inalienable possession. Table 6 below presents the 13 languages of the sample (in the rows) that use referential markers and/or agreement markers for both inalienable possession and alienable possession (in the columns).

The thick double line in Table 6 shows that my data confirm hypothesis (iii): if in a language person markers of inalienable possession are referential in nature, person markers of alienable possession are also referential in nature.<sup>29</sup> These data in turn demonstrate that markers of alienable possession are

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<sup>29</sup> This relationship is not statistically significant, due to the small sample size (N=13). When tested on a larger sample of languages, as in Chapter 3, the data do reveal a statistically significant correlation.

Table 6: Referential marking and agreement marking in 13 languages of the sample

Language	Inalienable possession	Alienable possession
Diegueño	REF / REF	REF
Nasioi	REF	REF
Nyulnyul	REF / REF	REF
Puyuma	REF	REF
Skou	REF / REF	REF
Tidore	REF	REF
Ungarinyin	REF / AGR	REF
Bororo	AGR	REF
Paumarí	AGR	REF
Koasati	AGR	AGR
Udihe	AGR	AGR
West Greenlandic	AGR	AGR
Mangarayi	REF	AGR

Notes: REF = referential marker and AGR = agreement marker. Referential markers are given in light shading and agreement markers are given in darker shading. A double line separates the lighter and darker shaded strategies.

inherently more likely to be referential in nature than markers of inalienable possession in individual languages. Like the generalizations in (i) and (ii) above, this finding can be attributed to the fact that possessors in alienable possession are mere optional additions to their head and therefore in greater need of a referential expression than possessors in inalienable possession.<sup>30</sup> This finding is also in keeping with the greater need for possessor-marking in alienable possession compared to inalienable possession (as discussed in the previous

<sup>30</sup> An additional motivation for the weaker referential status of inalienable than alienable person markers is the higher contextual salience of inalienable possessors compared to alienable possessors. As demonstrated by Dahl and Koptjevskaja-Tamm (1998: 43–44), inalienable possessors are usually highly predictable from the discourse context, which reduces the need for a referential marker. Diachronically, the weaker referential status of inalienable person markers can be attributed to their high degree of grammaticalization; as demonstrated in Chapter 3, the grammaticalization of possessive person markers involves not only a formal development from free to bound, but also a functional development from more to less referential.

subsection), since referential markers are possessor-marking; they are referential instantiations of the possessor carrying the (possessor) role information.<sup>31</sup>

One counterexample to the generalization in (iii) is Mangarayi (Australian, Australia) (bottom row of Table 6). This language uses one set of prefixes in both alienable and inalienable possession that is referential in the former, but expresses agreement in the latter; see (25a) and (25b), respectively:

- (25) a. (*ŋa-buɓuŋ-gu*)                      *ø-baŋam-ŋawu*  
           GEN.M-old.person-GEN.M    ABS.N-camp-3SG.NF.POSS  
           ‘the old man’s camp’
- b. (*landi*)    *jurgjurg-ŋawu*  
           tree        leaf-3SG.NF.POSS  
           ‘the leaves of a tree’ (Merlan 1982: 66, 74)

In Mangarayi, alienable possession (25a) and inalienable possession (25b) each receive the same possessive suffix, which expresses possessor role information in both NPs. However, only possessors in alienable possession additionally take a genitive case affix. As a result, only the marker in (25a) warrants an agreement analysis, since it can copy the relevant information – more specifically possessor role information – from the possessor nominal. In (25b), however, the possessor nominal does not provide role information, and therefore cannot be the source of this information on the possessive person marker. The marker is correspondingly analyzed as a referential marker. Note, however, that despite being a counterexample to the generalization in (iii), Mangarayi behaves as expected in terms of locus of marking: both alienable and inalienable possession mark both the possessor and the possessum, and are thus covered by the generalizations in (i) and (ii).

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<sup>31</sup> Interestingly, the possessive person markers investigated in this study show a greater preference for the expression of possessor role information in alienable possession than in inalienable possession, independently of the referential/agreement opposition. In fact, there is no language in my sample in which the inalienable person forms carry role information while the alienable person forms do not, while the inverse is attested quite frequently. This observation yields an interesting generalization open to further study: if inalienable possessive person markers carry possessor role information, alienable possessive person markers carry such information as well. Like the findings of this study, this generalization can be explained in terms of the inherent relationality of inalienable possessum nouns, which nullifies the need for possessor role marking as compared to alienable possessum nouns.

The data in Table 6 points to an additional interesting observation. Although markers of inalienable possession are inherently less likely to be referential in nature than markers of alienable possession, inalienable possession shows a preference for the use of referential markers when considered in its own right (8 languages with referential markers vs. 6 languages with agreement markers).<sup>32</sup> A possible explanation for the fact that inalienable possession prefers referential markers may be sought in the low contextual salience of possessors in comparison to other dependents, such as verbal arguments. Following Keenan and Comrie's (1977) accessibility hierarchy and subsequent work by Givón (1983) and Ariel (1990), possessors can be said to be less contextually salient and therefore less accessible in the mind of the hearer than (subject and object) arguments of verbs. This may trigger the need for a more salient means of referent tracking in the form of a referential marker, a person marker that instantiates the possessor dependent and overtly marks its possessor role. The use of referential markers in inalienable possession may thus serve a pragmatic function, although in semantic terms there is little need for their use in inalienable possession.

### **2.5.5 Locus and type of marking in alienable and inalienable possession**

In this final subsection, I compare locus of marking (as discussed in Sections 2.5.1. to 2.5.3) to type of marking by presenting the distribution of the different types of marking strategies (flagging, referential marking, and agreement marking) in terms of their locus in the 37 languages of the sample. Table 7 presents this distribution. It partly repeats Table 5 of Section 2.5.3, but additionally presents the item(s) representing each locus (in the second column) and the type of marking strategy of each locus (in the third column).

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<sup>32</sup> This only applies to the 13 languages in the sample with person marking of both alienable and inalienable possession, as given in Table 6. When additionally taking into account the 6 sample languages that only use person markers in inalienable possession, the data reveal that 11 of the 19 sample languages (i.e. 58%) employ agreement markers, which demonstrates a general preference for the use of agreement markers in inalienable possession.

Table 7: Counts of loci of marking and their marking strategies in the sample

Locus	Representation	Marking strategy	Alienable possession	Inalienable possession
Possessor	Noun	Flagging	21	2
	Referential marker	Flagging	3	1
Possessum	Noun	Flagging	6	9
		Agreement marker	2	6
Possessor & possessum	Noun <sup>(psr)</sup> & Noun <sup>(psm)</sup>	Flagging <sup>(psr)</sup> & agreement marker <sup>(psm)</sup>	2	6
	Referential marker <sup>(psr)</sup> & noun <sup>(psm)</sup>	Flagging <sup>(psr)</sup> & referential marker <sup>(psm)</sup>	6	11
Neither psr nor psm	–	irrelevant	4	12
<b>Total</b>			<b>44</b>	<b>47</b>

*Notes:* The locus type ‘possessor & possessum’ specifies – between brackets – the items representing each locus (in the second column) and the marking strategy that each item takes (in the third column). The abbreviations ‘psr’ and ‘psm’ refer to the possessor and the possessum, respectively. The totals are greater than 37 because some languages use more than one marking strategy for alienable and/or inalienable possession. This table thus presents counts of locus types in languages, not counts of languages per se. The floating marker in Lango is not taken into account in this table.

Table 7 points to the following preferences of locus of marking, repeated from Table 5 above: a predominance for marking (minimally) the possessor in alienable possession (32 of 44 instances, i.e. 73%) and for marking (minimally) the possessum in inalienable possession (32 of 47 instances, i.e. 68%). More specifically, alienable possession shows a clear preference for possessor-marking only (24 of 44 instances, i.e. 55%). Inalienable possession does not show a preference for possessum-marking only; the marking of both possessor and possessum is most common (17 of 47 instances, i.e. 36%) though the difference with possessum-marking only is minimal (15 of 47 instances, i.e. 32%). As can be seen as well, the fact that both the possessor and the possessum are frequently marked in inalienable possession is above all due to the common use of referential markers on the inalienable possessum (10 instances).

As the data in Table 7 reveals, the locus of marking preferences in the languages of the sample correlate strongly with a preference for a particular marking strategy. Marking the possessor in alienable possession typically involves flagging, i.e. the use of case markers, adpositions or other invariant markers, of the possessor nominal (21 instances). Only three sample languages

mark the possessor through flagging, i.e. by role marking, on the referential marker; an example is Ungarinyin (see (19a) in Section 2.5.1). Interestingly, the inverse asymmetry is attested for languages that mark the possessum in inalienable possession; this typically involves the use of (referential/agreement) markers (23 instances), rather than the use of flagging (9 instances). Different marking strategies thus prefer different loci and the type of loci they prefer depends on the type of dependency relation in the possessive NP: those containing argument possessors (inalienable possession) or those containing modifier possessors (alienable possession).

In sum, the data presented in this section show a preference for alienable possession to mark the possessor and to do so by means of flagging the possessor nominal, while inalienable possession prefers the marking of the possessum and does so by means of person marking. These preferences yield two generalizations for locus of marking in possessive NPs: (i) languages that mark the possessum in alienable possession also mark the possessum in inalienable possession, and (ii) languages that mark the possessor in inalienable possession also mark the possessor in alienable possession. Both findings follow from a need to mark the possessor in alienable possession: these possessors are not inherent in the semantics of their possessum noun and are thus in need of marking as functionally optional modifiers (unlike inalienable possessors, which are inherent to the meaning of the possessum and thus behave as arguments). In addition, it was shown that there is a relationship between the referential potential of possessive person markers and the opposition between alienable and inalienable possession: (iii) if in a language person markers in inalienable possession are referential in nature, person markers in alienable possession are referential in nature as well. This tendency demonstrates a greater need for alienable possessors to receive a referential expression than inalienable possessors, which follows from the fact that the former are not inherent to their possessum noun, unlike the latter. The next section discusses how these findings relate to previous work on possessive marking and its locus.

## 2.6 Comparison with previous work on possessive marking

The two generalizations (i) and (ii) identified in Section 2.5.1 and 2.5.2 support earlier generalizations most prominently put forward by Nichols (1986, 1988, 1992; see also already Lehmann 1983: 362–365). As Nichols (1992: 122) notes, “zero-marking is normally restricted to inalienable possession, whereas alienable possession requires overt marking” and “inalienables take marking that is more



nearly head-marking or less dependent-marking than the marking of alienables” (Nichols 1992: 117). Nevertheless, the findings of this study go beyond those of previous work in two important respects.

In the first place, I have shown that patterns of locus of marking are constrained by an opposition between two types of possessive dependency relations: inalienable possessive relations involving argument possessors and alienable possessive relations involving modifier possessors.<sup>33</sup> Nichols does not recognize this semantic opposition, nor its relevance with respect to locus of marking. In fact, she argues that (in)alienable possession is “not primarily a semantic distinction, but the automatic consequence of the closer formal bonding [between possessor and possessum] that results in head-marked possession: inalienables ... are most likely to occur possessed in discourse, and the formal marking of inalienability simply grammaticalizes that possession” (Nichols 1992: 121).

Other authors do not so much look at locus as they do, more generally, at the differences between the expression of alienable and inalienable possession. Their work nevertheless has a bearing on the results presented in this paper. Haspelmath (2008a: 19–22) adopts a view similar to Nichols’, arguing that, across languages, kinship terms and body part terms tend to occur with a possessor significantly more often than non-relational nouns. This makes the former type of possessive relationship more predictable to the hearer and therefore less susceptible to possessive marking. This frequency-based explanation of (in)alienable marking patterns contrasts with an earlier explanation proposed by Haiman (1983: 793–795, 1985: 130–136), which relies on principles of iconicity. According to Haiman (see also Croft 2008), kinship terms and body part terms are conceptualized as being in a closer relationship with their possessors than other types of nouns, due to their inherent relationality. This, in turn, allows the speaker to reduce possessive marking of relationships

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<sup>33</sup> Note, however, that I do not claim this opposition in dependency relations to be the sole motivation of the locus of marking patterns identified in this study. Since kinship and body part terms need not all be treated as inalienable nouns and concrete inanimate countable items need not all be treated as alienable nouns in individual languages (see Section 2.4.2), other factors are expected to play a role in the distribution of alienable/inalienable possessive coding as well. This paper nevertheless demonstrates that a universal semantic opposition between modifiers and arguments is an important motivating factor in the locus of possessive marking across individual languages.

involving such inherently relational items.<sup>34</sup> The view put forward in this paper combines both explanations. Like Haspelmath (but unlike Haiman), I argue that patterns of possessive marking are to a high degree motivated by economy, resulting from the predictability of possessors in inalienable possession for the hearer (see Haspelmath 2008b: 60). However, like Haiman (but unlike Haspelmath), I recognize that this predictability follows directly from the semantic properties of the relational noun rather than from the relative frequency with which such nouns occur possessed in discourse. As demonstrated in Section 2.2.3 for Tidore (7), the extent to which (contextually given) possessors are overtly expressed varies greatly per language. In fact, it may well be that argument possessors are more likely to undergo such context-induced omission than modifier possessors, since they are highly salient from the discourse context (cf. footnote 29). The type of frequency asymmetry argued for by Haspelmath is highly sensitive to such language-specific factors. The fact that an argument possessor needs to be (contextually) specified is nevertheless inherent to the semantics of the possessum and thus applies cross-linguistically. Moreover, this study recognizes that the modifier/argument opposition, as reflected by splits in alienable and inalienable possession, not only pertains to the possessive NP but also to many other types of dependency relations, such as NPs containing attributive adjectives, adpositional phrases, and grammatical relations in clauses.

Second, this study shows that possessor-marking cannot be collapsed with case marking or other means of flagging and that possessum-marking cannot be collapsed with agreement marking; these are parallels drawn in traditional head/dependent-marking grammar that have been frequently criticized (e.g. Haspelmath 1993: 496; Siewierska 1994: 149). By making a systematic distinction between referential markers and agreement markers, it has been demonstrated that possessor-marking can also occur in the form of person markers, namely in languages where the marker is a referential expression of the possessor itself and carries the (possessor) role information. Similarly, it has been shown that

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<sup>34</sup> Haiman and Haspelmath originally used iconicity and economy, respectively, not so much to predict locus of marking but to account for the decreasing 'linguistic distance' between relational nouns and their possessors, as compared to non-relational nouns and their possessors. The notion of linguistic distance refers to the presence versus absence, and the free versus bound status, of possessive markers. These contrasts nevertheless strongly correlate with the locus of marking patterns identified in this paper: the marking of inalienable possession typically involves either a bound person marker on the possessum or is zero, while alienable possession typically receives overt marking of the possessor.

possessum-marking need not involve agreement marking but may also involve referential marking. In fact, many sample languages employ referential markers that are cliticized or affixed to the possessum noun. Moreover, the opposition between referential marking and agreement marking has been shown to correlate with the distinction between alienable and inalienable possession (Section 2.5.4).

Importantly, the common use of referential clitics or affixes on the possessum noun across the languages of the sample demonstrates that in many of Nichols' head-marking languages, possessive person markers do not in fact express agreement but represent the possessor, i.e. the dependent, themselves. As demonstrated in this paper, referential markers are possible loci of marking in that they carry the marker(s) expressing the possessive dependency relation in the same way as (pro)nouns carrying genitive case markers or adpositions in traditional dependent-marking languages. Thus, from a semantic perspective, dependent-marking may also occur on heads. Although similar observations have been made with respect to verbal indexing (Kibrik 2012; Haspelmath 2013a), this study is the first to systematically investigate the issue in a worldwide sample of languages, focusing on possessive NPs.

## 2.7 Conclusions

This paper takes a semantic approach to the typological parameter of locus of marking, applying it to (in)alienable possessive NPs in a worldwide sample of 37 languages. The approach has two main features. On the one hand, it recognizes that cross-linguistic patterns of locus of marking reflect a basic split between two semantic types of possessive dependency relations: inherently relational nouns that take possessors behaving as arguments versus inherently non-relational nouns that take possessors behaving as modifiers. On the other hand, it integrates a novel typology of possessive person markers in terms of reference and agreement, proposed by Hengeveld (2012) for the verbal domain and here applied to the possessive NP. This typology provides a refinement of Nichols' analysis of possessive person markers as well as of other models of person marking, such as Siewierska's (1999, 2001, 2004), by drawing a distinction between referential markers and agreement markers on the basis of the distribution of grammatical feature information in the language and the construction in question. This approach is supported by recent work (Fedden et al. 2013; Witzlack-Makarevich & Iemmolo 2013), which demonstrates that

person markers show highly language-specific and construction-specific behavior.

This study specifically identified three cross-linguistic tendencies in (in)alienable possessive marking. The first two are patterns of locus of marking, and are given in (i) and (ii):

- (i) If a language marks the possessum in alienable possession, it also marks the possessum in inalienable possession.
- (ii) If a language marks the possessor in inalienable possession, it also marks the possessor in alienable possession.

Both tendencies reflect a strong preference for languages to mark the possessor in alienable possession and to mark the possessum in inalienable possession. Both preferences can be explained by the opposition between argument possessors and modifier possessors, which follows from the semantics of their respective possessum nouns: while argument possessors fill the argument slot provided by the relational noun, modifier possessors merely provide a further semantic characterization of the non-relational noun, and are thus functionally marked optional enrichments of their heads. As a result, modifier possessors are less predictable to the language user than argument possessors, which is in turn reflected in a greater need of modifier possessors for possessive marking as compared to argument possessors.

The third tendency identified in this study demonstrates a relationship between alienable and inalienable possession in terms of the referential potential of possessive person markers. As the typology of referential/agreement markers in this paper reveals, possessive dependency relations are marked with person forms of varying degrees of referential potential, and the referential potential of a person marker constitutes an independent typological parameter that interacts with the parameter of locus of marking. The following tendency in referential potential has been identified in this study:

- (iii) If in a language person markers of inalienable possession are referential in nature, person markers of alienable possession are referential in nature as well.

This tendency captures the fact that person markers used in alienable possession are inherently more likely to be referential in nature than those used in inalienable possession. This finding follows from the fact that since modifier

possessors are functionally optional modifiers, they are in greater need of a referential expression that identifies their possessor role than argument possessors. Referential markers fulfill exactly this function.

Finally, it has been demonstrated that there is an interesting relationship between locus of marking and the type of marking strategy that languages use: whereas possessor-marking typically is achieved by flagging the possessor nominal, usually by means of case markers or adpositions, possessum-marking typically occurs on the basis of person marking, i.e. (referential/agreement) markers that express the person (and often number/gender) of the possessor nominal with the possessum.

An interesting matter for future research is to examine how possessors relate to other arguments and modifiers, such as verbal arguments, adpositional arguments, and attributive adjectives, in terms of flagging versus indexing, and referential marking versus agreement marking. Another promising future enterprise is to uncover and compare the range of factors determining differential patterns of marking in these different grammatical domains. The typology presented in this paper provides a suitable framework for pursuing these aims.



## 3

## The grammaticalization of possessive person marking: A typological approach<sup>1</sup>

### Abstract

This study focuses on the grammaticalization of agreement markers from possessive pronouns, which has two different dimensions: loss of referentiality (function) and loss of morpho-phonological independence (form). I examine the referential potential and formal expression type of possessive person markers in a worldwide sample of 39 languages with an alienability distinction. Referential potential is measured independently of expression type by applying a new typology of person markers. First, I demonstrate that inalienable possessive marking is at least as referential and formally independent as alienable possessive marking, and often less referential and less independent. Unlike explanations in terms of frequency and iconicity, I argue that this asymmetry is essentially semantics-based: the presence of a possessive relationship is inherent to the meaning of the inalienable noun, which is therefore in less need of expressive marking than alienable nouns. Second, I show that loss of referentiality correlates with loss in form, but in a relative rather than an absolute sense: in individual languages, higher referential markers never show a greater degree of bonding with the possessum than lower referential markers. These results suggest that function and form evolve in the same direction, but need not evolve at the same pace.

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<sup>1</sup> This chapter appeared in *Transactions of the Philological Society*. The full reference for the article is: Van Rijn, Marlou. 2016. The grammaticalization of possessive person marking: A typological approach. *Transactions of the Philological Society* 114(2). 233–276. A number of modifications have been made to the chapter relative to the published article. First, Table 6 and 7 are published as part of an appendix but are given in the main text below. The total number of counts in Table 7 is not 61 but 77. Second, Nasioi was excluded from the published article but is included in this thesis, since it employs a combination of alienable and inalienable appositional referential (AR) markers. This raises the number of AR markers in Table 3 (Section 3.5.1.1) from 19 to 20 and the total number of combinations from 69 to 70. Third, the data contains not 11 but 13 contextual agreement markers that co-occur with possessor nouns, as shown in Table 5 (Section 3.5.4). This raises the total number of markers from 115 to 117. None of these modifications affect the results of the study.

### 3.1 Introduction

A well-studied grammaticalization process is the development of bound agreement markers from independent pronouns.<sup>2</sup> Most studies on this development focus on subject and object agreement markers on verbs (Givón 1976; Mithun 1986, 1991b, 2003; Siewierska 1999; Ariel 2000; Fuß 2005). However, agreement also obtains in other grammatical domains, a cross-linguistically frequent one being the possessive noun phrase. Possessive pronouns may develop into agreement markers much in the same way as subject/object pronouns do. Both types of developments are typically assumed to follow the grammaticalization cline in (1) below (see e.g. Lehmann 1982b: 39–42, 1988: 59–61; Hopper & Traugott 1993: 15; Fuß 2005: 4):

- (1) independent pronoun  
     > weak pronoun  
         > clitic pronoun  
             > affixal agreement marker  
                 > fused agreement marker  
                     > Ø

According to this cline, phonological erosion may turn an independent pronoun into a weak form, and subsequently into a clitic that attaches to the possessed noun (henceforth *the possessum*). Further loss of morpho-phonological substance causes the clitic to develop from a pronoun to a marker of agreement. While the former is traditionally considered to be a referential expression of the possessor, the latter is generally believed to lack any referential potential, as it only redundantly expresses features, such as person, number, gender and (genitive) case, in agreement with the possessor on the possessum.<sup>3</sup> The agreement marker eventually fuses with the possessum before disappearing altogether.

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<sup>2</sup> But note that independent pronouns are by no means the only diachronic source of agreement marking (cf. Heine & Song 2011 for an overview).

<sup>3</sup> This paper focuses solely on markers expressing possessor features (such as person, number and gender) for which the shorthand term *person marker* is used. Agreement markers may alternatively express features (such as number and/or gender) of the possessum on the possessor, but such markers are not attested in languages with a distinction between alienable and inalienable possession (Lehmann 1983: 362) and are therefore not considered in this paper.



A presumed major factor in this development is the presence of an opposition between alienable and inalienable possession (Nichols 1988: 579, 1992: 117–122; Dahl 2004: 152; Haiman 1983: 793–795; Haspelmath 2008a: 15–16, 18–22). This opposition involves the use of dedicated possessive marking for nouns that are inherently related to their possessors, like kinship terms and body part terms (inalienable), versus nouns that are not (alienable). The opposition is generally assumed to develop in two ways: markers of inalienable relations progress further down the cline in (1), leaving markers of alienable relations behind (Nichols 1988: 589), or new alienable constructions arise on the left end of the cline, leaving the old possessive morphology to mark inalienable relations (Dahl & Koptjevskaja-Tamm 1998: 48). The result of the two diachronic scenarios is the same: cross-linguistically, inalienable possessive marking tends to be more grammaticalized, i.e. located further rightwards on the cline in (1), than alienable possessive marking.

It is argued here that the major problem with the cline in (1) is that it collapses developments along two different dimensions: a loss of referentiality, i.e. the functional transition of a referential pronoun to a marker of agreement, and a loss of morpho-phonological independence, i.e. the formal transition of a separate word to a fusional form via affixation and cliticization. Although it is widely presupposed that both dimensions tend to go hand in hand, a claim sometimes referred to as the ‘parallel path hypothesis’ (Bakker & Siewierska 2009), they are at least in principle independent of each other (see also Bisang 2004 and Narrog 2009: 697, 2012: 107–109). This has been demonstrated most clearly for the domain of verbal person marking. On the one hand, there are languages with so-called ‘pronominal affixes’ (Corbett 2003, 2006) or ‘bound/incorporated pronouns’ (Mithun 1991b; Kibrik 2011: 92–104; Bresnan 2001: 144): person markers that function as free pronouns, in that they can be used independently, like English *he*, but that formally resemble agreement markers, in being affixed to the verb, like English *-s*. Such person forms have received much attention in the literature, due to their common use among the world’s languages (Siewierska 1999: 238). On the other hand, there are markers that have the form of independent pronouns, but that function as bound agreement markers. An example is the set of clitics coding (main clause) subjects in Skou (Skou, Indonesia; Donohue 2004: 238, see also Corbett 2006: 75–76 and Hengeveld 2012: 475). Both types of person markers represent an intermediate stage in the development of free pronouns to bound agreement markers, which is not captured by the cline in (1). The rise of such forms can only be accounted for when referential potential (function) and expression type (form) are

represented as individual pathways along which person markers may mature over time. The present paper does precisely this.

This paper pursues two goals. First, it investigates the widely held claim that inalienable possessive person marking shows a higher degree of grammaticalization than alienable possessive person marking, for the functional dimension and the formal dimension in isolation. To this end, I study the referential potential and formal expression type of possessive person markers in a worldwide sample of 39 languages with a distinction between alienable and inalienable possession. The degree of referential potential of individual person markers is determined on the basis of a four-part typology, proposed by Hengeveld (2012). The major advantage of this typology is that it straightforwardly accounts for person markers 'in between' free pronouns and bound agreement markers, such as those mentioned above. The referential potential of such markers is determined by considering the distribution of (grammatical) feature information between the possessive person marker on the one hand and the co-occurring possessor (pro)noun on the other.

The second aim of this study is to investigate to what extent loss of referentiality correlates with reduction in morpho-phonological form. The relationship between functional and formal changes has been the subject of much debate in the literature. As mentioned above, the dominant position within grammaticalization theory is that both types of changes will tend to coincide. Although there is disagreement as to the presence and nature of a causal relationship, it is generally believed that an item will lose formal independence as a result of a gradual loss or shift in meaning, often mediated by an increase in usage frequency (e.g. Givón 1975: 96; Bybee et al. 1994: 20; Heine 1994: 269; Haspelmath 1999: 1050). Thus, functionally more grammaticalized markers are expected to also be formally more grammaticalized (e.g. Givón 1984: 416; Lehmann 1982a: 236; Dahl 2001: 118; Siewierska & Bakker 2005).

In this paper, I investigate the relationship between function (referential potential) and form (expression type) for the possessive person markers in the 39 languages in my sample. I test the hypothesis that, in any language with two or more sets of possessive person markers, markers of a lower degree of referentiality never have a more independent expression form than markers of a higher degree of referentiality. This hypothesis expects function and form to develop in parallel, but is more specific than the parallel path hypothesis in two respects. On the one hand, it does not preclude the possibility of highly referential markers that are formally bound (i.e. so-called 'pronominal affixes' or 'bound/incorporated pronouns') or less referential markers that are formally independent (as the subject clitics in Skou). Hence, the relationship between

function and form is expected to be relative, rather than absolute. From a diachronic perspective, this means that function and form are expected to develop in the same direction, but not necessarily at the same pace. On the other hand, my hypothesis not only predicts an asymmetry in the expression of more or less referential markers across languages, but also within languages, which presupposes a much stronger relationship between function and form than the parallel path hypothesis.

The paper is organized as follows. Section 3.2 provides the theoretical background for the study. In Section 3.2.1, I first discuss the semantic opposition between inherently relational and inherently non-relational nouns, which underlies distinctions in the expression of (in)alienable possession. I also illustrate the cross-linguistically most common types of alienability contrasts, and discuss the necessity of separating function and form in accounting for their diachronic development. The functional development of possessive person markers, following the four-part typology of referential markers and agreement markers by Hengeveld, is discussed in Section 3.2.2. Section 3.3 in turn presents the three hypotheses tested in this study. The 39-language sample on which these hypotheses are tested, and the types of possessive NPs and person markers taken into account are presented in Section 3.4. The results of testing each hypothesis are discussed in Section 3.5. In this section, I also propose an explanation for the findings building on the inherently relational and inherently non-relational nature of possessums. I conclude with a summary and directions for further research in Section 3.6.

## 3.2 Theoretical background

### 3.2.1 The inherently (non-)relational nature of possessed nouns

Following much previous work (e.g. Seiler 1983a; Lehmann 1985; Barker 1995; Taylor 1996; Partee 1997 and Partee & Borschev 2003), this paper starts from the observation that languages distinguishing alienable and inalienable possession grammaticalize a semantic opposition between two types of nouns: those encoding concepts that are inherently relational, and those encoding concepts that are not. Nouns of the former type by their nature presuppose a relationship to a possessor. At least two types of nouns fit this semantic profile: kinship terms and body part terms. Part of the meaning of nouns such as ‘father’ or ‘leg’ is their relationship to another entity. Moreover, while a phrase such as *John’s father* is normally interpreted as involving an inherent relationship between two

individuals, a phrase such as *John's leg* is normally interpreted as denoting the inherent part of one's body.<sup>4</sup> Both the presence and the semantic interpretation of the possessive relationship are thus inherent to the meaning of the relational noun.

Based on these semantic properties, languages may reserve special morphosyntactic treatment for a distinct class of nouns. This is traditionally referred to as the opposition between alienable and inalienable possession. As is widely known, the precise composition of the class of inalienable nouns varies from language to language (Chappell & McGregor 1996: 9; Heine 1997: 174; Stolz et al. 2008: 38–40). In addition to kinship and body part terms, individual languages often include spatial nouns, other parts of wholes, culturally basic items and property nouns such as 'beauty' or 'strength' in their class of inalienable nouns (cf. Nichols 1988: 572, Nichols & Bickel 2013b). Despite this cross-linguistic variation, however, a set of kinship terms and/or body part terms is always part of any inalienable class (see also Haiman 1985: 136 and Chappell & McGregor 1989: 26). Moreover, these terms are also the most clearly inherently relational in terms of their lexical semantics, and are therefore the relational items focused on in this study (for further discussion, see Section 3.4.2).<sup>5</sup>

Nouns encoding kinship and body parts are often likened to verbs and adpositions as items with an argument structure (or valency): each may be conceived of as opening up a semantic argument position, and determining the semantic (and syntactic) relationship with items filling this position (e.g. Seiler 1983a: 11–13). As demonstrated in the next subsection, this argument position can be filled by an NP, i.e. a lexical noun or an independent pronoun, a person marker or both. The extent to which either of such items is obligatorily expressed varies extensively cross-linguistically. In many of the world's languages, relational nouns are obligatorily affixed with a possessive person marker, while the expression of the possessor NP is optional (so-called 'obligatorily possessed nouns', Bickel & Nichols 2013). Other languages do not require an expression of the possessor altogether, such as Tidore (West Papuan, Indonesia; Van Staden

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<sup>4</sup> In principle, a phrase such as 'John's leg' could alternatively be interpreted as referring to a leg detached from John's body, or to a leg of an animal that John is eating or that John has caught, for instance. In practice, however, such alienable interpretations occur only in certain pragmatic contexts, and are therefore far less natural (cf. the study by Lichtenberk et al. (2011) discussed below).

<sup>5</sup> Some languages show further variation in their class of inalienable nouns in that only a subset of kinship and/or body part terms is treated inalienably. For examples and a discussion of the methodological treatment of such languages in the present paper, I refer the reader to Section 3.4.2.

