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Subject agreement in control and modal constructions in Russian Sign Language

Implications for the hierarchy of person features


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The present research combines three fields of inquiry in sign language linguistics: verbal agreement, person features, and syntactic complexity. These topics have previously been addressed in isolation, but little is known about their interaction. This study attempts to fill this gap by investigating subject agreement in complement clauses in Russian Sign Language. By means of corpus investigation and grammaticality judgments, I found that subject agreement in clausal complements of the control predicates TRY, LOVE, WANT, BEGIN, and modal CAN may be deficient – in particular, it can be reduced to the forms identical to first-person marking even in the case of a third-person subject controller. Deficient subject agreement in complement clauses is thus reminiscent of non-finite verbal forms in spoken languages. I further argue that the choice of first-person forms in deficient agreement reveals a default status of first person in sign languages, which is consistent with proposals regarding the modality-specific properties of first-person reference in these languages.


Keywords: verbal agreement, person feature, complement clause, control clause, finiteness, sign language, Russian Sign Language

1. Introduction

The present study investigates subject agreement in constructions involving control and modal predicates in Russian Sign Language (RSL). Verbal agreement – that is, the spatial modification of verbs to align with their arguments – is a hotly debated topic in sign language (SL) linguistics. Specifically, some scholars attribute modality-specific properties of SL agreement to an interface with gesture (Liddell 2003; Fenlon et al. 2018; Schembri et al. 2018), while others propose strictly grammatical solutions in an effort to offer a unified analysis for spoken

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and signed language agreement (Pfau et al. 2018; Oomen 2020). This study provides empirical evidence in favor of the grammatical nature of SL agreement by investigating its properties in the context of syntactic subordination. By applying grammaticality judgment tests in combination with corpus investigation, I found that agreeing verbs embedded under canonical control (e.g., WANT, TRY, LOVE, BEGIN) and modal (e.g., CAN) predicates may display a reduced paradigm of subject agreement. While subject agreement is observed to be obligatory in simple RSL sentences, embedded agreeing predicates often occur in first-person subject agreement forms even when the subject itself is not first-person. The phenomenon is therefore reminiscent of non-finite predicative forms in spoken languages, which also often lack subject agreement.

In this study, I propose a formal analysis of deficient subject agreement in control and modal constructions which attributes the observed agreement pattern to the properties of the person feature system in SLs. Specifically, I suggest that, unlike spoken languages, first person is a default person feature in SLs, and, therefore, surfaces as a last-resort option whenever true agreement is not possible (e.g., in non-finite contexts). This approach is also consistent with current proposals regarding the person feature system in SLs, which highlight the prominent role of the first-person reference in these languages.

The results of this study contribute to the understanding of such notions as agreement, person features, and (non-)finiteness within SLs and beyond. They also inform the discussion on finite control and raising constructions (often referred to as hyperraising) in spoken languages (e.g., Hebrew, Greek, Brazilian Portuguese), which remain challenging for existing formal approaches to control and raising.

The paper is structured as follows. In Section 2, I provide some background information on three research topics that are directly related to the focus of the study: the person feature system in SLs (Section 2.1), verbal agreement in SLs (Section 2.1), and subordination (Section 2.3). Then, I briefly discuss previous research on complement clauses in RSL (Section 2.4), which first revealed the deficient agreement patterns in control clauses, thereby providing the motivation for the current study. Section 3 presents the methodology of this study, namely, the grammaticality judgment experiment. In Section 4, I present the results of the experiment. First, I provide some evidence for obligatory subject agreement in simple sentences (Section 4.1). Next, I summarize the results on deficient agreement in control and modal constructions (Sections 4.2–4.5). Section 5 presents the main proposal of this study, a model of a person feature system specific to SLs (Section 5.1) and its application to control (Section 5.2) and modal constructions (Section 5.3). Further, I put agreement properties of syntactic subordination in RSL into a typological perspective. I show that comparable agreement patterns

can be found in spoken languages (Section 6.1), while the hierarchy of the person feature system in RSL seems to be unprecedented (Section 6.2). Section 7 concludes the paper.

2. Background

This study relates to several (morpho)syntactic domains of investigation: person feature system, verbal agreement, and syntactic subordination. Each of these topics has been explored in isolation in previous works, but the interaction between them has never been explicitly addressed. In this section, I first provide the relevant background on these topics for SLs. I end the section with a brief overview of the studies on complement clauses in RSL, which inspired the research questions put forward in this study.

2.1 Person feature system in sign languages

One of the most prominent modality-specific features of SL grammar is the use of space by mapping grammatical relations onto spatial relations. Here, I focus on the mechanisms of linking discourse referents to specific referential loci (R-loci) in the signing space (i.e., the space in front of the signer) (Lillo-Martin & Meier 2011). Roughly, once introduced in the discourse, a referent can be assigned a specific, though often arbitrary, locus in space. Further, the signer can refer back to the referent by pointing towards this established locus with an indexical (pointing) sign (glossed as IX) instead of repeating the corresponding lexical item. Such use of indexical pointing towards R-loci is very similar to pronominal reference in spoken languages (Friedman 1975). In fact, many scholars in sign linguistics draw an explicit parallel between pointing in SLs and pronouns in spoken languages, thus suggesting that both strategies consistently mark person features (Sandler & Lillo-Martin 2006; Meier & Lillo-Martin 2010; Fenlon et al. 2019). In many spoken languages, person features can be marked by the use of different lexical pronouns (e.g., English *I, you, he/she/they*), while in SLs, person is marked by the topographic region where the R-locus was established. Thus, the first person is typically associated with the body of the signer, while second and third person are located in the signing space in frontal and lateral regions, respectively.

Second and third persons in SLs are often grouped together as “non-first person” (Meier 1990; Lillo-Martin & Meier 2011). This approach is motivated by the observation that first person in SLs is fixed, as it always targets the body of the signer, while R-loci associated with third and second persons may rely on the actual position of the referents, and are thus variable. For instance, if the

second-person referent (i.e., the addressee) is not directly in front of the speaker, they would be associated with the locus corresponding to their actual, physical position, but, crucially, not with the frontal region, as would commonly be the case. Similarly, third-person referents present in the immediate environment of the signer are linked not to arbitrary loci in the lateral regions, but to the loci corresponding to their actual position in space. If the referents move, so do the loci. This sensitivity to the real-world environment can be related to what is conceptualized in spoken languages as a discourse context. In this vein, the first vs. non-first partition draws a parallel with the inherent indexicality of first and second person as opposed to unbound third person in spoken languages. While the reference of first and second person in spoken languages is generally context-bound (e.g., Benveniste 1966; Kaplan 1989), non-first person reference in SLs is also context-dependent in that it relies on the real-world environment. In order to facilitate cross-modal comparison, I use a tripartite system in this study which differentiates second person from third person. However, I come back to this and other modality-specific properties of the SL person feature system in Section 5.1.

2.2 Verbal agreement in sign languages: A modality-independent approach

Agreement in SLs is realized by modifying the direction of movement in verbal signs (Mathur & Rathmann 2012). Thus, in order to agree with its arguments, the movement path of the predicate is modified such that the start point coincides with the locus associated with the subject referent and the end point with the locus associated with the object referent.¹ An example of the RSL predicate *HELP* involving two agreement forms is given in Figure 1.^{2, 3} Figure 1a illustrates first-person subject and second-person object agreement, while Figure 1b illustrates third-person subject and object marking. Note that the handshape of the predicate and its localization relative to the signer's body stay the same.

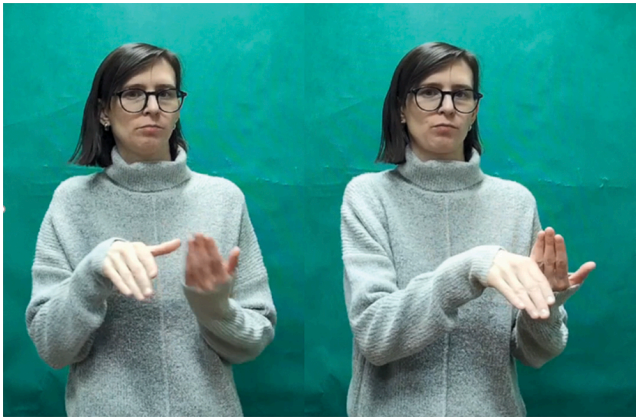
1. Some predicates are observed to employ the orientation of the palm or fingertips to agree with the object referent (Meir 1998), be it in combination with movement or by itself. In this study, I am not going to address agreement by orientation.

2. Notation conventions: Signs are glossed in SMALL CAPS. The gloss *IX* refers to a pointing sign, with subscript numbers referring to the person. In the gloss *IX_{3a/b}*, letter indices indicate contrasting ipsi- and contralateral directions of the pointing. The same system of number/letter indices is employed to specify subject/object agreement on the predicate. Thus, in ₁VERB₂, the first subscript indicates the person specification of the subject (object in backward predicates; see definition below), VERB is the lexical root of the predicate, and the second subscript indicates the person of the object (subject in backward predicates). Non-manual markers are placed above the glosses, with underscore showing their scope.

