Resolution agreement in German and Dutch: Implications for person feature decomposition*

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Accepted for *The Journal of Comparative Germanic Linguistics*

January 2024

Abstract

DP-conjunctions with a mismatch in person features call for additional resolution rules to determine the values the agreement target has to copy. Across languages, resolution for person features typically follows a hierarchy of the form 1 $\succ$ 2 $\succ$ 3 (Zwicky 1977) – with some well-known exceptions, namely German and Dutch coordinations conjoining 2nd and 3rd person which allow for both agreement options (Findreng 1976, Timmermans et al. 2004, Corbett 2006). This paper takes a closer look at resolution agreement in German, Dutch, Norwegian, Swedish, and Icelandic. The German(ic) anomaly provides evidence for the presence of an underlying binary feature system and the need for set union as a resolution mechanism. The pattern is derived within the framework of Distributed Morphology where vocabulary insertion happens late and is thereby sensitive to decomposed and unified feature sets. Crucial for the account is an independently motivated impoverishment rule that tracks the absence of 1st person inclusive exponents in Germanic.

1 Introduction

Whenever noun phrases with different ϕ-feature sets conjoin, the agreement system is faced with a dilemma since the agreeing verb has to pick one of the person/number/gender combinations each conjunct contributes. Often the ϕ-feature values are somehow resolved, following a set of resolution rules. The resolution of person features typically follows a person hierarchy of the form 1 $\succ$ 2 $\succ$ 3 (Zwicky 1977). Conjoining arguments with different person features will lead to agreement with the argument which contributes the highest person feature specification. We illustrate the resolution pattern with Spanish in (1). If a coordination mismatch contains a 3rd person conjunct,

*I would like to thank Jonathan Bobaljik, Daniel Harbour, Fabian Heck, Anke Himmelreich, Andrew Murphy, Ad Neeleman, Sandhya Sundaresan, Philipp Weisser, the audiences at *CGSW 32* in Trondheim and *NELS 48* in Iceland, and three anonymous reviewers at *JCGL* for helpful feedback. This research was developed within the graduate program *Interaction of Grammatical Building Blocks* (IGRA), funded by the Deutsche Forschungsgemeinschaft (DFG).

agreement will be resolved in favor of the participant conjunct, which is 1st person in (1a) and 2nd person in (1b). If two participant pronouns are coordinated (1c), agreement targets the highest participant pronoun, i.e. 1st person.

(1) *Spanish* (Dalrymple and Kaplan 2000: 778,784-785)

a. José y yo habl-amos. **3+1 ⇝1**
Jose and I speak-1PL
'José and I are speaking.'

b. José y tu habl-áis. **3+2 ⇝2**
Jose and you speak-2PL
'José and you are speaking.'

c. Yo y tu habl-amos. **1+2 ⇝1**
I and you speak-1PL
'You and I are speaking.'

Some languages draw a morphological distinction between 1st person inclusive and 1st person exclusive forms. A 1st person inclusive form includes the addressee in the group of referents, whereas a 1st exclusive form excludes the addressee. Interestingly, such languages reflect the clusivity distinction in person mismatch combination, shown with the paradigm from Fula in (2). A 1st person conjoining with 2nd person results in 1st person inclusive agreement, whereas 1st and 3rd conjunctions show agreement with the 1st person exclusive form.

(2) *Fula (Niger-Kongo)* (Dalrymple and Kaplan 2000: 782)

a. Bill e min kö Afriki mèn-djodi. **3+1 ⇝1excl**
Bill and I in Afrika 1PL.EXCL-live
'Bill and I, we live in Africa.'

b. An e Bill kö Afriki djodu-don. **3+2 ⇝2**
you and Bill in Afrika live-2PL
'You and Bill, you live in Africa.'

c. An e min kö Afriki djodu-dén. **1+2 ⇝1incl**
you and I in Afrika live-1PL.INCL
'You and I, we live in Afrika.'

The fact that a 1st person inclusive form is used exactly in such mismatched combinations which involve speaker and addressee signals that whatever principles guide the resolution rules is not random and presumably tied to a semantically driven system of person features and a unification of person features under conjunction. At the same time, the morpho-syntax allows for resolution of features even though there is no dedicated form that expresses the union of the person features involved, essentially in all combinations above except (2c). Based on the data in (1) and (2), Dalrymple and Kaplan (2000) conclude that the feature sets in conjunctions are unified and 3rd person features are radically underspecified (Benveniste 1971). This explains why a

conjunction including a 3rd person conjunct never triggers 3rd person agreement since 3rd person never contributes a morpho-syntactic feature to begin with. In this sense, resolution agreement provides a window into the decomposition of person feature systems revealing important insights into the privative vs. binary discussion of person features. Another topic where this discussion has been prominently picked up is the Person Case Constraint. For example, the derivation of the strong PCC crucially relies on the absence of person features on 3rd person objects in Béjar and Rezac's (2003) and Anagnostopoulou's (2003, 2005) work, whereas Nevins (2007) prominently argues against this view and argues for a binary person feature system to derive all variants of the PCC.

We will continue the discussion in Dalrymple and Kaplan (2000) but crucially focus on exceptions to the conjunction patterns above, that is cases where the application of resolution appears to fail. In German, verbal agreement with conjoined subjects does not act in accordance with the person hierarchy. Specifically, the conjunction of a 2nd and 3rd person conjunct allows for both 2PL and 3PL agreement (Findreng 1976). An example is given in (3) where (3b) shows that both the 2nd person form *seid* and the syncretic 1st/3rd person form *sind* is a possibility. Note that resolution agreement in general must be an option in German since all agreement forms in (3) reveal a resolved plural feature. Timmermans et al. (2004) conducted two language production experiments confirming the pattern in (3). Additionally, they found a similar optionality in Dutch for the choice of reflexive pronouns when co-referring with conjunctions of the type in (3).

(3) *German*[1]

a. Ich und mein Freund sind eingeladen. **1+3 ⇝1**
I and my friend are.1PL invited
'I and my friend are invited.'

b. Du und dein Freund seid/sind eingeladen. **2+3 ⇝2,3**
you and your friend are.2PL/are.3PL invited
'You and your friend are invited.'

c. Ich und du sind eingeladen. **1+2 ⇝1**
I and you are.1PL invited
'I and you are invited.'

The fact that languages like German and Dutch seem to block resolution agreement with 2+3 conjunctions questions the assumption that 3rd person does not contribute a person feature. The presence of the 3rd person conjunct in (3b) provides the option of 3rd person agreement, in addition to 2nd person agreement. If 3rd person were encoded as a lack of person features, we would not expect such an interaction. The 2+3

[1]If not otherwise indicated, all data come from my own fieldwork. Special thanks go to the following speakers for their valuable input: Albin Adolfsson, Irene Amato, Katja Barnickel, Mike Berger, Fenna Bergsma, Pètur Björnsson, Paula Fenger, Siri Gjersøe, Gísli Rúnar Harðarson, Herman Haverkort, Johannes Hein, Savio Megolhuto Meyase, Gurujegan Murugesan, Cora Pots, Jelena Stojković, and Joanna Zaleska.

conjunctions furthermore showcase the need for set union of features within conjunctions, as the agreement options only become available if both conjuncts contribute their person values to the coordinator. The German(ic) pattern also questions the existence of external, universally specified resolution rules (Corbett 1983a,b, 2006, van Koppen 2005, Fuß 2014). Given that resolution agreement does not seem to be an option only in some contexts in German and Dutch poses a problem since it suggests that resolution rules ought to be made language-specific.
In this paper, we will explore an alternative view based on underlying binary feature structures instead of external resolution rules. The analysis will be spelled out in the framework of Distributed Morphology (Halle and Marantz 1993, 1994) making reference to decomposed person features, which will be unified and targeted by an impoverishment rule (Bonet 1991, Halle and Marantz 1993, 1994) that tracks clusivity. In section 2, we provide an overview of the Germanic data set focusing on German and Dutch where resolution agreement is blocked in some configurations, contrasted with data from Norwegian, Swedish, and Icelandic where resolution always takes place. Section 3 discusses different set theoretic operations that have been proposed for conjunction. Furthermore, it will be explored in how far existing features systems are capable of deriving resolution to the highest person for mismatched conjunctions. The fact that some languages show a divergent resolution paradigm suggests that person feature systems in principle must be binary since privative systems undergenerate. A case in point are languages like German and Dutch which require the subfeature [−HEARER] on independent grounds, in order to capture 1/3 syncretisms (Frampton 2002). In section 4, we put forward the analysis for the Germanic resolution patterns, i.e. the Scandinavian agreement data that follow a strict hierarchy, and the German and Dutch agreement data which diverge from the hierarchy. Section 5 concludes.

2 The German(ic) anomaly

As was shown in the previous section, German subject-verb agreement does not act in accordance with the person hierarchy when it comes to resolution agreement. Concretely, 2+3 conjunctions allow for both 2PL and 3PL agreement (Findreng 1976, Corbett 1983a,b, 2006, Fuß 2014). None of the judgements change if the conjuncts switch places. We repeat paradigm (3) from the previous section in (4), where the conjuncts are swapped around.

(4) *German (preverbal order)*

a. Mein Freund und ich sind eingeladen. **3+1 ⇝1**
my friend and I are.1PL invited
'My friend and I are invited.'

b. Dein Freund und du seid/sind eingeladen. **3+2 ⇝2,3**
your friend and you are.2PL/are.3PL invited
'Your friend and you are invited.'

c. Du und ich sind eingeladen. **2+1 ⇝1**
you and I are.1PL invited
'You and I are invited.'

Nor do the judgements change if the conjunction is placed in post-verbal order, see (5). We conclude that the optionality in (3b/4b/5b) cannot be due to agreement taking place either with the highest conjunct or with the closest conjunct. If it were, 2PL agreement would not be an option in (5b) since the 2nd person conjunct is neither the highest nor the closest conjunct (cf. Marušič et al. 2015).

(5) *German (postverbal order)*

a. Zu der Party sind nur mein Freund und ich eingeladen.
to the party are.1PL only my friend and I invited
'Only my friend and I are invited to the party.' **3+1 ⇝1**

b. Zu der Party seid/sind nur dein Freund und du eingeladen.
to the party are.2PL/are.3PL only your friend and you invited
'Only your friend and you are invited to the party.' **3+2 ⇝2,3**

c. Zu der Party sind nur du und ich eingeladen.
to the party are.1PL only you and I invited
'Only you and I are invited to the party.' **2+1 ⇝1**

The optionality in the 2+3 pattern is not restricted to the suppletive verb *sein*, it carries over to lexical verbs, as is shown in (6)-(8), and modals (9). Furthermore, the pattern is not affected by tense (10).