2000), exemplified in the next subsection. Thus, the fact that possessors of nouns such as kinship terms and body part terms are semantically obligatory, as presupposed by the meaning of the noun, is independent of whether such possessors are obligatorily expressed in individual languages.

Non-relational nouns encode concepts that do not entail the presence of a possessor, and therefore lack an inherently relational meaning. A possessive relationship is not inherent to such nouns, but must be established, via the presence of a possessor (Seiler 1983a: 62). This possessor merely provides a further characterization of the possessum, restricting the reference of the possessum to a specific (subset of) item(s). Typical examples of non-relational nouns are concrete (inanimate), countable objects, such as ‘book’, ‘chair’, ‘basket’ or ‘pot’. Since nouns of this type do not presuppose an inherent relationship to a possessor, the possessive relationship may receive a range of different interpretations. Examples include legal ownership (*John’s car*, the car that John owns), but also location (*the house’s garden*, the garden near the house) and control (*Mary’s employees*, the employees Mary is responsible for) (cf. Seiler 1983a: 40–41; Koptjevskaja-Tamm 2004). This semantic behavior parallels that of attributive adjectives, relative clauses and other noun modifiers (Nikolaeva & Spencer 2013).

Many of the world’s languages, such as English, do not overtly express the opposition between relational and non-relational nouns in possessive NPs.<sup>6</sup> Interestingly, the opposition nevertheless has cognitive reality in speakers of such languages, as demonstrated by Lichtenberk et al. (2011). They show that the interpretation of possessive NPs by speakers of English strongly depends on whether or not the possessed noun is inherently relational. Phrases with inherently relational nouns, such as ‘my child’, tend to yield the interpretation inherent to the meaning of the noun, i.e. the possessor’s own child, not someone else’s child. Phrases with inherently non-relational nouns, however, are open to various interpretations, among which prototypical ownership, location and control, as illustrated above. These findings demonstrate that while inherently

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<sup>6</sup> The opposition may nevertheless have a syntactic correlate. In English, for instance, only nouns denoting non-relational concepts can normally function as subjects of a possessive predicate: compare *that book is John’s* to (?)*that leg is John’s*. The latter clause is typically acceptable only when the noun is possessed in an alienable manner, e.g. when referring to a detached leg or to a leg that inherently belongs to someone or something else. As pointed out by one of the referees, inalienable interpretations of the clause are possible in principle (e.g. in the context of a photograph depicting only a person’s legs), but highly unusual. Other examples are given in Partee (1997: 464), Van Valin and LaPolla (1997: 19) and Tsujiojka (2002: 115–117).

relational nouns yield one highly salient relationship to their possessor (i.e. the relationship inherent to their meaning, cf. footnote 4), no such salient relationship exists when the noun is inherently non-relational, and a variety of relationships are freely available. This in turn provides clear support for the distinction between inherently relational and inherently non-relational nouns described above, as well as its cross-linguistic relevance, even in languages without a formal alienability split.

In this paper, I focus solely on languages that, unlike English, make a formal distinction between alienable and inalienable possession in possessive NPs. This distinction is fairly common everywhere except in Eurasia and South-East Asia (Nichols & Bickel 2013b) and is generally assumed to develop via two diachronic routes, as briefly discussed in the introduction to this paper. The first route involves the innovative phonological reduction and morphological bonding of the possessor pronoun with alienable nouns, but not with inalienable nouns. In Nyulnyul (Australian, Australia), for instance, prefixes on body part nouns, such as *nga-* (1<sup>st</sup> person singular), *ya-* (1<sup>st</sup> person dual inclusive), *kurr-* (2<sup>nd</sup> person plural) and *irr-* (3<sup>rd</sup> person plural), derive historically from free pronouns, *ngay*, *yay*, *kurr* and *irr* respectively (see McGregor 1996: 272–278 for further discussion).

The second route involves the creation of a new construction for alienable possession, which typically happens on the basis of a demonstrative (Eksell Harning 1980: 19; Schuh 1983: 182–184), an invariant element expressing location or goal (Heine 1997: 144) or a lexical item meaning ‘possession’ or ‘thing’ (Eksell Harning 1980: 19, 24). Crucially, the new construction is not extended to inalienable possession, which continues to use the old, typically bound possessive morphology. This development is well documented for a number of Afro-Asiatic languages, such as Maltese, in which the possessive pronoun marking alienable possession consists of the inalienable possessive suffix combined with the preposition *ta’* ‘of’ (Koptjevskaja-Tamm 1996).

Both diachronic pathways contribute to the following cross-linguistic pattern: inalienable possession never shows a greater degree of linguistic distance than alienable possession (Haiman 1983: 793–795, 1985: 130–136). Two types of explanations have been offered for this pattern, to which I will return in Section 3.5.3. The important point here is that the notion of linguistic distance (and the related notion of cohesion, see Haspelmath 2008a) collapses three types of alienability contrasts, which are actually the result of distinct processes of grammaticalization: (i) overt possessive coding vs. lack of possessive coding, (ii) juxtaposition vs. bound expression and (iii) separably analyzable vs. portmanteau expression. Each contrast is briefly exemplified below.

The first contrast relates to the fact that the possessive relationship in the NP tends to be overtly specified only in alienable possession. Coding of this relationship usually takes the form of case affixes or adpositional marking. An example is provided for Nyangumarda (Australian, Australia) below, where the possessor takes the genitive case suffix *-mili* in alienable possession, as in (2a), while the possessor remains unmarked in inalienable possession, as in (2b):

- (2) a. *ngaju-mili japun*  
 1SG-GEN joey  
 'my joey (infant marsupial)'  
 b. *ngaju mùso*  
 1SG hand  
 'my hand' (Sharp 2004: 306, 313)

The second contrast captures the fact that the possessor has an independent expression in alienable possession, but a bound expression in inalienable possession. This is the case in Puyuma (Austronesian, Taiwan), as shown in (3a) and (3b) respectively:

- (3) a. *nantu basak*  
 3NOM.POSS bag  
 'their bags'  
 b. *temama-taw*  
 father-3.POSS  
 'their father' (Teng 2008: 64, 98)

The third contrast describes that the possessor often fuses with the inalienable noun stem, but not with the alienable noun stem. The fused (or portmanteau) expression of inalienable possession typically concerns high-frequency combinations of relational nouns and their possessor, such as 1<sup>st</sup> person possessors of kinship terms. This is demonstrated for Ungarinyin (Australian, Australia) in (4b) below. Example (4a) shows that the alienable possessive markers is a free form:

- (4) a. *dámbun ŋinaŋga*  
 country 1SG.POSS  
 'my country'

b. *idja*

1SG.mother

'my mother' (cf. *ɲara* 'mother') (Rumsey 1982: 51, 50)

Crucially, only the two contrasts exemplified in (3) and (4) illustrate oppositions in the form of the possessive person marker, which are the likely outcome of the increasing phonological reduction and morphological bonding of the person marker with the possessum.<sup>7</sup> This process is generally conceived of in terms of the cline in (5) (see e.g. Hopper & Traugott 1993: 7; Siewierska 2004: 262; Corbett 2006: 13):

(5) word > clitic > affix > fused marker (> Ø)

The contrast exemplified in (2), however, illustrates an opposition in function: while the person marker in (2a) uniquely identifies the relationship in the NP as a possessive one, as it is marked with the genitive case suffix *-mili*, the person marker in (2b) lacks this ability, since it remains unmarked. In other words, only the person marker in (2a) – but not the one in (2b) – uniquely identifies the relationship in the NP as a possessive one, and thus conveys possessor role information.<sup>8</sup> Loss of the ability to convey role information over time often goes paired with a decrease in other semantic distinctions, such as person, number, gender, inclusivity and honorificity (Bakker & Siewierska 2009). Although these changes are likely to interact with the formal ones depicted in (5), they are logically independent of each other. In fact, this is already demonstrated by Nyangumarda in (2), where the alienability contrast is implemented solely via the presence/absence of a genitive case marker, rather than via the formal realization of the person marker. A similar example, but then for bound person marking, comes from Udihe (Altaic, Russia). In Udihe, alienably possessed nouns (6a) and inalienably possessed nouns (6b) take the same set of person suffixes. However, like the independent person forms in Nyangumarda, these suffixes only overtly identify the possessive nature of the relationship in alienable possession, where they combine with the possessive marker *-ɲi*; in

<sup>7</sup> A related, but logically independent contrast is that of (segmental) length of coding: inalienable possessive coding is always shorter than alienable possessive coding (Haiman 1983: 795, Haspelmath 2008: 20–21).

<sup>8</sup> As pointed out by an anonymous referee, this does not mean that the inalienable person marker may not be interpreted as a possessor when co-occurring with a noun, as shown by its translation 'my'. The important point here is that while the marker in (2a) carries the possessor role information itself, the marker in (2b) does not.



inalienable possession the suffixes do not combine with a dedicated possessive marker, and thus do not carry the possessor role information themselves. Following terminology by Nichols & Bickel (2013b), the choice between such ‘simple’ versus ‘compound’ suffixes marks inalienable versus alienable possession:

- (6) a. *ja:-ŋi-ni*  
       cow-POSS-3SG  
       ‘his/her cow’  
    b. *neŋu-ni*  
       younger.sibling-3SG  
       ‘his/her younger sibling’ (Nikolaeva & Tolskaya 2001: 112, 111)

The aim of the present paper is to carefully tease apart the functional and formal changes involved in the grammaticalization of possessive person markers, unlike for instance Haiman (1983, 1985) and Haspelmath (2008a). Crucially, the ability of the person marker to convey possessor role information is treated here separately as a functional aspect of grammaticalization.<sup>9</sup> This development is characterized by the marker’s gradual loss in referential potential, and follows its own grammaticalization cline, as presented and discussed in the next subsection.

### 3.2.2 A four-part typology of referential/agreement markers

The functional dimension of the grammaticalization of independent pronouns into bound markers of agreement is captured by a four-part typology of person markers, drawing on recent work by Hengeveld (2012). The typology makes a systematic distinction between so-called *referential markers* and *agreement markers*, irrespective of their formal realization. The former is a neutral term for markers that function like pronouns: referential expressions of the (alienable or inalienable) possessor. The latter term is used for markers that are merely the result of an agreement rule: they simply copy the relevant features from the

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<sup>9</sup> Interestingly, while the ability of free person forms (and nouns) to provide possessor role information is widely known as ‘the genitive case’ (when expressed inflectionally), no accepted terminology exists for the same function of bound person forms, although some suggestions have been made in the recent literature, including that of ‘agreement differentiation’ (Bickel & Nichols 2007: 197, 223–224) and ‘index-set’ (Haspelmath 2013a: 203).

possessor NP to the possessed noun, and make no independent referential contribution. Such markers are referred to in this paper as having no ‘referential potential’.

The distinction between referential markers and agreement markers has been the subject of much debate, and different authors have put the dividing line at different points (e.g. Jelinek 1984; Mithun 1991b; Bresnan & Mchombo 1987; Siewierska 1999, 2001, 2004: 120–127; Corbett 2003: 184–192; LeSourd 2006; Bickel & Nichols 2007: 232–234; Schultze-Berndt 2011, Croft 2013, Haspelmath 2013a). The typology applied in this paper differs essentially from those put forward in previous work in two respects. First, it does not focus solely on bound person forms (e.g. Siewierska 2004: 127), nor does it determine the referentiality of a marker based on its formal expression type (e.g. Nichols 1992: 79–80). Instead, it applies to markers of any morpho-phonological realization, i.e. free forms, clitics, affixes and fused forms. As such, the typology systematically separates function and form. Second, person forms ‘in between’ free pronouns and bound agreement markers are given a unified treatment as referential markers or as markers of agreement, depending on the distribution of (grammatical) feature information in the language and the construction in question. This approach departs from traditional analyses where such markers receive a uniform treatment as referential markers, agreement markers, or both. The approach taken here nevertheless is supported by recent work (e.g. Fedden et al. 2013; Iemmolo & Witzlack-Makarevich 2013), demonstrating that person markers show highly language-specific and construction-specific behavior, and can therefore hardly be considered a single type. Each of the two features of the typology are further discussed and exemplified below.

The four types of person markers in Hengeveld’s typology can be ordered along a likely path of grammaticalization, in which each marker reflects a diachronic stage in the development of pronoun towards agreement marker. The corresponding cline is given in (7) below:

- (7) unique referential marker  
       > appositional referential marker  
           > contextual agreement marker  
               > syntactic agreement marker

The position of a marker on this cline is based on (i) the possible co-occurrence of a corresponding possessor noun or pronoun inside the same possessive NP, and (ii) when the (pro)noun occurs optionally, the distribution of feature information between the (pro)noun and the person marker. The first diagnostic

distinguishes between so-called *unique referential markers* – the functional equivalents of deictic or anaphoric pronouns – and *syntactic agreement markers* – the functional equivalents of canonical agreement markers. The second diagnostic applies to the markers that occupy a diachronically intermediate position on the cline, distinguishing between so-called *appositional referential markers* and *contextual agreement markers*. The typology is summarized in Table 1.<sup>10</sup>

Table 1: A four-part typology of referential/agreement markers

Type of referential/agreement marker	unique referential marker	appositional referential marker	contextual agreement marker	syntactic agreement marker
Co-occurrence with possessor	banned		optional	obligatory
Marker is richer in terms of (grammatical) feature information than possessor NP	n.a.	yes	no	n.a.

Given the fact that unique referential markers are the functional equivalents of deictic or anaphoric pronouns, and pronouns give rise to agreement markers (rather than the other way around, see e.g. Lehmann 1982a, Siewierska 2004: 262, and the work by Givón and Ariel discussed below), possessive person markers are expected to start out as unique referential markers. As the name suggests, markers of this type are the sole instantiations of the possessor in the possessive NP. They behave as pronouns in that they may only co-occur with another possessor when the latter is located outside the possessive phrase boundaries, e.g. as a left or right dislocated topic (as in *John, his house burnt down completely.*) or simply as the antecedent in preceding discourse (as in *John is moving to Canada. His house will be sold.*). Other common labels for unique referential markers are ‘anaphoric agreement markers’ (Bresnan & Mchombo 1987: 741; Lehmann 1982a: 219; Siewierska 1999: 226) and

<sup>10</sup> Other types of markers are not logically possible, such as, for instance, ‘appositional agreement markers’, which are excluded since the possessor (pro)noun cannot be in an appositional relation with a non-referential expression, or ‘syntactic referential markers’, which are excluded because the obligatory expression of a possessor (pro)noun shows that the marker has lost the ability to refer on its own (cf. the discussion below).

'pronominal agreement markers' (Bickel & Nichols 2007: 233). A language with such markers is Macushi (Cariban; Brazil, Guyana, Venezuela). Inalienable possession is marked with a person prefix on the possessum, which is in complementary distribution with a possessor NP, whether nominal (8a) or pronominal (8b). This shows that the prefix functions as the (inalienable) possessor itself:

- (8) a. *kaikusi no'pî*  
       jaguar wife  
       'the jaguar's wife'  
    b. (\**mîkîrî*) *i-no'pî*  
       3          3.POSS-wife  
       'its wife' (Abbott 1991: 62, 85, 87)

Importantly, referential potential is determined for nominal and pronominal possessors individually in this paper. This is warranted by the fact that the complementary distribution between the person marker and the possessor NP may be split, depending on the (pro)nominal character of the latter (cf. Siewierska 1999: 228–229, 2004: 151–154).<sup>11</sup> In one type of split, attested among the languages in my sample, the marker co-occurs with a lexical NP, but not with an independent pronoun. In languages with this type of split, the marker is of the unique referential type, but only in pronominal contexts. In NPs with a nominal possessor, the marker functions as an appositional referential marker or a contextual agreement marker.<sup>12,13</sup> The result of taking into account such construction-specific splits in person marking is a more fine-grained analysis of referential potential than in existing typologies, such as Siewierska's (1999, 2004),

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<sup>11</sup> Another split attested in the sample is one between proper nouns and common nouns: in Ungarinyin (Australia, Worroran; Rumsey 1982: 70–71) the possessive person marker may only co-occur with a proper noun, not with a common noun (which takes a genitive case marker). Similar splits also occur in other grammatical domains, of which main clauses have received most attention so far (e.g. Siewierska 2004: 149–162, Bickel 2010, Witzlack-Makarevich 2011: 175–181, and Van Lier & Van Rijn 2013 for an investigation of nominalizations).

<sup>12</sup> It is not logically possible for such a marker to be a syntactic agreement marker, because it can be used without a possessor NP, namely in pronominal contexts.

<sup>13</sup> The inverse pattern, i.e. co-occurrence with an independent pronoun but not with a lexical NP, is also attested among the world's languages, although not very frequently (Siewierska 2004: 152–154). The isolate Urarina (Peru) is the sole language demonstrating this pattern in my sample (Olawsky 2006: 339–340).

where such splits are not accounted for. For the sake of cross-linguistic comparability, I only provide examples of NPs with nominal possessors in this section.

Over time, the possessor (pro)noun may enter the possessive NP, as restrictions on its co-occurrence with the person marker are loosened. In the final stages of grammaticalization, the (pro)nominal occurs obligatorily, showing that the person marker has lost the ability to refer to the possessor on its own. Following Hengeveld (2012: 474, as well as Lehmann 1982a: 219 and Siewierska 2004: 126), I call such person markers ‘syntactic agreement markers’. Interestingly, I know of no language that employs such markers in possessive NPs. The few attested cases of syntactic agreement are found for subjects in main clauses, and are largely restricted to western Europe (Siewierska 1999: 238, 2004: 268–273).<sup>14</sup>

As mentioned previously, many of the world’s languages employ possessive person markers that are in between unique referential markers and markers of syntactic agreement. This third type of person marker co-occurs optionally with a corresponding (pro)noun. According to Givón (1976, 1983), the development of verbal markers of this type is the outcome of the overuse of topicalization constructions (‘The man, he came’), by which the dislocated topic becomes the subject and the (unique referential) marker becomes cliticized and eventually morphologically bound to the verb (‘The man he-came’). As pointed out by Siewierska (2004: 264), this is also a likely scenario for possessors, as they are typically human (or at least animate), definite and therefore highly topical. By contrast, Ariel (2000) argues that the development of such markers starts with the cliticization of first and second person possessors, due to their high accessibility in the memory store of the hearer. Further morpho-phonological reduction induces the need for a (pro)nominal expression of the possessor inside the possessive NP. A third potential source of this type of person marker are so-called ‘possessor raising/external possession constructions’ (cf. Haspelmath & König 1998), as proposed by, for instance, McGregor (1996).

A language in which a nominal and a prefixal expression of the possessor co-occur optionally is Nyulnyul (Australian, Australia). In (9a) the possessor is

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<sup>14</sup> A language that is arguably in the process of developing possessive markers of this type is Skou (Skou, Indonesia), where the presence of a co-occurring possessor pronoun is optional but preferred (Donohue 2004: 269). Interestingly, as mentioned previously, the language already employs syntactic agreement markers for subjects in main clauses.

expressed by both a noun and a person prefix, while in (9b) the nominal is dropped and only the prefix remains.<sup>15</sup>

- (9) a. *bin wamb ni-mal*  
       this man 3MIN.POSS-hand  
       ‘this man’s hand’  
    b. *ni-mal*  
       3MIN.POSS-hand  
       ‘his hand’ (McGregor 2012: 422, 117)

Person markers that co-occur optionally with a corresponding (pro)noun, as exemplified here for Nyulnyul, have received three types of analyses in the literature. Under the first analysis, the person marker is univocally regarded as a referential instantiation of the possessor. This means that when the (pro)noun is expressed in the NP, as in (9a), the marker and the (pro)noun are in an appositional relation, such that the possessor is referred to twice. This analysis is adopted in most functional frameworks (e.g. De Groot & Limburg 1986; Hengeveld & Mackenzie 2008; but also Kibrik 2011 and Schultze-Berndt 2011). Under the second analysis, the marker always expresses agreement. When the (pro)noun is absent, as in (9b), the marker is considered to agree with an underspecified possessor called ‘pro’. This analysis is adopted in much generative work (e.g. Jelinek 1984; Baker 1996) and partially in Nichols (1992: 59, 78–80). The third analysis considers the marker a case of agreement when the (pro)noun is expressed, as in (9a), but referential when it is dropped, as in (9b). This analysis is adopted in Siewierska’s (1999, 2004: 120–127) typology of person marking, who simply refers to such markers as ‘ambiguous agreement markers’.

In this paper, I adopt an alternative analysis to person markers that co-occur with optional possessors, as in Nyulnyul. Following Hengeveld (2012), this approach combines the first and second analyses discussed above, but without considering these to be present in parallel, as in the third analysis by Siewierska. Rather, the referential potential of possessive person markers is determined on a language-specific and a construction-specific basis. This means that the marker is referential in some languages, but expresses agreement in others. Moreover, even within the same language, some markers may be

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<sup>15</sup> The construction may be additionally accompanied an emphatic or oblique pronoun, which is optional in inalienable possession (but obligatory in alienable possession; McGregor 2012: 422, p.c.). Since the focus here is on the possessive prefix, this pronoun is not given in the examples below.

referential in nature, while others express agreement. Markers of the first type refer independently, and may occur in apposition with a (pro)nominal expression of the possessor. They are correspondingly referred to as ‘appositional referential markers’. Markers of the second type agree with a possessor (pro)noun, which is overtly expressed in the NP, or is present only in the discourse context. They are correspondingly referred to as ‘contextual agreement markers’.

Such a language-specific and construction-specific approach to the referential potential of person marking is warranted by the fact that the absence of the possessor (pro)noun may have two logically independent reasons. On the one hand, the (pro)noun may remain unexpressed because the marker itself provides sufficient reference to the possessor. This is the case in languages with unique referential markers, such as Macushi (8), where the referential nature of the person marker prevents the use of a (pro)noun inside the NP altogether.

On the other hand, languages may leave the possessor (pro)noun unexpressed because it is retrievable from the discourse context. The extent to which arguments of verbs are actually expressed has been typologized under the name of *referential density* (Bickel 2003). Interestingly, this typological parameter also applies to possessive NPs. A case in point is Tidore (West Papuan, Indonesia), where possessors (as well as verbal arguments) tend to remain unexpressed when the context provides sufficient information. As a result, possessive NPs (as well as entire clauses) often lack any overt specification of the possessor, as illustrated in (10):

- (10) *Dadi towaro papa la ngone fo-wako*  
 So take.leave father so 1PL.INCL 1PL.INCL.A-return  
 ‘So take leave of (your) father so that we go home.’ (van Staden 2000: 404)

From facts like these we may conclude, as mentioned above, that a distinction has to be made between possessor (pro)nouns that are not expressed because the possessive person marker is referential by itself, and those that are not expressed because the language concerned has a low referential density. In the latter case the possessive person marker is an agreement marker, despite the absence of the possessor (pro)noun, and agreement occurs with the possessor in the discourse context.

In order to determine whether a possessive person marker is a unique referential marker or a contextual agreement marker a simple test may be applied. I assume here an analysis in which agreement is a matter of copying (grammatical) feature information from the possessor NP to the possessum

(following Corbett's (2003, 2006) notion of canonical agreement, see also Lehmann 1982a: 203 and Bickel & Nichols 2007: 229). In such an analysis, only those features can be copied that can be retrieved from the possessor (pro)noun. This means that if a possessive person marker is richer in terms of the semantic information expressed in grammatical features than the possessor (pro)noun itself, it cannot be a contextual agreement marker but must be an appositional referential marker. The examples from Nyulnyul, partially repeated from (9) above, and the isolate Burushaski (Pakistan) below illustrate this. In these examples, the optionality of the possessor NP is indicated with parentheses, and the expression of possessor role information by the person marker is abbreviated as 'POSS' in glossing:

- (11) a. (*bin wamb*) *ni-mal*  
 this man 3MIN.POSS-hand  
 'this man's hand'
- b. (*wamb-in*) *i-n-dam-Ø* *yiil jan*  
 man-ERG 3.NOM-CM-hit-3MIN.ACC dog 1MIN.OBL  
 'The man hit my dog.' (McGregor 2012: 585)
- (12) a. (*hir-e*) *i-yas*  
 man-GEN 3SG.HUM.M-sister  
 'the man's sister'
- b. (*hir*) *i-phús-im-i*  
 man.ABS 3SG.HUM.M-bound-AOR-3SG.HUM.M.A  
 'he tied the man up' (Grune 1998, p.c.; Berger 1998: 117)

Example (11a) shows that the possessive person marker expresses person and role information (and number, but as I will explain below, number could not be taken into account in this study), while only the person information can be copied from the possessor nominal, which lacks role information. The possessive person marker is thus richer in terms of the grammatical features expressed than the possessor nominal, and for that reason must be referential in nature. Example (11b) shows that the person marker in (11a) indeed expresses possessor role information, as subjects require a different person marker.<sup>16</sup> The marker in

<sup>16</sup> In this paper, I consider a set of person markers unique to the possessive NP when it differs in at least one form from another set. Partial correspondences between sets of person markers are cross-linguistically common, but not easily classified in a systematic way (see Siewierska 1998 for an attempt). Therefore, these have not been taken into account in this study.



(11a) is thus unique for possessive constructions, and as such expresses its possessor role.

Example (12a) shows that the possessive person marker expresses person, number and (human masculine) gender, features that are also encoded by the possessor nominal, which furthermore encodes role information via a genitive case affix. In this case an agreement analysis is warranted, as the relevant features to be copied to the person marker are indeed available from the possessor noun. The fact that the person marker in (12a) does not provide possessor role information is demonstrated in example (12b), which shows that the marker is used to mark non-actors in general.

Note that another possibility is for the person marker and the possessor (pro)noun to express the same amount of feature information. In this case, an agreement analysis of the person marker is also warranted, since the marker can copy all of the relevant information from the (pro)noun. An example from Koasati (Muskogean, United States) is given in (13):

- (13) a. (*jhocilím*) *im-laykí*  
           star       3-dung  
           ‘a meteor’ (lit. ‘star’s dung’)
- b. (*nitá*) *im-walí:ka-t*  
           bear   3-run-PST  
           ‘(He) ran away from the bear.’ (Kimball 1991: 433, 131)

Example (13a) shows that the possessive person marker expresses the same person information as provided by the possessor nominal. As shown in (13b), the marker in (13a) does not provide possessor role information, since it also marks a range of other roles in main clauses, among which malefactive, as in the case of *nitá* ‘bear’ in (13b). This means that the relevant information, in this case just person information, can be readily copied from the possessor nominal, and the marker is correspondingly analyzed as a contextual agreement marker.

To sum up, contextual agreement marking and appositional referential marking are two different person marking strategies, which can be distinguished from one another by considering the distribution of (grammatical) feature information between the possessor (pro)noun on the one hand and the

possessive person marker on the other.<sup>17</sup> While referential markers expand on the feature information of the possessor NP, agreement markers can only express those features provided by the possessor NP, as they are mere copies of the (pro)noun and thus have no independent semantic contribution to make to the utterance. Importantly, I only focus on the distribution of possessor role information in this paper, not on that of other features, such as number and gender. This has two main reasons. The first is that many of the world's languages lack such features. With respect to number, Haspelmath (2013b) for instance demonstrates that over 30% the 291 languages in his sample completely lack plural marking for (a set of) nouns. Moreover, as demonstrated by Rijkhoff (2002: 38–41, 104–117), many languages, including Nyulnyul and Koasati exemplified above, employ so-called 'set nouns': nouns that in their unmarked form do not denote a single item, like regular count nouns as in English, but rather a set of items, which may consist of one item (a singleton set) or multiple items that together form a collective (a collective set). Instead of number, such nouns may express a feature Rijkhoff refers to as 'nominal aspect', which concerns marking the kind of set involved. Importantly, more than half of the 52 languages in Rijkhoff's sample employs (a group of) set nouns, suggesting that the absence of grammatical number is a cross-linguistically frequent phenomenon. The complete absence of grammatical gender is presumably even more common: while more than half of 257 languages studied by Corbett (2013) does not have a nominal gender system, almost 70% of the 378 languages in Siewierska's (2013a) sample does not distinguish gender in independent person forms.

The second reason for not taking number, gender or other features into account is that their distribution between nouns and person markers cannot be determined in a straightforward way. As pointed out above, set nouns do not express number but nominal aspect, and are therefore not well comparable to person forms in terms of number information. Gender is a problematic feature in that the gender of a noun is usually determined by forms outside of the NP itself, and thus cannot be determined independently.

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<sup>17</sup> Another diagnostic to determine whether indexes are referential or not that has been proposed in the literature (Bresnan & Mchombo 1987; Evans 1999, 2002; Austin & Bresnan 1996) can only be applied at the clausal level and is not well suitable for possessive NPs. It relies on differences in specificity and definiteness, i.e. the ability of the person marker to have a generic reading, to occur with nouns taking quantifiers or expressions such as 'nobody' or 'nothing', and their presence with nominals that are questioned. Since possessors are typically definite and specific, this diagnostic is hard to apply within the possessive NP (for further criticism, see Mithun 2003).

Importantly, the functions carried out by the bound person markers in examples (11) to (13) above could just as well have been carried out by free forms. This is demonstrated in example (14) from Ungarinyin and example (15) from Tiwi (both Australian, Australia):

- (14) a. (*Gádbuŋu*) *anàŋga* *dámbun*  
 Gadbuŋu 3SG.M.POSS country  
 ‘Gadbungu’s country’  
 b. *ada* *ŋima* *ɖjiri-guɖe*  
 sit I.will.do 3SG.M-COM  
 ‘I will sit down with him.’ (Rumsey 1982: 70, 74)
- (15) a. (*Purukupaɭi*) *ŋara* *mɔ.ɔani*  
 Purukupaɭi 3SG.M son  
 ‘Purukupaɭi’s son’  
 b. *ŋara* *jiikɔ.ɔimi* *jikwani*  
 3SG.M he.made fire  
 ‘He made fire.’ (Osborne 1974: 74, 61)

The examples in (14) and (15) are functionally completely parallel to (11) and (13). In (14a) it is shown that the free possessive person marker carries possessor role information, while the possessor nominal does not. Example (14b) shows that the possessive person marker indeed carries role information, since another set of free person forms is used outside possessive constructions, e.g. for comitatives in main clauses. The possessive person marker thus expands on the role information provided by the possessor nominal, and therefore must be referential in nature, just like the bound person marker in Nyulnyul (11a). In (15a), by contrast, neither the person marker nor the possessor nominal carries possessor role information. As shown in (15b), the marker is not unique to possessive constructions, since it also marks actors in main clauses, among other roles. This means that the marker does not expand on the role information provided by the possessor nominal, and in this case an agreement analysis is warranted, just as with the bound person markers in Koasati (13a).

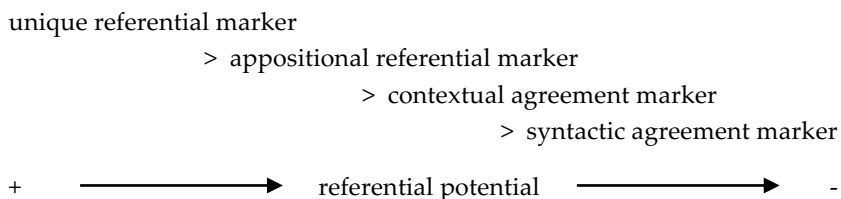
In sum, this paper applies a four-part typology of person markers, which makes a basic distinction between referential markers – those that instantiate the possessor – and agreement markers – those that copy information from a possessor (pro)noun to the possessed noun. Over time, a person marker is expected to develop from a referential marker to a marker of agreement, which is a development characterized by (i) its growing reliance on the expression of a

possessor (pro)noun inside the NP, and (ii) a gradual loss in (grammatical) feature information compared to the co-occurring possessor (pro)noun.<sup>18</sup> This process is expected to prefer markers of inalienable possession, as well as markers of a reduced morpho-phonological form (i.e. clitics rather than separate words and affixes rather than clitics). These predictions are tested in this study, and further discussed in the next section.