3. Unless specified otherwise, stills and videos are obtained from a deaf consultant.



a. $(IX_1)_1\text{HELP}_2 (IX_2)$



b. $(IX_{3a})_{3a}\text{HELP}_{3b} (IX_{3b})$

Figure 1. Two different forms of the RSL agreeing predicate *HELP* with the following meaning: (a) ‘(I) help (you)’; (b) ‘(He/she) helps (him/her)’

Verbal agreement in SLs displays a number of properties which distinguish it from canonical agreement patterns in spoken languages, although recent typological studies reveal that some, if not most, of these properties can be found in these languages as well (see Corbett (2006) for an overview; see Fedden (2019) for sporadic and optional agreement in spoken languages). First, agreement is overtly realized on only a subset of verb signs. These are referred to in the liter-

ature as agreeing predicates (or sometimes directional or indicating predicates).⁴ A second striking property of SL agreement is that among agreeing predicates, there is a number of so-called backward predicates (Friedman 1975; Padden 1988; Brentari 1998), in which the mapping of grammatical roles onto start/end point is reversed: the subject is marked at the end point of the movement, whereas the object is marked at the begin point. All other parameters align with common properties of regular agreeing predicates.

The final property of SL agreement deserving particular attention is that it is often observed to be optional. On the one hand, it has been reported for some SLs that subject marking may be dropped (see Padden (1988) for American SL (ASL); Engberg-Pedersen (1993) for Danish SL; Meir et al. (2007) for Israeli SL; Costello (2015) for Spanish SL, among others). On the other hand, for some SLs, it has been claimed that both object and subject agreement can be omitted (De Beuzeville et al. (2009) for Australian SL (Auslan); Legeland (2016) for Sign Language of the Netherlands (NGT); Fenlon et al. (2018) for British SL (BSL)). However, authors are not always clear about the exact form of the predicate in these cases. Notions such as “default agreement”, “unmarked agreement”, or “citation form” are often mentioned in this regard. Fenlon et al. (2018:85), for instance, define “citation form” for some BSL predicates as the forms which “begin at a location near the signer’s chest and end in the space immediately in front of the signer”. Notably, this description resembles the form in Figure 1a, that is, the form inflected for first-person subject and second-person object agreement. However, whether or not such citation or default forms are morpho-phonologically distinguishable from first-person subject agreement is not discussed in these studies. A notable exception is a seminal study by Bahan (1996) on agreement in ASL, where several arguments are provided against analyzing such forms as “citation”. He shows, for instance, that these forms feature full object and number agreement despite deficient subject agreement marking (see also Neidle et al. 2000).

There are also SLs for which agreement has been argued to be obligatory. A recent study by Oomen (2020), based on data from the German SL (DGS) corpus, showed that in many cases, the forms can be analyzed as congruent with full agreement for the syntactic context (i.e., the form for true agreement is the same as the default agreement form). If such forms are analyzed as expressing agree-

4. Oomen (2020), following Lourenço & Wilbur (2018), suggests that agreement properties can be distinguished not only in canonical agreeing predicates, but also in those that do not have a movement and/or orientation component, that is, in predicates that would traditionally be considered plain. According to Oomen (2020), overt agreement in plain predicates is blocked phonologically but remains relevant for an explanation of such grammatical phenomena as argument omission.

ment, agreeing predicates in DGS appear to almost always exhibit full agreement with their arguments. In what follows, I am going to suggest that RSL is also an example of a SL with obligatory agreement in the main clause.

The optionality of agreement reveals two points of divergence between spoken and sign languages. First, agreement in spoken languages (if it is marked at all) is almost always obligatory unless a particular syntactic environment (e.g., subordination) disallows it. Second, across spoken languages with verbal agreement, the subject is more likely to be marked than the object (Keenan 1976; Lehmann 1988).

The modality-specific properties we addressed here – existence of verb classes and backwards verbs, optionality of agreement, and priority of object over subject marking – raise the question whether SL agreement is actually a syntactic phenomenon akin to spoken language agreement. The debate is still ongoing, with proposals ranging from accounts that assign an important role to an interface with gesture (Liddell 2003; Fenlon et al. 2018; Schembri et al. 2018) to modality-independent syntactic accounts (Brunelli 2011; Pfau et al. 2018; Oomen 2020). In addition, there are hybrid approaches which argue for an interaction between syntactic and semantic components (Meir 2002; Bos 2017[1998]), as well as an analysis that argues for the cliticization of pronominal pointing (Nevins 2011).

The present study cannot do justice to all these approaches; rather, I focus on the modality-independent account proposed by Pfau et al. (2018). The benefit of this analysis is that it applies the same feature-checking mechanism that is widely used in studies of spoken language agreement couched within Minimalism (cf. Chomsky 2000 and subsequent works). Let us illustrate the mechanism involved in subject agreement by means of the representation in Figure 2:

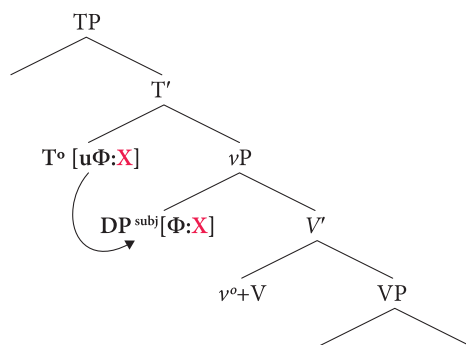


Figure 2. Subject agreement via feature-checking; adapted from Pfau et al. (2018)

The T(ense) head enters the derivation with unvalued uninterpretable phi-features $[u\phi:]$ and probes into its c-commanding domain for an element bearing

interpretable phi-features, which is often a subject Determiner Phrase (DP) in Spec, vP. The subject DP is known as the controller in the agreement relationship (not to be confused with control constructions; see Section 2.3). Once the controller is found, T and the subject enter into an Agree relation by virtue of T checking its uninterpretable feature against the interpretable feature of the controller. At the level of Phonological Form (PF), the result of feature-checking between T and the DP in subject position is realized as a subject agreement morpheme in line with standard assumptions of Distributed Morphology (Halle & Marantz 1993). The same rationale usually holds of object agreement, which is hosted by little v and checks its values against the object DP. It should also be pointed out that there are some syntactic contexts where the verb does not receive subject agreement. For instance, in non-finite clauses, the T head is often incapable of checking its phi-features, which results in infinitival predicative forms, as, for instance, English *to*-infinitives (cf. Noonan 2002).

Pfau et al. (2018) extended the above model to SL agreement by drawing the parallel between agreement affixes in spoken languages and the begin and end points of the verb's movement in SLs. Thus, apparent surface differences notwithstanding, both signed and spoken languages operate by the same underlying structure responsible for agreement patterns. Importantly, all modality-specific properties of SL agreement mentioned above receive a modality-independent treatment under this approach.

2.3 Subordination in sign languages and beyond

2.3.1 *Subordination in spoken languages*

Syntactic subordination is concerned with constructions involving two or more clauses (i.e., two or more TPs), where one of the clauses is structurally subordinate to the other. There are several types of subordinate clauses (e.g., adverbial clauses, relative clauses) but this study focuses on complement clause constructions. In these sentences, the subordinate clause occupies the structural position of the complement of the matrix predicate. Some English examples are given in (1), where the complement clauses are in square brackets.

- | | | |
|-----|---|-----------------------------------|
| (1) | a. John wants [to help his friend] | <i>subject control</i> |
| | b. John seems [to be a nice person] | <i>subject-to-subject raising</i> |
| | c. John thinks [that his friend needs help] | <i>full finite CP</i> |

The sentences in (1) show that complement clauses can be non-finite (1a, b) or finite (1c). The principal difference here is that the subordinate clause in (1c) is complete in that it contains all the functional categories a main clause would require. What marks it as a subordinate clause is the complementizer *that*. The

subordinate clauses in (1a, b) are, however, non-finite, which is indicated by (i) *to* heading a non-finite TP, (ii) the absence of Tense-Aspect-Mood (TAM) morphology on the embedded predicate, and (iii) the absence of subject agreement.

In sentences (1a, b), the embedded non-overt subject is coreferential with the subject of the matrix clause, that is, *John*. Although being superficially very similar, (1a) and (1b) differ in terms of the argument structure of the matrix predicate. In control constructions like the one in (1a), the subject *John* receives its theta-role from the matrix predicate *want*, while in the raising construction in (1b), the matrix predicate *seem* does not assign a subject theta-role although *John* occupies its subject position. This assumption receives support from the fact that expletive *it* can be used in place of *John* – for example, *It seems that John is a nice person*. In both (1a) and (1b), the referent of *John* is also the subject of the embedded predicate, although the latter has no overt subject. While most scholars agree that (1b) involves movement of the embedded subject DP into the matrix subject position, the analysis of (1a) is debated. Under the Movement Theory of Control (MTC) assumed in this study, it is suggested that both control and raising result from movement (Boeckx et al. 2010; Hornstein & Polinsky 2010). However, the kind of movement involved differs with regard to the structural position it targets, that is, a theta-position (i.e., Spec, vP) in control constructions, but a non-theta-position (Spec, TP) in raising constructions. More details on MTC are given in Section 5.2. Another way to link the two subjects in (1a) is to assume that the embedded clause contains a null pronoun PRO, whose reference is controlled by the matrix subject (see Landau (2013) and references therein).