(6) Du und dein Freund hab-t/hab-en für alles eine Erklärung.
you and your friend have-2PL/have-3PL for everything a explanation
'You and your friend have an explanation for everything.' **3+2 ⇝2,3**

(7) Du und dein Freund trag-t/trag-en zu viel Verantwortung.
you and your friend carry-2PL/carry-3PL too much responsibility
'You and your friend carry too much responsibilities.' **3+2 ⇝2,3**

(8) Du und dein Freund lauf-t/lauf-en wohl gern zur Arbeit.
you and your friend walk-2PL/walk-3PL WOHL gladly to work
'Looks like you and your friend like to walk to work.' **3+2 ⇝2,3**

(9) Du und dein Freund könn-t/könn-en sehr gut Gitarre spielen.
you and your friend can-2PL/can-3PL very well guitar play
'You and your friend can play the guitar very well.' **3+2 ⇝2,3**

(10) Du und dein Freund wusste-t/wusst-en alle Antworten.
you and your friend knew-2PL/knew-3PL all answers
'You and your friend knew all the answers.' **3+2 ⇝2,3**

Finally, a conjunction with all three persons involved resolves to the highest person, i.e., 1st person, see (11).

(11) Du, ich und mein Freund trag-en zu viel Verantwortung.
you I and my friend carry-3PL too much responsibility
'You, me, and my friend carry too much responsibility.' **3+2+1 ⇝1**

Interestingly, Timmermans et al. (2004) showed that the same optionality, or lack of resolution, also arises with Dutch reflexive verbs agreeing with 2+3 conjunctions. Note that verbal inflection in Dutch is syncretic for person features in the plural. Since plural agreement is required with resolution agreement, we have to consider reflexive verbs in order to investigate the resolution patterns. Reflexive verbs select for a reflexive pronoun which in turn is inflected for number and person. We will treat agreement for person on verbs and reflexive pronouns on par, following Rullmann (2004), Heim (2008), Kratzer (2009) who argue that binding configurations require syntactic agreement between the pronoun and the antecedent. Timmermans et al. (2004) conduct a production study confirming the resolution patterns for German reported above, and extending them to reflexive pronouns in Dutch. The results are reported in (12), shown with the reflexive verb *zich misdragen*. The percentages signal how often which reflexive pronoun was chosen by the speakers.[2] They asked 40 Dutch native speakers to complete the sentences with a reflexive construction starting with one of the conjunctions given in (12).

(12) *Dutch* (Timmermans et al. 2004: 915)

a. Jij en hij misdragen zich$_{61\%}$ / je$_{39\%}$ **2+3 ⇝2,3**
you and he misbehave 3PL.REFL / 2PL.REFL
'You and he misbehave.'

b. Hij en jij misdragen zich$_{50\%}$ / je$_{50\%}$ **3+2 ⇝2,3**
he and you misbehave 3PL.REFL / 2PL.REFL
'He and you misbehave.'

c. Jij en NP$_{sg}$ misdragen zich$_{60\%}$ / je$_{40\%}$ **2+3 ⇝2,3**
you and NP$_{sg}$ misbehave 3PL.REFL / 2PL.REFL
'You and NP$_{sg}$ misbehave.'

d. NP$_{sg}$ en jij misdragen zich$_{57\%}$ / je$_{43\%}$ **3+2 ⇝2,3**
NP$_{sg}$ and you misbehave 3PL.REFL / 2PL.REFL
'NP$_{sg}$ and you misbehave.'

[2]The percentage refers to the overall result, i.e., the combinations with *zich misdragen* 'to misbehave', *zich bedrinken* 'to fuddle oneself', *zich schamen* 'to feel ashamed', *zich vergessen* 'to make a mistake', and *zich verspreken* 'to make a slip of the tongue'.

As with the German data, the order of conjuncts does not influence the agreement choices. Nor does the type of noun phrase play a role. Overall, the 2PL and 3PL reflexives were chosen to an equal amount. Timmermans et al. (2004) make clear that the numbers do not necessarily reveal different grammars, as 27/40 participants show variability in their responses, whereas 13/40 participants gave homogeneous responses. Nevertheless, a reviewer makes us aware of a potential dialectal bias with respect to resolution agreement in Dutch. The study by Timmermans et al. (2004) does not provide information on the current residence of each participant. Our own investigations with the paradigm in (13) revealed a potential bias towards Southern Dutch varieties when it comes to the the lack of resolution. 2/4 Dutch speakers we consulted accepted both 2PL and 3PL in (13b), one speaking a Southern variety and the other classifying as in between Southern and Northern Dutch. The other two speakers followed a strict hierarchy, where one speaker classifies as Nothern Dutch and the other, again, in between Northern and Southern Dutch. Needless to say, this sample is extremely small, so that we refrain from drawing any concrete conclusions and leave this point to future work.

(13) *Dutch*

a. Ik en mijn vriend vervelen ons. **1+3 ⇝1**
I and my friend bore 1PL.REFL
'I and my friend are bored.'

b. Jij en je vriend vervelen je/zich. **2+3 ⇝2,3**
you and your friend bore 2PL.REFL/3PL.REFL
'You and your friend are bored.'

c. Jij en ik vervelen ons. **2+1 ⇝1**
you and I bore 1PL.REFL
'You and I are bored.'

Not all Germanic languages show lack of resumption in 2+3 conjunctions. In Icelandic, Norwegian, and Swedish, resolution is taking place with all person combinations. As for Icelandic, we can see this with verbal agreement, given that verbal inflection is sensitive to person distinctions. The paradigm in (14) shows that the combination of 1st and 2nd person as well as the combination of 1st and 3rd person results in 1PL agreement, whereas the combination of 2nd and 3rd person results in 2PL agreement.

(14) *Icelandic*

a. Ég og bróðir minn fór-um út. **1+3 ⇝1**
I and brother my go.PST-1PL out
'Me and my brother went out.'

b. þú og bróðir þinn fór-uð út. **2+3 ⇝2**
you and brother your go.PST-2PL out
'You and your brother went out.'

c. Ég og þú fór-um út. **1+2 ⇝1**
I and you go.PST-1PL out
'You and me went out.'

Like in Dutch, Norwegian and Swedish verbs do not inflect for person in the plural. So we turn to reflexive verbs again. The resolutions patterns in (15) and (16) are identical to the Icelandic one. Hence, both languages always show resolution to the highest person with mismatched conjunctions.

(15) *Norwegian*

a. Jeg og vennen min kjeder oss. **1+3 ⇝1**
I and friend my bore 1PL.REFL
'I and my friend are bored.'

b. Du og vennen din kjeder dere. **2+3 ⇝2**
you and friend your bore 2PL.REFL
'You and friend your are bored.'

c. Du og jeg kjeder oss. **2+1 ⇝1**
you and I bore 1PL.REFL
'You and I are bored.'

(16) *Swedish*

a. Jag och min vän skyndar oss. **1+3 ⇝1**
I and friend my hurry 1PL.REFL
'I and my friend hurry up.'

b. Du och din vän skyndar er. **2+3 ⇝2**
you and friend your hurry 2PL.REFL
'You and your friend hurry up.'

c. Jag och du skyndar oss. **1+2 ⇝1**
you and I hurry 1PL.REFL
'You and I hurry up.'

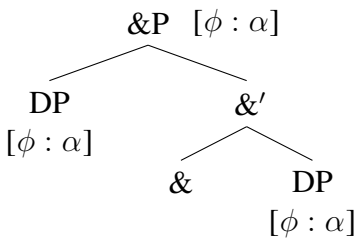
To sum up, German and Dutch display resolution patterns that diverge from the person hierarchy. Concretely, the 2+3 conjunctions seem to be resistant to resolution since both 2PL and 3PL agreement are an option. This is not a general trademark of Germanic languages since person mismatch conjunctions are strictly resolved in Icelandic, Norwegian, and Swedish. The next section will lay out in how far the German/Dutch pattern is problematic given existing accounts of resolution agreement and person feature systems.

3 Resolution patterns and their implications for person feature systems

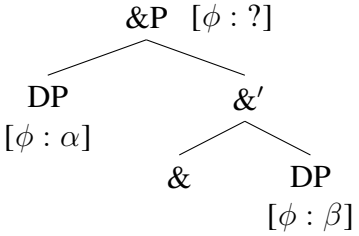
3.1 Resolution algorithms

Most accounts of resolution agreement operate under the assumption that the coordinator computes the ϕ-feature values of its conjuncts. If the conjuncts provide identical ϕ-values as schematized in (17a), no problem arises. If there is a mismatch in ϕ-features (17b), we need a resolution mechanism that predicts the value of the entire coordinate phrase, which will eventually enter Agree with a probe.

(17) a.



b.



One way to describe resolution patterns is to specify external, possibly universal, resolution rules, as this has been done by Corbett (1983a,b, 2006) for person, number, and gender features. Resolution rules have, however, also been made language specific, for example for Slovenian in terms of number (Marušič et al. 2015) and gender (Marušič and Shen 2021) resolution. The lack of resolution with 2+3 conjunctions in German and Dutch questions the universality of external rules also for person resolution, and indeed requires person resolution rules to be made language specific. Moreover, resolution rules must be able to take the number of conjuncts into account since 1+2+3 conjunctions resolve towards the highest person, as was shown in (11).
Alternative ways to predict the resolution patterns emerge by formalizing the resolved ϕ-feature value of the coordination via set-theoretic operations, either set union or set intersection. The latter results in an empty set with a mismatch of features (18b) and is often argued for with respect to gender resolution where mismatch coordination result in a default value which is not introduced by either of the conjuncts. Essentially, these are feature percolation accounts, as they act on the assumption that non-shared feature values cannot percolate up, resulting in empty intersections, which in turn trigger the insertion of a default value (Wechsler and Zlatić 2000, Franks and Willer-Gold 2014, Despić 2016).

(18) *Set intersection*

a. $\{\alpha\} \cap \{\alpha\} = \{\alpha\}$

b. $\{\alpha\} \cap \{\beta\} = \{\}$

The fact that person resolution for 2+3 conjunctions in German/Dutch allows for 2nd or 3rd person agreement provides a strong argument against an intersection approach. Even if we made the assumption that 3rd person plural agreement is default agreement for mismatched conjunctions, the option for 2nd plural agreement would still be left

unexplained. What the optionality rather indicates is that both person features must still be accessible in 2+3 conjunctions, as is predicted by a set union approach, see (19b).