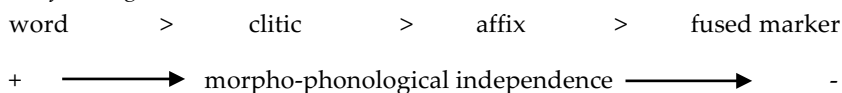
### 3.3 Hypotheses

The functional and formal changes involved in the diachronic development of possessive person markers can be conceived of as two distinct grammaticalization clines. The functional cline captures the marker's gradual loss of referentiality, following the four-part typology presented in the previous subsection. The formal cline captures the marker's gradual loss of morpho-phonological independence, or, formulated the other way around, its increase in morpho-phonological bonding with the possessum. Each cline is presented in (16) below:

(16) *The functional grammaticalization cline:*



*The formal grammaticalization cline:*



Three hypotheses are tested in this study. First, I investigate the relationship between alienable possession and inalienable possession in terms of function (hypothesis (i)) and form (hypothesis (ii)). I predict that if a language has a grammaticalized alienability split, person markers of alienable possession never

<sup>18</sup> The second diagnostic is not applied to fused forms, since they cannot be analyzed separately from the noun stem to which they attach, and are therefore unanalyzable in terms of the expression of possessor role information.

proceed further down the two clines than person markers of inalienable possession. This diachronic prediction has a clear synchronic counterpart: alienable possessive person markers show the same or a higher degree of referential potential and morpho-phonological independence as inalienable possessive person markers, but never a lower degree. The two corresponding hypotheses are formulated below:

- (i) A person marker used in alienable possession never shows a lower degree of referentiality than a person marker used in inalienable possession.
- (ii) A person marker used in alienable possession never shows a lower degree of formal independence than a person marker used in inalienable possession.

Hypothesis (i) predicts that, for instance, a language with contextual agreement markers in alienable possession employs contextual or syntactic agreement markers in inalienable possession, but never unique or appositional referential markers. Similarly, hypothesis (ii) predicts that, for instance, a language with person affixes in alienable possession may employ affixal or fusional markers in inalienable possession, but never free or cliticized ones. Both hypotheses follow previous findings in the literature showing that inalienable possessive marking is historically older, and thus more grammaticalized, than alienable possessive marking (such as Haiman 1983, 1985 and Haspelmath 2008a discussed above). The novelty of the hypotheses resides in the fact that the referential potential of alienable and inalienable means of person marking (hypothesis (i)) is investigated independently of its formal realization (hypothesis (ii)), as enabled by Hengeveld's four-part typology of referential/agreement markers presented in the previous subsection.

The third hypothesis tested in this study investigates the relationship between the two clines in (16), independently of the alienability distinction. I predict that as a marker moves down the functional cline, it cannot move up the formal cline. In other words, a marker that loses referential potential should never gain formal independence. The synchronic correlate of this diachronic prediction is that markers of a lower degree of referentiality (those on the right-hand side of the functional cline) never have a more independent expression form than markers of a higher degree of referentiality (those on the left-hand side of the functional cline) in individual languages. The corresponding hypothesis is formulated below:

- (iii) In individual languages, a possessive person marker with a lower degree of referentiality never has a more independent expression form than a possessive person marker with a higher degree of referentiality.

According to this hypothesis, there should be no languages, for instance, with appositional referential markers in the form of words, but unique referential markers in the form of clitics, or with contextual agreement markers in the form of clitics, but appositional referential markers in the form of affixes. As mentioned previously, this hypothesis is more specific about the relationship between function and form than the parallel path hypothesis in two respects. First, it expects the clines to be related in a relative sense, rather than in an absolute sense. For instance, it does not exclude the presence of languages where unique referential markers and appositional referential markers both have the form of clitics, or where appositional referential markers and contextual agreement markers both have the form of affixes. Hence, a move down the functional cline is not expected to necessarily go paired with a move down the formal cline. This prediction follows previous work on referential/agreement marking (e.g. Siewierska 2004: 262; Corbett 2006: 265), suggesting that person markers may very well occupy different positions on the two clines in different languages. Second, in addition to predicting a cross-linguistic tendency, the hypothesis in (iii) is expected to apply language-internally, and is tested by studying languages with minimally two sets of possessive person markers. This may be an alienable set and an inalienable set, or two alienable or inalienable sets of person markers, if a language employs more than one such set. The hypothesis thus extends beyond the alienability split and the corresponding hypotheses in (i) and (ii).

In the next section, I first present the language sample used to test each hypothesis (3.4.1) and then show which types of possessive NPs and person marking strategies are taken into account (3.4.2). Each hypothesis will be addressed in turn in Section 3.5.

## 3.4 Methodology

### 3.4.1 The language sample

The sample used in this study is created in such a way that it reflects the highest possible degree of genetic and geographical diversity. The genetic criterion is met by adopting the sampling method of Rijkhoff et al. (1993; Rijkhoff & Bakker

1998), which makes use of so-called ‘Diversity Values’ (henceforth ‘DV’). These values determine the number of languages to be selected from each language (sub)family based on the internal complexity of that (sub)family, given a particular preferred sample size. More internally complex (sub)families have a higher DV than less internally complex (sub)families, and are therefore represented by a higher number of languages in the sample. Isolates are, by definition, part of any sample. The method is applied to Ruhlen’s (1991) classification of the world’s languages.<sup>19</sup> The genetic criterion is combined with a geographical one: where possible, the languages selected on the basis of the genetic criterion are spoken in non-contiguous areas.

Within the restrictions of the genetic and geographical criteria, the sample satisfies a third, typological criterion. Given the hypotheses tested in this study, I made sure that the sample exclusively contains languages with a grammaticalized alienability split that use person marking in both alienable and inalienable possession. Note that the alienability split need not be made on the basis of two separate sets of (free or bound) person markers, as in Puyuma (3) and Ungarinyin (4) exemplified in Section 3.2.1. The sample also contains languages where the same set of person markers is used in both alienable and inalienable possession, and the distinction between both types of possession is made via the presence of an additional possessive morpheme in alienable possession, as in Bambara (2) and Udihe (6), and/or a difference in the referential potential of the person marker.

In just over half of the sample languages only NPs with a pronominal possessor could be investigated. In NPs with a nominal possessor, they only use person markers for inalienable possession, do not use possessive person markers at all (as in Macushi (8)), or lack an alienability split altogether.<sup>20</sup> Languages without any form of possessive person marking are not taken into account. Without language-specific diachronic information, it cannot be determined whether the absence of person marking marks the beginning or the end of

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<sup>19</sup> Ruhlen’s classification is often criticized for positing large, little supported, language families, such as the Amerindian family (e.g. Kaufman 1990; Nichols 1990; Campbell & Poser 2008). The classification is nevertheless very suitable for creating relatively small language samples, since a minimal sample composed with the DV technique consists of one language per family. Moreover, the method requires the selection of a large number of languages from internally complex language families, which compensates for the use of a rougher classification like Ruhlen’s.

<sup>20</sup> Other logical possibilities are not attested, such as languages in which only alienable possession is person-marked (cf. Siewierska 2004: 138), or languages that employ an alienability split only with nominal possessors (cf. Dahl & Koptjevskaja-Tamm 1998: 47).

grammaticalization, making languages of this kind unreliable candidates for testing the hypotheses in this study.

For this study, I started with an initial sample of 62 languages.<sup>21</sup> Twenty (sub)families (including six isolates) do not contain any languages that have an alienability split, either with nominal or pronominal possessors. Accordingly, these (sub)families are excluded from the investigation. As noted in Section 3.2.1, the lack of an alienability split is especially common among Eurasian and South-East Asian languages. The three languages Etruscan, Hurrian and Meroitic selected by the sampling method were also removed from the sample due to insufficient data. The result is a 39-language sample, which is presented in Table 2 below. Note that, despite the exclusion of certain language (sub)families, all six of Dryer's (1992) macro-areas (Africa, Eurasia, South-East Asia & Oceanic, Australia & New Guinea, North America and South America) are well represented in the sample.

The language (sub)families excluded from the sample appear in shading. The counts between brackets specify per (sub)family how many languages were selected on the basis of the typological stratification given above (before the slash) out of the languages originally required by Rijkhoff et al.'s sampling technique (after the slash). For instance, only three out of the seven Austric language groups contain a language that implements an alienability split and uses person marking as a means of coding alienable and inalienable possession. Therefore, only three Austric languages are part of the sample. Language isolates are abbreviated as 'LI'; Burushaski is the only isolate included in this study.

Table 2: The 39-language sample

<b>Language family (Ruhlen 1991)</b>	<b>Subfamilies</b>	<b>Language selected</b>	<b>Language family (WALS)</b>
Afro-Asiatic	Chadic (1/1)	Lele	Afro-Asiatic
	Berber (1/1)	Tamashek	Afro-Asiatic

<sup>21</sup> The number of languages to be selected from each (sub)family in a sample counting 60 languages is specified in Rijkhoff et al. (1993: 186). However, Rijkhoff et al. (1993) make use of the first edition of Ruhlen's classification (Ruhlen 1987); in the second edition (Ruhlen 1991), which I use in this study, two additional first-order language families are distinguished: Korean-Japanese-Ainu and Kartvelian. Each requires representation by a single language. This brings the initial sample size to 62 languages.



Table 2: The 39-language sample

Language family (Ruhlen 1991)	Subfamilies	Language selected	Language family (WALS)
	Semitic (1/1)	Maltese	Afro-Asiatic
Altaic (1/1)		Udihe	Altaic
Amerind (8/9)	Northern Penutian (1/1) (2/2)	Koasati	Muskogean
	Hokan (1/1)	Diegueño	Hokan
	Andean (1/1)	Urarina	isolate
	Eq.-Tucanoan (2/2)	Paumarí	Arauan
	M.-Tucanoan (1/1)	Hup	Nadahup
	Ge-Pano-Carib (2/2)	Tiriyo	Cariban
	Ge-Pano (1/1)	Bororo	Bororoan
	Centr. Amerind (0/1)	Kiowa	Kiowa-Tanoan
	Chib.-Paezan (1/1)	Sanuma	Yanomam
Australian (4/4)	Nyulnyulan (1/1)	Nyulnyul	Nyulnyulan
	Worrorran (1/1)	Ungarinyin	Worrorran
	Pama-Nyungan (1/1)	Nyangu-marda	Pama-Nyungan
	Other (1/1)	Mangarayi	Mangarrayi-Maran
Austic (3/7)	Austro-Tai (2/5)		
	Daic (0/1)	–	–
	Austro-Malayo-Pol. (1/1) (2/4)	Biak	Austronesian
	Atayalic (0/1)	–	–
	Paiwanic (1/1)	Puyuma	Austronesian
	Tsouic (0/1)	–	–

Table 2: The 39-language sample

Language family (Ruhlen 1991)	Subfamilies				Language selected	Language family (WALS)
	Austroasiatic (1/1)				Kharia	Austro-Asiatic
	Miao-Yao (0/1)				–	–
Basque (LI)					–	isolate
Burushaski (LI)					Burushaski	isolate
Caucasian (0/1)					–	–
Chukchi-Kamchatkan (0/1)					–	–
Elamo-Dravidian (0/1)					–	–
Eskimo-Aleut (1/1)					West Greenlandic	Eskimo-Aleut
Etruscan (LI)					–	–
Hurrian (LI)					–	–
Indo-Hittite (2/2)	Indo-European (1/1)				Icelandic	Indo-European
	Anatolian (1/1)				Hittite	–
Indo-Pacific (4/7)	Trans New Guinea (1/1)				Inanwatan	Marind
	Sko (1/1)				Skou	Skou
	E. Papuan (1/1)				Nasioi	East Bougainville
	W. Papuan (1/1)				Hatam	West Papuan
	Other subfamilies (0/3)				–	–
Kartvelian (0/1)					–	–
Ket (LI)					–	isolate
Khoisan (0/1)					Ju   'hoan	Kxa
Korean-Japanese-Ainu (0/1)					–	–
Meroitic (LI)					–	–
Na-Dene (1/1)					Slave	Na-Dene
Nahali (LI)					–	isolate
Niger-Kordofanian (5/5)	Niger-Congo (4/4)	N.-C. Proper (3/3)	Central N.-C. (2/2)	North Centr. N.-C. (1/1)	Dogon	Dogon

		South Centr. N.-C. (1/1)	Ewe	Niger-Congo
		West Atlantic (1/1)	Nigerian Fula	Niger-Congo
		Mande (1/1)	Bambara	Mande
		Kordofanian (1/1)	Krongo	Kadu
Nilo-Saharan (3/3)	East Sudanic (1/1)		Lango	Eastern Sudanic
	Centr. Sudanic (1/1)		Ngiti	Central Sudanic
	Kunama (1/1)		Kunama	isolate
	Nivkh (LI)		–	isolate
	Pidgins and Creoles (0/1)		–	–
Sino-Tibetan (1/2)	Sinitic (1/1)		Mandarin Chinese	Sino-Tibetan
	Tibeto-Karen (0/1)		–	–
	Sumerian (LI)		–	isolate
	Uralic-Yukaghir (0/1)		–	–

### 3.4.2 Delimitation of the constructions investigated

As pointed out in the previous subsection, this study exclusively focuses on languages with person marking at both ends of an alienability split. I examine NPs with both nominal and pronominal possessors, and person markers of any person (and number/gender). Note that in NPs with unique referential markers, the marker itself functions as the possessor pronoun. I do not consider possessive NPs that are morphosyntactically complex, which excludes NPs containing additional attributive modifiers or possessums embedded in possessor chains.

As is widely known, languages vary extensively in the types of nouns that participate in alienable and inalienable possession. This means that there is no one-to-one relationship between the inherently (non-)relational nature of concepts, and the nouns treated (in)alienably across individual languages. I accommodate this discrepancy by focusing solely on two classes of nouns, already mentioned in Section 3.2.1: kinship terms and/or body part terms (relational) versus concrete, inanimate and countable objects (non-relational).

Not only do these nouns most clearly qualify as respectively inherently relational and inherently non-relational on the basis of their semantic properties (items such as ‘leg’ and ‘father’ inherently require a possessor, while items such as ‘book’ or ‘basket’ do not), they also participate in any class of inalienable and alienable nouns across individual languages (as demonstrated above, if a language makes a formal alienability split, a set of kinship terms and/or body part terms always participates in the inalienable class). Moreover, kinship terms and body part terms are primary candidates for person marking: if a language uses person markers in NPs with a nominal possessor, these markers are at least used on kinship and/or body part terms (Stassen 1997: 39). This makes them the most suitable representatives of inalienable (i.e. relational) nouns for the purposes of this study. Note that other types of nouns that often participate in alienable possession, such as ‘house’ and ‘dog’, and inalienable possession, such as parts of wholes and spatial terms, do not contradict the findings of this study. They are incidentally used to illustrate alienable or inalienable possession when examples with nouns from the two classes above are not available.

Note that in a number of sample languages, only a subset of kinship and/or body part terms are treated inalienably. In Puyuma (Austronesian, Taiwan), for instance, only older generation kinship terms, such as ‘mother’, ‘father’ and ‘grandparent’, participate in the inalienable class, while younger generation kinship terms, as well as body parts, are found only in the alienable class (Teng 2008: 97). Similarly, in Nyulnyul only a small proportion of body part nouns (as well as some personal representations, such as ‘shadow’ and ‘name’, and some items of clothing) take the inalienable prefix-set (McGregor 1996: 257–264, 2012: 117–122). This includes the noun *-mal* ‘arm/hand’ exemplified in (9a) in Section 3.2.2. In order to make investigation of such languages possible, I focus solely on those items that participate in the inalienable class in the language in question, since these are generally also the items that are conceived of as the most prototypically relational – and thus as inherently and inseparably related to the possessor – in that language (see e.g. Chappell & McGregor 1996).<sup>22</sup> In Nyulnyul, for instance, only those body part nouns are inalienable that are conceived of as most important, visible and central to the possessor, which includes external body parts like *-mal* ‘arm/hand’, while those considered more peripheral to the possessor, such as internal organs and

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<sup>22</sup> This observation is supported by Bally (1996), who points out that only those items are generally treated inalienably in a given language that are conceived of as belonging to a human being’s personal sphere, which means that they are viewed as “associated with a person in an habitual, intimate or organic way” (Bally 1996: 33).

bodily products, are formally treated as alienable nouns (McGregor 1996: 257–264). This means that only body part nouns from the former class are taken as representatives of inalienable nouns in Nyulnyul. Conversely, the same approach is adopted for concrete (inanimate), countable objects: when treated as inalienable rather than as alienable nouns in a given language, I focused solely on those nouns that receive the alienable coding – and that are thus conceived of as possessed in a temporary, non-inherent manner – in that language. With respect to Nyulnyul, this means that personal representations, and the items of clothing part of the inalienable class are not taken as representatives of alienable nouns in this language.

Finally, note that about one third of the sample languages uses more than one person marking strategy in alienable possession, inalienable possession or both. This paper takes into account the referential potential and formal expression type of each of these strategies, in order to display the full range of variation found in the realm of possessive person marking. Most often, the different strategies are in complementary distribution, their use governed by a number of factors. One such factor is the division of possessums into lexical subclasses. Diegueño (Hokan; Mexico, United States; Miller 2001: 146), for instance, employs two sets of positional referential markers: one for kinship nouns, and one for all other types of inalienable nouns, including body parts. Another source of distinct strategies of possessive person marking are properties of the possessor NP, such as person, number and its (pro)nominal character. In Lango (Eastern Sudanic, Uganda), for instance, alienable and inalienable possessors trigger a distinct set of suffixes on the possessed noun only when they are pronominal and singular. The alienability distinction is collapsed for plural, pronominal possessors, which are indexed with a single set of suffixes on the possessum (Noonan 1992: 78). Another example comes from Lele (Afro-Asiatic, Chad), in which markers for singular inalienable possessors are suffixed directly onto the possessum, while markers for plural inalienable possessors attach to the genitive marker *dí/dú* (Frajzyngier 2001: 70–71).

A few other languages mark the same possessum twice. This is the case for 1<sup>st</sup> and 2<sup>nd</sup> person dual and plural possessors in Kharia (Austro-Asiatic, India; Peterson 2011: 163), which trigger an enclitic on the inalienable possessum – as shown in example (17a) below – and optionally another enclitic – as shown in example (17b) below. Each possibility is counted as a separate marking strategy with its own referential potential.

- (17) a. *aba=ŋ*  
 father=1SG  
 'my father'
- b. *jiyom=na=iŋ*  
 life=1.POSS=1SG  
 'my life' (Peterson 2011: 166)

With this outline of the languages and constructions examined in the study, I come to the discussion of my results in the next section. I first discuss the relationship between alienable and inalienable possessive person marking in terms of the (cross-)reference/agreement distinction, as predicted by hypothesis (i) (Section 3.5.1). In addition to a discussion of the data (Section 3.5.1.1) a separate subsection is devoted to an interesting finding: the complete absence of possessive person markers expressing syntactic agreement (Section 3.5.1.2). The relationship between alienable and inalienable possessive person marking in terms of their formal expression, as predicted by hypothesis (ii), is discussed in Section 3.5.2. In Section 3.5.3, I provide an explanation for the findings discussed in 3.5.1 and 3.5.2 in terms of the inherent (non-)relationality of possessums in the two types of possession. The relationship between the function and form of possessive person markers, as predicted by hypothesis (iii), is addressed in a final subsection (3.5.4).

## 3.5 Results

### 3.5.1 Hypothesis (i): the referential potential of (in)alienable possessive person marking

#### 3.5.1.1 Data

Table 3 below presents the data relevant for hypothesis (i), which predicts a relationship between alienable and inalienable possessive person markers in terms of their referential potential. It gives the distribution of alienable (AL) and inalienable (INAL) possessive person markers in terms of the four possible types of referential potential in Hengeveld's typology in the 39 languages of the sample. The order of the four types (in the columns) reflects a gradual loss in referential potential, as captured by the corresponding grammaticalization cline in (16) above.

There are sixteen logically possible combinations of alienable and inalienable marking strategies in terms of referential potential (in the rows marked 'a' to 'p'). Those that would be counterexamples to hypothesis (i) are marked with an asterisk and appear in dark shading. Importantly, Table 3 counts combinations of marking strategies (N=70), not languages (N=39). Each row consists of a particular combination of marking strategies in a particular language. Since many of the sample languages employ more than one combination of alienable and/or inalienable marking, they may occupy multiple rows in the table. Furthermore, since referential potential may be split depending on the (pro)nominal character of the possessor, the counts of each combination are specified separately for NPs with a co-occurring possessor noun (in the fifth column) and those with a co-occurring possessor pronoun (in the penultimate column). Note that for unique referential markers, the column labeled 'possessor pronoun' refers to the status of the marker itself, not to the co-occurrence of an independent pronoun, which is by definition impossible for markers of this type. The co-occurrence of a lexical possessor is also impossible for such markers, as indicated by the cells marked 'n.a.' (not applicable). Finally, eight sample languages are not taken into account in this table (Dogon, Fula, Hittite, Inanwatan, Kharia, Kunama, Lango and Tamashek). The referential potential of their person markers could not be determined, as information on the co-occurrence of a possessor pronoun – either in alienable possession, inalienable possession or both – is lacking. Table 1 in Appendix II lists the sample languages that instantiate each combination.

The table shows that none of the combinations marked with an asterisk is attested, except for one, discussed below. Hence, possessive person markers used in alienable possession are almost never of a referential/agreement type further to the right than those used in inalienable possession. Instead, they prefer to be of the same referential/agreement type (combinations a, h and m) or of a type further to the left (combinations c and i). This finding provides clear support for hypothesis (i): in languages with an opposition between alienable and inalienable possession, alienable possessive person markers strongly tend to be of the same or a higher degree of referential potential as inalienable possessive person markers, but never of a lower degree of referential potential. This generalization comprises three sub-relations, which can be formulated as the following implicational universals. First, if unique referential markers are used in inalienable possession, they are also used in alienable possession (compare combination a to \*e, \*f and \*g). Second, if inalienable possession takes appositional referential markers, alienable possession takes such markers as well, or markers of the unique referential type, but never (contextual/syntactic)

Table 3: The distribution of (in)alienable person markers in terms of referential potential

	unique referential marker	appositional referential marker	contextual agreement marker	syntactic agreement marker	Frequencies		
					Possessor noun	Possessor pronoun	Total (N=70)
a	AL, INAL				n.a.	31	31
b	AL	INAL			n.a.	-	-
c	AL		INAL		n.a.	3	3
d	AL			INAL	n.a.	-	-
*e	INAL	AL			n.a.	-	-
*f	INAL		AL		n.a.	-	-
*g	INAL			AL	n.a.	-	-
h		AL, INAL			14	6	20
i		AL	INAL		6	3	9
j		AL		INAL	-	-	-
*k		INAL	AL		1	1	2
*l		INAL		AL	-	-	-
m			AL, INAL		2	3	5
n			AL	INAL	-	-	-
*o			INAL	AL	-	-	-
p				AL, INAL	-	-	-

agreement markers (compare combinations b and h in relation to \*k and \*l). Third, the use of inalienable contextual agreement markers implies the use of alienable markers of any referential potential except syntactic agreement (compare combinations c, i and m to \*o).<sup>23</sup>

The only language that poses two counterexamples to hypothesis (i) is Mangarayi (Australian, Australia). It uses a single set of person markers in both alienable and inalienable possession, which expresses agreement in the former, but is referential in nature in the latter, as shown by the asterisk-marked pattern

<sup>23</sup> Each of these correlations is tested for statistical significance on the basis of a Fisher's Exact test ( $p < 0.05$ ). A Contingency Coefficient (CC) was also computed, which indicates the strength of a statistically significant correlation irrespective of sample size. It ranges from 0 to 1, with 0.10 indicating a weak correlation and  $0.45 \leq$  indicating a strong correlation (Everitt 1977). The first relation is statistically significant ( $p < 0.0001$ ) and very strong ( $CC = 0.676$ ). The second and third relations are not significant, due to the skewed distribution of marking combinations in the table.



'k'. This is the case for both nominal and pronominal possessors. An example of alienable (18a) and inalienable (18b) possession with a nominal possessor is given below:

- (18) a. (*ŋa-buɓuŋ-gu*)                      *ø-baŋam-ŋawu*  
           GEN.M-old.person-GEN.M    ABS.NT-camp-3SG.NF.POSS  
           'the old man's camp'
- b. (*landi*)    *jurgjurg-ŋawu*  
           tree        leaf-3SG.NF.POSS  
           'the leaves of a tree' (Merlan 1982: 66, 74)

The marker is analyzed as referential in nature in inalienable possession (18b), since there it carries information – more specifically possessor role information – that cannot be copied from the possessor NP. In alienable possession (18a), by contrast, the NP takes a genitive case affix, which means that the possessor role information can be readily copied onto the possessive person marker. The marker is correspondingly analyzed as expressing agreement. Note, however, that the fact that the role information in (18a) **can** be copied does not necessarily imply that it also **has** to be copied; in principle, it may still be the case that the marker provides the possessor role information independently, rather than copying this information from the possessor NP. In other words, constructions where the marker and the optional possessor NP share the possessor role information, as in (18a), are less clear-cut cases of agreement than those where the marker provides less information than the NP – and are therefore perhaps better considered to be unanalyzable in terms of (cross-)reference/agreement. As such, the pattern in (18) does not pose a strong counterexample to the hypothesis in (i). A true counterexample to the hypothesis would be a language without genitive case/adpositional marking, but with a unique set of person markers only in inalienable possession, not in alienable possession. None of the languages investigated in this study fit this description.<sup>24</sup>

The data in Table 3 show that the most frequently attested combinations of referential/agreement markers are those in which the alienable and inalienable

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<sup>24</sup> This observation yields an interesting generalization open to further study: if person markers in inalienable possession express possessor role information, person markers in alienable possession express such information as well. A possible explanation for this generalization is that the presence of a possessor already inherently follows from the semantics of the inalienable noun, which is therefore in far less need of specifying the possessive relationship than non-relational nouns. Section 3.5.3 discusses this explanation in more detail.

possessive person marker share the same referential potential (56 out of the 70 attested combinations – a, h or m – i.e. 80%). Combination a – the use of a unique referential marker for both alienable and inalienable possession – is the most frequently attested (31 out of 70 combinations, i.e. 44%). An example is provided for Puyuma (Austronesian, Taiwan) below, which demonstrates the complementary distribution between the independent possessor pronoun and the alienable (19a) and inalienable (19b) possessive person markers:

- (19) a. *tu=ruma'*            (*\*taytaw*)  
           3.POSS=house    3SG  
           'his/her/their house'
- b. *i*            *tina-taw*            (*\*taytaw*)  
           SG.NOM    mother-3.POSS    3SG  
           'his/her/their mother' (Teng 2008: 94, p.c.)

Another common pattern is the use of possessive person markers of the appositional referential type in both alienable and inalienable possession. This is combination h, which has 20 instances in the sample (i.e. 29%). This pattern is most frequently attested in NPs with a nominal possessor (14 out of 20 combinations, i.e. 70%). A case in point is Ungarinyin (Australian, Australia), which uses independent person forms in alienable possession, but a set of person prefixes in inalienable possession. Both person forms function as appositional referential markers, as they carry possessor role information that the possessor nominal does not carry. This is demonstrated in respectively (20a), repeating (14a) in Section 3.2.2, and (20b) below:

- (20) a. (*Gádbuŋu*)    *anàŋga*            *dámbun*  
           Gadbuŋu    3SG.M.POSS    country  
           'Gadbungu's country'
- b. (*ari*)    *a-marlarr*  
           man    3SG.M-forehead  
           'the man's forehead' (Rumsey 1982: 70, 43; Spronck p.c.)

Combinations in which the two person markers are of a distinct referential potential are considerably less frequent (14 out of the 70 combinations – c, i and k – i.e. 20%). An example of combination c is provided below for the language isolate Urarina (Peru), where the independent person markers coding alienable possession occur in complementary distribution with an additional, independent pronoun (21a), while the person clitics coding inalienable

possession occur optionally with the same pronoun (21b). Hence, co-occurrence restrictions are loosened only for inalienable possession, which directly reflects its more grammaticalized status in comparison to alienable possession:

- (21) a. (\**ii*)    *ii*    *kuriki*  
           2SG    2SG    money  
           ‘your money’  
       b. (*ii*)    *dz=aria*  
           2SG    2SG=family  
           ‘your family’ (Olawsky 2006: 562, 340, p.c.)

A language with combination *i*, for both nominal and pronominal possessors, is Bororo (Bororoan, Brazil). As shown below, the language employs appositional referential markers in the form of clitics in alienable possession (22a), but contextual agreement markers in the form of prefixes in inalienable possession (22b):

- (22) a. (*Barae*)        *eno=moto*  
           (Brazilian)    3PL.POSS=land  
           ‘Brazil’ (lit. ‘Brazilians land’)  
       b. (*Kuruiedi*)    *u-mana*  
           Kuruiedi        3SG-older.brother  
           ‘Kuruiedi’s older brother’ (Crowell 1979: 197, 215)

An explanation for the fact that combinations of (in)alienable possessive person markers with the same referential potential are more common than those with a distinct referential potential is that alienability splits are often already implemented via the formal expression of the person forms. That is, the alienable and inalienable possessive person forms are already of a distinct formal expression type. This is the case in each of the examples provided in (19) to (22). A language in which the alienable and inalienable person marker share the same expression type as well as the same referential potential is Koasati (Muskogean, United States). Koasati uses two sets of contextual agreement markers: one for alienable possession (as well as for indirect objects, benefactives, malefactives and subjects of a class of stative verbs), and another for inalienable possession (as well as for direct objects and subjects of another class of stative verbs) (Kimball 1991: 112). This is shown in respectively (23a), which repeats (13a) in Section 3.2.2, and (23b):

- (23) a. (*jhocilím*) *im-laykí*  
 star 3-dung  
 'a meteor' (lit. 'a star's dung')
- b. (*albatá*) *ø-a:nipó*  
 alligator 3-prepared.meat  
 'alligator meat' (Kimball 1991: 433, 438)

The distribution of marking combinations in the table demonstrates that, in keeping with hypothesis (i), alienable possession shows a stronger preference for (unique/appositional) referential marking (63 out of 70 combinations, i.e. 90%) than inalienable possession (53 out of 70 combinations, i.e. 76%). Hence, referential markers are more likely to be found in alienable possession, than in inalienable possession. However, these counts also show that both alienable possession and inalienable possession – when considered in their own right – prefer the use of referential markers over that of agreement markers. In the languages investigated, possessive person markers thus tend to be referential in nature rather than expressing agreement, irrespective of the type of possession that they mark. A possible explanation for this tendency may be sought in the low contextual salience of possessors in comparison to verbal arguments, especially subjects and objects. Following Keenan and Comrie's (1977) accessibility hierarchy, and subsequent work by Givón (1983) and Ariel (1988, 1990), possessors are less contextually salient – and therefore less accessible in the mind of the hearer – than (subject and object) arguments of verbs. This may be attributed to the embedded position of possessors in the clause. Importantly, this may trigger the need for a more salient means of referent tracking, i.e. a marker that refers to the possessor and that overtly specifies its possessor role.