The examples in (1) reveal that complement clauses come in various types. Likewise, languages differ greatly in terms of how they build complement constructions (see Noonan (2002) and Cristofaro (2003) for typological overviews). What is relevant for the present study is how languages differ in terms of those functional categories that are overtly realized on the embedded predicate. As mentioned above, non-finiteness is often associated with the absence of certain TAM categories on the verb as in (1a, b). However, there are languages which mark Tense and/or Aspect on infinitives (e.g., Greek; Joseph 1983). The lack of subject agreement is not universal either, as evidenced by Greek finite control in (2), where the embedded predicate *divasi* ‘reads’ is inflected for subject agreement.

- (2) I Maria prospathise na divasi
 the Maria try.PST.3SG SUBJ read.3SG
 ‘Maria tried to read.’ (Greek, adapted from Terzi 1997)

More examples of subject agreement in finite control and raising constructions will be given in Section 6. Here, it suffices to conclude that the notion of finiteness is expressed differently across languages. What seems to be a general tendency,

however, is that non-finite clauses involve fewer functional categories (i.e., less structure) than main clauses.

Apart from clausal subordination, non-finiteness is often discussed in relation to constructions involving modal predicates such as *must*, *can*, or *should* in English – for example, *John must/can/should help his friend*. These constructions receive different types of analyses. In many languages (e.g., Germanic, Romance), modal predicates are analyzed as T heads, hence auxiliary elements (Roberts & Roussou 2003), or as heads of a dedicated ModP projection within the extended TP (Cinque 1999). In both cases, modals take over the realization of TAM and subject agreement features (often covertly), while the lexical predicate remains uninflected. Crucially, this family of analyses implies that constructions with modals are mono-clausal. However, an alternative approach, assumed in this paper, suggests that modal constructions are better analyzed as bi-clausal, that is, as involving subject-to-subject raising (cf. Wurmbrand 1999). The advantage of this analysis is that it takes into account widely-attested similarities between embedded predicates in non-finite complement clauses and non-finite lexical verbs in modal constructions.⁵

2.3.2 Subordination in sign languages

Unlike agreement, subordination in SLs has not received much attention until recently. This is probably due to the fact that SLs generally feature a limited inventory of functional elements and manual subordination markers (Pfau et al. 2016). For example, most SLs do not consistently employ subordinating conjunctions like English *that*. In terms of non-finite clauses, the research is complicated by the absence of consistent morphosyntactic Tense marking on main clause predicates. If Tense is not present in the matrix clause, then its absence in a (potentially) subordinated clause is not informative. Nevertheless, there are ways to demonstrate syntactic subordination in SLs. For instance, it can be probed by various syntactic tests previously established on the basis of spoken language data. These may target various extraction patterns (e.g., topicalization) permitted in complement clauses, but disallowed in non-subordinate complex clauses, such as coordinate clauses (cf. Padden (1988) for American SL; van Gijn (2004) for NGT; Geraci & Aristodemo (2016) for Italian SL (LIS); Hauser (2020) for French SL (LSF)). example (3) from ASL illustrates that topicalization out of one clause only is possible in complement clauses (3a), whereas in coordinated clauses, it is judged as

5. For the sake of conciseness, I narrow the focus of the present investigation to deontic modality (i.e., associated with obligation, permission, and necessity), while epistemic meaning of modals is excluded.

ungrammatical (3b) (the underscore marks the underlying position of the topicalized constituent).

- (3) a. ^{top}
 TICKET₁ INDEX₁ TELL₂ GIVE₃ —_i
 ‘Those tickets, I told you to give to him.’
- b. ^{top}
 *MOTHER₁ HIT₃ SISTER INDEX₃ TATTLE₃ —_i
 ‘His mother, I hit my sister and he told.’
- (ASL, adapted from Padden 1988: 91–93)

Within complement clauses, different types can be distinguished based on the position of the sentential complement in the main clause. Thus, in some SLs, control complement clauses can be centrally embedded, while canonical finite complement clauses are usually sentence-final even in consistently head-final SLs, as is illustrated by the LIS examples in (4) (put forward in Geraci et al. (2008); see Göksel & Keleşir (2016) for a similar observation for Turkish SL).

- (4) a. GIANNI [COW MILK] TRY
 ‘Gianni tried to milk the cow.’
- b. ^{brow raise}
 GIANNI TELL [PIERO BIKE FALL]
- c. *GIANNI [PIERO BIKE FALL] TELL
 ‘Gianni said that Piero fell off the bike.’
- (LIS, Geraci & Aristodemo 2016: 103–105)

Constructions with modals have been described for a handful of SLs, including Brazilian SL (Ferreira Brito 1990), ASL (Wilcox & Wilcox 1995), Taiwan SL (Smith 1989), NGT (van Bedem 2006; Brunelli 2011; Klomp 2021), Catalan SL (LSC, Pfau & Quer 2007), LIS (Brunelli 2011), and DGS (Pfau & Quer 2007; Bross 2020). These studies provide descriptive and theoretical accounts of semantic and syntactic properties of modal predicates. In general, modal predicates in SLs often occupy a clause-final position (e.g., in DGS and LSC); yet, in some SLs, they may also precede the lexical predicate or be doubled in pre- and postverbal positions. example (5) illustrates all three options for ASL.

- (5) a. TELEPHONE NUMBER WOMAN ₃GIVE₁ SHOULD IX₃
 ‘The woman should give me the telephone number.’
- b. TELEPHONE NUMBER WOMAN SHOULD ₃GIVE₁ IX₃
 ‘The woman should give me the telephone number.’
- c. IX₁ MUST WIN RACE MUST IX₁
 ‘I must win the race.’
- (ASL, adapted from Wilcox & Wilcox 1995: 140)

While most of the above-mentioned studies are descriptive, those which do propose a formal analysis of modal constructions treat them as mono-clausal. Specifically, Brunelli (2011) regards modals as heads of a dedicated MoodP, while Pfau & Quer (2007) consider them as TP heads. As mentioned above, the present study assumes a different approach, suggesting that modal constructions are in fact a particular case of subject-to-subject raising (see Section 5.2 for details).

Taken together, research provides sufficient empirical evidence for distinguishing various classes of subordinate structures in SLs. At the same time, many details remain understudied, one of which is the link between verbal agreement and subordination. As mentioned before, control constructions in spoken languages are often associated with non-finite T, which does not enter into an Agree relation with the subject. Similarly, the use of modal predicates is also observed to co-occur with non-finite forms of a lexical predicate. Subject agreement is consistently marked at least on some predicates in some SLs (such as DGS and, as will be illustrated below, RSL), which allows us to study subject agreement in canonical non-finite contexts such as control and modal constructions. This paper presents such an attempt based on the investigation of complement clauses in RSL.

2.4 Complement clauses in Russian Sign Language

In her research on complement clauses in RSL, Khristoforova (2020) describes the basic morphosyntactic properties of these constructions. The study combines corpus investigation and grammaticality judgments targeting various morphosyntactic properties of different types of complement clauses. Those details that are directly relevant to the analysis of deficient agreement will be addressed when I present the results of the current study in Section 4. Here, I briefly review those findings that inspired the research on deficient agreement in subordinate clauses in RSL in the first place.

RSL has two types of complement clauses: full CP complements (6a) and control clauses (6b–c).

- (6) a. IX₁ THINK [WHAT WOMEN_{3a} COME₁]
 ‘I thought that the women would come to me.’
 b. WANT [WIFE₁ GIVE_{3a} BEAUTIFUL FLOWER]
 ‘(He) wants to give beautiful flowers to his wife.’
 c. CAT [CANARY EAT] WANT
 ‘The cat wants to eat the canary.’

Full CPs as in (6a) often have overt subjects, which may or may not be co-indexed with the matrix subject. In addition, full CP complements are often introduced by an optional complementizer sign *WHAT*, a typologically unusual pattern for

complement clauses in SLs.⁶ If the full complement clause contains an agreeing predicate, its subject agreement paradigm is intact, meaning the predicate agrees with the subject in person features as it would in the matrix clause. By contrast, control clauses have covert subjects co-referential with the matrix subject and exhibit a limited paradigm of subject agreement, which is reduced to the predicative form identical to first-person subject marking, as is evident in (6b). Thus, even though the subject is third-person, the movement of the verb starts close to the signer's body as if it was first-person marking, hence the subscript "1". Control clauses and full CPs also differ in their structural properties in that control constructions generally allow their complement clause to be centrally embedded, as in (6c), while full CP complements are almost always sentence-final. Finally, these two types of complement clauses differ in terms of which semantic classes of predicates can introduce them: achievement (TRY), desiderative (WANT), and commentative (LIKE, LOVE) predicates usually take control clauses, while knowledge (KNOW), propositional attitude (THINK), and utterance (SAY) predicates take full CPs.