(19) *Set union*

a. $\{\alpha\} \cup \{\alpha\} = \{\alpha\}$

b. $\{\alpha\} \cup \{\beta\} = \{\alpha, \beta\}$

Dalrymple and Kaplan (2000) propose that set union is the only ingredient to derive the strict person hierarchy in person mismatch combinations, which they argue follows by essentially increasing the cardinality of subfeatures with each person on the person hierarchy. The majority of set union approaches, however, argue for additional resolution rules which act on feature sets that have undergone set union (van Koppen and Rooryck 2008, Willer-Gold et al. 2016, Citko 2018, Al Khalaf 2022). Given the data in German and Dutch, we will adopt set union as the resolution mechanism to derive the patterns. In contrast to many other approaches though we will not postulate additional resolution rules. Rather, the patterns will fall out from set union and markedness considerations. The details will follow in section 4.

Before we enter the discussion of feature decomposition, let us briefly point out some further arguments in favor of set union. Another advantage of adopting a set union approach stems from the fact that the operation is already made use of in different parts of grammar. Set union arises as an epiphenomenon of a probe agreeing with more than one goal, if feature structures are considered to be flat (Adger 2010): If morpho-syntactic features are simply sets of attribute-value pairs, Agree merely alters the values of matching attributes by unification. Another area where set union has been made reference to is post-syntactic fusion (Müller 2006b, Assmann et al. 2014, Deal 2015). Deal (2015) coins the term 'smashing' for fusion as set union. Similar to Assmann et al. (2014), Deal uses the operation to unify ϕ-features that result from valuation between one probe and more than one goal. In Nez Perce, an agreement morpheme on the complementizer expones plural and 2nd person, even if the features originate on separate goals. Deal's agreement algorithm ensures that both feature sets are copied onto the probe. Crucially, vocabulary insertion can take place before or after feature sets are smashed/fused via set union. Müller (2006b) employs fusion to unify ϕ-features from separate probes originating on different heads that form a complex head after head movement. He argues that the person marking system in Sierra Popoluca can be explained by extending the domain of an impoverishment rule to span across v and T. Concretely, 3rd person is never marked if there is another 1st/2nd person argument. Under the assumption that each argument copies person features on v and T, respectively, and v moves T to form a complex head, fusion of the feature sets of v and T provides an extended application domain for an impoverishment rule that derives the person interactions.

Finally, it is also worth noting that the semantics of the coordinator provides strong motivation in favor of a set union approach to resolution agreement. Plurality-forming conjunctions have long been accepted to exist alongside standard sentence conjunction (Link 1983, Hoeksema 1983, Krifka 1990). Collective conjunctions triggering non-distributive readings, as shown in (20), are notoriously difficult to cover with a basic set intersection approach since e.g., the conjunction in (20) cannot denote the intersection

of the property of being Sue and the property of being Mary but rather the plurality formed by the two entities Sue and Mary. I take & in (17) to denote the sum operator $\oplus$, defined in (21a), where D_e, the domain of individuals, does not only contain individuals but also pluralities. Schwarzschild (1996) assumes individuals to denote singleton sets, while *and*$_\oplus$ triggers set union, see (21b).

(20) Sue and Mary met.

(21) a. $[\![\text{and}_\oplus]\!] = \oplus_{\langle e,ee\rangle} = \lambda x_e \lambda y_e . x \oplus y$

b. $[\![\text{Sue and Mary}]\!]$
$= [\![\text{and}_\oplus]\!]([\![\text{Sue}]\!])([\![\text{Mary}]\!])$
$= \{Sue\} \cup \{Mary\} = \{Sue, Mary\}$ *set union*

Taking conjunction to be non-boolean underlyingly, and thus non-intersective, is motivated by cross-linguistic observations concerning the mapping of semantic operators to morpho-syntactic complexity. Evidence comes from a number of languages where simplex conjunctions can produce non-distributive and distributive readings, whereas complex conjunctions restrict to distributive readings (Szabolcsi 2015). This seems to indicate that the coordinator itself is non-boolean and the extra morphology spells out a distributive operator (Flor et al. 2017, Schmitt 2020). A case in point is Hungarian, where the conjunction pattern *'A és B'* allows for both distributive and non-distributive readings, but the more complex conjunction pattern *'A is B is'* is restricted to the distributive reading, see (22).

(22) *Hungarian complex and simplex conjunctions* (Szabolcsi 2015)

a. Kati és Mari 100 kilót nyomott.
Kate CONJ Mary 100 kg weighed
'Kate and Mary weighed 100 kg.'
$\rightsquigarrow_{distributive}$ Kate weighed 100 kg and Mary weighed 100 kg
$\rightsquigarrow_{non\text{-}distributive}$ Kate and Mary weighed 100 kg together

b. Kati is Mari is 100 kilót nyomott.
Kate CONJ Mary CONJ 100 kg weighed
'Kate and Mary weighed 100 kg.'
$\rightsquigarrow_{distributive}$ Kate weighed 100 kg and Mary weighed 100 kg

Interestingly, singular as well as (resolved) plural agreement are agreement options for the simplex conjunction (23a), while singular agreement is the only option for complex conjunctions (23b).

(23) *Hungarian conjunctions and agreement*

a. Péter és János össze vesztek / veszett. (Kiss 2012)
Peter CONJ John PART quarelled.3PL / quarelled.3SG
'Peter and John quarelled.'

b. Kati is, Mari is aludt. (Szabolcsi 2018)
Kati CONJ Mari CONJ sleep.PST.3SG
'Kati as well as Mari slept.'

While we will not go further into the details of the analysis of number agreement, we note that there is arguably a connection between the semantics of the coordinator and the morpho-syntactic form as well as the agreement patterns available across languages.[3] Given the discussion in this section, we will assume set union as the underlying mechanism for person resolution in (mismatched) conjunctions.

3.2 Person feature systems

3.2.1 Person resolution beyond Germanic

Across languages, resolution patterns mostly adhere to the person hierarchy, that is the resolved value is always the highest person contributed by the conjuncts. This was shown for the Germanic languages Norwegian, Swedish, and Icelandic in section 2 as well as Spanish in section 1. With the following examples, we present a number of other languages fitting this category, shown with verbal agreement.

(24) *Czech* (Corbett 1983b: 176)

a. Bratr a já se učí-me hrát na klavír. **3+1 ⇝1**
brother and I learn-1PL to.play on piano
'Your brother and I are learning to play the piano.'

b. Tvůj otec a ty jste si podobni. **3+2 ⇝2**
your father and you are.2PL to.each.other similar
'Your father and you are similar.'

c. Já a ty zůstan-eme doma. **1+2 ⇝1**
I and you will.stay-1PL at-home
'You and I will stay home.'

(25) *French* (van Koppen and Rooryck 2008: 1-2)

a. Jean et moi part-ons. **3+1 ⇝1**
Jean and I leave-1PL
'Jean and I are leaving.'

b. Toi et lui part-ez. **3+2 ⇝2**
you and him leave-2PL
'Your and him are leaving.'

c. Toi et moi part-ons. **1+2 ⇝1**
you and I leave-1PL
'You and I are leaving.'

[3] Moreover, a direct interaction between interpretation and agreement can be observed with disjunctive coordination. In Croatian (Gračanin-Yuksek 2016) and Modern Greek (Kazana and Flouraki 2009), disjunctions trigger plural agreement with an inclusive reading and singular agreement with an exclusive reading. These observations suggest a fundamentally different set-up for each type of coordinator, which reflects its interpretation on the one hand and choice of agreement strategy on the other.

(26) *B(osnian)C(roatian)S(erbian)*

a. Moj otac i ja ćemo ostati kod kuće. **3+1 ⇝1**
my father and I will.1PL stay at home
'My father and I will stay at home.'

b. Tvoj otac i ti ćete ostati kod kuće. **3+2 ⇝2**
your father and you will.2PL stay at home
'Your father and you will stay at home.'

c. Ti i ja ćemo ostati kod kuće. **1+2 ⇝1**
you and I will.1PL stay at home
'You and I will stay at home.'

(27) *Italian*

a. Io e tua sorella siamo onest-i/e. **3+1 ⇝1**
I and your sister be.1PL honest-MASC/FEM
'Me and your sister are honest.'

b. Tu e tua sorella siete onest-i/e. **3+2 ⇝2**
you and your sister be.2PL honest-MASC/FEM
'You and your sister are honest.'

c. Io e tu siamo onest-i/e. **1+2 ⇝1**
I and you be.1PL honest-MASC/FEM
'You and I are honest.'

(28) *Polish*

a. Mój ojciec i ja zostanie-my w domu. **3+1 ⇝1**
my father and I will.stay-1PL at home
'My father and I will stay at home.'

b. Twój ojciec i ty zostanie-cie w domu. **3+2 ⇝2**
your father and you will.stay-2PL at home
'Your father and you will stay at home.'

c. Ja i ty zostanie-my w domu. **1+2 ⇝1**
you and I will.stay-1PL at home
'You and I will stay at home.'

Furthermore, languages which differentiate between inclusive and exclusive 1st person track this morphological distinction within resolution patterns. Dalrymple and Kaplan (2000) have shown this for verbal agreement in Fula, recall the data in (2) from section 1. We provide further examples along those lines with data from verbal agreement in Jingulu and possessor agreement in Tamil, Indonesian, and Tenyidie.