Finally, Table 3 shows that while many languages employ possessive person markers of the unique referential type (34 out of 69 combinations, i.e. 49%), none of the sample languages employs markers of the syntactic agreement type. As mentioned in Section 3.2.2, syntactic agreement markers are not attested in possessive NPs, and appear to be restricted to subjects in main clauses. The absence of such markers is striking given the common use of possessive person markers among the world's languages. Possible motivations for the complete absence of possessive syntactic agreement markers are briefly discussed in the next subsection. Interestingly, some of these motivations conversely explain the common use of unique referential markers among the sample languages, which is also briefly discussed in the section below.

### 3.5.1.2 The absence of syntactic agreement markers in possessive NPs

An interesting finding given in the previous subsection is that none of the sample languages, nor any language I know of, employs possessive NPs with syntactic agreement markers. This means that, in contrast to verbal person forms, possessive person forms are never obligatorily accompanied by a corresponding NP; in the presence of a possessive person form, a (pro)nominal expression of the possessor always occurs optionally, or is banned from the NP altogether. Two general explanations may be formulated for this finding, which partly resemble those provided by Siewierska (1999, 2004: 268–273) to account for the rarity of syntactic agreement markers in the clausal domain.

First, syntactic agreement markers may not develop since the possessor NP is dropped so often that it will not become obligatory. As discussed in Section 3.2.2, reasons for dropping the possessor NP may be two-fold. On the one hand, the person marker may be referential by itself. This is the case in many of the languages investigated in this study, since possessive markers strongly tend to be referential in nature, as demonstrated in the previous subsection. On the other hand, the possessor NP may remain unexpressed because it is retrievable from the discourse context. Languages with a low referential density, such as Tidore (11) exemplified in Section 3.2.2, show extreme examples of such context-induced omission of the NP. Both factors dispense the need for expressing the possessor as a free NP, thereby preventing the person marker from further grammaticalization.

A further, related reason for leaving the possessor NP unexpressed is the general informativeness of the person marking paradigm, i.e. the extent to which the marker expresses role information, as well as other features, such as person, number, gender, inclusivity and honorificity. As pointed out by Siewierska (2004: 269–272), the loss of such information – that is the rise of homophonous forms in the paradigm – may induce the presence of a free NP, for reasons of disambiguation or to convey information not expressed in the person forms. Siewierska shows that this is a likely scenario for the rise of syntactic agreement markers in the clausal domain. Conversely, the retention of semantic information may provide a likely motivation for the absence of syntactic agreement markers in possessive NPs: when the possessive person marker already provides sufficient information to identify the referent, an overt NP is relatively redundant, and may therefore remain unexpressed. This explanation applies to many of the languages in the sample, as they use paradigms of possessive person marking that are relatively informative, showing little homophony. The expression of the possessor NP may therefore be left to special

contexts only, such as focus, emphasis or contrast. In fact, most of the sample languages employ possessive person markers that are richer in terms of grammatical feature information – specifically possessor role information – than the co-occurring NP, which is illustrative of their referential nature. As noted above, this may discharge the need for a (pro)nominal expression of the possessor even further.

A second explanation for the absence of possessive syntactic agreement markers is the fact that the person marker may be lost before it reaches this final stage of grammaticalization. On the one hand, a loss of person marking may be due to formal changes: new person markers may be used once the old ones start to fuse with the possessum stem. This process often goes paired with the merging of paradigmatic distinctions, as discussed above, and/or a loss in referential potential, as further discussed in Section 3.5.4.

On the other hand, the person marker may simply fall into disuse. As pointed out by Siewierska (1999: 243, 2004: 276–278), this is often the result of language contact, which triggers the use of new, free forms in favor of the old, mostly bound, forms. This process, also known as ‘diffusion’, is a form of indirect borrowing: only structural patterns are borrowed, here the phenomenon of using independent person forms, rather than actual morphemes. A case in point is the language isolate Urarina (Peru). Under the influence of Spanish, younger Urarina speakers tend to abolish the proclitics used on inalienable possessums (24a) in favor of the independent person markers used also with alienable possessums (24b). A result of this process is the gradual neutralization of Urarina’s alienability opposition.

- (24) a. *ka=tihja*  
           1SG=foot  
           ‘my foot’  
       b. *kanu tihja*  
           1SG foot  
           ‘my foot’ (Olawsky 2006: 353)

In sum, there are a number of different scenarios that may prevent the development of syntactic agreement markers in possessive NPs. The absence of such markers shows that the optional expression of a possessor NP in the presence of a person marker is diachronically stable. Following Van Gijn (2011), this is due to the fact that such markers, reflecting the stages directly prior to syntactic agreement, are functionally optimal: they identify the possessor referent, but without obligatorily expressing information twice. This distribution

of functions is maximally economical, and therefore likely to be diachronically stable. As demonstrated in this section, this explanation may account not only for the cross-linguistic rarity of syntactic agreement markers in clauses, but also for the absence of such markers in possessive NPs.

Finally, note that three of the reasons provided above for the absence of possessive syntactic agreement markers may conversely account for the common use of possessive unique referential markers, as pointed out in the previous subsection. First, unique referential markers already refer to the possessor on their own, which may dispense the need for an additional referential expression of the possessor inside the possessive NP. Second, markers of this type may be highly informative in terms of the grammatical features that they express, and therefore do not require a lexical or pronominal possessor for disambiguation or to convey information not expressed in the person forms. As pointed out by Siewierska (2004: 268), the relative informativeness of person forms may be connected to their formal expression; as will be demonstrated in Section 3.5.4, unique referential markers strongly tend to be separate words, which makes them inherently less likely to lose information as a result of fusion with the possessum. A third reason relates to the frequency with which unique referential markers are expressed in discourse: in languages where pronominal expressions of the possessor are frequently dropped, for instance because they have a low referential density, such markers are less likely to further grammaticalize into markers of appositional cross-reference. This has been described by, for instance, Bisang (2008, 2009) as the lack of ‘overt complexity’ in Southeast Asian languages.

This subsection concludes the discussion of alienable and inalienable possessive person markers in terms of their referential potential. In the next subsection, I turn to the relationship between alienable and inalienable possessive person markers terms of their formal expression, as predicted by hypothesis (ii).

### **3.5.2 Hypothesis (ii): the formal expression of (in)alienable possessive person marking**

In this section, I present the data relevant to hypothesis (ii), which predicts a relationship between alienable and inalienable means of person marking and their formal expression type. Table 4 below presents the different types of marking combinations attested among the 39 languages of the sample. The order of the four expression types (in the columns) captures the gradual reduction in

morpho-phonological form predicted by the corresponding cline in (16). Otherwise, the table has the same structure as Table 3 above. Note that the total number of combinations in Table 4 (N=82) is higher than in Table 3 (N=70), since Table 4 includes the marking strategies excluded from Table 3 (which are unanalyzable in terms of referential potential, but analyzable in terms of formal expression type). Table 2 in Appendix II lists the sample languages that instantiate each combination of marking strategies.

The data in Table 4 confirm hypothesis (ii) without any counterexamples: person markers of alienable possession are never less formally independent, or formulated the other way around, never show a greater degree of formal bonding with the possessum than markers of inalienable possession. Four sub-relations follow from this generalization. First, if the inalienable person marker is a free form, the alienable marker is too (compare combination a to \*e, \*f and \*g). Second, inalienable markers in the form of clitics always combine with alienable markers in the form of words, never an affix or a fused form (compare combination b to \*k and \*l). The combination of alienable and inalienable possessive clitics is a logical possibility, but is not attested among the languages investigated. Third, when the inalienable marker is an affix, the alienable marker is a word, a clitic or an affix, but never a fused form (compare combinations c, i and m to \*o). The fourth and final relation involves the use of fused forms for inalienable possession, which combine with alienable markers in the form of words in the languages investigated. Combinations involving cliticized, affixal or fused alienable markers (j, n and p) are logically possible, but again not attested in the sample.<sup>25</sup>

The frequencies in the table show that combinations involving clitics and/or fused person forms are relatively uncommon (12 out of 82 instances, i.e. 15%). The rarity of person clitics is presumably due to the fact that clitics are recognized on the basis of different criteria or are not recognized in the available descriptions at all. As mentioned in Section 3.2.1, fused person forms arise only for certain (high-frequency) combinations of possessors and possessums, such as 1<sup>st</sup> person possessors of kinship terms.

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<sup>25</sup> Only the first relation is statistically significant ( $p=0.004$ ) and moderately strong ( $CC=0.291$ ). As with hypothesis (i), the other relations are not statistically significant, due to the skewed distribution of combinations in the table.



Table 4: The distribution of (in)alienable person markers in terms of formal expression type

	word	clitic	affix	fused marker	Frequencies		
					Possessor noun	Possessor pronoun	Total (N=82)
a	AL, INAL				1	12	13
b	AL	INAL			-	4	4
c	AL		INAL		11	23	34
d	AL			INAL	1	3	4
*e	INAL	AL			-	-	-
*f	INAL		AL		-	-	-
*g	INAL			AL	-	-	-
h		AL, INAL			-	-	-
i		AL	INAL		2	2	4
j		AL		INAL	-	-	-
*k		INAL	AL		-	-	-
*l		INAL		AL	-	-	-
m			AL, INAL		9	14	23
n			AL	INAL	-	-	-
*o			INAL	AL	-	-	-
p				AL, INAL	-	-	-

Comparing the distribution of combinations in the table shows that there is a slight preference for the alienable and inalienable possessive person marker to have a distinct formal expression: 46 out of the 82 attested combinations (i.e. 56%) are of type b, c, d or i, while 36 of the 80 combinations (i.e. 44%) are of type a or m. Combination c is the most frequently attested among the languages investigated (34 out of 82 combinations, i.e. 42%). It involves the use of person words in alienable possession, but of person affixes in inalienable possession. A number of relevant examples have been provided in previous sections: Puyuma (3), Ungarinyin (20) and Urarina (21).

A second frequent pattern is the coding of both alienable and inalienable possession by means of person affixes, i.e. combination m, which has 23 instances (i.e. 28%). In languages with this pattern, the alienability split is instead implemented via a difference in referential potential and/or the fact that the affixes form two separate sets. The latter was illustrated for Mangarayi (18) and Koasati (23) in Section 3.5.1.1. The former is illustrated for Udihe (Altaic, Russia) below. As previously shown in (6) in Section 3.2.1, Udihe employs one set of

person suffixes in alienable and inalienable possession, which expresses possessor role information only in alienable possession. The person marker thus expands on the role information provided by the possessor NP, but only in alienable possession, as shown in (25a), where it is correspondingly analyzed as an appositional referential marker. In inalienable possession, the suffix is analyzed as a contextual agreement marker, as shown in (25b):

- (25) a. (*nuani*) *ja:-ŋi-ni*  
           3SG       cow-POSS-3SG  
           ‘his/her cow’  
       b. (*nuani*) *neŋu-ni*  
           3SG       younger.sibling-3SG  
           ‘his/her younger sibling’ (Nikolaeva & Tolskaya 2001: 112, 111)

Interestingly, none of the languages investigated realizes person markers differently depending on the nominal or pronominal character of the possessor. There is no language, for instance, that uses person affixes with nominal possessors, but independent person forms with (or as) pronominal possessors, or that uses person clitics with nominal possessors, but person affixes with (or as) pronominal possessors. The absence of such splits yields the following generalization: if a language uses a set of person markers with a nominal possessor, it also always uses the same set of person markers with (or as) a pronominal possessor. This generalization is directly related to the absence of syntactic agreement markers: in the presence of a possessive person marker, a possessor NP is always optional, and the person marker thus occurs in both nominal and pronominal contexts.

In general, Table 4 reveals that person markers used in alienable possession tend to be realized as words (55 out of 82 instances, i.e. 67%), while inalienable person markers tend to be realized as affixes (61 out of 82 combinations, i.e. 74%). The preference for alienable marking with free person forms is strongest among pronominal possessors (42 out of the 58 combinations involving possessor pronouns – a to d – i.e. 72%). This is due to the fact that free person forms strongly tend to be unique referential markers, i.e. markers in complementary distribution with other referential expressions of the possessor, as illustrated for Puyuma (19) in Section 3.5.1.1. The preference of inalienable marking with affixal person forms is strongest among NPs with nominal possessors: only 2 non-affixal inalienable markers are attested for such possessors in the sample (one word, in combination a, and one fused form, in combination d).

Finally, I compare the formal expression of person markers in NPs with nominal possessors to that in NPs with pronominal possessors, irrespective of the alienability opposition. The figures in Table 4 show that possessive person markers strongly prefer an affixal expression form when they co-occur with a nominal possessor (22 out of the 24 combinations a possessor noun – c, i, and m – i.e. 92%). Conversely, they prefer to be realized as words in NPs with a pronominal possessor (42 out of the 58 combinations involving possessor pronouns – a to d – i.e. 72%). As noted above, this preference is due to the fact that independent person markers tend to function as unique referential markers, and thus instantiate the possessor pronoun themselves. The co-occurrence of an independent person marker with an additional, independent pronoun in the same possessive NP is rare. Together, these observations suggest that the co-occurrence of a possessor (pro)noun is much more likely when the marker has the form of affix than when it has form of a word. The corresponding data for this generalization are presented in Section 3.5.4, which investigates the relationship between referential potential and formal expression type in the languages of the sample. The next subsection first provides an explanation for the generalizations in (i) and (ii) that pertains to the semantic opposition between relational and non-relational nouns, as discussed in Section 3.2.1.

### 3.5.3 A semantic explanation of the findings

Together, the findings provided in the previous two subsections support the claim that inalienable possession never shows a greater degree of linguistic distance than alienable possession (cf. Section 3.2.1). Haiman and Haspelmath each provide a distinct motivation for this asymmetry, which will be discussed in turn below. I will subsequently argue for an alternative explanation of the findings, building on the opposition between inherently relational and inherently non-relational nouns.

The first explanation, proposed by Haiman (1983: 793–795, 1985: 130–136), provides an iconic motivation of alienability splits. According to Haiman (see also Croft 2008), the conceptual distance between possessor and possessum is greater in alienable possession than in inalienable possession, which is iconically reflected in the greater linguistic distance between the corresponding items.

An alternative explanation, relying on economy, is provided by Haspelmath (2008a, see also Nichols 1988: 579, 1992: 121). He argues that kinship terms and body part terms tend to occur with a possessor NP significantly more often than other (non-relational) nouns. This makes the possessive relationship

increasingly predictable to the hearer, allowing the speaker to use less expressive (more cohesive) coding for inalienable possession.

In this paper, I propose an alternative explanation, which combines the two accounts given above. Like Haspelmath (but unlike Haiman), I recognize that patterns of possessive marking are to a high degree economically motivated, as resulting from the predictability of inalienable possessors. However, like Haiman (but unlike Haspelmath), I argue that this predictability follows directly from the inherent relationality of nouns such as kinship terms and body part terms, rather than from the relative frequency with which such nouns occur possessed in discourse. Since such nouns are inherently relational, their relationship to a possessor follows automatically from their semantics. As a result, inalienable possessive relations are highly predictable and in far less need of expressive means of coding than alienable possessive relations, both in terms of function – the use of referential markers rather than of agreement markers – and in terms of form – the use of independent person markers rather than of bound person markers.<sup>26</sup>

The major advantage of a semantically based explanation of the attested patterns is that it applies irrespectively of language-specific (and construction-specific) differences in the degree to which possessor NPs are expressed. Recall from the discussion of Tidore in Section 3.2.2 that the extent to which languages use overt possessors varies greatly, due to differences in referential density. In fact, it may well be that inalienable possessors are more likely to be omitted than alienable possessors, since they tend to be directly related to the discourse context. This is demonstrated by Dahl & Koptjevskaja-Tamm (1998: 43–44), who point out that kinship terms tend to have possessors of 1<sup>st</sup> or 2<sup>nd</sup> person, while possessors of body part terms typically denote referents that are explicitly mentioned in the same or an immediately preceding clause (as in external possession constructions, such as *I hit him in the head*, see also Taylor 1996). As a result, possessors of such items are redundant from a communicative point of view.

Crucially, the type of frequency asymmetry argued for by Haspelmath is highly sensitive to differences in the extent to which individual languages express possessor NPs. In fact, this is demonstrated by his own corpus data, which show that in Spanish inalienable nouns much more frequently occur

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<sup>26</sup> As noted previously, kinship and body part terms need not all be treated as inalienable nouns in individual languages. However, if an item is perceived as inalienably possessed in a given language, it is also formally treated as such, and thus adheres to the explanation formulated here.

without a possessor than with a possessor, due to the common use of body part constructions like *levanta la mano* ‘raise your (lit. the) hand’ (Haspelmath 2008a: 20). The fact that a possessor is present in the discourse context is nevertheless inherent to the semantics of the inalienable possessum, and thus applies cross-linguistically. Moreover, the opposition between relational and non-relational items is not restricted to the possessive NP, but pertains also to other grammatical domains. Clear examples of other relational items are verbs and adpositions, while other non-relational items are nouns accompanied by attributive adjectives or relative clauses. The inherent relationality of the former types of items is expected to account for asymmetries in morphosyntactic coding similar to those discussed in this paper.

### 3.5.4 Hypothesis (iii): the relationship between function and form

The third and final hypothesis tested in this paper predicts a relationship between the referential potential (function) and the expression type (form) of possessive person markers, both across and within individual languages. Table 5 below presents the cross-linguistic distribution of the three attested types of referential/agreement markers (in the columns) in terms of their formal expression type (in the rows). The table excludes syntactic agreement markers, which are not attested, as well as fused person forms, which are unanalyzable in terms of referential potential (cf. footnote 18) and relatively rare (cf. Table 4 in Section 3.5.2). Moreover, it excludes six sample languages (Dogon, Fula, Hittite, Kunama, Lango and Tamashek) as they do not employ any possessive person markers of which the referential potential could be determined. Kharia and Inanwatan, excluded from Table 3 in Section 3.5.1.1, do participate in this table, as the referential potential of (some of) their possessive markers could be determined. In total, the table thus contains information from 33 out of the 39 sample languages. An overview of the marking strategies in each sample language is provided in Table 3 in Appendix II.

The table shows that the distribution of the different types of person markers among the languages in the sample is far from uniform. The vast majority of markers is of the (unique or appositional) referential type (respectively 47 and 43 instances), while far less markers are of the (contextual) agreement type (only 25 instances). These data support the observation, made in Section 3.5.1.1, that possessive person markers tend to be referential in nature, rather than cases of agreement. With respect to formal expression type, the table

Table 5: The referential potential and formal expression of (in)alienable person markers

		possessor type	Referential potential (function)			Total
			unique referential marker	appositional referential marker	contextual agreement marker	
Expression type (form)	word	noun	n.a.	8	-	8
		pronoun	31	2	-	33
<b>subtotal</b>			<b>31</b>	<b>10</b>	<b>-</b>	<b>41</b>
	clitic	noun	n.a.	2	-	2
		pronoun	1	1	3	5
<b>subtotal</b>			<b>1</b>	<b>3</b>	<b>3</b>	<b>7</b>
	affix	noun	n.a.	18	13	31
		pronoun	15	12	11	38
<b>subtotal</b>			<b>15</b>	<b>30</b>	<b>24</b>	<b>69</b>
<b>Total</b>			<b>47</b>	<b>43</b>	<b>27</b>	<b>117</b>

reveals that the markers in the sample prefer to be expressed as affixes (67 instances) rather than as separate words (41 instances). Person markers realized as clitics are very poorly attested (only 7 instances), which, as noted previously, may perhaps be attributed to their identification by means of varying criteria.

Despite the skewed distribution of person markers in the table, the data show a clear asymmetry in the way referential markers and agreement markers are expressed. Unique referential markers are the most likely to take the form of separate words (31 out of 47 instances, i.e. 66%), followed by appositional referential markers (10 out of 43 instances, i.e. 23%). There are no contextual agreement markers in the form of separate words, although these are attested outside the sample, for instance in the extinct isolate Atakapa (United States; Swanton 1929) and in Tiwi (Australian, Australia; Osborne 1974: 74–75).

Instead, contextual agreement markers strongly tend to be realized as affixes (24 out of 27 instances, i.e. 90%), followed by appositional referential markers (30 out of 43 instances, i.e. 70%). Unique referential markers are in turn the least likely to be expressed as affixes (15 out of 47 instances, i.e. 32%). These figures clearly demonstrate that the likelihood of a possessive person marker to have an expression form on the left-hand side of the formal cline decreases with every step to the right of the functional cline. In other words, functionally more grammaticalized markers also tend to be formally more grammaticalized, while functionally less grammaticalized markers also tend to be formally less

grammaticalized. From a diachronic perspective, this suggests that there is a strong tendency for functional and formal changes to proceed in the same direction: as a marker loses referential potential, it also tends to lose – but not gain – formal independence, e.g. it develops from a free form to an affix on the possessum, but not the other way around. This in turn could be taken as evidence that function and form are parallel paths.

However, at the same time, the data clearly show that the parallel path hypothesis cannot be made absolute: in many of the languages investigated, function and form do not synchronically coincide, suggesting that a move down the functional cline need not go paired with a move down the formal cline, and vice versa. This is demonstrated in Table 5, where it is shown that possessive person markers expressing contextual agreement may take the form of clitics (3 instances), while possessive person markers expressing (unique or appositional) cross-reference may take the form of affixes (respectively 15 and 30 instances). In fact, such so-called ‘mismatches’ (Lehmann 1982a: 236) in function and form are rather common: as mentioned above, 32% of all attested unique referential markers is affixal, and an affixal expression form is even preferred among markers of the appositional referential type (70%). Ample examples of affixal referential markers have been provided in the previous subsections. An example of a contextual agreement marker in the form of a clitic, used with both nominal (26a) and pronominal possessors (26b), is provided below for Kharia (Austro-Asiatic, India):

- (26) a. (*Raʃa=yaʔ*)    *ayo=ɖom*  
           Rata=GEN    mother=3.POSS  
           ‘Rata’s mother’  
       b. (*am=aʔ*)    *ɖhangar=nom*  
           2SG=GEN    servant=2.POSS  
           ‘your servant’ (Peterson 2011: 87, 164)

Thus, the data show that possessive person markers may, and in fact often do, demonstrate variable behavior in terms of referential potential (function) and expression type (form). This clearly demonstrates that function and form cannot be directly related in a one-to-one relationship, thereby arguing against an absolute interpretation of the parallel path hypothesis. Moreover, it demonstrates that functional and formal changes cannot be collapsed into a single cline, as commonly done in the traditional grammaticalization literature (cf. the cline in (1) given in the introduction).

Instead of an absolute relationship between function and form, the data reveal that the relationship between both dimensions of grammaticalization is of a relative nature. This can be demonstrated by comparing the referential potential and expression type of possessive person markers in individual languages. The result of this comparison is given in Table 6 below. The table presents the distribution of the 27 logically possible combinations of possessive person markers of a distinct referential potential (in the rows) in terms of their formal expression (in the columns), as well as the languages employing each combination. Like Table 5, Table 6 excludes syntactic agreement markers and fused person forms. The following abbreviations are used: 'UR' for unique referential marker, 'AR' for appositional referential marker and 'CA' for contextual agreement marker.

Table 6: The distribution of markers of a distinct referential potential in terms of formal expression type

	word	clitic	affix	Languages		
				Possessor noun	Possessor pronoun	Total (N=17)
i	UR, AR			n.a.	-	-
ii	UR	AR		n.a.	-	-
iii	UR		AR	n.a.	Tiriyo	1
*iv	AR	UR		n.a.	-	-
*v	AR		UR	n.a.	-	-
vi		UR, AR		n.a.	-	-
vii		UR	AR	n.a.	-	-
*viii		AR	UR	n.a.	-	-
ix			UR, AR	n.a.	-	-
x	UR, CA			n.a.	-	-
xi	UR	CA		n.a.	Urarina	1
xii	UR		CA	n.a.	Tiriyo	1
*xiii	CA	UR		n.a.	-	-
*xiv	CA		UR	n.a.	-	-
xv		UR, CA		n.a.	-	-
xvi		UR	CA	n.a.	-	-
*xvii		CA	UR	n.a.	-	-
xviii			UR, CA	n.a.	-	-
xix	AR, CA			-	-	-
xx	AR	CA		-	-	-



Table 6: The distribution of markers of a distinct referential potential in terms of formal expression type

	word	clitic	affix	Languages		
				Possessor noun	Possessor pronoun	Total (N=17)
xxi	AR		CA	Tiriyo, Ungarinyin, Biak	-	3
*xxii	CA	AR		-	-	-
*xxiii	CA		AR	-	-	-
xxiv		AR, CA		-	-	-
xxv		AR	CA	Bororo	Bororo	2
*xxvi		CA	AR	-	-	-
xxvii			AR, CA	Udihe, Paumari, Ungarinyin, Mangarayi, Biak	Udihe, Tiriyo, Mangarayi	9

Without any counterexamples, the table reveals that if a language employs two sets of possessive person markers of a distinct referential potential, the person marker of a lower degree of referential potential never has a more independent expression form than the marker of a higher degree of referential potential. Instead, lower referential markers are always less or equally formally independent as higher referential markers. For instance, there is one language in which appositional referential markers have the form of clitics and contextual agreement markers have the form of affixes (Bororo; pattern xxv), and six languages in which both types of markers have the form of affixes (Udihe, Paumari, Ungarinyin, Mangarayi, Biak and Tiriyo; pattern xxvii). However, there is no language in which appositional referential markers have the form of affixes, while contextual agreement markers have the form of affixes (pattern xxvi). These data provide clear support for hypothesis (iii). From a diachronic perspective, they suggest that as a marker moves down the functional cline, it cannot move up the formal cline. Thus, a loss in referential potential never goes paired with a gain in formal independence. However, a loss in referential potential need not go paired with a loss in formal independence either, as was already demonstrated above. Together, these findings suggest that function and form develop in the same direction, but need not develop at the same pace.

On a final note, Table 6 demonstrates that not every combination predicted by hypothesis (iii) is also attested among the sample languages. This is mainly due to the fact that in many of the languages investigated, possessive person markers are not of a distinct, but of the same referential potential. This is demonstrated in Table 7, which presents the distribution of combinations of possessive person markers sharing the same referential potential (in the rows) in terms of their expression type (in the columns). Note, however, that none of the combinations in this table contradict the hypothesis in (iii).

Table 7: The distribution of markers of the same referential potential in terms of formal expression type

	word	clitic	affix	Frequencies		
				Possessor noun	Possessor pronoun	Total (N=77)
i	UR, UR			n.a.	14	14
ii	UR	UR		n.a.	2	2
iii	UR		UR	n.a.	17	17
iv		UR, UR		n.a.	-	-
v		UR	UR	n.a.	1	1
vi			UR, UR	n.a.	9	9
vii	AR, AR			1	-	1
viii	AR	AR		-	-	-
ix	AR		AR	9	2	11
x		AR, AR		-	-	-
xi		AR	AR	1	-	1
xii			AR, AR	9	6	15
xiii	CA, CA			-	-	-
xiv	CA	CA		-	-	-
xv	CA		CA	-	-	-
xvi		CA, CA		-	1	1
xvii		CA	CA	-	-	-
xviii			CA, CA	2	3	5

In sum, the data discussed in this section suggests that, although (a loss in) referential potential strongly correlates with (a loss in) formal independence, this relationship cannot be made absolute, since highly referential markers may be, and in fact often are, formally bound, while lower referential markers may be formally independent. Instead, the relationship between function and form is

shown to be relative in nature: lower referential markers are never more formally independent than higher referential markers, in individual languages. Together, these findings suggest that functional and formal changes proceed in the same direction, but need not proceed at the same pace.

### 3.6 Conclusions

The diachronic development of free pronouns to markers of agreement is a widely debated topic in the literature (e.g. Givón 1976; Corbett 2003; Siewierska 1999, 2004: 261–273). Focusing on person markers in possessive NPs, the paper shows that this development is characterized, on the one hand, by a loss in referential potential, and, on the other hand, by a reduction in morpho-phonological form. Each dimension follows its own grammaticalization cline, which is investigated separately for alienable and inalienable possessive person markers in a worldwide sample of 39 languages.

The referential potential of individual person markers is captured by a four-part typology (Hengeveld 2012), which provides a refinement to existing typologies of referential/agreement markers in two ways. First, it is able to distinguish referential markers and agreement markers independently of their formal expression type. Second, it straightforwardly determines the referential potential of a cross-linguistically common type of possessive person marker: those that optionally co-occur with a possessor noun or pronoun inside the same possessive NP. Such person markers are given a unified analysis as referential markers or as markers of agreement, depending on the distribution of grammatical feature information in the language and the construction in question. This approach is supported by recent work (e.g. Fedden et al. 2013; Iemmolo & Witzlack-Makarevich 2013), demonstrating that person markers show highly language-specific and construction-specific behavior, and can therefore hardly be regarded as a single type. The result is a much more fine-grained analysis of person marking in terms of referentiality than in existing typologies of (cross-)reference/agreement.

The paper tests three hypotheses, each of which is fully borne out by the data. The results for the first two hypotheses demonstrate a robust relationship between alienable and inalienable possessive person markers in terms of referential potential (hypothesis (i)) and in terms of formal expression type (hypothesis (ii)). It is demonstrated that, across individual languages, person marking of inalienable possession is never more referential and never more formally independent than person marking of alienable possession. In fact,

inalienable possessive marking tends to be less referential and formally more reduced than alienable means of coding. These findings are explained in terms of the inherent relationality of inalienable nouns as opposed to the inherent non-relationality of alienable nouns. Since the presence of a possessive relationship follows automatically from the semantics of the inalienable noun, it is in far less need of a referential and morpho-phonologically independent expression of the possessor than alienable nouns. The diachronic implication of these results is that inalienable possessive person marking is more grammaticalized, both in terms of function and in terms of form, than alienable possessive person marking. These results support previous findings in the literature (Haiman 1983: 793–795; Haspelmath 2008a: 18–22; Nichols 1992: 121–122).

The third hypothesis tested in this study demonstrates a strong relationship between the referential potential and the formal expression type of possessive person markers, independently of alienability splits. It is shown that, in individual languages, markers of a lower degree of referentiality never show a greater degree of formal independence than markers of a higher degree of referentiality. Differently put, higher referential markers never show a greater degree of bonding with the possessum than lower referential markers in individual languages. This finding provides clear support for the unidirectionality of grammaticalization processes (see e.g. Haspelmath 1999; Hopper & Traugott 1993: 126–128), as it suggests that a loss in referential potential never goes paired with a gain in formal independence. However, at the same time, it is shown that a loss in referential potential need not go paired with a loss in formal independence either: while referential markers may, and in fact often do, have the form of affixes, agreement markers may have the form of clitics. Thus, the relationship between function and form is relative, rather than absolute. From a diachronic perspective, this suggests that function and form develop in the same direction, but not at the same pace. Notably, this is a much more specific relationship between function and form than is often presumed in the literature, most prominently by proponents of the parallel path hypothesis.

In sum, this study demonstrates that only when different dimensions of grammaticalization are systematically separated in synchronic typological work can their precise diachronic interplay be revealed. This not only applies to person markers in possessive NPs, but also to those in other grammatical domains, most prominently (main) clauses and adpositional phrases, for which the same conflation of function and form is often presupposed. The identification and comparison of (splits in) the referential potential and the formal expression of person markers in each of these domains is an interesting

future enterprise. The typology of referential/agreement marking applied in this paper provides a suitable framework for pursuing this aim.