The results in Khristoforova (2020) thus support the distinction of two classes of complement clauses in RSL. The crucial evidence comes from structural and lexical differences between the two classes, with one of the properties, that is, a reduced paradigm of subject agreement in control clauses, being particularly reminiscent of morphosyntactic marking of non-finiteness in spoken languages. The present study zooms in on this property of control clauses, extending it to modal constructions. The main goal of this research is to probe further into this phenomenon and to propose a formal account that not only fully embraces modality-specific features of SL agreement and subordination but also captures modality-independent aspects of the phenomena in focus.

3. Methodology

The present study is based primarily on grammaticality judgment tasks. Corpus data from the on-line RSL corpus (<http://rsl.nstu.ru/>; Burkova 2012) was also

6. The sign WHAT also functions as an interrogative in RSL, hence the gloss (Khristoforova 2020). Both anonymous reviewers noted that example (6a) might also be analyzed as a question-answer pair (QAP) (i.e., [IX₁ THINK WHAT?] [WOMEN_{3a} COME₁]). QAPs are complex constructions employed in many SLs to separate the focus from the presupposed information on a par with spoken language cleft constructions (Wilbur 1996). Khristoforova & Kimmelman (2021) found that QAPs in RSL are often marked with a specific set of non-manual markers (eye gaze shift, head and body leans, and turns), none of which is present in (6a) and similar examples. Hence, a QAP analysis of (6a) is rather unlikely.

investigated but, due to the limited size of the corpus, control and modal constructions with agreeing predicates were sparse and unbalanced in terms of person features. Whenever relevant, I supplement experimental data with corpus findings.

The grammaticality judgment experiment consisted of two rounds: a pilot round and a main round. The pilot round served to verify that the peculiar first-person agreement in control clauses, as in (6b), is not an artifact of a corpus methodology, but can also be obtained in a judgment experiment. This pilot study implemented a simplified research protocol and examined only a limited number of conditions as explained in Section 3.3. The pilot confirmed the predictions concerning agreement patterns in control constructions, which made it possible to conduct a more formal and extensive experiment (henceforth main round) following the state-of-art practices adopted in SL linguistics (see Section 3.3 for details). Results of the main round reported in Section 4 are consistent with the findings of the pilot. However, to avoid collapsing different experimental procedures, in Section 4, we do not report details of the pilot, and focus on the main results instead.

3.1 Participants

In total, eight deaf native RSL signers participated in the experiment: six signers participated in the pilot round and four in the main round, including two signers participating in both rounds. One of the participants of the pilot round acted as a consultant in the main round. All signers were born to deaf parents and are active members of the Deaf community in Russia. The relevant sociolinguistic information is given in Table 1.

Table 1. Sociolinguistic profile of participants and participation (on-line or on-site) in the two experimental rounds

Signer	Gender	Age	Region	Pilot round	Main round
1	female	40	Moscow	on-line	consultant
2	female	38	Moscow	on-line	on-site
3	male	41	Saint Petersburg	on-line	on-line
4	male	50	Moscow	on-line	–
5	female	32	Moscow	on-line	–
6	female	36	Moscow	on-line	–
7	female	60	Moscow	–	on-site
8	female	44	Kovrov	–	on-site

3.2 Stimuli

Grammaticality judgments were collected using pre-recorded signed stimuli. The stimuli for the pilot were recorded by the author, a hearing L2 signer, which may not be an ideal experimental set-up for a SL study, yet was considered adequate for a pilot. The stimuli for the pilot study consisted of the deficient and full agreement forms of three different agreeing predicates in combination with three different control predicates, thus making them identical to set III described in detail below. Within the same experiment, stimuli involving different RSL constructions (classifier constructions; see Zwitserlood 2012) were included and acted as fillers for the target stimuli.

Once the data obtained from the pilot round had been analyzed and the expectations regarding agreement patterns in control clauses had been confirmed (see details below), the stimuli for the main round were designed and recorded from a native RSL signer.

The stimuli for the main round were composed of six sets targeting different conditions (72 stimuli in total). For each of the conditions within the sets I–VI, three stimuli were included with different agreeing predicates. Agreeing predicates for the test were chosen such that they (i) consistently agree with both the subject and object, (ii) are quite frequent (judging by the corpus), and (iii) do not involve iconic handshapes (e.g., handling or entity classifier handshapes). The latter criterion was used in order to avoid a confusion between genuine agreeing verbs and predicates of other types, such as spatial and classifier predicates (Padden 1988). Where the context permitted, the same agreeing predicates were used throughout all sets of stimuli. The agreeing predicates used in the experiment are: HELP, HEAL, VISIT, CALL.BY.PHONE, TEACH, PAY.ATTENTION, TAKE.PHOTO (backward), DISTRACT (backward), BORROW (backward).

I. *Baseline incorrect sentences*

This set consists of simple transitive sentences containing agreeing verbs, which are deliberately wrongly inflected for verbal agreement. An example of a baseline stimulus is presented in (7a), where the subject TEACHER and the object BOY are third-person, while the verb HELP is inflected for a first-person subject and second-person object as indicated by indices. In (7b), the reverse ungrammatical pattern is used.

- (7) a. TEACHER IX_{3a} BOY IX_{3b} $HELP_1$
 ‘The teacher helps the boy.’
 b. IX_1 IX_2 $HELP_{3a}$
 ‘I help you.’

These stimuli were included in order to provide a baseline for the target stimuli. The set contains ungrammatical stimuli for the four agreeing predicates *HELP*, *HEAL*, *VISIT*, and *TEACH* in two forms represented in (7a), thus yielding eight negative baseline stimuli.

II. Agreement in simple clauses

These are simple transitive clauses with an agreeing predicate presented in two conditions: (i) subject agreement is full (i.e., matching the subject, which is third-person) as in (8a), or (ii) subject agreement on the verb is deficient (i.e., identical in form to the first-person value) as in (8b). The example stimuli in (8) contain a lexical third-person subject and object, both localized in the signing space by the pointing signs IX_{3a} and IX_{3b} , respectively.^{7 8} (8a) presents full third-person agreement for the subject and object. In (8b), object agreement also matches the locus introduced for the object *BOY*. Subject agreement, however, is identical to first person, thus mismatching the true person value of the subject *TEACHER*.

- (8) a. *TEACHER* IX_{3a} _{3a} *HELP* _{3b} *BOY* IX_{3b}
 b. *TEACHER* IX_{3a} ₁ *HELP* _{3b} *BOY* IX_{3b}
 ‘The teacher helps the boy.’

The sign order of the stimuli is SVO following observations made by Kimmelman (2012) on basic sign order in RSL.⁹ Stimuli such as the one in (8a) with full subject agreement were used to confirm that the verbal sign can agree with both the subject and object. This is important, as predicates involving partial agreement (“hybrids” in Oomen (2020)) exist. These readily agree with their object but remain body-anchored with respect to the starting point of the movement

7. With the exception of stimulus set VI, where some of the objects are inanimate, all stimuli included animate subject and object arguments.

8. Indexical determiner signs are incorporated in the stimuli in order to establish the localization of a referent in signing space. Thus, the observed agreement patterns cannot be attributed to the indefiniteness of the arguments. At the same time, the distribution of the determiners in RSL has never been systematically investigated. In this regard, I follow advice provided by my RSL consultant while constructing the stimuli. In the following examples, the indexical determiners can follow or precede the nominal sign. Although it does not seem to affect the agreement patterns, it remains unclear whether the position of determiners is freely variable.

9. Although agreeing predicates appear to favor SOV in many SLs (Napoli & Sutton-Spence 2014), Kimmelman (2012) observed that agreeing predicates in RSL favor SVO, although other factors (e.g., reversibility of the event, syntactic complexity of the object, and aspectual marking) also play a role. Throughout the experiment, none of the participants proposed corrections for sign order in the stimuli, which proves that this parameter is orthogonal to the present investigation.

(cf. Oomen (2020) and references therein). Thus, if (8a) were judged unacceptable, the stimulus would have been excluded. The stimulus in (8b) targets the grammaticality of deficient subject agreement in a simple sentence. If the agreement pattern in (8b) was acceptable in a simple clause, then deficient subject agreement could not be attributed to syntactic subordination.

The set features two agreement conditions, deficient and full agreement, and the three agreeing predicates *HELP*, *HEAL*, and *TEACH*, which yields six stimuli in total.

III. *Deficient vs. full subject agreement in control complement clauses*

These stimuli involve sentences with agreeing verbs embedded under control predicates representing desiderative (*WANT*), achievement (*TRY*), and commentative (*LOVE*) semantic classes. All three predicates were found in the corpus to select for complement clauses with a null subject controlled by the matrix subject. All stimuli in this set were presented both with deficient (9a) and full subject agreement (9b). In all these cases, the relevant arguments were third-person.

- (9) a. BOY IX_{3a} WANT ${}_1$ HELP ${}_3b$ IX_{3b} FRIEND
 b. BOY IX_{3a} WANT ${}_3a$ HELP ${}_3b$ IX_{3b} FRIEND
 ‘The boy wants to help a friend.’