(29) *Jingulu (Australian)* (Pensalfini 1997: 209,242)

a. Ngarri-na baba ngaya dirdikirri-nginyu-ju wanu
1SG.GEN-MASC older.brother 1SG.NOM wait-1DL[EXCL]-do
kirda-rna.
father-DAT
'My older brother and I are waiting for Dad.' **3+1 ⇝1excl**

b. Nyamirni ngaya mankiyi-mindi-ju, marrinjku imbiyi-mindu-ju.
2SG.ERG 1SG.NOM sit-1DL[INCL]-do language talk-1DL[INCL]-do
'You and I are sitting, talking language.' **1+2 ⇝1incl**

(30) *Tamil (Dravidian)*

a. [Naan-um en-oːde kanavar-um]$_i$ engal-oːde$_i$ vitt-ai
1SG-CONJ 1SG-GEN husband-CONJ 1PL[EXCL]-GEN house-ACC
tolachit-om.
lost-1PL
'Me and my husband lost our house.' **3+1 ⇝1excl**

b. [Nii-um un-oːde kanavar-um]$_i$ ungal-oːde$_i$ vitt-ai
2SG-CONJ 2SG-GEN husband-CONJ 2PL-GEN house-ACC
tolachitii-ŋga.
lost-2PL
'You and your husband lost your house.' **3+2 ⇝2**

c. [Naan-um nii-um]$_i$ nam-oːde$_i$ vitt-ai tolachit-om.
1SG-CONJ 2SG-CONJ 1PL[INCL]-GEN house-ACC lost-1PL
'Me and you lost our house.' **1+2 ⇝1incl**

(31) *Indonesian (Austronesian)*

a. [Aku dan kamu]$_i$ makan makanan kita$_i$. **1+2 ⇝1incl**
1SG and 2SG eat food POSS.1PL[INCL]
'Me and you are eating our food.'

b. [Aku dan suami-ku]$_i$ makan makanan kami$_i$. **1+3 ⇝1excl**
1SG and man=POSS.1SG eat food POSS.1PL[EXCL]
'Me and my husband are eating our food.'

(32) *Tenyidie (Tibeto-Burman)*

a. [Á mú nó]$_i$ āvó$_i$-kǐ kʰrɔ́. **1+2 ⇝1incl**
1SG and 2SG POSS.1DL[INCL]-house buy.PST
'Me and you bought our house.'

b. [Á mú ā-niò-pfə̃]$_i$ hiēnié$_i$-kǐ kʰrɔ́.
1SG and POSS.1SG-child-FEM POSS.1DL[EXCL]-house buy.PST
'Me and my daughter bought our house.' **1+3 ⇝1excl**

If we want to dispense with externally stipulated resolution rules, we need a person feature system that naturally derives resolution to the highest person via union of features. At the same time, this system has to be powerful enough to capture 1st person inclusive vs. exclusive distinctions. Crucially, this system should also be able to provide exactly the right set of unified features in case resolution does not apply, as was shown with 2+3 conjunctions in German and Dutch where both 2nd person and 3rd person are agreement options. In the next section, we will discuss in how far existing approaches to agreement resolution and person features are successful in taking on such challenges.

3.2.2 Hierarchies and clusivity

Besides clusivity and syncretism patterns, person hierarchies serve as viable diagnostics to detect underlying feature systems. The person feature theories presently debated in the literature can be distinguished along two dimensions: one is based on the distinction between a *speaker–hearer* system (Dalrymple and Kaplan 2000, Frampton 2002, Müller 2006a,b, Bobaljik 2008, Kratzer 2009, Wechsler 2010, Albright and Fuß 2012) and an *author–participant* system (Halle 1997, Harley and Ritter 2002, Béjar 2003, Béjar and Řezáč 2009, Nevins 2011b, Ackema and Neeleman 2013, Harbour 2016, Preminger 2017). The other dimension divides the theories into privative and binary systems. We will mainly focus on the latter for the discussion in this paper.
Let us start with privative feature systems. Table 1 presents decompositions previously proposed in the literature for languages with a clusivity distinction (+CLUS) and without it (–CLUS). The speaker–hearer decomposition is taken from Dalrymple and Kaplan (2000), while the author–participant system comes from McGinnis (2005), though versions of the latter have also been proposed by Harley and Ritter (2002), Béjar (2003), Béjar and Řezáč (2009), van Koppen (2011), Ackema and Neeleman (2013), Preminger (2017). In contrast to binary features, privative features encode negative values via absence of the feature. In such systems, 3rd person is radically underspecified. Broadly speaking, a speaker–hearer system can easily make a distinction between inclusive and exclusive forms since it contrasts 1st person with 2nd person. An author-participant system, however, needs to introduce another feature for languages with a clusivity distinction since participant subsumes speaker and hearer and thus cannot single out hearer. The author–participant system though fares better with respect to the derivation of hierarchies since it is intrinsically implicational (author entails participant), whereas this is not straightforward in a speaker–hearer system.

Table 1: *Privative feature systems (Dalrymple and Kaplan 2000, McGinnis 2005)*

	speaker–hearer		author–participant	
	+CLUS	–CLUS	+CLUS	–CLUS
1^{st}*incl*	[SPEAK,HEAR]		[AUTH,ADDR,PART]	
1^{st}*excl*	[SPEAK]		[AUTH,PART]	
1^{st}	[SPEAK]	[SPEAK,HEAR]	[AUTH,PART]	[AUTH,PART]
2^{nd}	[HEAR]	[HEAR]	[ADDR,PART]	[PART]
3^{rd}	[ ]	[ ]	[ ]	[ ]

A speaker–hearer system contrasts 1st and 2nd person, thereby providing a straightforward way to encode an inclusive form by combining 1st and 2nd person. As can be seen in (33), the feature decomposition in the first column in Table 1 leads directly to the insertion of 1st person inclusive forms for conjunctions of 1st and 2nd person. Since 3rd person is underspecified, mismatched conjunctions including 3rd person will resolve towards the participant feature.

(33) *Privative resolution contexts for speaker–hearer in* +CLUS*:*

a. 1 ∪ 2 = [SPEAK] ∪ [HEAR] = [SPEAK,HEAR]

b. 2 ∪ 3 = [HEAR] ∪ [ ] = [HEAR]

c. 1 ∪ 3 = [SPEAK] ∪ [ ] = [SPEAK]

As for languages without clusivity, Dalrymple and Kaplan (2000) derive the person hierarchy by gradually increasing the specificity of the person features, see second column in Table 1. Although this provides the right output, as is shown in (34), the decomposition seems "more analytically convenient than theoretically justified" (van Koppen and Rooryck 2008: 3). It is not clear what independent motivation there is that 1st person encodes SPEAK and HEAR other than that it is required to derive resolution to 1st person in conjunctions of 1st and 2nd person in (34a).

(34) *Privative resolution contexts for speaker–hearer in* –CLUS*:*

a. 1 ∪ 2 = [SPEAK,HEAR] ∪ [HEAR] = [SPEAK,HEAR]

b. 2 ∪ 3 = [HEAR] ∪ [ ] = [HEAR]

c. 1 ∪ 3 = [SPEAK,HEAR] ∪ [ ] = [SPEAK,HEAR]

The person hierarchy follows much more naturally in author–participant systems, shown in (35) for languages without clusivity. In such a system, person features are based on entailment relations, thus each person feature higher on the person scale will intrinsically encode more features.

(35) *Privative resolution contexts for author–participant in* –CLUS*:*

a. 1 ∪ 2 = [AUTH,PART] ∪ [PART] = [AUTH,PART]

b. 2 ∪ 3 = [PART] ∪ [ ] = [PART]

c. 1 ∪ 3 = [AUTH,PART] ∪ [ ] = [AUTH,PART]

Languages with clusivity, however, enforce the addition of an addressee feature to capture the distinction between inclusive and exclusive interpretations. If the addressee feature is added to the inventory, strict resolution patterns follow without further ado, as shown in (36).

(36) *Privative resolution contexts for author–participant in* +CLUS*:*

a. 1 ∪ 2 = [AUTH,PART] ∪ [ADDR,PART] = [AUTH,ADDR,PART]

b. 2 ∪ 3 = [ADDR,PART] ∪ [ ] = [ADDR,PART]

c. 1 ∪ 3 = [AUTH,PART] ∪ [ ] = [AUTH,PART]

So far, we have seen how privative feature systems can derive strict hierarchies in languages with and without a clusivity distinction. Can these systems also capture the curious patterns in German and Dutch? The answer is no. Note that all privative decomposition systems encode 3rd person as the lack of a person feature. Crucially, this assumption is incompatible with resolution patterns in German and Dutch where 2+3 conjunctions allow for 2nd person and 3rd person agreement. There is no possiblity for 3rd person agreement, if 3rd person does not contribute a feature to begin with. Hence, the German and Dutch resolution patterns provide counter-evidence against privative person feature systems more generally.

Let us then turn to binary person feature systems to see if they can capture the German and Dutch patterns more successfully. Binary feature systems have been argued to be decomposed into either [±SPEAKER] and [±HEARER] (Frampton 2002, Müller 2006a,b, Bobaljik 2008, Kratzer 2009, Wechsler 2010, Albright and Fuß 2012, Sundaresan 2020) or [±AUTHOR] and [±PARTICIPANT] (Halle 1997, Nevins 2007, 2011b, Nevins and Sandalo 2011, Arregi and Nevins 2012, Harbour 2016). Again, we present the feature decompositions summarized for each system in Table 2. The speaker–hearer system is taken from Bobaljik (2008), while the author–participant comes from Nevins (2007). A speaker–hearer system can group 1PS and 3PS together against 2PS by the shared feature [–HEAR], thereby capturing 1/3 syncretism, which is in particular persistent in the person feature systems of Germanic languages. This system can also provide a straightforward context for inclusive forms with [+SPEAK,+HEAR]. In contrast, an author–participant system requires the addition of a feature to provide an inclusive–exclusive distinction, modeled in Nevin's system with the addition of a privative addressee feature [ADDR]. This feature is absent in languages without a clusivity distinction. An author–participant system is designed to group 1PS with 2PS against 3PS via [+PART], thereby capturing 1/2 syncretisms and 1/2 $\prec$ 3 hierachy effects, e.g., in languages with strong PCC effects (Béjar and Rezac 2003, Anagnostopoulou 2003).

Table 2: *Binary feature systems (Bobaljik 2008, Nevins 2007)*

	speaker–hearer		author–participant	
	+CLUS	–CLUS	+CLUS	–CLUS
1^{st}*incl*	[+SPEAK,+HEAR]		[+AUTH,+PART,ADDR]	
1^{st}*excl*	[+SPEAK,–HEAR]		[+AUTH,+PART]	
1^{st}	[+SPEAK,–HEAR]	[+SPEAK,–HEAR]	[+AUTH,+PART]	[+AUTH,+PART]
2^{nd}	[–SPEAK,+HEAR]	[–SPEAK,+HEAR]	[–AUTH,+PART,ADDR]	[–AUTH,+PART]
3^{rd}	[–SPEAK,–HEAR]	[–SPEAK,–HEAR]	[–AUTH,–PART]	[–AUTH,–PART]

A binary feature system can overcome the difficulties privative accounts face, in that it provides the right insertion contexts of capturing divergence from the person hierarchy, which is what we observe with 2+3 conjunctions in German and Dutch. Hence, we will employ a binary feature system for the remainder of the paper. Languages which display strict person hierarchies fall out naturally by assuming a sensitivity to marked features, i.e., positive values.[4]

[4]See also Despić (2016) who makes reference to markedness in order to resolve gender mismatches in BCS.