## 4

## Alignment beyond the clause: the morphosyntactic expression of phrasal and clausal dependency relations from a typological perspective<sup>1</sup>

### Abstract

This paper investigates alignment, not only as a clausal phenomenon, but as applying to both clauses and phrases. Specifically, I investigate the degree of identical morphosyntactic coding of possessive NPs, adpositional phrases and arguments in verbal main clauses, in a worldwide sample of 39 languages. It is shown that alignment patterns are sensitive to a semantic distinction between modifier dependents and argument dependents on the one hand, and to the phrasal versus clausal nature of the dependency relation on the other. This finding demonstrates the typological relevance of alignment as a phenomenon that transcends the domain of the clause.

### 4.1 Introduction

Ever since Nichols' (1986) seminal paper, it has been known that the syntactic relationship between two units in a phrase or clause can be analyzed in terms of head and dependent. The head governs, or subcategorizes for, the dependent and determines the syntactic category and distribution of the constituent as a whole. This highly influential distinction, developed within structuralist syntax and, more specifically, within the framework of dependency grammar (e.g. Tesnière 1959; Mel'čuk 1988), applies to a range of basic phrase and clause types, of which possessive noun phrases, adpositional phrases and the relationship between a verb and its core argument(s) in main clauses are relevant to this paper.

This paper starts from the observation that dependency relations may be of two semantic types. On the one hand, there are heads that inherently require reference to a dependent, which may therefore be considered the head's *argument*. Typical examples of such inherently relational heads are adpositions

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<sup>1</sup> This chapter has been submitted for publication.

and verbs, but also nouns denoting, for example, kinship terms and body parts. On the other hand, there are heads that take their dependent as a *modifier*; such dependents are not inherently presupposed by the head, but merely provide additional information about it. Examples of such dependency relations are those between a noun and an attributive adjective, a verb and a (manner/degree) adverb, as well as those between prototypical non-relational nouns, such as those denoting concrete inanimate objects, and their possessor. Importantly, the distinction is relevant to the range of phrasal and clausal dependency relations investigated by Nichols, as it divides these relations into those containing arguments and those containing modifiers.

Languages show extensive variation in the degree to which they have dedicated means of coding – in the form of indexing or flagging<sup>2</sup> – for different dependency relations. As demonstrated by Siewierska (1998), formal correspondences between index-sets are cross-linguistically common: 52% (82 out of 157) of the languages in her sample use (fully or partially) identical person forms for possessors on nouns and for arguments on verbs. Similarly, languages commonly exhibit identities in inflectional case forms – a phenomenon known as ‘case syncretism’ (Baerman et al. 2005: 38–57; Baerman 2008). This obtains not only within clauses, i.e. syncretism of core grammatical cases (nominative with accusative, and absolutive with ergative), but also across phrases and clauses. An example is the use of a single genitive/ergative case form for adnominal possessors and A arguments, as in West Greenlandic and other Eskimo languages.<sup>3</sup> Gil (2013) furthermore demonstrates that it is common for languages to use the same means of coding for different noun modifiers, more specifically possessors, attributive adjectives and relative clauses.

This paper investigates to what extent languages use identical means of coding for a range of phrasal and clausal dependency relations. Specifically, the aim is to show to what extent patterns of identical coding are sensitive to the semantic distinction between modifier dependents and argument dependents on the one hand, and the phrasal versus clausal nature of the dependency relation

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<sup>2</sup> I follow Haspelmath (2005, 2013a) in using the term *index(ing)* for affixal person forms (irrespective of whether they are referential markers or agreement markers, cf. Chapters 2 and 3 of this thesis) and the term *flagging* for case markers, adpositions, attributive particles and other invariant markers of the dependency relation. Purely morphological marking, such as tonal marking, is also subsumed under the notion of flagging.

<sup>3</sup> I use the following labels for verbal argument roles: S<sub>A</sub> is the agent-like argument of a one-participant predicate, S<sub>P</sub> is the patient-like argument of a one-participant predicate, A is the more agent-like argument of a two-participant predicate, and P is the more patient-like argument of a two-participant predicate.



on the other. To this end, I examine the morphosyntactic coding of three classes of dependency relations in a worldwide sample of 39 languages: modifiers within phrases (possession of non-relational nouns), arguments within phrases (possession of relational nouns, adpositional phrases) and arguments within main clauses (the core arguments of one- and two-participant verbs).<sup>4</sup> I hypothesize that one logically possible pattern of coding is cross-linguistically rare or non-existent: one in which modifiers in phrases receive the same morphosyntactic treatment as arguments in clauses, while arguments in phrases are treated differently.

A problem in comparing languages in terms of the coding of dependency relations is that a single dependency relation may be expressed by multiple means of coding. This phenomenon has been discussed most extensively in typological work on clausal alignment, where it has received a number of different labels including ‘split’ coding (Silverstein 1976), ‘differential subject/object marking’ (Bossong, 1985, 1998; Comrie 1989) and ‘differential argument marking’ (Baerman 2008). However, it also plays a crucial – yet understudied – role in phrasal dependency relations, including those investigated in this study. A major source of differential coding patterns are referential properties of dependents, including lexical properties, such as person, humanness, animacy and (pro)nominality, and discourse-based properties, such as definiteness and specificity (Bickel 2010). In English, for instance, the choice of genitive construction is in part conditioned by the referential type of possessor: the ‘Saxon’ genitive (*John’s house*) is preferred for human nouns and nouns denoting higher animals, while the ‘Norman’ genitive (*house of John*) is preferred for collective nouns denoting groups of people (see Keizer 2007 for a comprehensive overview of the relevant factors). In this paper, I take into account the full range of variation in the coding of phrasal and clausal dependency relations conditioned by referential factors in individual languages.<sup>5</sup> Moreover, I show how languages can be compared in the face of such variation, following much recent work in clausal alignment typology (Bickel 2010; Bickel et al. 2013; Bickel et al. 2015; Witzlack-Makarevich 2011).

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<sup>4</sup> Considerations concerning the choice of these specific constituent types are provided in Section 4.4.2.

<sup>5</sup> Other factors that may affect the coding of dependency relations are properties of the head, such as the lexical type of noun or verb, and properties of the whole clause, such as tense/aspect/mood. The ways in which these factors are dealt with in the present study are discussed in Section 4.4.2.

The organization of the paper is as follows: Section 4.2 discusses the modifier/argument opposition, as pertaining to dependency relations of different kinds, in more detail. In Section 4.3, I formulate the hypothesis that follows from this theoretical opposition, tested in this study. Section 4.4 provides the necessary methodological background: Section 4.4.1 presents the language sample, and Section 4.4.2 discusses the types of dependency relations investigated. Section 4.4.3 illustrates how referential factors may impact morphosyntactic coding in clauses and, specifically, phrases, and shows how this variation is dealt with in the study. Section 4.4.4 provides further methodological preliminaries, and, finally, Section 4.4.5 explains how language-specific coding patterns relate to the hypothesis formulated in Section 4.3. The results of the study are presented in Section 4.5. Section 4.6 in turn discusses the central role of adpositional phrases in the overall patterns. Finally, Section 4.7 summarizes the main findings and provides directions for further research.

## 4.2 The modifier/argument distinction

In this paper, I start from the observation that dependency relations, as they are investigated by Nichols, may be of two semantic types: those between a head and its argument, and those between a head and its modifier. Heads that take their dependent as an argument are inherently relational, i.e. they encode concepts that by their very nature set up a relationship with a dependent. Well-known examples are adpositions and verbs. With a verb, this property is generally known as ‘valence’, i.e. “its inherent relationality that allows it to govern a particular number of arguments of a particular type” (Haspelmath & Müller-Bardey 2004: 1130). However, as pointed out by a number of scholars (Seiler 1983a; Lehmann 1985; Dahl & Koptjevskaja-Tamm 1998; Partee 1997; Partee & Borschev 2003), the same property also applies to nouns: relational, or bivalent, nouns are intrinsically linked to another item. Clear examples of such nouns are kinship terms and body part terms: while a noun such as ‘mother’ inherently denotes a relationship between two individuals, a noun such as ‘arm’ inherently denotes a part of an (animate) whole (Barker 1995; Taylor 1996).<sup>6</sup> Both the presence and the type of dependent are determined by the lexical

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<sup>6</sup> These items can of course also be used in a non-relational sense, e.g. *John’s leg* can refer to a chicken leg that John is eating, but such interpretations are pragmatically marked and occur only in certain special contexts (cf. Lichtenberk et al. 2011: 671).

specification of the relational head noun, in a fashion reminiscent of verbal predicates and adpositions.<sup>7</sup>

By contrast, there are dependents that are not inherently presupposed by their head. They merely provide a further semantic characterization of the referent or state-of-affairs expressed by the head, thereby functioning as a modifier. Well-known examples of noun modifiers are attributive adjectives, relative clauses, and possessors of non-relational nouns. Typical non-relational nouns, such as ‘pot’ or ‘pen’, denote concrete (inanimate), countable objects. Such nouns lack an inherently relational meaning; as a result, the dependency relation may receive a range of different interpretations, determined by the context of use. A phrase such as *Mary’s pot*, for instance, can refer to a pot she made, a pot she bought, one that she is using, etc. (Seiler 1983a: 40–41; Koptjevskaja-Tamm 2004; Lichtenberk et al. 2011).

Interestingly, languages differ extensively in the degree to which the semantic type of dependency relation is reflected morphosyntactically, either in terms of indexing or in terms of flagging. Some languages make a clear distinction between modifiers on the one hand and arguments on the other. In the language isolate Burushaski (Pakistan), for instance, a single set of person prefixes is used on relational items, be they nominal (1a), verbal (1b), or adpositional (1c):

- (1) a. *a-yáŋis*  
1SG-head  
‘my head’
- b. *a-p<sup>h</sup>ús-u*  
1SG-tie.up-3SG  
‘she tied me up’
- c. *a-páčĭ*  
1SG-with  
‘with me’ (Berger 1998: 91; Berger 1974: 49; Lorimer 1935: 96)

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<sup>7</sup> Other nouns that may fit this semantic profile are spatial nouns (e.g. ‘top’ or ‘bottom’), or those denoting parts of inanimate wholes (e.g. ‘branch’ or ‘handle’) and physical or mental states (e.g. ‘strength’ and ‘fear’). As is well known, the valency of individual lexical items, be they nouns or verbs, varies extensively cross-linguistically. The way in which the distinction between modifiers and arguments is made in the present study is discussed in Section 4.4.2.

Modifiers, including possessors of non-relational nouns, remain unindexed, as shown in (2):

- (2) *ǰã hághoor*  
 1SG.GEN horse  
 ‘my horse’ (Biddulph 1884: 22)

A formal opposition between possessive arguments, as in (1a), and possessive modifiers, as in (2), is cross-linguistically common, and generally known as a distinction between *alienable* and *inalienable possession*.

Means of flagging may also be sensitive to the modifier/argument opposition. This can be illustrated for Katukina-Kanamari (Katukinan, Brazil), in which a single genitive/ergative case suffix is used for arguments of nouns (3a), verbs (3b) and adpositions (3c):

- (3) a. *Pityira-na=tyo Tikon.*  
 Pityira-GEN=daughter Tikon  
 ‘Tikon is Pityira’s daughter.’  
 b. *Kopa-na=ti: pi:da.*  
 Kopa-ERG=killed jaguar  
 ‘Kopa killed a jaguar.’  
 c. *Pioru-na=katu Tirin.*  
 Pioru-OPOSTP=com Tirin  
 ‘Tirin is with Pioru.’ (Dos Anjos 2011: 224)

Possessive modifiers also take this case suffix, but additionally require the possessive marker *wa* to occur in between the modifier and the possessed noun, as demonstrated in (4):

- (4) *Kontan-na=wa poako itowun*  
 Kontan-GEN=POSS paddle this  
 ‘This is Kontan’s paddle.’ (Queixalós forthcoming: 6)

Additionally, modifiers and arguments may be distinguished by means of the presence vs. absence of flagging; in Bambara (Mande, Mali), for instance, arguments of nouns (5a), verbs (5b) and adpositions (5c) remain unmarked:

- (5) a. *mùso fâ*  
 woman father  
 ‘the woman’s father’  
 b. *dònsow sé-ra*  
 hunters arrive-PRF  
 ‘the hunters arrived’  
 c. *du kònò*  
 compound inside  
 ‘inside the compound’ (Hewson 2014: 6, 5, 63)

Possessive modifiers, however, require a possessive marker *ká*, as shown in (6):

- (6) *mùso ká líburu*  
 woman POSS book  
 ‘the woman’s book’ (Hewson 2014: 6)

Conversely, the distinction between modifiers and arguments may be formally neutralized to varying degrees. In Dutch (Indo-European, Netherlands), for instance, the preposition *van* is used not only for possessive modifiers (7a), but also for possessive arguments (7b) and for arguments of (a set of) prepositions (7c):

- (7) a. *het boek van Jan*  
 DEF.N book of Jan  
 ‘Jan’s book’  
 b. *de vader van de jongen*  
 DEF.C father of DEF.C boy  
 ‘the father of the boy’  
 c. *links van het huis*  
 left of DEF.N house  
 ‘left of the house’

A more extensive degree of formal neutralization is found in Abkhaz (Northwest Caucasian, Georgia), where a single set of prefixes is used on non-relational nouns (8a), relational nouns (8b), adpositions (8c) and for (1<sup>st</sup> and 2<sup>nd</sup> person) S arguments (8d), A arguments (8e), and P arguments (8f):

- (8) a.  $s_9\text{-}\check{s}^{\circ}q^{\circ}\check{s}$   
1SG-book  
'my book' (Chirikba 2003: 57)
- b.  $s\text{-}an$   
1SG-mother  
'my mother' (Hewitt 2008: 76)
- c.  $s\text{-}q^{\circ}nt^{\circ}$   
1SG-from  
'from me' (Hewitt 1979: 103)
- d.  $s\text{-}ca\text{-}wá\text{-}jt'$   
1SG-go-PRS-FIN  
'I am going.' (Chirikba 2003: 39)
- e.  $s\text{-}j\check{\theta}\text{-}s(\check{\alpha})\text{-}\emptyset\text{-}(j)t'$   
1SG-3SG-hit-AOR-FIN  
'I hit him.' (Chirikba 2003: 40)
- f.  $d\check{\alpha}\text{-}z\text{-}s\text{-}'m\check{\alpha}\text{-}s\check{\alpha}\text{-}\emptyset\text{-}jt'$   
3SG-1SG-POT-not-hit-PST-FIN  
'S/he couldn't hit me.' (Hewitt 2008: 81)

The degree to which languages formally neutralize the modifier/argument distinction across phrases and clauses, as demonstrated in (1) to (8), is the focus of the present study. I henceforth refer to such patterns of formal neutralization as *alignment patterns*, following the traditional use of the term for the formal neutralization of (a subset of) core arguments in clauses.

Modifiers and arguments are found in both phrasal and clausal dependency relations, which yields four logically possible domains of morphosyntactic coding, outlined in Table 1 below:

Table 1: Four types of dependency relations

		Semantic relationship	
		Head-modifier	Head-argument
Syntactic category	Phrase	Modifier in phrase	Argument in phrase
	Clause	Modifier in clause	Argument in clause

One of the four types of dependency relations – modifiers in clauses – is excluded from this study, for three reasons. First, this class is internally quite diverse, as it includes both adjunct phrases and (manner/degree) adverbs. Likewise, the cross-linguistic coding of the two types of modifiers varies

significantly: while adjunct phrases typically receive different means of flagging, depending on their semantic role such as beneficiary, comitative or location, adverbs rarely take overt means of coding. Second, it proves to be very difficult to distinguish modifiers and arguments in clauses in individual languages (see e.g. Creissels 2014; Forker 2014; Haspelmath 2014; Haspelmath & Hartmann 2015); different tests of argumenthood have been proposed in the literature, but each is known to suffer from a range of limitations (cf. Comrie 1993). Finally, the exclusion of clause modifiers has a theoretical motivation: adjunct phrases modify a non-lexical head, i.e. the entire clause, which consist minimally of the verb and one or more core arguments, while the modifiers (and arguments) investigated in this study are dependents of a lexical head. This also applies to manner/degree adverbs, which may modify at the level of the clause (*John angrily left the room*) aside from modifying at the level of the individual predicate (*John walked slowly*).

This study thus limits itself to three classes of dependency relations: modifiers in phrases, arguments in phrases and arguments in clauses. The individual dependency relations in each class studied in the paper are discussed in Section 4.4.2. In the next section, I present the hypothesis tested in this study.

### 4.3 Hypothesis

This paper investigates to what extent languages have identical means of coding for different phrasal and clausal dependency relations; specifically, I expect patterns of coding to be constrained by the modifier/argument distinction on the one hand, and by the phrasal vs. clausal nature of the dependency relation on the other. This prediction yields a classification of five logically possible types of alignment patterns that may be found in individual languages, presented in Table 2 below. In this table, capitals indicate neutralization by means of a single coding strategy, be it indexing, flagging, or the absence of both, i.e. zero-coding.

Table 2: Typology of alignment types

	1	2	3	4	5
<b>Modifier in phrase</b>	A	A	A	A	A
<b>Argument in phrase</b>		B		B	B
<b>Argument in clause</b>	B			C	A

In alignment patterns of the first type, modifiers in phrases receive the same coding strategy as arguments in phrases, while arguments in clauses are

coded differently. In the second pattern, arguments in phrases receive the same coding strategy as arguments in clauses, while modifiers in phrases are coded differently. The third pattern illustrates the formal neutralization of dependents in each of the three categories, while the fourth pattern illustrates the inverse: the complete absence of formal neutralizations across the three types of dependency relations. The fifth logically possible pattern is one in which modifiers in phrases are coded like arguments in clauses, while arguments in phrases receive a different coding strategy.<sup>8</sup> Following observations by Hengeveld & Mackenzie (2008: 383–387) and an earlier pilot study (Van Rijn 2011), I predict patterns 1 to 4 to be cross-linguistically common, while pattern 5 is expected to be cross-linguistically rare or non-existent. This prediction yields the following hypothesis, tested in this study:

- (i) If modifiers in phrases are coded in the same way as arguments in clauses, arguments in phrases receive the same formal treatment.

Put differently, coding strategies are expected to cover continuous segments of the following scale:

- (9) modifier in phrase – argument in phrase – argument in (main) clause

I expect languages to use a single coding strategy for modifiers in phrases and arguments in phrases (pattern 1), for arguments in phrases and arguments in clauses (pattern 2), for all three types of dependency relations (pattern 3) or for neither (pattern 4), but I do not expect languages to use a single coding strategy for dependency relations that are both semantically distinct (in terms of the modifier/argument distinction) and syntactically distinct (in terms of their phrasal vs. clausal nature), as in alignment patterns of type 5.

Before turning to the results of testing the hypothesis, I present the methodological background to the study in the next section.

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<sup>8</sup> Importantly, formal neutralizations need not affect each dependency relation from a given category; this is further discussed in Section 4.4.5.



## 4.4 Methodological background

### 4.4.1 The language sample

For this study, I composed a worldwide sample of 39 languages that is both genetically and geographically balanced. Maximal genetic independence is obtained by applying the Diversity Value technique proposed by Rijkhoff et al. (1993) and Rijkhoff & Bakker (1998) to Ruhlen's (1991) classification of the world's languages.<sup>9</sup> This technique involves the computation of so-called 'Diversity Values' (henceforth DVs), which determine the number of languages to be selected from each family and subfamily on the basis of its internal complexity, given a particular desired sample size. The degree of internal complexity of a given (sub)family is based on the number of branches it contains (the width of the tree) and the time-frame over which the languages in these branches developed (the depth of the tree). Crucially, more internally complex (sub)families are assumed to show higher degrees of linguistic diversity than less internally complex (sub)families, thus yielding a higher DV. Language (sub)families with a higher DV are in turn represented by a higher number of languages in the sample than language (sub)families with a lower DV. Isolates are, by definition, part of any sample.

The genetically balanced sample is combined with a geographic stratification: within the restrictions of the DV technique, I selected solely languages spoken in non-contiguous areas. Finally, bibliographical restrictions apply: where the genetic and geographic stratifications allowed for a choice between languages from a given subgroup, selection was based on the quality of source materials and the availability of language informants.

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<sup>9</sup> Although Ruhlen's classification is largely outdated – given its postulation of some large, poorly supported language families like Amerindian (e.g. Kaufman 1990; Nichols 1990; Campbell & Poser 2008) – it is suitable for creating relatively small, but well-balanced, language samples, because in the DV technique a minimal sample consists of one language per first-order language family. Classifications such as Grimes (2000), used in *WALS*, and *Glottolog* (Hammarström et al. 2016) are more up-to-date, but also much subtler (*Glottolog*, for instance, distinguishes 433 first-order language groups), and are thereby more difficult to use in composing small, well-balanced samples with the DV technique. Also note that the DV technique requires internally complex (sub)families to be represented by a large number of languages, which partly compensates for relying on a rougher classification like Ruhlen's.

The 39-language sample is presented in Table 2 below. The first three columns present the number of languages selected from each family and subfamily, between brackets; language isolates are abbreviated as 'LI'. The fourth column presents the languages selected, and the final column lists the highest-order family of each sample language in the WALS (see footnote 9). Three languages (Etruscan, Meriotic and Nahali) selected by the sampling method were removed from the sample due to insufficient data.

Table 3: The 39-language sample

<b>Language family (Ruhlen 1991)</b>	<b>Subfamilies</b>	<b>Language selected</b>	<b>Language family (WALS)</b>	
Afro-Asiatic (2)	Chadic (1)	Hausa	Afro-Asiatic	
	Semitic (1)	Maltese	Afro-Asiatic	
Altaic (1)		Turkish	Altaic	
Amerind (5)	Northern (1)	Koasati	Muskogean	
	Andean (1)	Urarina	isolate	
	Eq.-Tucanoan (1)	Tariana	Arawakan	
	Ge-Pano-Carib (1)	Macushi	Cariban	
	Chib.-Paezan (1)	Sanuma	Yanomam	
Australian (2)	Pama-Nyungan (1)	Nyangumarda	Pama-Nyungan	
	Other (1)	Mangarayi	Mangarrayi-Maran	
Austriac (4)	Austro-Tai (2)	Daic (1)	Thai	Tai-Kadai
		Austronesian (1)	Drehu	Austronesian
	Austroasiatic (1)	Kharia	Austro-Asiatic	
	Miao-Yao (1)	Hmong Njua	Hmong-Mien	
Basque (LI)		Basque	isolate	
Burushaski (LI)		Burushaski	isolate	
Caucasian (1)		Abkhaz	Northwest Caucasian	
		Itelmen	Chukotko-Kamchatkan	
Elamo-Dravidian (1)		Tamil	Dravidian	
Eskimo-Aleut (1)		West Greenlandic	Eskimo-Aleut	

Table 3: The 39-language sample

Language family (Ruhlen 1991)	Subfamilies	Language selected	Language family (WALS)
Etruscan (LI)		–	–
Hurrian (LI)		Hurrian	–
Indo-Hittite (1)		English	Indo-European
Indo-Pacific (3)	Trans New Guinea (1)	Inanwatan	isolate
	Sko (1)	Skou	Sko
	West Papuan (1)	Tidore	West Papuan
Kartvelian (1)		Georgian	Kartvelian
Ket (LI)		Yeniseian	isolate
Khoisan (1)		Nama	Khoe-Kwadi
Korean-Japanese-Ainu (1)		Japanese	Japanese
Meroitic (LI)		–	–
Na-Dene (1)		Navajo	Na-Dene
Nahali (LI)		–	isolate
Niger-Kordofanian (3)	Niger-Congo (2)	N.-C. Proper (1)	Babungo
			Niger-Congo
		Mande (1)	Bambara
			Mande
		Kordofanian (1)	Krongo
			Kadu
Nilo-Saharan (1)		Lango	Eastern Sudanic
Nivkh (LI)		Nivkh	isolate
Pidgins and Creoles (1)		Berbice Dutch Creole	–
Sino-Tibetan (1)		Mandarin Chinese	Sino-Tibetan
Sumerian (LI)		Sumerian	isolate
Uralic-Yukaghir (1)		Hungarian	Uralic

#### 4.4.2 The dependency relations studied

In each sample language I investigated the coding of seven unique types of dependency relations, which belong to three types of constituents: possessive noun phrases, adpositional phrases and verbal main clauses containing one- and

two-place predicates. These constituent types were selected, because they are all in principle open to three types of coding strategies: flagging, indexing and the absence of both, i.e. zero-coding. As such, they are an interesting testing ground for studying the typological alignment of phrases and clauses.

Given my focus on phrasal and clausal dependency relations, I exclude dependent parts of compounds or incorporation constructions from the study. I also exclude dependents that take the form of (deranked) dependent clauses, such as relative clauses and complement clauses, as well as action nominalizations, participle and converb constructions. The latter typically show 'mixed' phrasal (i.e. nominal) and clausal (i.e. verbal) behavior, which makes it difficult to reliably classify them as either phrasal or clausal. Furthermore, I do not consider dependents that are internally complex, such as possessors in possessor chains. Finally, three-participant predicates are left out of present consideration.

Table 4 below presents the seven dependency relations studied, in terms of their combined semantic and syntactic type, following the five-way typology given in Section 4.3 (in the first column), their constituent type (in the second column), the type of dependent (the third column) and the type of head (the fourth column), followed by some illustrative examples (in the final column).

Table 4: Inventory of the dependency relations studied

Semantico-syntactic category	Constituent type	Dependent	Head	Example
Modifiers in phrases	Possessive NP	Possessor	Concrete, inanimate noun	<i>John's book</i>
Arguments in phrases	Possessive NP	Possessor	Kinship noun or body part noun	<i>Mary's hair</i>
	Adpositional phrase	Adpositional argument	Adposition	<i>Near the girl</i> <i>Inside (of) the house</i>
Arguments in clauses	Main clause	S <sub>A</sub>	Verb	<i>The dog runs.</i> <i>John swims.</i>
		S <sub>P</sub>		<i>The grandfather dies.</i> <i>The cat falls.</i>
		A		<i>Mary hits John.</i>
		P		<i>The cat kills the mice.</i>

The overview of dependency relations in Table 4 requires some explanation. First, let us consider the way in which modifiers and arguments are distinguished in this paper. As already noted, this distinction is a notoriously difficult one to draw. On the one hand, the valency of individual lexical items, be they nouns or verbs, displays significant cross-linguistic variation. With respect to nouns, it is often observed that languages with a formal distinction between alienable and inalienable possession vary in the types of nouns participating in each class: while in some languages only a set of kinship terms or body part terms is inalienable, in other languages this class additionally includes spatial nouns, (other) parts of wholes, property nouns and a set of culturally-specific objects (such as ‘net’ or ‘hammock’) (Nichols 1988: 572; Nichols & Bickel 2013b; Chappell & McGregor 1996: 8–9).

The same type of variation is attested with verbs: while the verb *like* in English takes a subject and a direct object, as shown in (10), the German equivalent *gefallen* takes an indirect object and a subject respectively, as shown in (11):

(10) *I like him.*

(11) *Er gefällt mir.*  
 He.NOM like.3SG.PRS I.DAT  
 ‘I like him.’

Such cross-linguistic variation in ‘predicate classes’ (also called ‘verb classes’ or ‘valency classes’) has been widely studied, a recent example being the Leipzig Valency Patterns project (Hartmann et al. 2013).

On the other hand, most tests used to distinguish modifiers and arguments are language-specific and are therefore not applicable cross-linguistically (cf. Haspelmath 2014; Forker 2014). For instance, arguments are often defined as being obligatorily expressed, but in many languages all sorts of dependents may be freely dropped – a phenomenon recently studied under the name of *referential density* (Bickel 2003). Notably, this problem is not only known from research into clausal alignment and verbal valency (cf. Witzlack-Makarevich 2011: 99–137 and Haspelmath & Hartmann 2015) but from studies on the valency of nouns as well (cf. Partee & Borschev 2003). In order to reliably distinguish modifiers and arguments across the languages of the sample, I therefore focus on prototypical instances of such dependents only. Prototypical relational (argument-taking) possessums are kinship terms and body part terms, while prototypical non-relational (modifier-taking) possessums are concrete, inanimate objects, such as ‘pot’ or ‘pen’. Across individual languages,

inalienable coding is minimally used for (a subset of) kinship terms and/or body part terms, while concrete object nouns are typically found in the alienable class (cf. Nichols 1988: 572; Nichols 1992: 120; Haiman 1985: 136). Moreover, as shown in Section 4.2, such nouns clearly qualify as, respectively, relational and non-relational on the basis of their inherent semantic properties.<sup>10</sup>

The same approach is adopted for the delineation of verbal arguments. With respect to two-participant verbs, I follow work on main clause alignment (such as Comrie 1989: 111, 2013 and Lazard 2002) in focusing solely on prototypical action verbs, i.e. physical effect verbs like ‘hit’, ‘break’ and ‘kill’.<sup>11</sup> Such verbs are semantically prototypical two-participant predicates, and they are at the core of transitive verb classes in individual languages (cf. Haspelmath 2014, and references therein). With respect to one-participant verbs, I focus on two generalized predicate classes: (i) basic motion and activity verbs such as ‘run’, ‘jump’ and ‘play’, representative of one-participant active verbs, and (ii) uncontrolled change of state verbs like ‘die’, ‘fall’ and ‘burn’, representative of one-participant stative verbs.<sup>12</sup> In this way, I accommodate languages with so-called ‘split-S’ or ‘stative/active’ systems of clausal alignment, in which Ss are treated either like the A or like the P, depending on semantic factors, such as affectedness and control (cf. Mithun 1991b; Donohue & Wichmann 2008).

Note that the semantic classes of nouns and verbs selected for this paper need not receive internally consistent coding. In Koasati (Muskogean, United

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<sup>10</sup> Possessors of kinship terms and body part terms are by definition human or animate; inanimate possessors are found only with spatial nouns (*the inside of the house*) and other part-whole relations (*the wheels of the bicycle*). As a result, animacy-based splits in possessive coding, and in alignment in general, are not included in this study. This is unproblematic as there is only a single sample language, Burushaski, in which animacy conditions alignment (specifically, the coding of Ss and Ps). Importantly, none of the coding options for possessed nouns other than those currently investigated contradict the main findings of the study.

<sup>11</sup> An alternative approach is to focus on the major two-participant predicate class (in the sense of lexical types) in any given language (cf. Bickel et al. 2015; Witzlack-Makarevich 2011: 111–114). I did not adopt this approach because counts are rarely reported in the relevant sources, or have not been made at all. Moreover, as pointed out by Haspelmath (2015), both approaches probably yield the same results, as prototypical action verbs are typically part of the largest class of two-participant predicates across individual languages. My data support this observation.

<sup>12</sup> I did not consider other prototypical stative verbs, i.e. properties such as ‘hungry’, ‘black’ and ‘little’, since these concepts are often treated as adjectives rather than as verbs in individual languages (as in English, for instance). In some sample languages, only such properties are stative verbs, which therefore do not surface in the data.