These stimuli target the grammaticality of deficient subject agreement in control complement clauses, which is the focus of this study. The set features the same two agreement conditions as set II for three different agreeing predicates embedded under the control predicates *WANT*, *LOVE*, and *TRY*. In total, the stimulus set includes six conditions and eighteen stimuli.

IV. *Deficient vs. full subject agreement in constructions with modal and phasal predicates*

In this set, deficient agreement was examined for predicates embedded under modal *CAN* and the phasal predicate *BEGIN*.¹⁰ The set was designed according to the schema in set III: all sentences were presented in deficient (10a/11a) and full subject agreement conditions (10b/11b). In addition, in order to exclude the

10. The term “phasal” refers to a semantic class of complement-taking predicates specifying the phase of an event or an act (e.g., its beginning or ending) (Noonan 2007). As this type of predicates is sometimes analyzed on a par with modal auxiliaries (i.e., as heading dedicated projections in an extended TP (Cinque 1999)), the phasal predicate *BEGIN* was initially anticipated to pattern together with modal *CAN*, hence included in the same stimulus set. Experimental results, however, revealed that *BEGIN* patterns together with control predicates and is further analyzed as such.

potential effect of different object positions, the object referent was introduced in a preceding sentence, while in the target embedded clause, it was dropped.¹¹

- (10) a. POSS₁ BROTHER IX_{3b} DIFFICULT MATH // TEACHER IX_{3a} CAN₁HELP_{3b}
 b. POSS₁ BROTHER IX_{3b} DIFFICULT MATH // TEACHER IX_{3a} CAN_{3a}HELP_{3b}
 ‘My brother finds math difficult, (but) the teacher can help him.’
- (11) a. GIRL IX_{3b} EVENING HOME COME NOT // MOTHER POSS_{3b} BEGIN₁CALL_{3b}
 b. GIRL IX_{3b} EVENING HOME COME NOT // MOTHER POSS_{3b} BEGIN_{3a}CALL_{3b}
 ‘The girl is not coming back home in the evening. Her mother starts to call her.’

Similar to stimulus sets II and III, set VI contains two agreement conditions for three agreeing predicates. In this set, they are embedded under two matrix predicates thus resulting in four experimental conditions and twelve stimuli in total.

V. *Subject agreement in constructions with first-person embedded object*

This set contains sentences where the embedded object is a first person.¹² In this context, I expect (deficient) first-person subject marking on the predicate as in (12a) and (13a) to be blocked for two reasons: (i) unlike subject agreement, object agreement is expected to always match the locus assigned to the object, which will correspond to the signer’s body in this context, and (ii) marking first-person agreement for both the subject and object is phonologically constrained (leaving aside reflexive forms). If this prediction is borne out, the next logical question is what forms the embedded subject agreement would take in the context of first-person object marking. Two options are examined: (12b) and (13b) represent full agreement with third-person subject and first-person object; (12c) and (13c) display second-person subject marking on the embedded predicate, thus mismatching the third person of the subject.

- (12) a. IX₁ MATH DIFFICULT // TEACHER IX_{3a} CAN₁HELP_{3b/2}
 b. IX₁ MATH DIFFICULT // TEACHER IX_{3a} CAN_{3a}HELP₁
 c. IX₁ MATH DIFFICULT // TEACHER IX_{3a} CAN₂HELP₁
 ‘I find math difficult, (but) the teacher can help me.’

11. The object drop was implemented with CAN and BEGIN but not with WANT, TRY, and LOVE to make the results of the main round comparable to the pilot round, where the latter group of predicates was examined without object drop. As shown in Section 4.3, constructions with BEGIN further proved to pattern with the predicates WANT, TRY, and LOVE in terms of agreement patterns in the embedded clause and can thus be treated as control constructions. Accordingly, in this set of stimuli, the class of control predicates is represented by the predicate BEGIN.

12. First-person objects were tested for CAN and BEGIN, but not for the control predicates WANT, TRY, and LOVE. We can, however, take BEGIN as an example of control predicates since it aligns with all other control predicates (see also footnote 10).

- (13) a. TIME EVENING IX₁ HOME COME NOT // MOTHER BEGIN₁ CALL_{3a/2}
 b. TIME EVENING IX₁ HOME COME NOT // MOTHER BEGIN_{3a} CALL₁
 c. TIME EVENING IX₁ HOME COME NOT // MOTHER BEGIN₂ CALL₁
 ‘I am not coming back home in the evening. My mother starts to call me.’

In contrast to previous sets, this one contains not two but three agreement conditions: first-, second-, and third-person subject agreement forms in combination with first-person object agreement. In addition, the set features two matrix predicates and three agreeing predicates, hence six conditions and eighteen stimuli in total.

VI. *Deficient vs. full subject agreement in impersonal constructions with modals*

A corpus search revealed that modal CAN may occur in impersonal constructions, which was not attested for control predicates. The goal of this stimulus set is to examine how subject agreement behaves in the context of impersonal constructions with CAN. To make the impersonal construction more natural, it was incorporated into a conditional sentence thus providing the context. An example stimulus is given in (14). Note that BORROW is a backward agreeing predicate, and therefore, the first subscript in the glosses corresponds to the object locus (i.e., the car), while the second subscript corresponds to the subject marking (i.e., deficient first person in (14a) and full third person in (14b)).

- (14) a. $\frac{\text{brow raise}}{\text{CAR NEED}} // \text{CAN}_{3b} \text{BORROW}_1$
 b. $\frac{\text{brow raise}}{\text{CAR NEED}} // \text{CAN}_{3b} \text{BORROW}_{3a}$
 ‘(If) one needs a car, one can borrow it.’

This set includes two agreement conditions for the five agreeing predicates HELP, HEAL, BORROW, UNDERSTAND, and TAKE.PHOTO, all embedded under modal CAN. This more extensive list of lexical predicates serves to avoid the risk of semantic rather than grammatical unacceptability, given that impersonal constructions are more lexically constrained. Thus, for this set, there were two conditions and ten stimuli in total.

3.3 Procedure

The pilot and the main round of experiments were carried out with a four-month interval between the rounds. Due to the COVID-19 outbreak in March 2020, the pilot was conducted on-line via video call in Zoom. Except for one experimental session, the main round was carried out on-site. As mentioned in the previous

section, stimulus set III was used in both rounds, although the pilot round made use of stimuli recorded from a non-native signer. Comparison of the estimated scores for stimulus set III between the pilot and main rounds revealed very small differences (0.04 for the deficient condition and 0.1 for the full agreement condition). This suggests that the non-native production in the pilot stimuli had no effect on ratings, but no methodological generalizations can be made due to the small scale of the study. For the sake of coherence, the numeric results reported in Section 4 are for the main round of the experiment only.

For both rounds, stimuli were presented using jsPsych library (de Leeuw 2015), a set of tools which allows for the creation of an on-line questionnaire using JavaScript and HTML. JsPsych is convenient for various reasons, the most relevant of which are customized randomization and representation of the video stimuli. Thus, each participant received their own order of the stimuli, randomly assembled by the jsPsych engine. During the on-line experiments, participants went through the questionnaire while being on a Zoom video-call with the research assistant. During on-site sessions, on the other hand, the participants filled in the questionnaire using a laptop. This way, the difference between the two modes of data collection was minimized.

Each experimental session followed the same procedure. All sessions were recorded: off-line sessions were recorded via a camera, on-line sessions were recorded via the screen-recording function in Zoom. Before each experimental session, participants signed a consent form and filled in a background questionnaire. They also received instructions in RSL about the procedure. Once the participant had indicated that the procedure was clear, the experiment began. First, participants were asked to watch a video clip with a signed stimulus; they were free to replay the video as many times as they wanted. Then, they were asked to replicate the stimulus as accurately as possible. All participants were forewarned that the stimuli might be deliberately incorrect, but were instructed to nevertheless replicate even the incorrect stimuli as they were presented. The repetition of the stimuli is meant to prevent signers from giving inflated scores, which was previously observed in experiments with passive observation instead of repetition (Neidle et al. 2000; Kimmelman 2021). To avoid biasing participants towards a particular assessment strategy, repetitions were also implemented for the baseline incorrect stimuli. The obtained replications were further examined for accurateness.

Next, participants were asked to evaluate the grammaticality of each stimulus on a 5-point Likert scale, where “0” meant “strongly incorrect” and “4” “well-formed”. Finally, if the score was below “4”, participants were encouraged to explain the source of ungrammaticality and to propose a correct version. In total, each session lasted approximately 60–90 minutes.

3.4 Statistical analysis

Only the results obtained in the main round were considered for the statistical analysis. For each condition, mean scores were calculated using *lme4* package (Bates et al. 2015) in R (R Core Team 2016). Where applicable, the mean scores for different conditions were contrasted against each other with the use of mixed effects linear regression in order to determine whether the effect produced by a specific condition was statistically significant. The models were structured as follows: $score \sim condition + (1|participant)$, where *score* is a dependent variable (i.e., the scores given by participants), *condition* is a fixed independent variable (e.g., type of the matrix predicate (if present) or type of the agreement pattern on the agreeing predicate); $(1|participant)$ stands for a random intercept for the participants. When clauses introduced by different predicates were grouped together (as in stimulus set III), a random intercept for matrix predicates ($(1|matrix_v)$) was also added. The p-values were obtained by using *tab_model* function from *sjPlot* package (Lüdtke 2021).