In parallel to the arguments in Nevins (2007), we propose that resolution agreement in languages which adhere to the person hierarchy is guided by marked values, which are + for person features. More concretely, we propose that the dominance of languages which resolve to the highest person in every context, compared to the few exceptional languages that do not, follows from the fact that morphological exponents are strongly biased to encode marked values.[5] We will spell out this idea following a speaker–hearer decomposition, as such a system is likely at work in Germanic due to the known 1/3 syncretisms throughout the person paradigms (Frampton 2002). First, note that in Table 2 the feature decomposition for speaker-hearer systems is identical for 1st, 2nd, and 3rd person independent of the presence of clusivity. Languages with an inclusive form simply spell out one more feature combination. In (37), we present the resolution contexts for each person combination based on set union, subsuming languages with and without clusivity.[6]

(37) *Binary resolution contexts for speaker–hearer:*

a. $1 \cup 2 = [+\text{SPEAK}, -\text{HEAR}] \cup [-\text{SPEAK}, +\text{HEAR}]$
$= [+\text{SPEAK}, -\text{HEAR}, -\text{SPEAK}, +\text{HEAR}]$

b. $2 \cup 3 = [-\text{SPEAK}, +\text{HEAR}] \cup [-\text{SPEAK}, -\text{HEAR}]$
$= [-\text{SPEAK}, +\text{HEAR}, -\text{HEAR}]$

c. $1 \cup 3 = [+\text{SPEAK}, -\text{HEAR}] \cup [-\text{SPEAK}, -\text{HEAR}]$
$= [+\text{SPEAK}, -\text{HEAR}, -\text{SPEAK}, -\text{HEAR}]$

If we take these resolution contexts and only consider the marked features, indicated with a box in (38), we can see that the resolution pattern for languages with a clusivity distinction fall out immediately. Conjunctions of 1st and 2nd person lead to the insertion of 1st person inclusive forms (38a), and any conjunction of 1st/2nd with 3rd person results in resolution towards the 1st exclusive (38c) or 2nd person (38b).

(38) *Binary resolution contexts for speaker–hearer (marked values):*

a. $1 \cup 2 = [\ \boxed{+\text{SPEAK}}\ , -\text{HEAR}, -\text{SPEAK}, \boxed{+\text{HEAR}}\ ]$

b. $2 \cup 3 = [\ -\text{SPEAK}, \boxed{+\text{HEAR}}, -\text{HEAR}\ ]$

c. $1 \cup 3 = [\ \boxed{+\text{SPEAK}}\ , -\text{HEAR}, -\text{SPEAK}, -\text{HEAR}\ ]$

As for languages without clusivity, contexts (38b) and (38c) again provide the right outcome if we only consider the marked values. The conjunction of 2nd and 3rd person allows for the insertion of 2nd person which is [−SPEAK,+HEAR] and thus matches in its marked (+) values with the insertion context in (38b). Similarly, the conjunction of 1st person and 3rd person allows for the insertion of 1st person which is [+SPEAK,−HEAR] and thus matches the context in (38c) in its marked values. Essentially, 3rd person never wins over 1st/2nd person, as it is encoded only with unmarked values. Before we turn to conjunctions of 1st and 2nd person, consider first what happens in

[5] We thank a reviewer for suggesting this avenue of thought.

[6] Note that set union in a binary system leads to contradicting feature bundles. This assumption, however, is not unprecedented, see Citko (2005), Bhatt and Walkow (2013), among others.

languages where resolution agreement does not follow the person hierarchy, that is in German and Dutch. We propose that if vocabulary insertion into unified contexts is not driven by markedness, languages will potentially diverge from the person hierarchy. With respect to the context in (38b), this opens up the possibility to insert either the 2nd person or the 3rd person exponent, thus paving the way for different agreement options with 2+3 conjunctions. In principle, this could also happen with 1+3 conjunctions, that is with the context in (38c), though this will ultimately depend on the specificity of the relevant vocabulary items in German and Dutch. What is important is that once a language is not guided by markedness considerations, resolution to the highest person is not guaranteed.

Finally, let us address conjunctions of 1st and 2nd person. With the current state of the proposal, we predict that languages without clusivity can potentially display 1st or 2nd person agreement with 1+2 conjunctions. This is crucially also true for languages in which exponents are sensitive only to marked features. With the context in (38a), 1st person exponents [+SPEAK] as well as 2nd person exponents [+HEAR] would be compatible and match a marked feature, respectively. Hence, a binary feature approach needs to account for the observation that Norwegian, Swedish, and Icelandic as well as many non-Germanic languages do not show 2nd person agreement with 1+2 conjunctions. We argue that the lack of 2nd person agreement and thus strict resolution to 1st person with 1+2 conjunctions is related to the lack of an inclusive form in such languages. Recall that the context in (38a) correctly predicts the insertion of an inclusive form in languages with a clusivity distinction. We will now argue that even languages which on the surface show no clusivity distinction nevertheless encode it underlyingly. A difference between inclusive and exclusive forms, however, never surfaces since an impoverishment rule neutralizes the distinction. Impoverishment thereby creates syncretism between an inclusive and an exclusive form. The impoverishment rule is given in (39) and the effect thereof is shown in Table 3. The rule states that [+HEAR] is deleted in the context of [+SPEAK]. Treating the lack of clusivity via an impoverishment rule is motivated by the fact that this property holds across paradigms (Bobaljik 2001, Harley 2008).

(39) *Impoverishment rule in languages without clusivity:*

$[+\text{HEAR}] \rightarrow \varnothing \,/ [+\text{SPEAK}]\_\_\_$

The presence of (39) leads to a person system in which 1st person is not morphologically distinguished with respect to inclusiveness since the context [+SPEAK,+HEAR] is ruled out by (39). Languages characterized as –CLUS have such a rule in their inventory and therefore never provide morphologically distinguished 1st person inclusive forms. The rule is independently motivated by markedness requirements, in that the marked category is neutralized towards its unmarked (less-specific) counterpart 1st person exclusive (Noyer 1992, Nevins 2011a, Arregi and Nevins 2012). Hence, (39) constitutes a case of markedness-targeted neutralization (Nevins 2011a). Note also that another natural consequence of this view is Zwicky's (1977) generalization: inclusive meaning in languages without clusivity is always expressed with 1st person, never with 2nd person.[7]

[7] Another corner of the grammar where this impoverishment rule is arguably at play can be found

Table 3: *Languages with and without a clusivity distinction based on (39)*

		+CLUSIVITY	−CLUSIVITY
1^{st}*incl*	[+SPEAK,+HEAR]	✓	✗
1^{st}/1^{st}*excl*	[+SPEAK,−HEAR]	✓	✓
2^{nd}	[−SPEAK,+HEAR]	✓	✓
3^{rd}	[−SPEAK,−HEAR]	✓	✓

Given that languages without a clusivity distinction come with the impoverishment rule in (39), we now predict that 1+2 conjunctions provide a context where this rule will apply. Hence, the final resolution contexts for languages without clusivity are given in (41). Languages for which exponents realize only marked features are now predicted to show resolution to the highest person consistently across all mismatch configurations. These are Norwegian, Swedish, Icelandic, among many others. At the same time, we can derive the lack of resolution agreement in German and Dutch with the assumption that in such languages exponents are encoded via positive and negative features, for example due to the requirement to model certain syncretisms.

(41) *Binary resolution contexts for speaker–hearer in* −CLUS*:*

a. $1 \cup 2$ = [**+SPEAK** , −HEAR, −SPEAK, ~~+HEAR~~]

b. $2 \cup 3$ = [−SPEAK, **+HEAR**, −HEAR]

c. $1 \cup 3$ = [**+SPEAK** , −HEAR, −SPEAK, −HEAR]

with the expression of (co-)hortatives, a directive speech act in which the speaker urges the addressee to perform an action jointly (van der Auwera et al. 2004). In English, this speech act is expressed with the *let*-construction as in *Let us play!* In other languages like French the cohortative shares many properties with the imperative but makes use of 1st person plural morphology (40a). In parallel to 1+2 conjunctions, languages with clusivity which express cohortatives with 1st person also make use of the 1st person inclusive forms in such constructions, see e.g., the Colombian language Awa Pit in (40b).

(40) *Cohortatives with 1st person morphology* (van der Auwera et al. 2004)

a. Chant-ons! French
sing-IMP.1PL
'Let us sing!'

b. Ku-pay! Awa Pit
eat-IMP.1DL[INCL]
'Let's eat (both you and me).'

The fact that even in languages like French which do not exhibit a morphological clusivity distinction cohortatives like (40a) must always be interpreted as 1st person inclusive indicates that the syntax can provide 1st inclusive feature, e.g., via a Jussive head (Zanuttini et al. 2012), which is then sent off to LF to trigger the cohortative meaning, while at the same time being morphologically impoverished on PF so that the distinction remains unexpressed in the agreement morphology. This is exactly what is made possible with the impoverishment rule in (39). We thank a reviewer for making us aware of this connection.

In sum, this section demonstrated that the resolution data from German and Dutch require the decomposition of person features into binary features and a resolution algorithm which is based on set union. While such feature systems at first sight seem to allow for too many options, we propose they can be reigned in by further assuming that for the insertion of exponents into unified features sets, only marked features are relevant. This principle derives adherence to the person hierarchy. Markedness, however, is not always at play since there are languages for which it can be argued that they display exponents that also encode unmarked features, e.g., in German and Dutch. Hence, the resolution can be blocked in German and Dutch, which we observe for 2+3 conjunctions where both agreement options arise. Finally, resolution to 1st person in 1+2 conjunctions is derived via the presence of an impoverishment rule which tracks the absence of inclusive markers. Conversely, languages with a clusivity distinction will not display such a rule and thus resolve 1+2 conjunctions towards 1st inclusive.[8]

4 Morphological decomposition

In this section, we will provide the concrete analyses of each resolution paradigm of the Germanic languages under investigation. After some background on the syntax of coordination and a short recap of the feature analysis for Germanic developed in the previous section, we will attend to the German and Icelandic verbal paradigm in section 4.2, followed by the pronoun paradigms in Dutch, Swedish and Norwegian in section 4.3.