States), for instance, inalienable prefixes are used for only a minority of kinship and body part terms; the majority of such terms receive alienable prefixes (Kimball 1991: 433). In the case of such lexical splits in possessive coding, I take both coding strategies into account, i.e. argument-taking nouns are treated as allowing two types of possessive coding.<sup>13</sup>

The same kind of lexical variation is sometimes attested within the three classes of verbal predicates considered: in certain varieties of the isolate Basque (France, Spain), for instance, arguments of *korritu* ‘run’ receive ergative coding, while absolutive coding is more regularly used for arguments of *dantzatu* ‘dance’, *saltatu* ‘jump’ and *hegatu* ‘fly’ (Aldai 2008: 203). Similarly, in Koasati, most two-participant action verbs, including *batáplin/bóklin* ‘hit’ and *wakóʔin/wakó:lin* ‘break’ are part of the same predicate class, while *latáʔkan/látkan* ‘kick’ and *ciʔipkan/ciʔkan* ‘spear’ are part of another (Kimball 1991: 56–89).<sup>14</sup> In such cases, I adopt a lexical-typological approach (cf. Nichols et al. 2004; Nichols 2008; Haspelmath 2013c, 2015), i.e. I focus on the coding of the translational equivalents of individual lexical items, more specifically ‘run’ (for one-participant active verbs), ‘die’ (for one-participant stative verbs) and ‘hit’ (for two-participant verbs).<sup>15</sup> The choice for these particular lexemes is mainly a practical one: information on their coding is commonly given in language descriptions and is easily checked with language informants. Also, they can take arguments with different referential properties, e.g. human, animate, definite, indefinite, which is important given the inclusion in this study of such properties as conditions on alignment. In one case, namely Skou (Skou, Indonesia; Donohue 2004: 214–215), the indexing of ‘hit’ turned out to be highly irregular, both in terms of form (stem suppletion and special initial consonant alternations) and frequency (few other verbs show this pattern) and is therefore not representative of its class; I therefore adopted the regular, more frequent pattern of indexing for As in this language.

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<sup>13</sup> In many languages, inalienable nouns may take alienable coding but only when possessed in an alienable (i.e. non-relational) manner; since such differential coding goes hand in hand with a semantic shift, it is left out of present consideration.

<sup>14</sup> As in other Muskogean languages, pairs of Koasati verb forms mark the singularity vs. plurality of the subject or object, or the number of times the action is performed.

<sup>15</sup> This approach could not be straightforwardly applied to (modifier-taking and argument-taking) possessum nouns and adpositions, for two reasons. First, there was no lexical item for which the selected coding strategy was available in all 39 sample languages. Second, I had no strong intuitions, nor found any suggestions in the typological literature, on the most prototypical instances of such items.

Additionally, differential coding in clauses may be conditioned by a range of other factors, such as clause type (main vs. dependent clauses), polarity (positive vs. negative clauses), tense/aspect/mood and diathesis. Following much other typological work (e.g. Siewierska 2013b; Comrie 2013) I focus solely on main, positive, declarative clauses in the indicative mood, thereby excluding most of those factors from the study. Only tense/aspect-based splits in alignment have been taken into account, in the same way as the lexical splits in possessive coding discussed above (and referential splits, discussed in the next subsection). Overtly derived diathesis alternations, such as passive or antipassive constructions, have not been taken into account; one sample language, Hurrian (Uralic, Turkey), has a formally underived antipassive construction, yielding three additional alignment patterns (one for indexing and two for flagging). Finally, clausal alignment may depend on so-called ‘co-argument’ or ‘scenario’ conditions (cf. Witzlack-Makarevich 2011: 94; Witzlack-Makarevich et al. 2016), i.e. the coding of A and P depends on the referential properties of either or both arguments. This is the case in Mangarayi (Mangarrayi-Maran, Australia), where identity of the A prefixes with the S prefixes depends on the person/number/gender properties of both A and P (Merlan 1982: 160). Each combination of A and P properties yielding an alignment split has been taken into account, in the same way as referential conditions, described in the next subsection.

Focusing in turn on adpositional phrases, I follow Bakker (2013) in defining adpositions as formally independent elements that display morphosyntactic behavior distinct from regular verbal, nominal and adverbial elements in any given language. The first part of the definition excludes case affixes and adpositional clitics that attach to NPs rather than to nouns; although in many languages such markers historically derive from freestanding adpositions, they now attach to the argument, rather than functioning as heads of phrases themselves. As a consequence, they cannot take indexes or govern flagging of the argument, like freestanding adpositions, and are therefore irrelevant to the present paper. The second part of the definition excludes adpositional meanings expressed by nouns, verbs or adverbs. Typical ‘nominal’ behavior includes the ability to take (the full range of) case markers or other means of flagging available in the language, and the possibility of being pluralized, lexically modified or marked as (in)definite. Typical ‘verbal’ behavior includes the use of tense/aspect/mood markers and the ability to be modified by adverbs. Typical ‘adverbial’ behavior includes an item’s ability to be separated from or used without an argument, and the absence of case assignment to the argument. I define adpositions as items that differ from nouns, verbs or adverbs



in at least one of these properties, or that can no longer function as these parts of speech at all.<sup>16</sup> Seven sample languages (Inanwatan, Itelmen, Ket, Mangarayi, Nyangumarda, Thai, West Greenlandic) do not have any adpositions according to this definition, or the respective language sources lack sufficient information to permit determination of the presence of such a class.<sup>17</sup> Finally, adpositions commonly show lexically-conditioned splits in coding: in some languages, only a subset of adpositions can be indexed or take a particular case marker. As with possessum nouns, each coding option is taken into account in individual languages.

In addition to the factors discussed in this subsection, another major source of coding splits is variation in the referential properties of modifiers and arguments. In the next subsection I give examples of cross-linguistically attested splits, and I explain how they are treated in the present study.

#### **4.4.3 Referential conditions on alignment and their methodological treatment**

With respect to clausal alignment, typologists have recognized that “a characterization of whole languages as representing a particular alignment pattern in case marking, agreement, etc. is known to provide a simplified picture as languages can show variations in their alignment patterns often referred to as alignment splits” (Witzlack-Makarevich 2011: 65). Alignment splits are often conditioned by referential properties of dependents, such as person, animacy, humanness, definiteness, specificity and anaphoricity, i.e. the (pro)nominal nature of the dependent. This phenomenon has been widely studied in the clausal domain under a variety of labels, including ‘differential subject/object marking’ (Bossong 1985, 1998; Comrie 1989), ‘differential argument marking’ (Baerman 2008) and ‘split ergativity’ (Silverstein 1976). However, referentially-

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<sup>16</sup> The motivation for this relatively ‘tolerant’ definition of adpositions is mainly practical: most sources provide insufficient information to allow determination of the full extent of the deranked behavior of such items in individual languages.

<sup>17</sup> A distinction is sometimes made in the literature between lexical and grammatical adpositions: the former are instantiated by lexical items, and are thus able to head an adpositional phrase, while the latter solely express semantic functions (cf. Hengeveld & Mackenzie 2008: 251, 401). However, given a lack of consensus on the defining properties of the two types of adpositions (cf. Keizer 2008; Mackenzie 2013), such a distinction is not made here.

conditioned splits in coding are also found in the phrasal domain, where they remain understudied. A number of examples are provided below.

Starting with flagging, it may be observed that pronominal possessors are often expressed differently from nominal possessors; most Indo-European languages, such as English, have unique sets of possessive pronouns. Anaphoricity is also relevant for possessive flagging in Krongo (Kadu, Sudan): while pronominal possessors of kinship terms are marked with the possessive prefix *kà-* (12a), nominal possessors of kinship terms may be marked with the genitive prefix *má-* (12b):

- (12) a. *ní-imò kà-tí*  
 mother POSS-1SG  
 'my mother'
- b. *ní-imò má-Kàkká*  
 mother GEN-Kaka  
 'Kaka's mother' (Reh 1985: 318, 316)

Another type of referential split in possessive flagging is found in Drehu (Austronesian, New Caledonia), where the marker *n(e)* is used for common nouns (13a), while the marker *i* is used for proper nouns (13b):

- (13) a. *la uma ne la qatreföe*  
 ART house ASS ART old.woman  
 'the house of the old woman'
- b. *la uma i Hagee*  
 ART house ASS Hagee  
 'the house of Hagee' (Moyse-Faurie 1983: 59)

Referential factors may also condition the presence vs. absence of means of flagging: cross-linguistically, highly referential nouns are often overtly marked, while low referential nouns are not (cf. Chappell & McGregor 1989; Aikhenvald & Dixon 2013: 44). A well-studied case in point is Turkish (Altaic, Turkey), where the genitive case suffix is used on specific nouns (14a), but not on non-specific nouns (14b):

- (14) a. *bir balıĝ-m kuyruĝ-u*  
 a fish-GEN tail-3SG.POSS  
 'the tail of a fish'

- b. *bir balık kuyruğ-u*  
 a fish tail-3SG.POSS  
 ‘a fish tail’ (Nilsson 1985: 69)

Differential flagging in adpositional phrases is also attested. Consider, again, Turkish, where a subset of postpositions assigns the genitive case to pronouns (except for 3<sup>rd</sup> person plural pronouns), as shown in (15a), but not to nouns (15b):

- (15) a. *on-un için*  
 he-GEN for  
 ‘for him’  
 b. *Ahmet için*  
 Ahmet for  
 ‘for Ahmet’ (Kornfilt 1997: 301)

In Kharia (Austro-Asiatic, India), postpositional arguments prefer the genitive case marker =*yaʔ* when definite (16a), but the absence of case-marking when indefinite (16b):

- (16) a. *aba=ɖom=aʔ lekhe=ga*  
 father=3POSS=GEN lekhe=FOC  
 ‘like his father (he spread out the net)’  
 b. *samudar lekhe*  
 ocean like  
 ‘like an ocean’ (Peterson 2011: 204, 205)

Referential properties also commonly condition indexing: specifically, Siewierska (2004: 148–162) found that highly referential dependents are more likely to be indexed than low-referential dependents, in clauses but also in phrases. Anaphoricity is a common referential condition on indexing: languages often use indexes only in the absence of a nominal dependent in the phrase.<sup>18</sup> A

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<sup>18</sup> In some languages, the index may nevertheless co-occur with a free pronoun, while in others this is impossible as well. The inverse pattern, i.e. the presence of indexes with nouns but the absence of indexes with free pronouns, is cross-linguistically very rare, and is not attested in my sample (cf. Siewierska 2004: 154 for an example). For this reason, in this study I only consider the co-occurrence of indexes with nominal dependents, not with pronominal ones.

case in point is Lango (Eastern Sudanic, Uganda), where this is found in possessive NPs, as shown in (17a) and (17b), and in adpositional phrases, as shown in (17c) and (17d):

- (17) a. *wì rwòt*  
 head king  
 'the king's head'
- b. *wì-è*  
 head-3SG  
 'his/her head'
- c. *bòt dákô*  
 to woman  
 'to the woman'
- d. *bòt-é*  
 to-3SG  
 'to him/her' (Noonan 1992: 157, 82, 42, 107)

Another common factor governing the use of indexes is person. In Drehu, as shown in (18a), 1<sup>st</sup> person possessors are indexed with a suffix, while, as shown in (18b), 2<sup>nd</sup> and 3<sup>rd</sup> person possessors take the form of free pronouns plus the marker *i*, also used for proper nouns (cf. (13b)):

- (18) a. *uma-ng*  
 house-1SG  
 'my house'
- b. *la uma i angeic*  
 ART house ASS he  
 'his house' (Moyse-Faurie 1983: 61, 59)

As with flagging, referential factors may condition not only the presence vs. absence of indexes, but also the type of index-set selected. In Lango, for instance, singular (pronominal) possessive modifiers take a unique possessive index-set, as shown in (19a), while plural (pronominal) possessive modifiers take the index-set additionally used for prepositional arguments and P arguments, as demonstrated in (19b), (19c) and (19d) respectively:

- (19) a. *gúlú-mérê*  
 pot-3SG.POSS  
 'his pot'

- b. *pàlà-gí*  
knife-3PL.ACC  
'their knife'
- c. *tê-gí*  
under-3PL.ACC  
'under them'
- d. *ò-nènò-gí*  
3SG.NOM-see.PRF-3PL.ACC  
'He saw them.' (Noonan 1992: 79, 79, 107, 37)

In some languages, the same referential factor(s) are relevant in phrases and in clauses. In Kharia, for instance, definiteness not only conditions the use of the genitive case on postpositional arguments, as shown in (16), but also the use of the oblique marker =*te* on Ps in main clauses, as shown in (20a) and (20b):

- (20) a. *dáʔ=te*      *yo=yoʔ*  
water=OBL    see=ACT.PST  
'(He) saw the water.'
- b. *ɪn*    *dáʔ*    *biʔh=oʔ*  
1SG    water    pour.out=ACT.PST.1SG  
'I poured water out.' (Peterson 2011: 144, 265, p.c.)

Similarly, indexing in Lango is sensitive to anaphoricity not only in possessive NPs and prepositional phrases, as shown in (17), but also for Ps in main clauses, shown in (21a) and (21b):

- (21) a. *dákó*      *ò-jwátò*      *lócà*  
woman    3SG-hit.PRF    man  
'The woman hit the man.'
- b. *dákó*      *ò-jwát-é*  
woman    3SG-hit.PRF-3SG  
'The woman hit him.' (Noonan 1992: 128, 239)

Crucially, referential splits in the coding of dependency relations, be they phrasal or clausal, may yield splits in the overall alignment of a given language. In this study, I take into account, per sample language, the set of dependency relations covered by the same coding strategy and the type of (referential and/or lexical) condition under which this occurs, following practice in recent work on clausal alignment typology (Witzlack-Makarevich 2011; Bickel et al. 2013; Bickel

et al. 2015). Each alignment pattern is then classified in terms of the five-way typology presented in Section 4.3. A number of concrete examples of how this works are provided below.

Mapping the alignment patterns in a given language is relatively straightforward when only a single referential condition splits coding in one (or more) dependency relations. In Macushi (Cariban; Brazil, Guyana, Venezuela), for instance, indexing is conditioned by anaphoricity in all seven dependency relations studied: as in Lango, indexes are used in the absence of a nominal dependent ([−N]), but not in the presence of a nominal dependent ([+N]). This split yields two unique alignment patterns, presented in Table 5. The table presents the coding of individual dependency relations (in the columns) under each referential split (in the final column). Formally identical index-sets are given the same abbreviation.

Table 5: Indexing alignment in Macushi

Possessive modifier	Possessive argument	Adpositional argument	S <sub>A</sub>	S <sub>P</sub>	A	P	Referential conditions
suffix	suffix	∅	∅	∅	∅	∅	[+N]
ACC prefix	ACC prefix	ACC prefix	NOM prefix	NOM prefix	ERG suffix	ACC prefix	[−N]

A split into two alignment patterns is impossible when multiple dependency relations display differential coding, under varying referential conditions. In Lango, exemplified in (17), (19) and (21), indexing is conditioned by anaphoricity (for possessors, adpositional arguments and Ps), number (for possessors) and humanness (for Ps). In order to map the alignment variation in the language, these referential properties have to be cross-classified, which yields four unique alignment patterns, given in Table 6. Importantly, splits in coding may but need not trigger splits in alignment. As shown in the second row of the table, possessors, adpositional arguments and Ps alternate between zero-indexing (for nouns) and accusative indexing (for human, plural pronouns). This is a form of differential coding, but not of differential alignment, since, under both conditions, the relevant dependency relations are covered by a single (differential) coding strategy. Both conditions therefore take up only a single row in the table.<sup>19</sup>

<sup>19</sup> Note additionally that splits in alignment, as studied in this paper, do not subsume splits in clausal alignment. The differential indexing of Ps in Lango governs an overall alignment split, but clausal alignment unequivocally follows an accusative pattern.

Table 6: Indexing alignment in Lango

Possessive modifier	Possessive argument	Adpositional argument	S <sub>A</sub>	S <sub>P</sub>	A	P	Referential conditions
∅	∅	∅	NOM	NOM	NOM	∅	[+N]
ACC suffix	ACC suffix	ACC suffix	prefix	prefix	prefix	ACC suffix	[-N],[+hum],[-sg]
ACC suffix	ACC suffix	ACC suffix	NOM prefix	NOM prefix	NOM prefix	∅	[-N],[ -hum],[-sg]
AL suffix	INAL suffix	ACC suffix	NOM prefix	NOM prefix	NOM prefix	ACC suffix	[-N],[+hum],[+sg]
AL suffix	INAL suffix	ACC suffix	NOM prefix	NOM prefix	NOM prefix	∅	[-N],[ -hum],[+sg]

Alignment splits may also be conditioned by lexical factors; as discussed in the previous subsection, such factors are taken into account when relevant in (possessive and adpositional) phrases. Lexical alignment splits are treated in the same way as referential splits: as separate subsystems in individual languages. For instance, in the isolate Burushaski (Pakistan), different postpositions trigger four different case suffixes on the argument: absolutive, relative, dative and ablative. This yields a three-way split in alignment, as shown in Table 7 below. The alternation between the dative and ablative case does not yield an alignment split, as these case markers are not used in any of the other dependency relations studied.

Table 7: Flagging alignment in Burushaski (for inflection classes 1, 3 and 4)

Possessive modifier	Possessive argument	Adpositional argument	S <sub>A</sub>	S <sub>P</sub>	A	P	Lexical conditions
REL <i>-e</i>	REL <i>-e</i>	ABS ∅	ABS ∅	ABS ∅	REL <i>-e</i>	ABS ∅	Postposition class 1
REL <i>-e</i>	REL <i>-e</i>	REL <i>-e</i>	ABS ∅	ABS ∅	REL <i>-e</i>	ABS ∅	Postposition class 2
REL <i>-e</i>	REL <i>-e</i>	DAT <i>-(a)r</i> ABL <i>-cum</i>	ABS ∅	ABS ∅	REL <i>-e</i>	ABS ∅	Postposition class 3

It is quite common for alignment to be governed by lexical *and* referential factors. In Burushaski, a single relative case is used on possessors and As of all

inflection classes except one: human females.<sup>20</sup> This inflection class formally distinguishes a genitive case (on possessors) and an ergative case (on As). As a result, three additional alignment patterns have to be taken into account for this inflection class, given in Table 8. As shown in Tables 7 and 8, each combination of the lexical and referential conditions relevant in Burushaski yields a unique alignment pattern.<sup>21</sup>

Table 8: Flagging alignment in Burushaski (for inflection class 2)

Possessive modifier	Possessive argument	Adpositional argument	S <sub>A</sub>	S <sub>P</sub>	A	P	Lexical conditions
GEN <i>-mu</i>	GEN <i>-mu</i>	ABS $\emptyset$	ABS $\emptyset$	ABS $\emptyset$	ERG <i>-e</i>	ABS $\emptyset$	Postposition class 1
GEN <i>-mu</i>	GEN <i>-mu</i>	GEN <i>-mu</i>	ABS $\emptyset$	ABS $\emptyset$	ERG <i>-e</i>	ABS $\emptyset$	Postposition class 2
GEN <i>-mu</i>	GEN <i>-mu</i>	DAT <i>-(a)r</i> ABL <i>-cum</i>	ABS $\emptyset$	ABS $\emptyset$	ERG <i>-e</i>	ABS $\emptyset$	Postposition class 3

Finally, lexical and referential factors may interact, such that lexical factors give rise to additional alignment patterns for a subset of referential dependents only. This is the case in Lango, where a small number of kinship terms take the alienable index-set, rather than the inalienable index-set (Noonan 1992: 82). Since both sets are formally distinct only for singular pronominal possessors (cf. Table 6) this lexical condition yields only two additional alignment patterns, presented in Table 9.

<sup>20</sup> In Burushaski, class assignment is semantic and can therefore be described in terms of referential properties (human male vs. human female vs. animate vs. inanimate); however, this is not the case in all sample languages (and even in Burushaski there are some lexical exceptions: some inanimates form part of the ‘animate’ inflection class). Therefore, alignment splits based on inflectional classes are analyzed in the same way as referentially-conditioned and lexically-conditioned splits.

<sup>21</sup> Flagging alignment in Burushaski additionally exhibits a tense-based split – A arguments receive the absolutive case in the future – which, for convenience sake, has not been illustrated here.



Table 9: Indexing alignment in Lango for a small subset of kinship terms

Possessive modifier	Possessive argument	Adpositional argument	S <sub>A</sub>	S <sub>P</sub>	A	P	Referential conditions
AL suffix	AL suffix	ACC suffix	NOM prefix	NOM prefix	NOM prefix	ACC suffix	[-N],[+hum],[+sg]
AL suffix	AL suffix	ACC suffix	NOM prefix	NOM prefix	NOM prefix	∅	[-N],[-hum],[+sg]

In sum, this subsection has shown how referential factors may impact the coding of possessive NPs and adpositional phrases in individual languages. More importantly, I have shown how referential and lexical factors can be taken into account in comparing languages in terms of the alignment of phrases and clauses. In the next subsection, I discuss further issues in data analysis and coding. The classification of alignment patterns following the five-way typology in Section 4.3 is discussed in Section 4.4.5.

#### 4.4.4 Further methodological preliminaries

The alignment of flagging and the alignment of indexing are considered separately in this study. Free and clitic person forms are considered to be pronouns – and thus treated under the alignment of flagging – while affixal person forms are considered to be indexes – and thus treated under the alignment of indexing.<sup>22</sup> As is well known, pronouns need not be obligatorily expressed. Following Comrie (2013), I take the alignment of pronouns into account irrespective of conditions on their use; only when they cannot be used in dependent positions at all, or no information on their use is available, are they left out of present consideration.

Within the alignment of flagging, a further distinction is made between flagging of the dependent and flagging of the head. This is done to accommodate languages in which the dependent and the head are both marked, but with distinct means of flagging. In West-Greenlandic (Eskimo-Aleut, Greenland; Fortescue 1984: 172, 216), for instance, possessive modifiers and possessive arguments both receive a genitive case marker – and are thus considered under the alignment of dependents – but only possessive modifiers are additionally flagged on the head with the suffix *-uti* – which are thus

<sup>22</sup> In most sample languages, clitics and affixes could be reliably distinguished; in only a few cases did a lack of information force me to follow the orthography of the source consulted.

considered under the alignment of heads. Similarly, the alignment of free pronouns is considered separately from the alignment of cliticized pronouns on the head. In a few cases, formal identities between coding strategies do not show up in the data, because they differ in locus (Nichols 1986, 1992). For instance, in Skou (Donohue 2004: 190–191), a single set of pronominal enclitics is used on possessums – head-marking, thus considered under the alignment of heads – and on A arguments – dependent-marking, thus considered under the alignment of dependents. A dependent or head may also be marked twice, i.e. by a combination of prefixes and suffixes. This applies to case-marking in Mangarayi (Merlan 1982: 56) and the indexing of Ss in Itelmen (Bobaljik & Wurmbbrand 2002). In such cases, I treat the combination of markers as a single coding strategy. Finally, indexes that differ in their position with respect to the head, i.e. prefixes vs. suffixes, are considered to be separate indexing strategies, irrespective of identities in form.

The lack of indexes is interpreted as the absence of indexing rather than as indexing realized by zero. The same applies to flagging: case marking with zero exponence (typically nominative and absolutive) is analyzed on a par with the absence of other means of flagging (such as differential genitive or accusative case marking). This is motivated by the present approach to alignment patterns as transcending the domain of the clause, under which a zero nominative or absolutive case form serves the same function as, for instance, a zero genitive case form: in both cases, a given dependency relation receives no overt form of coding.

Finally, allomorphic sets of indexes or case forms are considered to be formally identical when conditioned by the same factor, typically the same morpho-phonological rule. Sometimes, conditions are not logically applicable across dependency relations, e.g. when the choice of an indexical allomorph depends on tense/aspect/mood with verbs, but on lexical noun class with possessum nouns. Since it is impossible to empirically determine the formal identity of the allomorphs in such cases, I take the unitary approach of considering both sets to be identical.

#### **4.4.5 Typological classification of alignment patterns**

Each alignment pattern attested in the sample is assigned to one of the five types in the typology presented in Section 4.3, repeated for convenience in Table 10:

Table 10: Typology of alignment types

	1	2	3	4	5
<b>Modifier in phrase</b>	A	A	A	A	A
<b>Argument in phrase</b>		B		B	B
<b>Argument in clause</b>	B			C	A

The classification of language-specific alignment patterns following this typology is exemplified for the inventory of indexing alignment patterns in Lango, re-presented in Table 11:

Table 11: Indexing alignment in Lango

<b>Modifier in phrase</b>	<b>Argument in phrase</b>		<b>Argument in clause</b>				<b>Referential conditions</b>	<b>Type</b>
<b>Possessive modifier</b>	<b>Possessive argument</b>	<b>Adpositional argument</b>	<b>S<sub>A</sub></b>	<b>S<sub>P</sub></b>	<b>A</b>	<b>P</b>		
∅	∅	∅	NOM	NOM	NOM	∅	[+N]	3
ACC suffix	ACC suffix	ACC suffix	prefix	prefix	prefix	ACC suffix	[-N],[+hum], [-sg]	
ACC suffix	ACC suffix	ACC suffix	NOM prefix	NOM prefix	NOM prefix	∅	[-N],[-hum], [-sg]	1
AL suffix	INAL suffix	ACC suffix	NOM prefix	NOM prefix	NOM prefix	ACC suffix	[-N],[+hum], [+sg]	2
AL suffix	INAL suffix	ACC suffix	NOM prefix	NOM prefix	NOM prefix	∅	[-N],[-hum], [+sg]	4

The first alignment pattern in the table is a type 3 pattern, because dependency relations from each of the three categories are formally neutralized: possessive modifiers (modifiers in phrases), possessive and adpositional arguments (arguments in phrases) and Ps (arguments in clauses) may each be expressed by means of the accusative suffix or remain unindexed. The second alignment pattern in the table is a type 1 pattern, since a single formal treatment is given to phrases (possessive modifiers, possessive arguments and adpositional arguments, expressed by the accusative suffix), while another is given to clauses (Ss and As, expressed by the nominative prefix, and Ps, which remain unindexed). The third pattern belongs to type 2, since possessive modifiers (modifiers in phrases, expressed by the alienable suffix) are given a separate treatment from phrasal and clausal arguments (adpositional phrases and Ps, expressed by the accusative suffix). The final pattern belongs to type 4, as it

shows the complete absence of cross-categorical neutralizations – although neutralizations within each category are, of course, possible, such as that of  $S_A$ ,  $S_P$  and  $A$ , expressed by the nominative prefix.

Importantly, the neutralizations defining a pattern's type need not affect each dependency relation from a given category: in Lango,  $S_{AS}$ ,  $S_{PS}$  and  $A_S$  do not participate in the type 3 pattern (full neutralization), while in the type 2 pattern (modifiers vs. arguments) only adpositional phrases and  $P_S$  participate. Also note that assignment of a pattern to one of the five types is always based on the most extensive type of cross-categorical neutralization, i.e. the coding strategy that covers the most categories. The first alignment pattern in Table 11, for instance, is classified as a type 3 pattern, because the zero and accusative indexes cover dependents from all three categories: phrase modifiers, phrase arguments, and clause arguments. This applies irrespective of additional formal neutralizations, e.g. if not only  $S_S$  and  $A_S$ , but also adpositional arguments are expressed with a nominative prefix.

Where both alignment patterns cover an equal number of dependency relations, the criterion of maximum cross-categorical neutralization cannot enforce a decision between one and the other alignment type. This applies to patterns of types 1 and 2, and those of types 2 and 5. Burushaski provides an example of the former, as shown in Table 12.

Table 12: Flagging alignment in Burushaski (for inflection class 2 and a subset of postpositions)

Possessive modifier	Possessive argument	Adpositional argument	$S_A$	$S_P$	$A$	$P$	Lexical conditions
GEN <i>-mu</i>	GEN <i>-mu</i>	ABS $\emptyset$	ABS $\emptyset$	ABS $\emptyset$	ERG <i>-e</i>	ABS $\emptyset$	Postposition class 1

On the one hand, this pattern shows the formal neutralization of phrases (possessive modifiers and possessive arguments, expressed by a single genitive case marker) which is characteristic of type 1 patterns, while on the other hand it shows the formal neutralization of arguments (adpositional and verbal arguments, expressed by the absence of flagging) which is characteristic of type 2 patterns. Since both neutralizations cover dependents of two categories, such patterns are considered a separate type, unambiguously named 'type 1&2' in the remainder of the paper. This brings the number of possible alignment types to six. Alignment patterns showing neutralizations of type 2 and the unpredicted type 5 are unequivocally classified as type 5 patterns, in order to maximize the *a*

*priori* likelihood of finding a counterexample in the data.<sup>23</sup>

The seven dependency relations investigated in this study can be formally neutralized in 877 distinct ways in any given language. In other words, there are 877 unique alignment patterns logically available in each sample language.<sup>24</sup> The distribution of these 877 unique patterns over the six alignment types in the typology is presented in Table 13 below. As shown in the table, type 4 patterns have the lowest number of unique instantiations (30 patterns), which is a logical consequence of the fact that cross-categorical neutralizations (absent from patterns of this type) are given preference in the assignment of patterns to types. The distribution also reflects the fact that the seven dependency relations studied do not divide equally over the three categories, i.e. I study one phrasal modifier, two phrasal arguments and four clausal arguments. For instance, in a type 3 pattern, each of the two phrasal arguments and four clausal arguments can in principle participate (note that phrasal modifiers are always part of such a pattern), while in a Type 1 pattern only the single phrasal modifier and the two phrasal arguments can participate. The 877 unique alignment patterns are presented in Appendix III.

Table 13: Distribution of unique, logically possible alignment patterns over alignment types

<b>Alignment type</b>	<b>Frequency of unique, logically possible alignment patterns</b>
1	45
1 & 2	74
2	173
3	235
4	30
5	320
<b>Total</b>	<b>877</b>

The distribution of the six alignment patterns in the data is discussed in the next section, where the results of the study are presented. I will first focus on

<sup>23</sup> Note that the alternative approach – the introduction of a separate alignment type ‘2&5’ – does not affect the results of this study, since, as shown in the next section, type 5 neutralizations are cross-linguistically very rare.

<sup>24</sup> The number of different ways in which a set of variables can be partitioned is expressed by so-called ‘Bell numbers’; for 7 variables, this number is 877 (Guichard forthcoming: 21–27).

the alignment of flagging (Section 4.5.1) and then on the alignment of indexing (Section 4.5.2). An overview of the alignment patterns in each sample language is provided in Appendix IV.

## 4.5 Results

### 4.5.1 Alignment of flagging

Table 14 below presents the distribution of the six alignment types for flagging in the sample; it gives the alignment type (in the first column), the number of observed alignment patterns of each type (in the second column), the number of unique, logically possible patterns of each type (in the third column, repeating Table 13), the number of patterns to be expected in the data given the actual number of observations (in the final column), and the factor difference between the observed and expected frequencies of each type (in the final column). Note that the table counts alignment patterns (N=175), not sample languages (N=39), since any given language may exhibit multiple alignment patterns. The distribution of alignment types over the sample languages is presented in a separate table, given later in this section.

Table 14: The observed and expected distribution of alignment of flagging

Type	Observed frequency	Frequency of unique, logically possible alignment patterns	Expected frequency	Factor difference observed/expected frequencies
1	56	45	8.98	6.24
1 & 2	35	74	14.77	2.37
2	27	173	34.52	0.78
3	54	235	46.89	1.15
4	2	30	5.99	0.33
5	1	320	63.85	0.02
Total	175	877	175	-

As shown in the second column of this table, alignment patterns of type 5, characterized by the formal identity of (possessive) modifiers in phrases and (one or more) arguments in clauses to the exclusion of arguments in phrases, are cross-linguistically very rare: although this type has the highest number of unique, logically possible patterns (320 out of 877, i.e. 36%), it has only a single

attestation in the data. Type 4 patterns, characterized by the full formal differentiation of the three types of dependency relations, are also uncommon, but this is unsurprising given that only 3% (30 of 877) of all logically possible alignment patterns are of this type. The four other alignment types are attested much more frequently. These data confirm the main hypothesis for flagging: if the same flagging strategy is used for modifiers in phrases as for arguments in clauses, arguments in phrases receive this flagging strategy as well. Alignment patterns in which a single means of flagging is used for modifiers in phrases and for arguments in clauses, but not for arguments in phrases, are rare. This finding is captured by the scale in (9), repeated in (22):

(22) modifier in phrase – argument in phrase – argument in (main) clause

Flagging strategies, i.e. overt means of flagging or their absence, strongly tend to cover continuous segments of this scale. Languages may formally neutralize the modifier/argument distinction (as in type 1 neutralizations), the phrase/clause distinction (as in type 2 neutralizations), both (as in type 3 neutralizations) or neither (as in type 4 neutralizations), but the formal neutralization of dependency relations that are both semantically and syntactically distinct is strongly dispreferred (type 5 neutralizations). This finding demonstrates the typological relevance of the opposition between modifiers and arguments, and that between phrases and clauses in the formal expression of dependency relations through flagging.