For each model, assumptions for the use of mixed-effect models were checked, namely assumptions of linearity, homogeneity of variance, and normal distribution of residuals. Respective calculations are given in the supplementary materials for each model (see below). It is important to note that not for all models, assumptions were met, which means that the use of inferential statistics for the respective subsets of data may be inadequate. This is not unexpected given the small number of participants. The results of those models that do meet the assumptions outlined above are reported in the Results section. Nevertheless, I acknowledge that the number of participants in this study does not allow for a fully-fledged implementation of inferential statistics, which, however, does not undermine its empirical contribution.

As often happens when a Likert scale is used, individual participants may interpret the scale in slightly different ways: some participants are reluctant to give low scores, while others may avoid the middle portion of the scale limiting their answers to “0” and “4”. In order to prevent different interpretations of the scale, z-standardization was implemented, which makes the results from the different participants comparable with each other (cf. Schütze & Sprouse 2014). Further analysis, however, revealed that although z-standardization slightly improved the overall distribution of scores, the observed effects and their statistical significance or lack thereof remained the same. In other words, most participants interpreted the scale in a similar way. Thus, for the sake of clarity, mean scores without standardization are presented throughout the paper. Whenever relevant, mean scores are supplemented with the plots representing the distribution of z-scores for different conditions.

Supplementary materials, i.e., the raw data in .csv format and the implemented R script, are available on the OSF public repository: <https://osf.io/avyd7/>. A more detailed output of the statistical modeling both for original and z-scores, including estimates, standard error, 95% confidence, and p-values, is given in these supplementary materials.

4. Results

This section is structured following the order of stimulus sets II–VI outlined in Section 3.2. Ungrammatical control stimuli presented in Section 3.2 (set I) received the lowest mean score of 0.47 on the 0–4 scale. This is crucial, as it indicates that all participants are very much aware of agreement violations.

4.1 Agreement in non-embedded contexts

Grammaticality judgments revealed that subject agreement is obligatory in simple transitive sentences in RSL. Thus, a stimulus with deficient subject agreement (i.e., a form identical to first-person agreement) was judged as ungrammatical if the subject was third-person, as in (15).¹³

- (15) *TEACHER IX_{3a}₁ HELP_{3b} BOY IX_{3b}
 ‘The teacher helps the boy.’

The mean score for this type of deficient subject agreement is 1.4 points, while the counterpart with full agreement received a mean score of 3.5. Full subject agreement receives a significantly higher score ($p < 0.001$). The distribution of z-scores is shown in Figure 3.¹⁴

13. The star symbol ‘*’ denoting ungrammaticality is assigned to items that received a score below 2. It must be noted that none of the experimental conditions scored as low as the baseline incorrect sentences.

14. Henceforth, we use violin plots to visualize the distribution of the z-scores. Wider sections of the plot represent the higher density of scores falling within the respective region of continuous z-scores on the y-axis. Different conditions are categorically distributed on the x-axis and are color-coded. Dots represent individual responses.

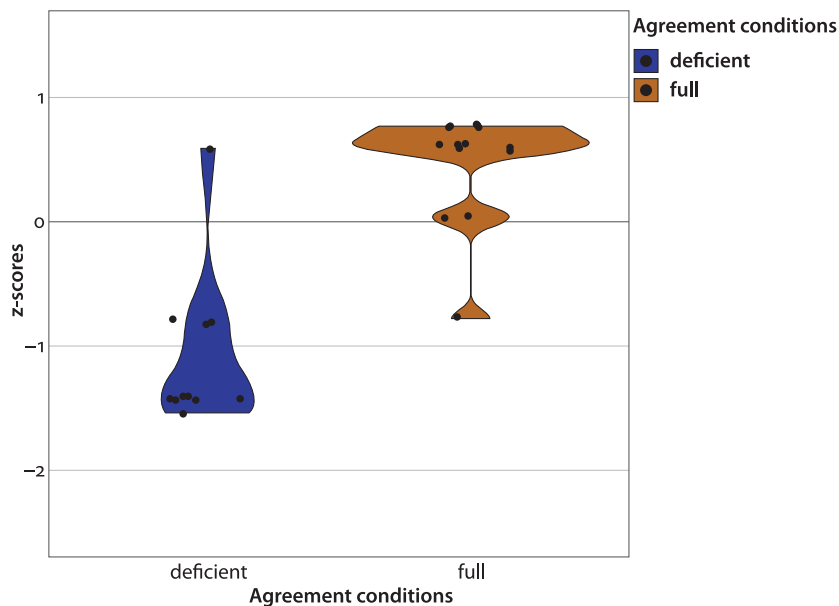


Figure 3. The distribution of z-scores across deficient and full subject agreement in simple transitive sentences [Conditions: 2 agreement conditions; 3 agreeing predicates; 24 data points]

4.2 Subject agreement in control constructions

In clear contrast with agreeing predicates in simple sentences, deficient subject agreement in control clauses (16a) is judged to be grammatical, with a mean score of 3.75. The mean score for full subject agreement in control clauses like (16b) is 3.6. Thus, deficient agreement received a higher score, but the difference is not statistically significant ($p = 0.37$).

- (16) a. BOY IX_{3a} WANT₁ HELP_{3b} IX_{3b} FRIEND
 b. BOY IX_{3a} WANT_{3a} HELP_{3b} IX_{3b} FRIEND
 ‘The boy wants to help a friend.’

The distribution of z-scores in Figure 4 also illustrates that the assessment of deficient subject agreement in (16a) and the full agreement counterpart in (16b) do not diverge significantly from each other.

Although deficient subject agreement does not score significantly higher than full subject agreement, there is reason to believe that the deficient form is preferred in this context. The first piece of evidence comes from the corpus data, which reveal that among the 28 cases of embedded subject agreement (all embedded under WANT), none unambiguously displays the true non-first agreeing form.

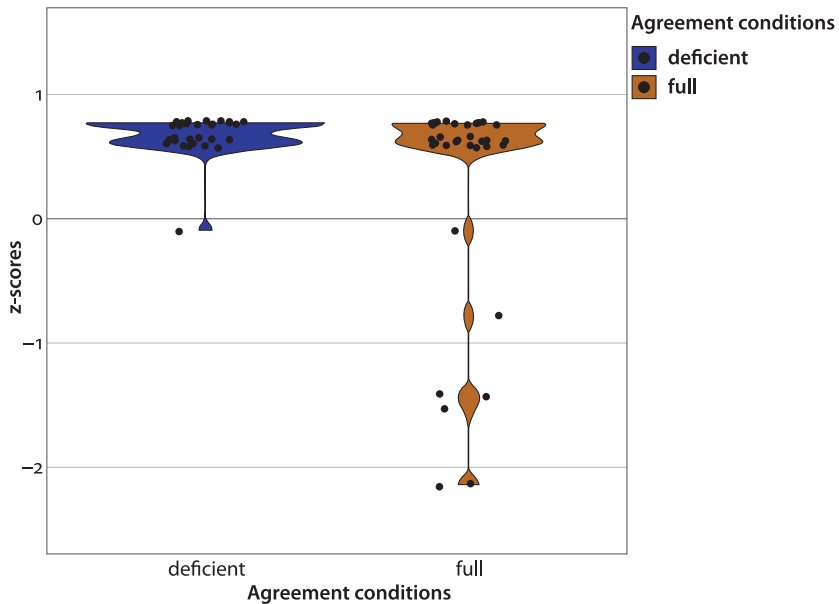


Figure 4. The distribution of z-scores across deficient and full subject agreement in control complement clauses [Conditions: 2 agreement conditions; 3 control predicates – 6 conditions in total; 3 agreeing predicates; 52 data points]

Thus, all agreeing predicates in control clauses could either be interpreted as referring to the first-person subject, or subject agreement was clearly deficient, since it mismatched the third-person feature of the subject. Therefore, even though the signers gave high scores to full subject agreement forms in the experiment, the corpus data suggests that there might be variation as to how often such forms are actually produced in spontaneous narratives. The second piece of evidence comes from a closer look at the variation in scores given to full agreement as opposed to deficient agreement. This variation is visible in Figure 4, where z-scores for full subject agreement are distributed more widely than those for deficient subject agreement. This variation is not only attested across participants, but also within participants, who were not consistent in their judgments concerning full subject agreement.