4.1 Preliminaries

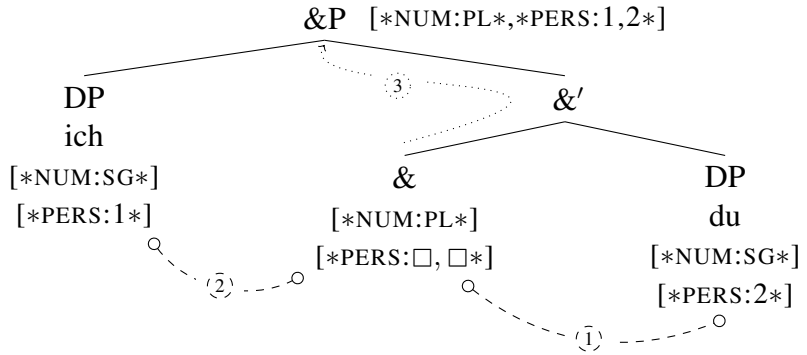
A few syntactic assumptions are in order to ensure that resolution agreement can take place. As is shown in (42), the conjunctive coordinator is the head of its own functional projection and takes the conjuncts as its arguments (Munn 1987, Johannessen 1998, Zhang 2009). This coordinator bears a person probe with separate unvalued agreement slots that collects the person features of its arguments in a cyclic fashion. The probe on the coordinator & first searches downward but since one conjunct can only value one slot, the probe on & must project so that it can probe into the specifier to get fully valued (Béjar and Řezáč 2009). We will assume that the number feature enters the derivation already valued for plural.[9] After Agree, the ϕ features project up to the root node &P, which acts as the closest goal for agreement with T.[10]

[8] Markedness considerations and the impoverishment rule can potentially also be implemented in binary author-participant systems, though the rule would target [ADDR] in the context of [+PART]. Since this paper focuses on Germanic languages, we leave it to future work to develop this proposal further.

[9] This assumption is sufficient for Germanic languages but requires more thought e.g., with respect to languages with a tripartite number system which includes a dual category.

[10] The last step requires checked features to not get deleted, which can be modeled either with a feature sharing approach (Frampton and Gutmann 2006) or via Legate's (2005) model of Cyclic Agree.

(42)



West Germanic languages like German and Dutch provide independent evidence to decompose PERSON features into [±SPEAKER] and [±HEARER]. This feature set-up makes it possible to capture the presence of 1/3 syncretisms since it can single out 1st person and 3rd person to the exclusion of the addressee via [−HEARER] (Frampton 2002). Though this type of syncretism is reported to be cross-linguistically rare (Cysouw 2005, Baerman et al. 2005). A language like German requires a binary speaker-hearer system to account for 1/3 syncretisms in past and plural forms. While Modern Dutch has only one syncretic plural form, Middle Dutch shows 1/3 syncretism in plural (Aalberse 2009). The syncretism is also reflected in past and plural forms in Dutch dialects (Aalberse and Don 2009) as well as for a closed class of modal verbs across dialects (Ackema and Neeleman 2013). Among the North Germanic languages, 1/3 syncretisms are currently unattested (Frampton 2002, Cysouw 2003), with the exception of Modern Icelandic (Thráinsson 1994). Icelandic exhibits 1/3 syncretisms in the subjunctive for singular past and present forms as well as in indicative forms for singular past (Thráinsson 1994: 159). The latter is also attested in Old Norse (Faarlund 2004: 51-52).

To recap, we proposed in section 3.2.2 that the lack of inclusive forms is derived via an impoverishment rule, which we repeat in (43). Since no Germanic language shows a clusivity distinction, we assume that the rule in (39) is part of the inventory of Germanic languages.

(43) *Impoverishment rule in Germanic:*

[+HEAR] → ∅ /[+SPEAK]___

Given the rule in (43) and provided that conjunctions trigger set union of person features, we arrive at the following resolution contexts in (44)-(46). Set union and impoverishment apply post-syntactically (Bonet 1991, Halle and Marantz 1993, 1994) and provide the contexts for vocabulary insertion which is itself driven by the Subset Principle (Halle 1997).

(44) **1+3**

a. $[+\text{SPEAK}, -\text{HEAR}]^1 \cup [-\text{SPEAK}, -\text{HEAR}]^3$
= [+SPEAK, −HEAR, −SPEAK]

b. impoverishment: does not apply

(45) **2+3**

a. $[-\text{SPEAK},+\text{HEAR}]^2 \cup [-\text{SPEAK},-\text{HEAR}]^3$
$= [-\text{SPEAK}, -\text{HEAR}, +\text{HEAR}]$

b. impoverishment: does not apply

(46) **1+2**

a. $[+\text{SPEAK},-\text{HEAR}]^1 \cup [-\text{SPEAK},+\text{HEAR}]^2$
$= [+\text{SPEAK}, +\text{HEAR}, -\text{HEAR}, -\text{SPEAK}]$

b. impoverishment: $[+\text{SPEAK}, \cancel{+\text{HEAR}}, -\text{HEAR}, -\text{SPEAK}]$

Since the coordinator comes with a number feature fixed for plural, nothing changes if one or all of the conjuncts is valued plural. The impoverishment rule lets the 1+2 context be identical to the 1+3 context. Under the assumption that exponents of 3rd person are often not marked (Siewierska 2010) and, thus, analyzed as an elsewhere marker (Halle and Marantz 1993: 133), they will often be less specific than the 1st person or 2nd person exponents. For strict hierarchies in Norwegian, Swedish, and Icelandic, we will argue that the exponents exclusively encode marked features. Mismatched conjunctions will always lead to resolution to the highest person since 3rd person only contributes unmarked subfeatures. $1 \succ 2/3$ agreement patterns in German and Dutch are then due to a non-empty feature specification of 3rd person.

4.2 German vs. Icelandic

The first thing to note is that a binary person system does not necessitate divergence from the person hierarchy. Since the current proposal allows underspecification of exponents, paradigms with fewer or no syncretisms will have greater flexibility as to the encoding of vocabulary items. In contrast to verbal agreement, possessor agreement in German follows a strict hierarchy with person mismatch coordinations, as is shown in (47). Conjoining two participant pronouns produces 1st person agreement on the possessor (47c). If one of the conjuncts is 3rd person, the participant pronoun will act as the agreement controller for the possessor, see (47a) and (47b).

(47) *German possessor agreement*

a. [Ich und mein Mann]$_i$ hab-en unsere$_i$ Karten vergessen.
I and my husband have-1PL POSS.1PL tickets forgotten
'I and my husband forgot our tickets.'

b. [Du und dein Mann]$_i$ hab-t eure$_i$ Karten vergessen.
you and your husband have-2PL POSS.2PL tickets forgotten
'You and your husband forgot your tickets.'

c. [Ich und du]$_i$ hab-en unsere$_i$ Karten vergessen.
I and you have-1PL POSS.1PL tickets forgotten
'I and you forgot our tickets.'

We propose the vocabulary items in (48) for the morphological paradigm shown in Table 4. Key to understanding the pattern in (47) is the lack of syncretism patterns in the plural, which makes it likely that 3rd person is encoded as an elsewhere marker.

Table 4: *German possessives*

	SING	PLU
1ST	mein-	uns-
2ND	dein-	eu-
3RD	ihr-/sein-	ihr-

(48) PERSON/NUMBER/GENDER *VIs for German possessives*:

a. /uns-/ ↔ [+SPEAK,+PL]

b. /eu-/ ↔ [+HEAR,+PL]

c. /mein-/ ↔ [+SPEAK]

d. /dein-/ ↔ [+HEAR]

e. /sein-/ ↔ [+MASC]

f. /ihr-/ ↔ [ ]

Below, we show the vocabulary insertion rules for possessive pronouns, where the most specific compatible vocabulary items are listed for each context, respectively. Recall, that the plural feature enters the feature bundle via the coordinator. Number is encoded as a binary feature but nothing hinges on this decision. The 1st person plural possessive *uns-* is the most specific compatible exponent for both context (49) and (51). For the context in (50) the 2nd person plural possessive *eu-* is the most specific.

(49) **3+1 ⇝1 (German)**

context: [+SPEAK, −HEAR, −SPEAK, +PL]

► /uns-/ ↔ [+SPEAK,+PL]

(50) **3+2 ⇝2 (German)**

context: [−SPEAK, −HEAR, +HEAR, +PL]

► /eu-/ ↔ [+HEAR,+PL]

(51) **2+1 ⇝1 (German)**

context: [+SPEAK, ~~+HEAR~~, −HEAR, −SPEAK, +PL]

► /uns-/ ↔ [+SPEAK,+PL]

This account implements the hierarchy by the independently motivated impoverishment rule, plus the overall tendency of 3rd person forms to be less specific than 1st and 2nd person. An immediate advantage of the system is the flexibility it offers for the feature composition of the vocabulary items – an opportunity we will use to explain the German subject verb agreement pattern which diverges from the person hierarchy.
Recall from section 2 that German verbal agreement permits optionality between 2nd and 3rd person agreement with 2+3 coordinations. The paradigm in (52) provides one example for illustration.

(52) *German subject-verb agreement*

a. Ich und mein Freund trag-en zu viel Verantwortung.
I and my friend carry-1PL too much responsibility
'I and my friend carry too much responsibility.'

b. Du und dein Freund trag-t/trag-en zu viel Verantwortung.
you and your friend carry-2PL/carry-3PL too much responsibility
'You and your friend carry too much responsibilities.'

c. Ich und du trag-en zu viel Verantwortung.
I and you carry-1PL too much responsibility
'I and you carry too much responsibility.'

In order to capture the syncretisms of the inflectional paradigm shown in Table 5, we propose the vocabulary items shown in (53). Table 5 provides paradigms for strong an weak forms, the former being used for verbs that display stem change from present to past tense. The verb in (52) is strong since its stem in the past is *trug-*, compared to the stem *trag-* in the present. An example for a weak form is *glauben* 'believe', where there is no stem change from *ich glaub-e* 'I believe.PRS-1SG' to *ich glaub-te* 'I believe-PST'.