Statistical support for this finding is provided by a chi-square goodness-of-fit test, which tests whether the distribution of alignment types observed in the data (in the second column) differs significantly from the distribution of alignment types to be expected in the data (in the fourth column) on the basis of the number of unique alignment patterns belonging to each type (in the third column). Since the distribution of unique alignment patterns over the different types is inherently skewed, it possibly interferes with the observed distribution of alignment types in the data; the chi-square test determines the likelihood of such interference. The expected distribution of alignment types is computed by multiplying the probability of each type with the total number of alignment patterns attested (N=175); for instance, 45 of the 877 unique patterns are of type 1, which, given the total sample size of 175 patterns, yields an expected number of 9 patterns of this type. The test demonstrates a statistically significant difference between the two distributions ( $\chi^2 = 341.19$ ,  $p < 0.0001$ ), showing that it is highly unlikely for the observed distribution to be the outcome of the logically possible distribution of unique patterns over types. Rather, the strong

underrepresentation of type 5 patterns – only 1.6% (1 out of 64) of such expected patterns is attested – shows that the distribution is best explained in terms of the semantic and syntactic nature of the dependency relation, as captured by the scale in (22).

Tariana (Arawakan, Brazil) provides the sole counterexample: possessive modifiers, as shown in (23a), and verbal arguments, i.e. S<sub>AS</sub> (23b), S<sub>PS</sub> (23c), A<sub>S</sub> and P<sub>S</sub> (23d), do not trigger flagging on the head, while possessive and adpositional arguments are marked by an invariant prefix *i-*, as shown in (23e) and (23f). The pattern is limited to nominal dependents, and to a subset of relational nouns and postpositions.

- (23) a. *tfinu panisi*  
 dog house  
 'dog's house'
- b. *diha itfida di-eku-kha*  
 ART turtle 3SG.NF-run-away  
 'The turtle ran.'
- c. *diha ne:ri di-ñami-pidana*  
 ART deer 3SG.NF-die-REM.PST.REP  
 'The deer died.'
- d. *tfinu kuphe di-nitu-mahka*  
 dog fish 3SG.NF-steal-REC.PST.NVIS  
 'The dog stole the fish.'
- e. *ne:ri i-whida*  
 deer INDF-head  
 'the head of a deer'
- f. *ne:ri i-pumi*  
 deer INDF-after  
 'after the deer' (Aikhenvald 2003: 483, 667, 657, 296, 3, 3)

Note that this counterexample only targets head-marking; dependent-marking is fully in line with the hypothesis. Moreover, possessive modifiers and P<sub>S</sub> are formally neutralized only via the absence of flagging: counterexamples making use of overt means of flagging are not attested in the sample.

Furthermore, it can be argued that the prefix *i-* is not a marker of the possessive dependency relation, but a mere dummy morpheme required to fill the prefix-slot of obligatorily (i.e. inalienably) possessed nouns in the absence of other morphology. In Tariana, pronominal possessive arguments are obligatorily indexed on the possessum head through prefixes; nominal possessive arguments



cannot be indexed, as a result of which the prefix *i-* has to be used as a semantically empty placeholder (the same analysis is argued for by Hengeveld & Mackenzie 2008: 412). Further support for this analysis comes from the fact that the prefix is also used in the absence of possessive arguments, i.e. it marks the non-possessed (and thereby non-indexed) form of obligatorily possessed nouns, e.g. *ñama i-sawi* (two INDF-horn) ‘two horns’ (Aikhenvald 1995: 183). A third argument in favor of this analysis is that the overt coding of inalienable possession but not of alienable possession, as (arguably) in Tariana, is cross-linguistically extremely rare (Haiman 1983, 1985: 130–136; Haspelmath 2006, 2008: 19–22; see also Chapters 2 and 3 of this thesis). Importantly, under a ‘dummy’ analysis of the prefix, the pattern illustrated in (23) does not constitute a counterexample.

Finally, it should be noted that the pattern in (23) is diachronically unstable, as the prefix is being lost under the influence of contact with Tucano languages that do without this prefix (Aikhenvald 2003: 124, 129–131). This results in the simple juxtaposition of possessor and possessum as in alienable possession, and occasionally in the use of indexes not only in the absence but also in the presence of nominal possessors. Notably, these innovative forms of possessive coding yield alignment patterns that are fully in line with the hypothesis.

Returning to the distribution of alignment types, it can be observed that patterns of type 1 (phrases vs. clauses, 56 instances) and type 3 (full neutralization, 54 instances) are most commonly attested. Type 3 alignment typically displays the absence of flagging; only Burushaski, Georgian, Tamil and West Greenlandic use a single (overt) means of flagging for dependents from each of the three categories. This can be attributed to the fact that some languages lack means of flagging altogether, while in many others dependency relations are overtly flagged only under certain referential or lexical conditions.

While the number of observed type 3 patterns does not deviate strongly from expectation (the factor difference is 1.15), type 1 patterns are attested roughly 6 times as often as expected, as shown in the final column of Table 14. Type 1&2 patterns display a similar asymmetry: they are (roughly) twice as frequent as expected. Type 2 patterns (modifiers vs. arguments), however, show the inverse kind of asymmetry: only 78% of all expected patterns are attested. Together, these data demonstrate that the sample languages strongly tend to formally neutralize dependency relations that are semantically distinct (i.e. the modifier/argument distinction, as in type 1 neutralizations) rather than those that are syntactically distinct (i.e. the phrase/clause distinction, as in type 2 neutralizations). Put differently: across the sample, the opposition between

phrasal and clausal dependency relations is expressed more often through flagging than the opposition between modifiers and arguments.

Interestingly, neutralizations of type 1 (phrases vs. clauses) minimally target possessive arguments: almost all type 1 and 1&2 patterns use the same flagging strategy – typically a single genitive case marker – for possessive modifiers and possessive arguments, or for all three phrasal dependents; the identical coding of possessive modifiers and adpositional arguments to the exclusion of possessive arguments is attested in only five type 1 and 1&2 patterns. In the sample as a whole, this type of formal neutralization is found in only nine alignment patterns of flagging. A likely explanation for the commonness of formal identity of possessive modifiers and possessive arguments is their shared possessor role. Diachronic factors may also be relevant: since adpositions often originate historically in relational nouns, such as body part terms, they are more likely to inherit the flagging of possessive arguments than that of possessive modifiers.

Finally, Table 15 below presents the distribution of the six alignment types over the 39 sample languages. It presents the alignment types (in the first column), the number of sample languages employing each type (in the second column), the number of alignment patterns attested per type (tokens, in the third column), and the number of unique alignment patterns – out of the 877 logically possible patterns – attested (types, in the final column). In the discussion of the table below, capitals are used for the alignment types in the first column and lower case is used for the unique alignment types in the final column. Seven sample languages are not part of the final column, as their alignment patterns could not be assigned to a unique type, due to the absence of adpositions or the indeterminacy of such a class.

The data show a highly homogeneous dispersion of alignment Types over sample languages, both in terms of tokens and in terms of types. In other words, the different alignment Types are found in many different languages; it is not the case that only a small number of languages are responsible for the frequent attestation of a certain alignment Type. This empirical observation is supported statistically, as there is a strong correlation between the distribution of sample languages and the distribution of alignment tokens ( $r = 0.997$ ), and between the distribution of sample languages and the distribution of alignment types ( $r =$

Table 15: The token, type and language distribution of alignment of flagging

Type	Frequency of languages	Frequency of attested alignment patterns (tokens)	Frequency of unique, attested alignment patterns (types)
1	24	56	10
1 & 2	17	35	10
2	12	27	11
3	23	54	16
4	1	2	2
5	1	1	1
Total	78	175	50

0.892).<sup>25</sup> Moreover, the distribution of alignment tokens correlates strongly with the distribution of alignment types ( $r = 0.891$ ), showing that alignment Types that are cross-linguistically frequent, and thus have many tokens, strongly tend to belong to different unique patterns.

This section concludes the discussion of the results for the alignment of flagging. In the next section, I turn to the results for the alignment of indexing.

#### 4.5.2 Alignment of indexing

Table 16 below presents the distribution of alignment types for indexing in the 39-language sample. Like Table 14 in the previous subsection, it presents the six alignment types (in the first column), the observed frequency of each alignment type (in the second column), the frequency of unique, logically possible patterns per type (in the third column), the expected frequency of each type given the actual number of observations (in the fourth column), and, finally, the factor difference between the observed and expected frequencies (in the final column).

<sup>25</sup> Correlations are computed using Pearson's correlation coefficient ( $r$ ); the coefficient ranges from 0 to 1 (for positive correlations), with 0 indicating no correlation and 1 a total positive correlation (Johnson 2013: 302–307).

Table 16: The observed and expected distribution of alignment of indexing

Type	Observed frequency	Frequency of unique, logically possible alignment patterns	Expected frequency	Factor difference observed/expected frequencies
1	33	45	5.9	5.59
1 & 2	15	74	9.7	1.55
2	8	173	22.69	0.35
3	57	235	30.82	1.85
4	1	30	3.93	0.26
5	1	320	41.96	0.02
Total	115	877	115	-

The table demonstrates that indexing alignment of type 5 is cross-linguistically rare: only one such pattern is attested, while there are 320 logically possible patterns of this type. Alignment of type 4 is also attested once, but this is unsurprising given the low number of logically possible patterns of this type (only 30 out of 877, i.e. 3%). Other alignment types are either much more frequent (type 1, with 33 instances, and type 3, with 57 instances) or are not as strongly underrepresented as type 5 (this concerns type 2, which has a factor difference of 0.35). This distribution of alignment types confirms the main hypothesis for indexing: if modifiers in phrases are indexed in the same way as arguments in clauses, arguments in phrases are expressed by this indexing strategy as well. The use of a single indexing strategy for dependency relations that are both semantically and syntactically distinct, as in type 5 patterns, is strongly dispreferred across the languages of the sample. Hence, the data show that indexing strategies, i.e. individual indexes or their absence, always cover continuous segments of the scale repeated in (24):

(24) modifier in phrase – argument in phrase – argument in (main) clause

This empirical finding is supported by a chi-square goodness-of-fit test, which demonstrates that the difference between the observed distribution of alignment types (in the second column) and the expected distribution of alignment types

(in the fourth column) is statistically significant ( $\chi^2 = 201.29$ ,  $p < 0.0001$ ).<sup>26</sup> This finding demonstrates that the modifier/argument opposition and the phrase/clause opposition both play an important role in the cross-linguistic encoding of dependency relations, not only in terms of flagging, but also in terms of indexing.

Interestingly, the sole counterexample for indexing in the data stems from the same language as the sole counterexample for flagging: Tariana. As shown below, possessor modifiers (25a) and P arguments (25b) are never indexed in Tariana, as opposed to possessor arguments (25c), postpositional arguments (25d), S<sub>AS</sub> (25e), S<sub>PS</sub> (25f) and A<sub>s</sub> (25b). This type 5 pattern only applies to pronominal dependents, and to a subset of relational nouns and postpositions.

- (25) a. *naha amaku-pe*  
 3PL hammock-PL  
 ‘their hammocks’
- b. *na-na na-pinita-ka-ta*  
 3PL-OBJ 3PL-follow-DECL-REPV  
 ‘They were following them.’
- c. *na-whe-ri-nipe*  
 3PL-grandparent-M-PL  
 ‘their grandfathers’
- d. *na-dalipa*  
 3PL-near  
 ‘near them’
- e. *na-musu na:*  
 3PL-go.out 3PL.go  
 ‘They started going out.’
- f. *na-yami-na*  
 3PL-die-REM.PST.VIS  
 ‘They died.’ (Aikhenvald 2003: 652, 470, 634–635, 533, 438, 413)

Like the type 5 pattern of flagging in Tariana, this pattern is based on the absence of formal coding; no sample language uses a single overt index-set for phrase modifiers and clause arguments, but not for phrase arguments.

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<sup>26</sup> Expected frequencies are computed in the same way as explained in the previous subsection, e.g. 45 of out 877 possible indexing patterns belong to type 1, which, given a total sample size of 115 indexing patterns, yields an expected number of 5.9 patterns of this type.

Focusing on the distribution of alignment types 1 to 4, it can be observed that indexing alignment of type 3 is most common (57 instances) and is almost twice as common as expected (cf. the final column of Table 17). It happens almost exclusively on the basis of the absence of indexing (in 51 out of 57 patterns, i.e. 90%); only Abkhaz, Macushi, Nivkh and Turkish use overt means of indexing for each of the three types of dependency relations. As with flagging, indexing patterns of type 1 show the largest difference between observed and expected frequencies: this type is more than 5 times as common as expected. Type 1&2 patterns are also more frequent than expected, though only slightly: 1.5 times. The inverse asymmetry applies to patterns of type 2: only 3.5% of all expected patterns are attested in the data. In sum, these asymmetries demonstrate a clear preference for the formal neutralization of the modifier/argument opposition (in type 1 neutralizations) as opposed to the phrase/clause opposition (in type 2 neutralizations). Hence, the opposition between phrasal and clausal dependency relations is expressed more often than the opposition between modifiers and arguments, in flagging (as shown in the previous subsection) as well as in indexing. Moreover, as with flagging, type 1 neutralizations where possessor modifiers and adpositional arguments are expressed with the same indexing strategy to the exclusion of possessor arguments are rare: only three such type 1 and 1&2 patterns are attested. The same synchronic motivation – the shared role of possessor modifiers and possessor arguments – and diachronic motivation – the shared historical origin of possessor arguments and adpositional arguments – given for flagging may apply here.

Finally, Table 17 presents the distribution of alignment types (in the first column) in terms of the number of sample languages (in the second column), the number of attested alignment patterns (tokens, in the third column) and the number of unique, attested alignment patterns (types, in the final column). As with Table 15, capitals are used for alignment types in the first column, while lower case is used for alignment types in the final column. The seven sample languages excluded from Table 15 are also excluded here.

The data show strong correlations between the individual columns: the distribution of sample languages correlates strongly with the distribution of tokens ( $r = 0.995$ ) and with the distribution of types ( $r = 0.976$ ). Hence, cross-linguistically common alignment Types, both in terms of alignment patterns in general (tokens) and in terms of unique alignment patterns (types), are widely dispersed among the different sample languages. Also note that token frequency correlates strongly with type frequency ( $r = 0.964$ ), showing that alignment

Types with a high number of tokens also belong to a high number of unique types.

Table 17: The token, type and language distribution of alignment of indexing

Type	Frequency of languages	Frequency of attested alignment patterns (tokens)	Frequency of unique, attested alignment patterns (types)
1	16	33	8
1 & 2	10	15	6
2	5	8	6
3	31	57	16
4	1	1	1
5	1	1	1
Total	67	115	41

In sum, this section has shown that alignment patterns are sensitive to the semantic nature of dependency relations (head-modifier relations vs. head-argument relations) as well as to their syntactic type (phrasal vs. clausal). Specifically, it is shown that if (possessor) modifiers in phrases receive the same flagging or indexing strategy as arguments in clauses, (possessor or adpositional) arguments in phrases receive this coding strategy as well. In the next section, I show that adpositional phrases play a similar bridging role to phrase arguments in general, but then in the formal neutralization of arguments in possessive NPs and arguments in main clauses.

## 4.6 The bridging role of adpositional phrases

In the previous section it was demonstrated that arguments in phrases play a bridging role in the formal neutralization of modifiers in phrases and arguments in clauses. Interestingly, adpositional phrases play the same bridging role, but then among arguments only. Specifically, the data point to the following generalization: if arguments in possessive NPs are expressed in the same way as (one or more) arguments in main clauses, arguments in adpositional phrases receive this formal treatment as well. This generalization applies to both flagging and indexing, discussed in turn below.

Table 18 provides the relevant data for flagging. The first and second columns present the five distinct ways in which possessor arguments (PSR ARG), adpositional arguments (ADP ARG) and clausal arguments (CLS ARG)

can be formally neutralized, which are labeled types A to E; brackets separate formally identical dependency relations. The table also presents the observed distribution of each type (in the third column), the distribution of the 877 unique, logically possible alignment patterns over the five types (in the fourth column), the expected frequency of each type (in the fifth column) and finally the factor difference between the observed and expected frequencies (in the final column).<sup>27</sup>

Table 18: The observed and expected distribution of flagging alignment of arguments

Type	Patterns of identical coding	Obs. freq.	Freq. of unique, possible alignment patterns	Exp. freq.	Factor difference obs./ exp. freq.
A	(POSS ARG, ADP ARG) (CLS ARG)	29	67	12.07	2.40
B	(POSS ARG) (ADP ARG, CLS ARG)	35	173	31.17	1.12
C	(POSS ARG, ADP ARG, CLS ARG)	45	136	24.5	1.84
D	(POSS ARG) (ADP ARG) (CLS ARG)	24	83	14.95	1.60
E	(POSS ARG, CLS ARG) (ADP ARG)	25	418	75.31	0.33
Total		158	877	158	-

Comparing the observed frequencies with the expected ones shows that all alignment types are attested more often than expected, except for one: type E, which is strongly underrepresented. As shown in the final column, only 33% of all expected type E patterns are attested. This asymmetry demonstrates that the identical flagging of possessor arguments and (one or more) clausal arguments to the exclusion of adpositional arguments is dispreferred cross-linguistically. A chi-square goodness-of-fit test shows that the difference between the observed and the expected frequencies is statistically significant, supporting this empirical finding ( $\chi^2 = 80.44$ ,  $p < 0.0001$ ). On the one hand, this finding can be explained by the phrasal vs. clausal nature of the relevant dependency relations: possessor arguments, as parts of phrases, can only be encoded as arguments in clauses, when other arguments in phrases, i.e. adpositional arguments, receive this

<sup>27</sup> The expected frequency of each type is computed in the same way as in the previous section, but note that the number of unique, possible patterns per type differs, since a different set of alignment patterns is being investigated here. As in testing the main hypothesis, formal neutralizations need not affect all clausal arguments. Patterns in which possessor arguments receive the same coding as (one of more) clausal arguments are classified as the unpredicted type E, irrespective of additional formal identities. This maximizes the *a priori* likelihood of finding a counterexample.



coding strategy as well. On the other hand, diachronic factors may be relevant: since adpositions often historically derive from body part nouns and other relational nouns, they are likely to receive the same coding as possessor arguments; however, adpositions also commonly derive from verbs in serial verb constructions, which may motivate their formal identity with clausal arguments. Generalizations regarding the type of coding used, discussed below, support these motivations. In general, this finding demonstrates the typological relevance of the phrasal vs. clausal nature of dependency relations, not only across modifiers and arguments (as demonstrated in the previous section), but within the domain of arguments as well.

Focusing on the type of flagging strategies used, it can be observed that adpositional arguments are often formally identical to possessor arguments and/or clausal arguments (as in types A, B and C) due to the absence of flagging. By contrast, the formal identity of adpositional arguments and possessor modifiers, or possessor modifiers **and** possessor arguments is typically revealed through overt means of flagging, such as a shared genitive case marker. This tendency can be explained by the fact that possessor arguments are often unmarked, especially in languages with an alienability split, which in turn follows from the fact that they are semantically inherent to the head noun and therefore need no overt coding of their possessor role (cf. Chapters 2 and 3 of this thesis). Again, diachronic factors may apply: adpositions may inherit the (absence of) flagging of possessive arguments – given their historical origin as relational nouns – or from verbs in serial verb constructions where the clausal argument typically remains unmarked. Note, however, that adpositional and clausal arguments may also receive the same overt means of flagging; interestingly, this typically involves the P, e.g. a single accusative or oblique case marker, rather than the A, e.g. a single ergative case marker. This is consistent with findings in other types of typological research, such as the relationship between adpositional phrases and P arguments in terms of word order (Dryer 2013). A relevant example is given in (26) for Nama (Khoe-Kwadi, Namibia):

- (26) a. *'oms-à xuú*  
           house-ACC from  
           'from the house'
- b. *'áo-p ke 'àrí-p-à kè mũũ*  
           man-3M.SG DECL dog-3M.SG-ACC PST see  
           'The man saw the dog.' (Hagman 1977: 193, 148)

Finally, note that the unique flagging of adpositional arguments (as in alignment

of types D and E) is typically characterized by overt flagging: zero-flagging is attested in only 3 of the 49 patterns.

The bridging role of adpositions also surfaces in indexing; Table 19 presents the relevant data, in the same manner as Table 18.

Table 19: The observed and expected distribution of indexing alignment of arguments

Type	Patterns of identical coding	Obs. freq.	Freq. of unique, possible alignment patterns	Exp. freq.	Factor difference obs./ exp. freq.
A	(POSS ARG, ADP ARG) (CLS ARG)	15	67	7.18	2.09
B	(POSS ARG) (ADP ARG, CLS ARG)	18	173	18.54	0.97
C	(POSS ARG, ADP ARG, CLS ARG)	48	136	14.58	3.29
D	(POSS ARG) (ADP ARG) (CLS ARG)	4	83	8.9	0.45
E	(POSS ARG, CLS ARG) (ADP ARG)	9	418	44.80	0.20
Total		94	877	94	-

The table demonstrates that type E is again the most underrepresented type: only 20% of the expected patterns of this type are attested in the data. Type D patterns are also underrepresented, but less strongly so: 45% of the expected patterns of this type are attested. A chi-square goodness-of-fit test demonstrates a significant difference between the observed and the expected distribution of types ( $\chi^2 = 116.47$ ,  $p < 0.0001$ ).

Importantly, type E patterns are significantly underrepresented in the sample as a whole, while type D patterns are not. This can be demonstrated by two Fisher's Exact tests. The first compares the observed and expected frequencies of type E patterns with the observed and expected frequencies of all other alignment types, as represented by the following 2x2 contingency table:

Table 20: The observed and expected frequency of type E vs. other alignment types

	Observed frequency	Expected frequency
Type E	9	45
Types A, B, C, D	85	49

The p value for this table is  $< 0.0001$  (one-tailed), showing that type E patterns are indeed significantly underrepresented compared to the other alignment types. The second Fisher's Exact test shows that this does not apply to alignment patterns of type D, for which a similar 2x2 contingency table can be given:

Table 21: The observed and expected frequency of type D vs. other alignment types

	Observed frequency	Expected frequency
Type E	4	9
Types A, B, C, D	90	85

This table yields a *p* value of 0.13 (one-tailed), showing that type D patterns are not significantly underrepresented compared to the other alignment types attested. In sum, this demonstrates that type E patterns are indeed cross-linguistically rare, and thus that languages tend to avoid using the same indexing strategy for possessor arguments and clausal arguments without using this indexing strategy for adpositional arguments as well. This in turn supports the bridging role of adpositions in the formal neutralization of possessor arguments and clausal arguments across the languages of the sample.

Turning to the type of indexing strategies used, the data show that the formal identity of adpositional arguments and possessor arguments (as in type A and C patterns) is often achieved through the absence of indexing. This could be due to the fact that the indexing of adpositions is relatively uncommon cross-linguistically: it is found in 28% of the languages in Siewierska (2004) and in 34% (11 out of 32) of the languages with adpositions in my sample. However, the use of identical indexes for these two arguments is also attested, which can be attributed to the fact that possessor arguments are frequently indexed as opposed to possessor modifiers (cf. Siewierska 2004: 143-145; Stassen 1997: 38). The frequent indexing of possessor arguments may in turn be related to the argumenthood of such possessors via grammaticalization: as semantically obligatory dependents of the head, possessor arguments are arguably expressed more often than possessor modifiers, and therefore more likely to grammaticalize into indexes on the head (cf. Nichols 1992: 121–122; Haspelmath 2008: 19–22). Adpositional and verbal arguments also often remain unindexed (as in type B and C patterns), but may share the same overt indexing strategy as well. Interestingly, indexes on adpositions strongly tend to be identical to those used for P arguments, sometimes also used for S<sub>P</sub> arguments, rather than A or S<sub>A</sub> arguments. A possible explanation lies in the semantic connection between patientive arguments and possessor arguments, being items that have no control over the relationship to their head, which in turn explains their common identical expression across the world’s languages (cf. Seiler 1983a: 22, 1983b; Wilson 1982: 123–130). Given that relational nouns are common diachronic sources of adpositions, this may explain why adpositional and clausal arguments often share the same overt indexing strategy.

In sum, this section has shown that possessor arguments and clausal arguments are rarely coded alike without the additional inclusion of adpositional arguments. Adpositional arguments thus play a bridging role in the formal neutralization of possessor arguments and clausal arguments, which can be explained by the shared phrasal nature of possessive NPs and adpositional phrases on the one hand, and the diachronic link between adpositions and possessum nouns, and between adpositions and verbs on the other. This finding shows that the phrase/clause distinction is relevant, not only in the coding of dependency relations in general (as shown in the previous section) but also in the coding of arguments in particular.

## 4.7 Conclusions

Alignment is traditionally studied as the morphosyntactic coding of verbal arguments in main clauses. In this paper, I study alignment as a notion that transcends the domain of the clause, as motivated by a semantic distinction between modifier dependents and argument dependents, which applies to both phrases and clauses. The aim of this paper is to determine to what extent the alignment of phrasal and clausal dependency relations is sensitive to the opposition between modifiers and arguments on the one hand, and the phrasal vs. clausal nature of the dependency relation on the other. To this end, I studied the morphosyntactic coding of possessive NPs, adpositional phrases and the core arguments of one- and two-participant verbs in main clauses, in a worldwide sample of 39 languages. In so doing, I took into account language-internal variation in alignment conditioned by referential and (partly) lexical factors, following recent work on clausal alignment typology. I hypothesized that languages show significant variation in alignment patterns, but that one pattern is cross-linguistically rare: the identical coding of modifiers in phrases and arguments in clauses without the inclusion of arguments in phrases. This hypothesis is fully borne out by the data, providing evidence for the following cross-linguistic tendency:

- (i) If modifiers in phrases are encoded in the same way as arguments in clauses, arguments in phrases receive the same formal treatment.

This generalization shows that arguments in phrases play a bridging role in the formal neutralization of modifiers in phrases and arguments in clauses, which is motivated by the phrasal nature of the dependency relation that they share with modifiers in phrases, and their argumenthood shared with arguments in clauses.

Additionally, it was shown that adpositional phrases play a similar bridging role, but then among arguments only. The data yield the following cross-linguistic tendency:

- (ii) If possessor arguments (in phrases) are coded in the same way as arguments in clauses, adpositional arguments (in phrases) receive the same formal treatment.

This finding is motivated by the shared phrasal nature of dependency relations containing possessor arguments and adpositional arguments, and by the diachronic link between adpositions and (relational) possessum nouns, on the one hand, and between adpositions and verbs in serial verb constructions, on the other.

To conclude, this study has shown that alignment is a phenomenon pertaining not only to clauses, but to phrases as well. Specifically, it has been shown that alignment patterns are sensitive to the semantic nature of the dependency relation (head-modifier relations vs. head-argument relations) as well as to the syntactic nature of the dependency relation (phrasal vs. clausal). Both the modifier/argument opposition and the phrase/clause opposition have been shown to be two relevant typological parameters in the morphosyntactic coding of dependency relations.

In order to further corroborate these findings, future research should expand the sample of languages and the constituent types investigated in this study. Ideally, such research will also shed more light on the cross-linguistic relevance of referential properties in possessive and adpositional coding, which remain underresearched, and their relationship to referential conditions on clausal argument coding. Finally, future research should look beyond the prototypical noun and verb classes considered in this study, as this may yield a richer typology of alignment patterns to be observed in the world's languages.



# 5

## Conclusions and outlook

In this final chapter, I will review the findings obtained in the preceding chapters, which provide an answer to the following central research question: *To what extent does the modifier/argument distinction constrain the cross-linguistic expression of dependency relations?* Four dimensions of expression were investigated, for different dependency relations: (i) locus of marking in possessive NPs (Chapter 2), (ii) the referentiality of person marking in possessive NPs, (iii) the formal realization of person marking in possessive NPs (both in Chapter 3), and, finally, (iv) the identity of marking across possessive NPs, adpositional phrases, and one- and two-participant verbal main clauses (Chapter 4). Each domain of inquiry will be discussed in turn in Section 5.1, where I will summarize the main findings, draw conclusions, and discuss the contribution that each study makes to the fields of locus of marking, grammaticalization and alignment. In Section 5.2, I will examine some potentially fruitful topics for future research.

### 5.1 Conclusions

The general prediction that follows from the opposition between modifiers and arguments is that modifiers, as functionally optional enrichments of the head, are in greater need of (more expressive means of) morphosyntactic coding than arguments, which are inherent to the head's lexical semantics. This asymmetry would be in keeping with the relationship between functional markedness and morphosyntactic coding. The data presented in this thesis confirm this prediction, both with respect to locus of marking in possessive NPs (Chapter 2) and with respect to the referentiality and formal realization of possessive person markers (Chapter 3). The findings obtained in each chapter are discussed below.

Focusing first on locus of marking, the prediction resulting from the marked status of modifiers as functionally optional enrichments of the head is that they are more likely to be the locus of morphosyntactic coding than arguments. This prediction is borne out by the data; the findings are schematically outlined in Table 1 below.

Table 1: Cross-linguistic tendencies of locus of marking

	Possessor		Possessum
Alienable possession	Modifier	>	Head
	$\cap$		$\cup$
Inalienable possession	Argument	<	Head

As indicated by angled brackets in the table, there is a preference for modifier-marking in possessive head-modifier relations (“alienable possession”), and a preference for head-marking in possessive head-argument relations (“inalienable possession”). These preferences yield two generalizations for locus of marking in languages with an adnominal alienability split, as represented by implication signs in Table 1: (i) if a language marks the head in head-modifier relations, it also marks the head in head-argument relations, and (ii) if a language marks the argument, it also marks the modifier. These findings corroborate earlier findings by Nichols (1986, 1988, 1992), but go beyond her work in two ways.

First, they reflect a universal, semantic opposition between modifiers and arguments. Nichols does not base her argumentation on the semantic underpinning of the asymmetries in (in)alienable coding, but argues instead that they are due to differences in frequency: inalienable possessums simply co-occur with a possessor more often than alienable possessums (see also Haspelmath 2008a, 2008b). However, as pointed out in Chapter 2, this need not always be the case: in many languages, such as Tidore (West Papuan, Indonesia), all kinds of dependents may be freely dropped – be they alienable or inalienable possessors – due to the low degree of referential density of these languages. In fact, it may well be that, in individual languages, inalienable possessors are dropped more often than alienable possessors, because they tend to be highly contextually salient: kinship terms tend to have 1<sup>st</sup> or 2<sup>nd</sup> person possessors, and possessors of body parts are typically mentioned in previous discourse. It remains unclear how these facts relate to a frequency-based account of alienability splits.