It is also worth mentioning that deficient subject agreement is observed not only for the regular agreeing predicates but also in backward agreement (17) and in constructions with agent-backgrounding (18). Agent-backgrounding refers to a variety of constructions serving to reduce the prominence of the agent across different languages and modalities (Barberà & Cabredo Hofherr 2018). example (18) was suggested by participants as an equally grammatical alternative to the stimulus in (17). In spoken languages, agent-backgrounding is often realized via passive

constructions, which is a viable analysis for (18) as well, albeit passives have not been widely attested in SLs so far. Alternatively, (18) can be analyzed as a subject-to-object raising construction, with a null embedded subject – for example, $CAT_{IX_{3a}} WANT (OWNER_{3b})_{3b} PAY.ATTENTION_1$. In either case, the crucial point illustrated in (18) is that the embedded agreeing predicate $PAY.ATTENTION$ displays deficient agreement with its internal third-person argument CAT .

(17) $CAT_{IX_{3a}} WANT_{3b} DISTRACT_1 IX_{3b} OWNER$
 ‘The cat wants to distract the owner.’

▶ (18) $CAT_{IX_{3a}} WANT_{3b} PAY.ATTENTION_1$
 ‘The cat wants to receive attention (of the owner).’

As expected, in these cases, deficient subject agreement corresponds not to the start point but to the end point of the movement. See Figure 5 for an illustration.¹⁵

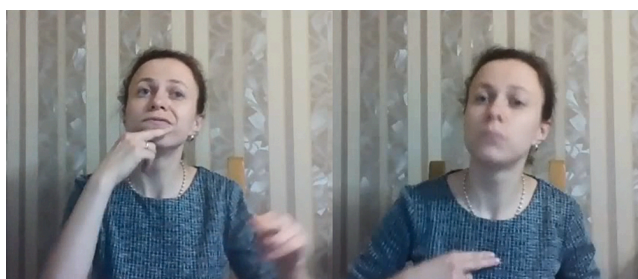


Figure 5. Realization of the agreeing predicate $_{3b}PAY.ATTENTION_1$ in (18)

4.3 Subject agreement in constructions with *CAN* and *BEGIN*

Similar to control clauses, but in contrast to simple clauses, constructions with modal *CAN* and the phasal predicate *BEGIN* can contain either full agreement with a third-person subject or deficient agreement. The phasal predicate *BEGIN* patterns similarly to the control predicates described above, with a 3.75 mean score for the deficient agreement form and 3.7 for the full form of subject agreement. As in case of the control predicates *WANT*, *TRY*, and *LOVE*, the score for the deficient agreement is slightly higher, but this difference is not statistically significant ($p=0.78$). I thus group *BEGIN* together with control predicates.

15. *PAY.ATTENTION* is a two-handed sign which is not anchored to the body of the signer. Thus, in Figure 5, the movement begins in front of the signer's chin and ends on the body at chest-level. The path of the left hand mimics the right one, but is slightly lower and thus falls partially outside the picture frame.

The evaluation of full versus deficient agreement in constructions with modal CAN, however, shows a slightly different pattern. As mentioned in Section 4.2, in control clauses, deficient subject agreement is slightly preferred over full subject agreement. In constructions with CAN, however, the reverse tendency is observed. The mean score for deficient subject agreement in modal constructions is 3.2, while full forms received a mean score of 3.5.¹⁶ Consequently, full subject agreement in constructions with CAN scored slightly higher, although the difference is not statistically significant ($p = 0.396$). However, just like full agreement in control clauses, judgments of deficient agreement embedded in constructions with CAN showed more variation across and within participants, as illustrated by the distribution of z-scores in Figure 6.

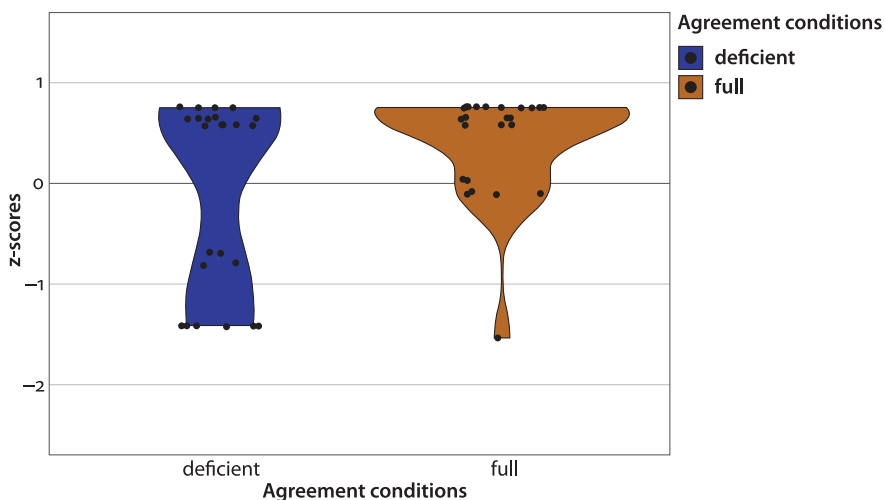


Figure 6. The distribution of z-scores across deficient and full subject agreement in constructions with modal CAN [Conditions: 2 agreement conditions; 3 agreeing predicates; 24 data points]

16. The rating for modal constructions is overall slightly lower than for control predicates WANT, TRY, LOVE, and BEGIN. This might be due to the fact that participants did not always consider the use of the modal predicate CAN necessary in a particular context. For instance, in (19), participants occasionally suggested to omit CAN, while indicating that this would still have the general meaning expressed in the translation, namely that teachers in general are able to help with math problems. It can thus be hypothesized that the semantics of modal CAN is more restricted than that of its English or Russian counterparts. The present study, however, is not concerned with the semantic properties of modal predicates. I therefore leave this topic for the future research.

4.4 Subject agreement in constructions with first-person objects

For modal *CAN* and the phasal predicate *BEGIN*, complement clauses with a first-person object were examined. First, ungrammaticality of (19a) (mean score = 1.6) confirms that, unlike embedded subject agreement, embedded object agreement must match the person features of the controller. Given that the first-person value of the object must be marked on the embedded predicate, first-person subject marking is phonologically blocked because it is not possible to both begin and end the movement of a verbal sign on the signer's body (except for reflexives).

- (19) a. *IX₁ MATH DIFFICULT // TEACHER IX_{3a} CAN₁ HELP_{3b/2}
 b. IX₁ MATH DIFFICULT // TEACHER IX_{3a} CAN_{3a} HELP₁
 c. IX₁ MATH DIFFICULT // TEACHER IX_{3a} CAN₂ HELP₁
 'I find math difficult, (but) the teacher can help me.'

The ungrammaticality of (19a) could be taken to suggest that forms with first-person object stand out as not being able to take a deficient subject agreement form. However, examples (19b, c) reveal that full third-person subject agreement in (19b) can alternate with second-person subject agreement in (19c), even though the subject *TEACHER* is evidently a third person in both cases. Figure 7a demonstrates that the movement component of *HELP* in (19c) starts in the region in front of the signer, which is typically associated with second-person reference. Conversely, the third-person subject agreement form of *HELP* in (19b), illustrated in Figure 7b, starts in the ipsilateral region, where the referent of *TEACHER* is localized by a corresponding indexical sign IX_{3a}.

Although both second- and third-person subject forms of the embedded predicate in (19b, c) are accepted as grammatical, the second person subject marking in (19c) is evaluated marginally significantly lower than full agreement in (19b), with mean scores of 3.2 and 3.9, respectively ($p = 0.058$). The distribution of z-scores for all three subject agreement options represented in (19a–c) is given in Figure 8.

I therefore suggest that second-person inflection in these contexts can also be analyzed as deficient subject agreement. See Section 5.2 on how the deficient agreement mechanism operates in such cases.

4.5 Subject agreement in impersonal constructions with modals

An interesting property of *CAN* is that it occurs in impersonal constructions. Having observed such constructions in the data extracted from the RSL corpus, I decided to probe into signers' grammaticality judgments (20).



a. The second-person subject first-person object agreement form of HELP in (19c)



b. The third-person subject first-person object agreement form of HELP in (19b)

Figure 7. Two different subject agreement forms of the embedded agreeing predicate HELP: (a): ${}_2\text{HELP}_1$ (19c); (b) ${}_3\text{HELP}_1$ (19b)

- (20) a. $\frac{\text{brow raise}}{\text{CAR NEED // CAN } {}_{3b}\text{BORROW}_1}$
 b. $\frac{\text{brow raise}}{? \text{CAR NEED // CAN } {}_{3a}\text{BORROW}_{{}_{3b}}}$
 '(If) one needs a car, one can borrow it.'