Table 5: *German syncretisms for inflectional verbal morphemes*

	STRONG				WEAK			
	PRESENT		PAST		PRESENT		PAST	
	SING	PLU	SING	PLU	SING	PLU	SING	PLU
1ST	-ə	-(ə)n	-∅	-(ə)n	-ə	-(ə)n	-te	-te-n
2ND	-st	-t	-st	-t	-st	-t	-te-st	-te-t
3RD	-t	-(ə)n	-∅	-(ə)n	-t	-(ə)n	-te	-te-n

(53) PERSON/NUMBER/TENSE *VIs for German*:

a. /-t/ ↔ [−SPEAK,−HEAR,−PL,+PRES][11]

b. /-t/ ↔ [+HEAR,+PL]

c. /-st/ ↔ [+HEAR]

d. /-(ə)n/ ↔ [−HEAR,+PL]

e. /-te/ ↔ [−PRES,−STRONG]

f. /-(e)/ ↔ [ ]

Two pieces of the analysis are taken from Müller (2006a,b). First, the marker (e) in (53f) is abstract in that its phonological realization depends on whether there is stem alternation from present to past. If there is stem alternation in past tense contexts (strong forms): (e) → ∅; otherwise (e) → ə in present tense contexts if there is no other marker. Second, fission ensures that weak past tense inflectional markers can contain the additional vocabulary item *-te*. Fission allows multiple vocabulary insertion into one functional morpheme by discharging the subfeatures of every VI with every insertion cycle until no compatible inflectional marker is left (Noyer 1992, Frampton 2002). We illustrate fission in (54) with the insertion context for the cell 1st person, plural, weak, past in Table 5 above. This context allows for both *-te* and *-(ə)n* to be inserted since each exponent discharges a separate subset of the feature bundle (discharged features are marked in gray).

(54) *Fission (Noyer 1992) for weak past tense in German*

a. 1ST, PLU, WEAK, PAST: [+SPEAK,−HEAR,+PL,−PRES,−STRONG]

b. cycle 1: $\sqrt{}$-[+SPEAK,−HEAR,+PL,−PRES,−STRONG] ↔ $\sqrt{}$-te

c. cycle 2: $\sqrt{}$-[+SPEAK,−HEAR,+PL,−PRES,−STRONG] ↔ $\sqrt{}$-te-(ə)n

Important for the agreement patterns we discuss in this paper are the two plural markers in (53b) and (53d). Apart from the 1/3 syncretism in the singular, there is a consistent 1/3 syncretism in the plural emerging from the paradigm in Table 5, which we encode in (53d) with [−HEAR,+PL]. This makes German special in that an exponent encodes an unmarked feature. Crucially, the two plural markers (53b) and (53d) are equally specific with respect to the unified feature set of 2nd and 3rd person. The vocabulary items in (53), together with the rule in (43), will then derive the resolutions pattern observed in (52) above.

The insertion contexts resulting from resolution agreement are shown in (55)-(57), where tense information and the weak-strong distinction are ignored for clarity. (55) as well as (57) select the syncretic *-(ə)n* plural marker to be the most specific exponent to be inserted. Crucial for the German pattern, however, is that both plural exponents, *-(ə)n* and *-t*, are compatible with the context in (56), while also being equally specific.

[11] Following the arguments in Albright and Fuß (2012), we assume that the German 2PL/3SG syncretism is the result of *accidental homophony*, hence (53a) and (53b), as opposed to e.g. the 1PL/3PL syncretism which is due to *morphological identity* (see also Sauerland and Bobaljik (2013) for an argument in favor of accidental homophony).

We assume that such a configuration leads to optional insertion of either one or the other marker (Hein 2008, Davis 2021). No optionality is predicted with 1+2 conjunctions in (57) since [+HEAR] is deleted before vocabulary insertion is taking place due to the impoverishment rule in (43). Note that the optionality with 2+3 conjunctions in (56) comes about as a result of resolution, analyzed as set union. These operations are uniquely qualified to create feature sets with identical features but conflicting feature values. Superimposing a feature hierarchy (e.g. number is more important than gender) to regulate vocabulary insertion between equally specific items will not resolve the conflict. This restricts optionality arising across the board via identical cardinality of feature sets.

(55) **3+1 ⇝1 (German)**

context: [+SPEAK, −HEAR, −SPEAK, +PL]

► /-(ə)n/ ↔ [−HEARER,+PL]

(56) **3+2 ⇝2 (German)**

context: [−SPEAK, −HEAR, +HEAR, +PL]

► /-(ə)n/ ↔ [−HEARER,+PL]

► /-t/ ↔ [+HEARER,+PL]

(57) **2+1 ⇝1 (German)**

context: [+SPEAK, ~~+HEAR~~, −HEAR, −SPEAK, +PL]

► /-(ə)n/ ↔ [−HEARER,+PL]

The accounts extends to 1+2+3 conjunctions, which include all persons and display resolution towards 1st person, recall example (11) from section 2. To see how this follows, compare (58) to (57). Set union and the impoverishment rule create identical insertion contexts independent of the presence of 3rd person. This is because the union of 1st and 2nd person already results in a feature bundle that contains all possible subfeatures. Including 3rd person does not add to the set union of 1st and 2nd person.

(58) **3+2+1 ⇝1 (German)**

context: [+SPEAK, ~~+HEAR~~, −HEAR, −SPEAK, +PL]

► /-(ə)n/ ↔ [−HEARER,+PL]

In contrast to German, Icelandic displays strict resolution patterns. Again, we repeat the data set from section 2 in (59). Like in German, resolution patterns can be investigated based on verbal inflection.

(59) *Icelandic verbal agreement*

a. Ég og bróðir minn fór-um út. **1+3 ⇝1**
I and brother my go.PST-1PL out
'Me and my brother went out.'

b. þú og bróðir þinn fór-uð út. **2+3 ⇝2**
you and brother your go.PST-2PL out
'You and your brother went out.'

c. Ég og þú fór-um út. **1+2 ⇝1**
I and you go.PST-1PL out
'You and me went out.'

In Table 6, we show a partial paradigm of the inflectional verb system in Icelandic. Similar to German, the weak/strong distinction is also at work in Icelandic, though considerably more complex with several conjugational classes for the strong and the weak verbs. The verb *fara* 'go' in (59) belongs to class 6 of the strong verbs, the stem changes from present to past (vowel change: e>ó). Table 6 provides the inflectional markers in present and past for class 6 of the strong verbs. In light of the complexity of the inflection paradigm and the focus of this paper, we will not attempt to provide a full fledged analysis of the morphological decomposition. The vocabulary items in (60) suffice to discuss our analysis of resolution agreement with respect to the Icelandic data in (59).

Table 6: *Verbal inflection for strong verbs (class 6) in Icelandic*

	PRESENT		PAST	
	SING	PLU	SING	PLU
1ST	-∅	-um	-∅	-um
2ND	-ð	-ið	-st	-uð
3RD	-∅	-a	-∅	-u

In contrast to German, Icelandic is well behaved in that all agreement exponents realize marked values. The decomposition is motivated by the fact that morphemes naturally expone marked values (Wunderlich and Fabri 1995, Blevins 2000, Penke et al. 2004) unless there has been some historical change or certain paradigmatic constrasts require the reference to an unmarked value, for example a 1/3 syncretic plural marker. As can be seen in Table 6, there is no syncretism in the plural in Icelandic. The only syncretism we find is for 1/3 in the singular, which is in parallel to German encoded with the elsewhere marker in (60h). Recall from section 4.1 that this syncretism was an invention of Modern Icelandic (Thráinsson 1994, Frampton 2002), and thus has a different status than the German 1/3 syncretism in the plural.

(60) PERSON/NUMBER/TENSE *VIs for Icelandic (strong, class 6)*:

a. /-ið/ ↔ [+HEAR,+PL,+PRES]

b. /-ð/ ↔ [+HEAR,+PRES]

c. /-a/ ↔ [+PL,+PRES]

d. /-um/ ↔ [+SPEAK,+PL]

e. /-uð/ ↔ [+HEAR,+PL]

f. /-st/ ↔ [+HEAR]

g. /-u/ ↔ [+PL]

h. /-∅/ ↔ [ ]

Turning to our resolution contexts in (61)-(63), we see that resolution agreement in Icelandic is guided by markedness. Given that the exponents only encode marked values, *-um* must be inserted in contexts (61) and (63) since it is the only exponent that is compatible and matches the most marked features. The same is true for *-uð* in context (62). The exponent *-u* is less specific and therefore not relevant for the insertion into resolution contexts. Since agreement in (59) always shows resolution to the highest person and the agreement markers in Icelandic arguably encode only marked features, it follows that resolution is follows a strict hierarchy in Icelandic.

(61) **3+1 ⇝1 (Icelandic)**

context: [+SPEAK , −HEAR, −SPEAK, +PL, −PRES]

► /-um/ ↔ [+SPEAK,+PL]

(62) **3+2 ⇝2 (Icelandic)**

context: [−SPEAK, −HEAR, +HEAR , +PL, −PRES]

► /-uð/ ↔ [+HEAR,+PL]

(63) **2+1 ⇝1 (Icelandic)**

context: [+SPEAK , /+HEAR/ , −HEAR, −SPEAK, +PL, −PRES]

► /-um/ ↔ [+SPEAK,+PL]

This section explored a verbal agreement pattern with mismatched conjunctions that does not follow a strict person hierarchy. A precondition for the pattern is an underlying feature system that is non-privative. Whether a language follows the person hierarchy in agreement with mismatch coordinations depends on the level of underspecification of 3PL exponents vs. 2PL and 1PL exponents. If 3PL exponents are less specified than 2PL and 1PL exponents, strict patterns result as in Icelandic. If, on the other hand, 3PL exponents are as specific as 2PL and/or 1PL exponents, divergences like the German verbal pattern arise. In German, there is a dedicated 1/3 syncretic plural exponent which requires reference to the unmarked [–HEARER] feature in the plural.

In Icelandic, however, the 1/3 syncretism is restricted to the singular which is derived by an elsewhere marker. This difference has consequences for resolution agreement, in that it ultimately leads to the optionality of 2nd person and 3rd person agreement in German. The rarity of such a divergence from the person hierarchy is thus tied to the fact that exponents generally encode marked values but in rare cases can be specified for an unmarked value in the plural, as it is the case in German.

4.3 Dutch vs. Swedish and Norwegian

Timmermans et al. (2004) report on a resolution agreement paradigm in Dutch that is identical to German but found with reflexive verbs. While person is syncretic in the plural with respect to verbal inflection, the reflexive pronouns reveal a divergence from the person hierarchy. We repeat (13) from section 2 in (64).

(64) *Dutch reflexive verbs*

a. Ik en mijn vriend vervelen ons. **1+3 ⇝1**
I and my friend bore 1PL.REFL
'I and my friend are bored.'

b. Jij en je vriend vervelen je/zich. **2+3 ⇝2,3**
you and your friend bore 2PL.REFL/3PL.REFL
'You and your friend are bored.'

c. Jij en ik vervelen ons. **2+1 ⇝1**
you and I bore 1PL.REFL
'You and I are bored.'