Second, I depart from work by Nichols in systematically separating function (referentiality) and form (morpho-phonological realization) in the analysis of person forms in terms of locus. It is shown that bound person forms need not express agreement, but may be referential expressions of the dependent themselves, while freestanding person forms need not be referential (i.e. pronouns), but may express agreement. Following work by Hengeveld (2012), the distinction between referential markers and agreement markers is made by



considering the distribution of grammatical feature information – specifically, possessor role information – in the possessive NP: while referential markers expand on the possessor role information provided by the possessor noun, agreement markers are mere copying devices, and as such can only express those features provided by the possessor NP. Accordingly, bound referential markers, which are shown to be cross-linguistically common, are not only head-marking, but mark (the possessor role of) the dependent as well. This demonstrates that, from a semantic perspective, dependent-marking may – and indeed frequently does – occur on heads. This observation in turn challenges the clear-cut distinction between head-marking and dependent-marking made in traditional locus of marking typology. Moreover, by looking at the distribution of feature information in possessive NPs in individual languages, this study provides a more detailed analysis of person markers in terms of agreement/(cross-)reference than in Nichols’ work and other literature (e.g. Siewierska 1999, 2004). Finally, on a more general level, this study highlights the importance of the typology of referential/agreement marking for locus of (person) marking.

In Chapter 2, I show that, cross-linguistically, modifiers are not only more likely to be the locus of morphosyntactic marking, they are also more likely to be expressed by referential markers than arguments. This finding is captured in Table 2 below:

Table 2: Cross-linguistic tendencies of referentiality of possessive person marking

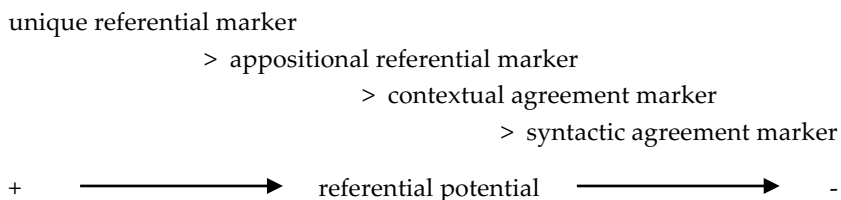
Head-modifier relations (alienable possession)	Referential marker	>	Agreement marker
	$\cap$		$\cup$
Head-argument relations (inalienable possession)	Referential marker	>	Agreement marker

The implication signs in the table reflect the following generalization: (iii) if possessive head-argument relations are expressed by referential markers, possessive head-modifier relations are expressed by referential markers as well, and, conversely, if possessive head-modifier relations are expressed by agreement markers, possessive head-argument relations are expressed by agreement markers as well. This finding supports the functional markedness of modifiers compared to arguments, as a result of which modifiers are more often expressed by referential markers than arguments. As indicated with the angled brackets, both types of relations prefer referential marking when considered on

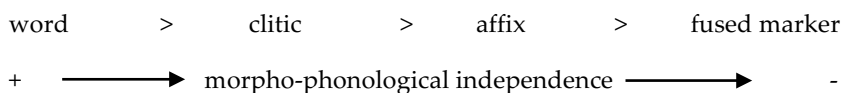
their own. A possible explanation, offered in this chapter, is the low-level saliency of possessors in discourse compared to other dependents, such as verbal arguments in main clauses.

The generalizations summarized in Table 2 are corroborated in Chapter 3, which studies a larger sample of languages with an alienability split. The prediction tested in this chapter is that modifiers are in greater need of a more referential and a more formally independent expression type than arguments. The diachronic implication of this prediction is that the possessive coding of arguments (“inalienable” possessive coding) is more grammaticalized than that of modifiers (“alienable” possessive coding). While many traditional approaches to grammaticalization collapse form and function, the study in Chapter 3 separates the dimensions of referentiality (function) and morpho-phonological expression type (form). Each dimension is assumed to follow a distinct grammaticalization cline, repeated in (1) below. The functional cline captures the marker’s gradual loss of referential potential, following the typology of referential markers and agreement markers already partly introduced in Chapter 2. The formal cline captures the marker’s gradual loss of morpho-phonological independence, via cliticization, affixation and fusion.

(1) *The functional grammaticalization cline:*



*The formal grammaticalization cline:*



The data confirm the prediction formulated above; it is shown that possessive person marking in head-modifier relations is (i) never less referential and (ii) never less formally independent, i.e. never located further rightwards on each cline, than possessive person marking in head-argument relations. Hence, the expression of head-modifier relations tends to be more referential and more formally independent than the expression of head-argument relations, which can again be attributed to the functional status of modifiers as optional additions

to the head. This finding furthermore supports the claim that inalienable possessive marking shows a higher degree of grammaticalization than alienable possessive marking, but for function and form independently.

In Chapter 3, I also investigate the relationship between the two clines in (1), independently of the modifier/argument opposition. The results suggest that the development of a marker along the functional cline is independent of its development along the formal cline: while referential markers are often realized as words, they are also often realized as affixes; similarly, while agreement markers prefer to be realized as affixes, they may also be realized as clitics. From a diachronic perspective, this means that a given marker need not wait for a loss in formal independence before it may lose referential potential, and vice versa. Hence, the relationship between the two clines is not absolute – in fact, it is relative: the data show that, in individual languages, lower referential markers are never more formally independent (i.e. located further leftwards on the formal cline) than higher referential markers. This finding supports the unidirectionality of grammaticalization processes, since it suggests that a decrease in referential potential never goes hand in hand with an increase in formal independence. Moreover, it provides a refinement to the common assumption that function and form develop in parallel, as it suggests that functional and formal changes proceed in the same direction, but need not proceed at the same pace. As such, this study sheds new light on a widely investigated topic – the grammaticalization of free pronouns into bound markers of agreement – stressing the importance of a careful separation of function and form in studying this diachronic process.

In sum, the findings obtained in Chapters 2 and 3 demonstrate a robust relationship between the modifier/argument opposition and three types of typological parameters: locus of marking, the referentiality of possessive person marking, and the formal expression of possessive person marking. It is shown that, in comparison to arguments, modifiers are in greater need of (a) morphosyntactic marking of the dependency relation, (b) a more referential expression type and (c) a more formally independent expression type. Hence, this thesis shows that, both within and across individual languages, more functional and formal substance is used in the expression of modifiers than in the expression of arguments. As such, it provides strong support for the typological relevance of the semantic opposition between modifiers and arguments in the expression of possessive NPs, both in terms of function and in terms of form.

Chapter 4 considers the typological relevance of the modifier/argument opposition beyond the domain of the NP. In this chapter, I investigate yet

another typological parameter: identity of morphosyntactic coding, or, as it is referred to in this study, *alignment*, in correspondence to its use for argument coding in verbal main clauses. Specifically, I investigate the degree to which languages use the same morphosyntactic forms to mark three types of dependency relations: modifiers in phrases (head-modifier relations in possessive NPs), arguments in phrases (head-argument relations in possessive NPs, adpositional phrases) and arguments in clauses (the core arguments of one- and two-participant verbs in main clauses). The possible range of variation in alignment patterns is captured by the six-way typology in Table 3 below.

Table 3: Typology of alignment types

	1	2	1&2	3	4	5
<b>Modifier in phrase</b>	A	A	A	A	A	A
<b>Argument in phrase</b>		B			B	B
<b>Argument in clause</b>	B		B		C	A

The prediction tested in this study is that patterns of type 5 are cross-linguistically rare; in such a pattern, modifiers in phrases receive the same morphosyntactic coding as arguments in clauses, while arguments in phrases are coded differently. This prediction is fully borne out by the data, yielding the following cross-linguistic tendency: if modifiers in phrases are coded in the same way as arguments in phrases, arguments in clauses receive this morphosyntactic coding as well. This tendency shows that alignment is constrained by the opposition between modifiers and arguments, as well as by the phrasal vs. clausal nature of the dependency relation. As such, it demonstrates the typological importance of alignment as a phenomenon that pertains not only to clauses but to phrases as well.

The cross-linguistic relevance of the phrasal vs. clausal nature of dependency relations also surfaces in a second generalization obtained in this study: if arguments in possessive phrases are expressed in the same way as arguments in main clauses, arguments in adpositional phrases receive the same morphosyntactic treatment. This finding can be attributed to the shared phrasal nature of possessive NPs and adpositional phrases, on the one hand, and to the diachronic link between adpositional phrases and both possessive NPs and verbal main clauses, on the other.

Finally, Chapter 4 addresses the topic of alignment splits, known from work on clausal alignment typology, by taking into account alignment splits governed by referential properties of dependents, such as humanness, person

and anaphoricity. Moreover, it highlights the important role that referential properties play in the coding of (possessive and adpositional) phrases – a phenomenon that has received relatively little attention in the literature so far.

This section concludes the discussion of the main findings obtained in this thesis; in the next, and final, subsection I will suggest directions that future research may take.

## 5.2 Outlook

The results of this thesis may be expanded on in future research in a number of different ways, discussed in turn below.

First, future research may add to the findings obtained in this thesis by including more languages. This may prove especially fruitful for the generalizations on the referentiality of possessive person marking (Chapter 3) and the identity of morphosyntactic marking across different dependency relations (Chapter 4). These parameters were investigated from a novel perspective for the first time in the present work.

A second topic for future research is to determine to what extent the modifier/argument distinction works together with other factors in accounting for alienability splits in individual languages. As is well known, and also pointed out in this thesis, semantically relational nouns need not also be formally relational (i.e. marked as inalienable) in individual languages. As a consequence, it is likely that other factors, in addition to the modifier/argument opposition, play a role in alienability splits, and consequently in the findings obtained in Chapters 2 and 3. It is quite common, for instance, for only a subset of kinship terms and/or body part terms to receive inalienable possessive coding in a given language. Moreover, it has been proposed that alienability is not a property of nouns, but of possessive constructions, since many languages show some degree of flexibility in that they can use both the alienable and the inalienable construction for the same (set of) nouns. The choice of one or the other construction is often attributed to the degree of control that the possessor has over the possessum (cf. Lichtenberk 1983; Seiler 1983a: 22; Wilson 1982: 123–130). Other factors invoked to explain alienability splits are differences in the frequency with which certain nouns are used in possessive constructions (cf. Nichols 1988, 1992; Haspelmath 2008a, 2008b) or differences in the items perceived as more important for the speaker or the hearer (the ‘personal domain’ in Bally’s 1996: 33 terminology). Language-specific, culturally-determined factors may also play a role (cf. Chappell & McGregor 1996). This has been

noted, for instance, by Crowley (1996: 385) for Paamese (Austronesian, Vanuatu):

*Body parts which would be life-threatening (or at least unbearably painful) if removed (under non-medical conditions) are possessed inalienably (...), as well as a variety of body products that are exuded as part of normal rather than transient bodily functions (even though these all eventually become separated from our bodies). Internal body parts are generally treated as inalienable when they are perceived to be central to our emotions and our sense of individuality and to the maintenance of life itself. However, when an internal organ is one that is typically removed separately when butchering or cooking an animal for eating, it is considered to be alienable.*

This semantic generalization accounts for subtle contrasts such as *vulingasi-n* ‘his/her nose’ (inalienable body part) versus *heipus one-n* ‘his/her wart’ (alienable body part) and *ahā-n* ‘his/her brain’ (inalienable internal organ) versus *heias one-n* ‘his/her kidney’ (alienable internal organ) (Crowley 1996: 392, 396, 398). It would be interesting to determine how, and to what extent, different factors shape the category of (in)alienability in individual languages, and consequently the role that such factors play in cross-linguistic tendencies of (in)alienable coding in terms of locus and referentiality. Fortunately, there is a growing number of studies investigating the distribution of (in)alienable constructions in individual languages, and the relevant factors behind the use of such constructions, putting this topic high on the research agenda (e.g. Chappell & McGregor 1996; Aikhenvald & Dixon 2013; Von Prince 2016).

Importantly, languages may also differentiate formally between modifiers and arguments in possessive NPs without an alienability split. Partee & Borschev (2003: 188-189), for instance, argue that in Russian (Indo-European, Russia) the distinction is made via word order: while postnominal possessors can only be interpreted as arguments (e.g. ‘the murderer of Petja’), prenominal possessors can only be interpreted as modifiers (e.g. ‘the murderer that Petja hired’). Moreover, prenominal possessors, i.e. modifiers, agree in gender and number with the possessum, while postnominal possessors, i.e. arguments, do not. Similarly, some languages only allow relational nouns to receive a non-relational reading, i.e. to take a modifier, when accompanied by a specialized marker – a process sometimes referred to as ‘derelationalization’ (cf. Lehmann 2002: 123-124). Yet other languages require non-relational nouns to be formally ‘relationalized’ in order to take their possessor as an argument (see Von Prince

2016 on Daakaka (Austronesian, Vanuatu)). As with alienability splits, which items are formally treated as modifiers and arguments varies cross-linguistically, and they may deviate to a greater or lesser extent from semantic relationality. Further study on the modifier/argument distinction in individual languages without an alienability split is an interesting future enterprise.

A third topic for future research is to determine locus of marking and referentiality of person marking in other grammatical domains than the possessive NP, e.g. in adpositional phrases, and one- and two-participant verbal main clauses, and to compare it with locus of marking and referentiality of person marking in possessive NPs. As demonstrated by Nichols (1992: 76-77, see also Cysouw 2002), there is a general tendency for languages to be consistently head-marking or consistently dependent-marking. Moreover, she finds that while clauses favor head-marking, NPs (including nouns modified by adjectives) favor dependent-marking. These correlations yield the following implicational universal: if in a language NPs are head-marked, clauses are head-marked as well – a finding replicated by Siewierska (2004: 127-128), who shows that person marking on possessed nouns implies person marking on verbal predicates (and that person marking on adpositions implies person marking on both possessed nouns and verbal predicates). It would be interesting to see how these findings relate to the locus of marking typology introduced in Chapter 2, in which person forms are given a novel analysis in terms of referentiality, and consequently, in terms of locus of marking. In order to do so, we would need to determine how the typology of referential/agreement marking can be applied to other dependency relations than the possessive NP, especially to clauses. Here lies a potential challenge, which can be illustrated by Lango (Eastern Sudanic, Uganda). As shown in Chapter 4, Lango employs a nominative index-set and an accusative index-set that is additionally used on postpositions and possessed nouns. On the one hand, it can be argued that the accusative index-set expresses role information, since it marks a specific set of verbal arguments (Ps) and as such contrasts with the nominative index-set (for Ss and As). This is the approach adopted by Hengeveld (2012). However, following the criterion used for possessive person markers in Chapters 2 and 3, the accusative index-set does not express role information, since it is also used outside the clausal domain. Thus, in order to further investigate the relationship between traditional locus of marking typology and the locus of marking typology applied in this thesis, we first need to determine what it means for a verbal person form to express role information. In doing so, we may also take into account other criteria of referential potential. A suggestion made by Hengeveld (2012: 473) is to consider whether or not the person marker co-occurs with a pivotal argument

(nominative/absolute); he argues that if a marker is a contextual agreement marker, it is more likely to co-occur with a pivotal argument than with others, since it agrees with a contextually given and activated argument. Future research may further explore these and other diagnostics of referential potential. Ideally, such research would also take into account other types of information, such as number and gender information, which was excluded from consideration in this thesis.

It is also worth investigating to what extent the typology of referential/agreement marking applied in this thesis correlates with other domains of morphosyntactic coding. For instance, the distinction between referential markers and agreement markers, as made by Hengeveld (2012) on the basis of a number of case studies, correlates with the order of person forms relative to tense/aspect/mood markers on the verbal stem: referential markers occur closer to the verb stem, since they express arguments directly, while agreement markers take more peripheral positions, since they are the result of a late copying mechanism. This finding could be substantiated by research on a balanced sample of languages. Further research could also investigate whether the same correlation applies to other grammatical domains, such as possessive NPs; perhaps referential potential also correlates with the order of possessive person forms relative to other markers on the possessum noun, such as invariant possessive markers, gender/noun class markers, number markers and bound determiners.

Finally, future research could further explore alignment as a typological parameter that applies across phrases and clauses, by including additional constituent types, such as different types of nominal modifiers, and action nominal constructions, which are semantically and formally 'in between' possessive NPs and verbal main clauses. Such research could also shed more light on the relevance of referential properties for coding in different types of phrases and the extent to which it correlates with referential conditions on argument coding in main clauses. Thus, we may arrive at a clearer picture of how referential properties affect the overall alignment of phrases and clauses in the world's languages.



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## Summary in English

### The expression of modifiers and arguments in the noun phrase and beyond: A typological study

Lexical items that occur in a phrase or clause enter into dependency relations. In these relations, the lexical item that is the head governs, or subcategorizes for, the dependent and determines the syntactic category and distribution of the entire constituent. In keeping with observations made within the framework of Functional Discourse Grammar (henceforth FDG; Hengeveld & Mackenzie 2008), this thesis argues that dependency relations come in two semantic types: head-modifier relations and head-argument relations. While arguments are inherent to the meaning of the head, modifiers merely supplement the head with additional information. Although the opposition between modifiers and arguments is widely acknowledged as applying to verbal heads and their dependents, it also applies to nominal heads (see e.g. Hengeveld & Mackenzie 2008: 305–307). Examples of head-argument relations are those between a verbal predicate and its core argument(s), an adposition and its argument, and those between a relational noun (typically a kinship term or body part term) and its possessor. Examples of head-modifier relations are those between a noun and an attributive adjective, a verb and a (manner/degree) adverb, and those between a non-relational noun (typically one denoting a concrete, inanimate object, such as ‘pen’ or ‘pot’) and its possessor.

This thesis investigates the extent to which the semantic opposition between modifiers and arguments constrains the cross-linguistic expression of different dependency relations. First, I focus on possessive NPs (i.e. the semantic opposition between relational and non-relational nouns), and then I go on to consider adpositional phrases and verbal main clauses as well. For possessive NPs, I study three dimensions of expression: (i) the location (or *locus*) of possessive marking (in Chapter 2), (ii) the degree of referentiality of possessive person marking, and (iii) the degree of formal independence of possessive person marking (both in Chapter 3). The fourth dimension studied (in Chapter 4) is (iv) the degree of identical coding of possessive NPs, adpositional phrases, and one- and two-participant verbal main clauses.

In Chapter 2, I focus on languages that make a formal distinction between modifiers and arguments in possessive NPs – this is traditionally referred to as a distinction between *alienable* and *inalienable possession*. The data indicate that languages with this distinction prefer to mark the modifier in head-modifier

relations (“alienable possession”) and to mark the head in head-argument relations (“inalienable possession”). These preferences yield two cross-linguistic generalizations concerning locus of marking: if a language marks the head in head-modifier relations, it also marks the head in head-argument relations, and if a language marks the argument, it also marks the modifier. Both findings can be explained by the fact that the semantic relation between a head and a modifier is not inherent to the meaning of the head. As a result, these relations call more strongly for morphosyntactic marking than head-argument relations.

In this second chapter, I apply a novel analysis of possessive person markers in terms of locus, distinguishing referential markers from agreement markers on the basis of the distribution of (possessor) role information between the person marker and the possessor NP. Not only does this distinction yield a theoretical refinement of traditional locus of marking typology, it also reveals another cross-linguistic tendency: if, in a language, head-argument relations are expressed by referential markers, head-modifier relations are expressed by referential markers as well. This tendency captures the fact that, cross-linguistically, modifiers are inherently more likely to receive a referential expression than arguments – a finding that can also be attributed to the functional markedness of modifiers as optional enrichments of the head.

The referential potential of possessive person markers is investigated further in Chapter 3. Here, I study two dimensions of expression: the degree of referentiality and the degree of formal independence of possessive person forms, focusing again on languages with an adnominal alienability distinction. In contrast to much earlier work, referential potential (function) and morpho-phonological expression type (form) are studied as two independent typological parameters. The data show that, in individual languages, person marking in head-modifier relations is never less referential and never less formally independent than person marking in head-argument relations. Hence, cross-linguistically, the expression of possessive modifiers tends to be more referential and more formally independent than the expression of possessive arguments. This finding can again be attributed to the functional markedness of modifiers as compared to arguments, as a result of which modifiers are in need of more expressive means of coding than arguments. It furthermore supports the widely held assumption that inalienable possessive marking shows a higher degree of grammaticalization than alienable possessive marking, but for function and form independently.

In Chapter 3, I also show that the relationship between referential potential (function) and morpho-phonological expression type (form) is relative, rather than absolute. It is shown that markers of a high degree of referentiality



need not also have a high degree of formal independence, and, conversely, that markers of a low degree of referentiality need not also have a low degree of formal independence. Rather, in individual languages, higher referential markers are never less formally independent than lower referential markers. From a diachronic perspective, this finding suggests that functional and formal changes proceed in the same direction, but need not proceed at the same pace. This is a much more specific relationship between function and form than is often presumed in the literature.

Finally, in Chapter 4, I show that there is a robust relationship between the opposition between modifiers and arguments and the degree to which languages use the same morphosyntactic forms to mark the dependency relation in possessive NPs, adpositional phrases and verbal main clauses. The extent to which these dependency relations receive the same means of coding is often sensitive to properties of the head, such as the type of possessed noun or adposition, or referential properties of the modifier or argument, such as person, humanness and (pro)nominality. In this study, I therefore take such conditions on patterns of identical coding into account. The dependency relations studied form three logical classes: modifiers in phrases (possessors of non-relational nouns), arguments in phrases (possessors of relational nouns, arguments of adpositions), and arguments in clauses (the core arguments of one- and two-participant verbal predicates). The data reveal that if, in a language, modifiers in phrases receive the same coding – e.g. the same person marker or case form – as one or more arguments in clauses, arguments in phrases receive this coding strategy as well. This finding shows that both the semantic type of dependency relation (head-modifier vs. head-argument) and the syntactic category of the constituent (phrase vs. clause) constrain the degree of identical coding of the different dependency relations studied.

Another, more specific finding of this study is that if, in a language, possessors of relational nouns receive the same coding as one or more arguments in clauses, then arguments in adpositional phrases receive this coding strategy as well. This result can be explained by the phrasal nature of possessive NPs and adpositional phrases, on the one hand, and by the diachronic link between adpositional phrases and both possessive NPs and verbal main clauses, on the other.

In sum, the findings obtained in this thesis demonstrate that the cross-linguistic expression of dependency relations is highly sensitive to the semantic opposition between modifiers and arguments, in the possessive NP and beyond.



## Samenvatting in het Nederlands

### De uitdrukking van modificeerders en argumenten in de nominale constituent en daarbuiten: Een typologische studie

Lexicale elementen in een constituent of zin vormen afhankelijkheidsrelaties. Deze relaties bestaan uit een hoofd en een afhankelijk element; het hoofd is het element dat de syntactische categorie en distributie van de gehele constituent bepaalt. In navolging van de taalkundige theorie Functional Discourse Grammar (voortaan FDG; Hengeveld & Mackenzie 2008) veronderstelt deze studie dat deze afhankelijkheidsrelaties in te delen zijn in twee semantische typen: hoofd-modificeerdersrelaties en hoofd-argumentsrelaties. Argumenten zijn inherent aan de betekenis van het hoofd, terwijl modificeerders slechts optionele informatie toevoegen aan de betekenis van het hoofd. Hoewel het onderscheid tussen modificeerders en argumenten van werkwoordelijke hoofden breed gedragen wordt, is dit onderscheid ook van toepassing op naamwoordelijke hoofden (zie, bijvoorbeeld, Hengeveld & Mackenzie 2008: 305–307). Voorbeelden van hoofd-argumentsrelaties zijn die tussen een verbaal predicaat en zijn argument(en), een adpositie en zijn argument, en die tussen een relationeel naamwoord (typisch een verwantschapsterm of een naamwoord dat een lichaamsdeel aanduidt) en zijn bezitter. Voorbeelden van hoofd-modificeerdersrelaties zijn die tussen een naamwoord en een bijvoeglijk naamwoord, een werkwoord en een bijwoord van wijze of graad, en die tussen een niet-relationeel naamwoord (typisch naamwoorden die concrete, niet-levende objecten aanduiden, zoals ‘pen’ of ‘pot’) en zijn bezitter.

In deze studie onderzoek ik de mate waarin het semantische onderscheid tussen modificeerders en argumenten de cross-linguïstische uitdrukking van verschillende afhankelijkheidsrelaties bepaalt. Ik richt me in de eerste plaats op possessieve nominale constituenten (voortaan NCs) – dat wil zeggen, het semantische onderscheid tussen relationele en niet-relationele naamwoorden. Daarnaast richt ik me ook op adpositionele constituenten en werkwoordelijke hoofdzinnen. Met betrekking tot possessieve NCs bestudeer ik drie aspecten van uitdrukking: (i) de plaats (of *locus*) van possessieve markering (in Hoofdstuk 2), (ii) de mate van referentialiteit van persoonsmarkering, en (iii) de vormelijke onafhankelijkheid van persoonsmarkering (beide in Hoofdstuk 3). Het vierde aspect dat bestudeerd wordt (in Hoofdstuk 4) is (iv) de mate van identieke codering van possessieve NCs, adpositionele constituenten en één- en tweeplaatsige werkwoorden in hoofdzinnen.

In Hoofdstuk 2 richt ik me op talen die een vormelijk onderscheid maken tussen modificeerders en argumenten in possessieve NCs – dit wordt traditioneel aangeduid als een onderscheid tussen *vervreemdbaar* en *onvervreemdbaar* bezit. Uit de data blijkt dat talen met dit onderscheid typisch de modificeerder markeren in hoofd-modificeersrelaties (“vervreemdbaar bezit”) en typisch het hoofd markeren in hoofd-argumentsrelaties (“onvervreemdbaar bezit”). Deze bevindingen geven aanleiding tot twee cross-linguïstische generalisaties: als een taal het hoofd markeert in hoofd-modificeerdersrelaties, dan markeert het ook het hoofd in hoofd-argumentsrelaties, en als een taal het argument markeert, markeert het ook de modificeerder. Beide generalisaties kunnen worden toegeschreven aan het feit dat de semantische relatie tussen een hoofd en een modificeerder niet inherent is aan de betekenis van het hoofd. Het gevolg is dat deze relaties een grotere behoefte hebben aan morfosyntactische markering dan hoofd-argumentsrelaties.

In dit tweede hoofdstuk hanteer ik daarnaast een nieuwe analyse van persoonmarkeerders in termen van locus, waarin ik een onderscheid maak tussen referentiële markeerders en congruentiemarkeerders op basis van de distributie van (possessieve) rolinformatie tussen de persoonsmarkeerder en de bezitter. Dit onderscheid is niet alleen een theoretische verfijning ten opzichte van de traditionele typologie van locus van markering, het brengt ook een andere cross-linguïstische tendens aan het licht: als, in een taal, hoofd-argumentsrelaties uitgedrukt worden door referentiële markeerders worden hoofd-modificeerdersrelaties ook uitgedrukt door referentiële markeerders. Deze bevinding geeft aan dat, cross-linguïstisch, modificeerders vaker een referentiële uitdrukking krijgen dan argumenten, hetgeen ook kan worden toegeschreven aan de functionele gemarkeerdheid van modificeerders als optionele toevoegingen van het hoofd.

De referentialiteit van possessieve persoonsmarkeerders wordt verder onderzocht in Hoofdstuk 3. In dit hoofdstuk bestudeer ik twee aspecten van uitdrukking: de mate van referentialiteit en de mate van vormelijke onafhankelijkheid van persoonsmarkeerders, waarbij ik me wederom richt op talen met een onderscheid tussen *vervreemdbaar* en *onvervreemdbaar* bezit. In tegenstelling tot veel eerder werk, worden referentialiteit (functie) en morfofonologisch uitdrukkingstype (vorm) bestudeerd als twee onafhankelijke typologische parameters. De data laat zien dat, in individuele talen, persoonsmarkering in hoofd-modificeerdersrelaties nooit minder referentieel en nooit minder vormelijk onafhankelijk is dan persoonsmarkering in hoofd-argumentsrelaties. Cross-linguïstisch krijgen possessieve modificeerders dus een meer referentiële en een meer vormelijk onafhankelijke uitdrukking dan

possessieve argumenten. Deze bevinding kan wederom worden toegeschreven aan de functionele gemarkeerdheid van modificeerders, met als gevolg dat zij meer expressieve markering vereisen dan argumenten. Daarnaast ondersteunt deze bevinding de breed gedragen aanname dat de markering van onvervreemdbaar bezit een hogere mate van grammaticalizatie laat zien dan de markering van vervreemdbaar bezit, maar voor vorm en functie afzonderlijk.

In Hoofdstuk 3 laat ik daarnaast zien dat de relatie tussen referentialiteit (functie) en morfo-fonologisch uitdrukkingstype (vorm) niet absoluut is, maar relatief. Uit de data blijkt dat markeerders met een hoge mate van referentialiteit niet ook een hoge mate van vormelijke onafhankelijkheid hoeven te laten zien, en dat markeerders met een lage mate van referentialiteit niet ook een lage mate van vormelijke onafhankelijkheid hoeven te laten zien. In individuele talen hebben meer referentiële markeerders echter nooit een lagere mate van vormelijke onafhankelijkheid dan minder referentiële markeerders. Vanuit diachroon perspectief suggereert deze bevinding dat vorm en functie zich ontwikkelen in dezelfde richting, maar niet op dezelfde snelheid. Dit duidt op een veel specifiekere relatie tussen vorm en functie dan vaak wordt aangenomen in de literatuur.

Tot slot laat ik in Hoofdstuk 4 zien dat er een robuuste relatie bestaat tussen het onderscheid in modificeerders en argumenten en de mate waarin talen dezelfde morfosyntactische vorm gebruiken om de afhankelijkheidsrelatie te markeren in possessieve NCs, adpositionele constituenten en werkwoordelijke hoofdzinnen. De mate waarin deze constituenten en zinnen dezelfde markering ontvangen, hangt vaak af van eigenschappen van het hoofd, zoals het type naamwoord of adpositie, of referentiële eigenschappen van de modificeerder of het argument, zoals persoon, menselijkheid en (pro)nominaliteit. In deze studie neem ik daarom deze condities op identieke codering mee. De afhankelijkheidsrelaties die bestudeerd worden, vormen drie logische groepen: modificeerders in constituenten (bezitters van niet-relatieve naamwoorden), argumenten in constituenten (bezitters van relationele naamwoorden, adpositionele constituenten) en argumenten in hoofdzinnen (de argumenten van één- en tweelaatsige werkwoordelijke predicaten). De data laat zien dat als in een taal modificeerders in constituenten dezelfde markering ontvangen – bijvoorbeeld dezelfde persoonsmarkeerder of casus – als een of meer argumenten in zinnen, argumenten in constituenten deze markering ook ontvangen. Deze bevinding laat zien dat zowel het semantische type relatie (hoofd-modificeerder vs. hoofd-argument) als de syntactische categorie van de relatie (constituent vs. zin) de mate van identieke markering van afhankelijkheidsrelaties bepaalt.

Een andere, specifiekere bevinding is dat als in een taal bezitters van niet-relatieve naamwoorden dezelfde markering ontvangen als een of meer argumenten in zinnen, argumenten in adpositionele constituenten deze markering ook ontvangen. Dit resultaat kan enerzijds worden toegeschreven aan de gedeelde syntactische categorie (constituent) van possessieve NCs en adpositionele constituenten, en anderzijds aan de historische connectie tussen adpositionele constituenten en zowel possessieve NCs als werkwoordelijke hoofdzinnen.

Samengevat laten de bevindingen van deze studie zien dat de cross-linguïstische uitdrukking van afhankelijkheidsrelaties in grote mate bepaald wordt door het semantische onderscheid tussen modificeerders en argumenten, niet alleen in possessieve NCs, maar ook daarbuiten.