Like in Dutch, verbs in Norwegian and Swedish do not inflect for person in the plural. So the next best place to investigate resolution agreement is reflexive pronoun agreement. In section 2, we showed that both languages display resolution patterns following the person hierarchy. The data sets are repeated for convenience in (65) and (66).

(65) *Norwegian reflexive verbs*

a. Jeg og vennen min kjeder oss. **3+1 ⇝1**
I and friend my bore 1PL.REFL
'I and my friend are bored.'

b. Du og vennen din kjeder dere. **3+2 ⇝2**
you and friend your bore 2PL.REFL
'You and friend your are bored.'

c. Du og jeg kjeder oss. **2+1 ⇝1**
you and I bore 1PL.REFL
'You and I are bored.'

(66) *Swedish reflexive verbs*

a. Jag och min vän skyndar oss. **1+3 ⇝1**
I and friend my hurry 1PL.REFL
'I and my friend hurry up.'

b. Du och din vän skyndar er. **2+3 ⇝2**
you and friend your hurry 2PL.REFL
'You and your friend hurry up.'

c. Jag och du skyndar oss. **1+2 ⇝1**
you and I hurry 1PL.REFL
'You and I hurry up.'

The paradigms for the reflexive pronouns are provided in Table 7 for Dutch, in Table 8 for Norwegian, and in Table 9 for Swedish. Note that the forms for 1st and 3rd person are cognates across Dutch, Norwegian and Swedish and share their distribution. The paradigms differ only in the 2nd person, in that there is a dedicated singular form in Norwegian and Swedish but not in Dutch. As for the resolution patterns, Swedish and Norwegian always show resolution to the highest person, whereas the Dutch pattern displays a diversion similar to the German pattern. Recall from the previous section that we explained the divergence in German with the requirement to encode the 3rd person plural marker as [−HEAR] in German, as opposed to the elsewhere in Icelandic, given the independent requirements emerging from the verbal inflection paradigms in each language. While there is no such synchronic evidence in the Dutch reflexive pronoun paradigm, we do find indirect evidence for 1/3 syncretisms, and thus a [−HEAR] feature, in earlier stages of the grammar (Aalberse 2009) and Dutch dialects (Aalberse and Don 2009). In contrast, 1/3 syncretisms are unattested in Old Norse (Frampton 2002), which then might explain the bias in Swedish and Norwegian against morphological decomposition via [−HEAR].

Table 7: *Dutch reflexives*

	SING	PLU
1ST	me	ons
2ND	je	je
3RD	zich	zich

Table 8: *Norwegian reflexives*

	SING	PLU
1ST	meg	oss
2ND	deg	dere
3RD	seg	seg

Table 9: *Swedish reflexives*

	SING	PLU
1ST	mig	oss
2ND	dig	er
3RD	sig	sig

We will take the insights from the (un)availability of 1/3 syncretisms and reflect them in the vocabulary items for Dutch (67), Norwegian (68), and Swedish (69). As in Icelandic, the VIs in Swedish and Norwegian only encode marked, that is positive features. Thus, we predict no divergence from the person hierarchy with resolution agreement. In Dutch, however, unmarked features enter the featural decomposition, specifically the [−HEAR] feature in the 3rd person (67d), potentially as a consequence of the overall

availability of 1/3 syncretism in an earlier stage of the grammar. There is no motivation for [−HEAR] in Norwegian and Swedish, so 3rd person is radically underspecified, see (68e) and (69e).

(67) PERSON/NUMBER *VIs for Dutch reflexives*:

a. /me/ ↔ [+SPEAK,−PL]

b. /ons/ ↔ [+SPEAK,+PL]

c. /je/ ↔ [+HEAR]

d. /zich/ ↔ [−HEAR]

(68) PERSON/NUMBER *VIs for Norwegian reflexives*:

a. /meg/ ↔ [+SPEAK]

b. /deg/ ↔ [+HEAR]

c. /oss/ ↔ [+SPEAK,+PL]

d. /dere/ ↔ [+HEAR,+PL]

e. /seg/ ↔ [ ]

(69) PERSON/NUMBER *VIs for Swedish reflexives*:

a. /mig/ ↔ [+SPEAK]

b. /dig/ ↔ [+HEAR]

c. /oss/ ↔ [+SPEAK,+PL]

d. /er/ ↔ [+HEAR,+PL]

e. /sig/ ↔ [ ]

We now turn to the derivation of the resolution patterns. Let us start with Dutch. Contexts (70) and (72) only allow for the 1PS reflexive pronoun *ons* to be inserted. The 2+3 resolution context in (71), however, permits both *je* and *zich*. In parallel to the analysis of verbal agreement in German, both reflexive pronoun exponents can be inserted because they are compatible with the context in (71) and equally specific.

(70) **3+1 ⇝1 (Dutch)**

context: [+SPEAK, −HEAR, −SPEAK, +PL]

► /ons/ ↔ [+SPEAK,+PL]

(71) **3+2 ⇝2 (Dutch)**

context: [−SPEAK, −HEAR, +HEAR, +PL]

► /zich/ ↔ [−HEAR]

► /je/ ↔ [+HEAR]

(72) **2+1 ⇝1 (Dutch)**

context: [+SPEAK, ~~+HEAR~~, −HEAR, −SPEAK, +PL]

- /ons/ ↔ [+SPEAK,+PL]

Since there are only minimal differences between the exponents, we will discuss the Norwegian and Swedish data sets in parallel. For the contexts involving 1st person, that is (73) and (75), *oss* wins over *seg/sig* since 3rd person is the designated elsewhere marker. Similarly, for the 2+3 context in (75), *dere/er* wins over *seg/sig* since *dere/er* is more specific.

(73) **3+1 ⇝1 (Norwegian, Swedish)**

context: [+SPEAK , −HEAR, −SPEAK, +PL]

- Norwegian: /oss/ ↔ [+SPEAK,+PL]
- Swedish: /oss/ ↔ [+SPEAK,+PL]

(74) **3+2 ⇝2 (Norwegian, Swedish)**

context: [−SPEAK, −HEAR, +HEAR , +PL]

- Norwegian: /dere/ ↔ [+HEAR,+PL]
- Swedish: /er/ ↔ [+HEAR,+PL]

(75) **2+1 ⇝1 (Norwegian, Swedish)**

context: [+SPEAK , ~~+HEAR~~ , −HEAR, −SPEAK, +PL]

- Norwegian: /oss/ ↔ [+SPEAK,+PL]
- Swedish: /oss/ ↔ [+SPEAK,+PL]

In analogy to section 4.2, the trigger for divergent resolution patterns with reflexive pronouns was implemented via the non-empty feature specification of 3rd person. Whereas 3rd person reflexives in Norwegian and Swedish are radically underspecified, 3rd person reflexives in Dutch are not. This difference decides over whether an agreement paradigm follows or diverges from the person hierarchy. A precondition for divergence, however, lies in the nature of the underlying feature system, in that it has to be binary. The Dutch reflexive agreement pattern for person mismatch coordinations thus provides additional evidence for the current analysis. Admittedly though, the case study of reflexive pronuns is not as convincing as the verbal agreement study in section 4.2, as it relies on indirect diachronic reasoning.

Overall, this section presented a morphological decomposition analysis for Germanic resolution patterns, without making reference to external resolution rules. Pursuing a binary feature system where person feature sets undergo set union and vocabulary insertion is guided by markedness, we predict that 2+3 and 1+3 conjunctions always display resolution to the highest person. Languages with clusivity will resolve 1+2 conjunctions to 1st person inclusive. Languages without clusivity neutralize 1st person

via an impoverishment rule, which in turn also accounts for resolution to 1st person in 1+2 conjunctions. The conjunction data in German and Dutch follow if we assume that in some languages morphological exponents necessarily make reference to unmarked features. This effectively derives the Germanic anomaly, that is the lack of resolution in 2+3 conjunctions. Crucially, the analysis presupposes that the underlying person feature system is binary, otherwise the unified feature set would not result in a context that makes agreement options possible in the first place.

5 Conclusion

This paper investigated the resolution patterns across Germanic languages, specifically German and Dutch which show a seemingly exceptional divergence from the standard resolution pattern. Conjunctions of a 2nd person and a 3rd person argument can trigger 2nd person or 3rd person agreement, suggesting that resolution has not taken place. The data indicate the requirement of an underlying binary person feature system and set union as the resolution mechanism at work in conjunctions. Agreement options with mismatched conjunctions cannot be derived in privative feature systems, where 3rd person is radically underspecified and thus does not contribute any subfeatures. Hence, privative systems undergenerate when it comes to the agreement patterns in German and Dutch. In contrast, binary features decompose 3rd person with negative subfeatures, which in turn can be referred to via vocabulary insertion. The analysis of the vocabulary items leaves room for underspecification so that not every agreement environment necessarily allows for agreement options. Future research will show whether more languages than so far attested show resolution patterns different from a strict hierarchy.

We further extend our proposal to languages which display strict resolution to the highest person. While this study focuses on Norwegian, Swedish, and Icelandic as examples for strict person hierarchies, there are in fact many more languages that follow this pattern (Zwicky 1977), as was indicated with our small comparative case study in section 3.2.1. The overall more dominant strict resolution patterns arise since morphological exponents universally show a strong bias to encode marked features, which are + for person (Nevins 2007, 2011b). This bias derives resolution towards participant features in 1+3 and 2+3 conjunctions, and resolution towards 1st person inclusive forms in 1+2 conjunctions. As for languages that lack a clusivity distinction, their morphological set-up involves an impoverishment rule which neutralizes clusivity in the 1st person, and which ultimately leads to 1st person agreement with 1+2 conjunctions.

Resolution hierarchies, thus, provide a unique window into the underlying feature system languages make use of. They serve as a useful tool, in addition to clusivity, PCC effects, and syncretisms, and should thus be taken into consideration. Above all, the current account contributes an important argument for the post-syntactic component of grammar (Halle and Marantz 1993, 1994) since morphological operations can manipulate morpho-syntactic feature bundles in areas such as resolution agreement where syntax proper is too restricted. The creation of unified feature sets takes place in the post-syntax via fusion. A prerequisite for fusion is a syntactic Agree operation which locates the person features of the conjuncts on a single head. Since vocabulary insertion

makes reference to fused feature bundles, it must be post-syntactic.

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