The default first-person subject agreement in (20a) was judged as grammatical (mean score = 3.7), but constructions with third-person agreement, such as (20b), scored much lower (mean score = 2.7). Recall that BORROW is a backward predicate, and that subject agreement is thus realized at the end point of the movement, hence the reverse order of subscripts in (20). The difference between the two conditions is statistically significant ($p = 0.004$). Yet, the score for full subject agreement in impersonal constructions is still significantly higher than the score for the

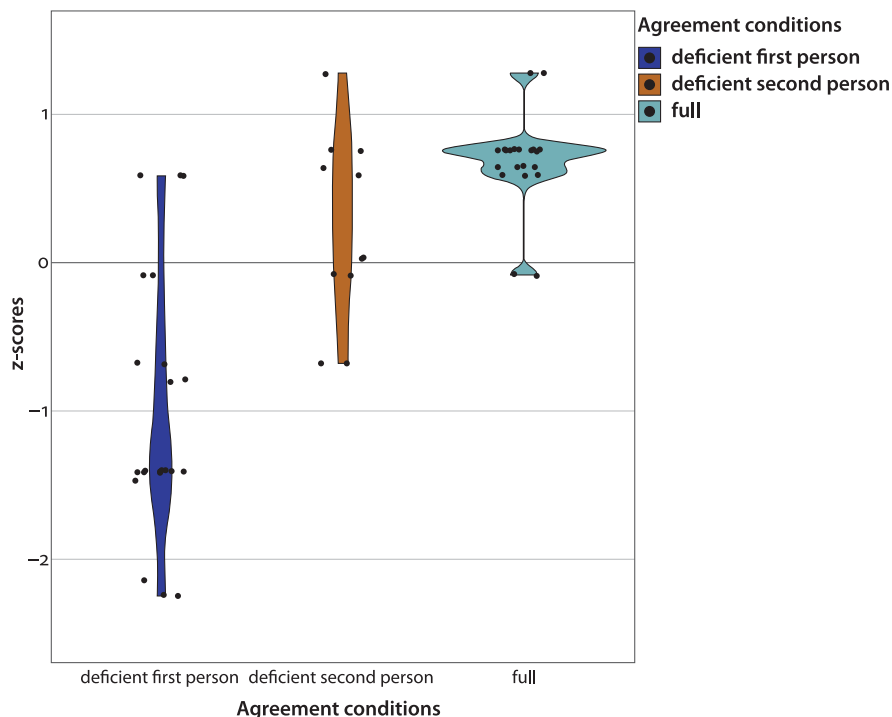


Figure 8. The distribution of z-scores across deficient first-person, deficient second-person, and full third-person subject agreement in constructions with embedded first-person object [Conditions: 3 agreement conditions; 2 complement-taking predicates – 6 conditions in total; 3 agreeing predicates; 52 data points]

baseline incorrect stimuli ($p < 0.001$), and also significantly higher than the score for ungrammatical deficient agreement in simple sentences as in (15) ($p = 0.001$). The z-scores for deficient and full subject agreement in impersonal constructions are given in Figure 9.

Figure 9 illustrates that judgments scores of the full subject agreement forms in impersonal constructions have a wide distribution. A closer examination of judgments offered by individual participants (represented by different dot shapes on the plot) reveals that the wide distribution cannot be attributed to the different judgments by one or two participants. Hence, it remains unclear whether examples like (20b) should be interpreted as ungrammatical. Nevertheless, default first-person agreement in impersonal constructions with *CAN* does seem to be unambiguously preferred as opposed to full third-person agreement.

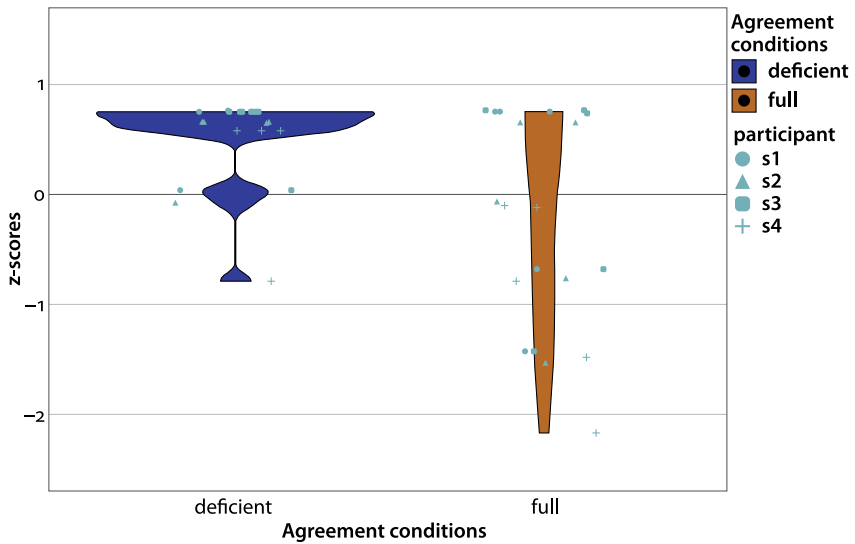


Figure 9. The distribution of z-scores across deficient first-person and full third-person subject agreement in impersonal constructions with CAN; dots of different shapes represent judgment z-scores of individual participants [Conditions: 2 agreement conditions; 5 agreeing predicates; 40 data points]

4.6 Interim summary

The results presented in the previous sections reveal that agreeing predicates in RSL exhibit different subject agreement properties depending on the syntactic environment in which they appear. While in simple sentences, subject agreement in RSL must be full, meaning the verb must agree with its subject and object in person features (Section 4.1), in embedded contexts, the subject agreement paradigm can be optionally reduced to the first-person marking regardless of the actual person feature of the matrix subject (Sections 4.2–4.3). This use of first-person marking is found not only in regular agreement but also in backward agreement and in agreement with an internal argument in agent-backgrounding constructions (Section 4.2). Deficient subject agreement in RSL can be compared to non-finite predicative forms in many spoken languages, which usually do not exhibit subject agreement. A notable difference, however, is that in spoken languages, verbs in non-finite contexts tend to lack agreement inflection altogether, while in RSL, similar syntactic contexts involve first-person subject and full object agreement. As illustrated by deficient agreement on embedded backward agreeing predicates and passive constructions in Section 4.2 (examples (17) and (18), respectively), these first-person subject agreement forms in control clauses cannot be considered a citation form of the sign, but should rather be

identified as deficient agreement. In Section 5.1, I will argue that the observed difference can be attributed to the modality-specific hierarchy of person features in SLs.

Another important finding of this study is that the modal predicate *CAN* – though also attested with deficient subject agreement on the embedded predicate – is different from control predicates in that it is still more likely to co-occur with the full subject agreement forms. This may suggest that modal constructions and control constructions involve different underlying structures. Yet, I propose in the next section that the mechanism deriving deficient subject agreement is the same in both constructions.

5. Formal analysis

I begin this section by proposing a person feature system inspired by the analysis of person and number developed by Harley & Ritter (2002) and Sauerland (2008). In Section 5.2, I show how the hierarchical nature of the feature system can be used to explain deficient subject agreement in RSL while preserving a modality-independent analysis of control, raising, and agreement as assumed in Minimalism. In Section 5.3.1, I suggest that different agreement patterns in modal and control constructions in RSL are indicative of different underlying structures. Accordingly, I propose a raising analysis for constructions with *CAN* following Wurmbrand (1999) as opposed to a control analysis for clauses introduced by *WANT/TRY/LOVE* and *BEGIN*. Section 5.3.2 is dedicated to impersonal constructions with *CAN* and deficient subject agreement therein.

5.1 Hierarchy of the person feature system

Before turning to the actual analysis of RSL, let us first set the stage by outlining the basic assumptions about feature systems in spoken languages. Here, I follow Harley & Ritter (2002); Sauerland (2008), and Zeijlstra (2015) in suggesting that the relation between person values can be attributed to the different number of features underlying person values and, hence, their semantic markedness. Following Sauerland (2008), I assert that a person value *X* (e.g., first, second, or third person) is semantically marked with respect to another value *Y* if *Y* is specified only with a subset of the features of *X*.

In this regard, it has been suggested for spoken languages that third person is specified for only one core feature [person]. First and second persons are endowed with the core [person] feature as well, but, depending on the language, they may be further specified for participant features, [participant, speaker] and

[participant, addressee], respectively (addition of the [participant] feature is motivated below). Therefore, first and second persons are semantically marked with respect to third person, because the latter contains only a subset of the features of the former. Such a feature system has, for instance, been suggested for English and many other languages (Ackema & Neeleman 2018). The resulting distribution of person features can be outlined as in (21).

- (21) third person [person]
 second person [person, participant, addressee]
 first person [person, participant, speaker]

One consequence of (21) is that third person does not induce a feature conflict with second and first person by virtue of being underspecified and, therefore, it can refer to both participants as well as to third parties. In contrast, second and first persons in English do have conflicting features, namely [addressee] and [speaker], which disallow coreference between them in the same context. The hierarchy in (21) is, however, by no means universal. For instance, for Dutch, Zeijlstra (2015) reports that second person can, under certain circumstances, refer to the speaker, hence it is semantically unmarked with respect to first person. At the same time, second person in Dutch remains more specific than the default third person because it can only refer to the participants of the discourse (see Zeijlstra (2015) for details). Therefore, the hierarchy of person features in Dutch must be different from English and can be sketched as in (22). As we shall see, (22) is a mirror image of what I suggest for the person feature system in RSL, although the arrangement of person values will be reversed with respect to semantic markedness.¹⁷

- (22) third person [person]
 second person [person, participant]
 first person [person, participant, speaker]

The case of Dutch provides evidence for typological variation in the person feature system across spoken languages. However, spoken languages seem to share the property of third person being the least semantically marked. This also relates to the inherent indexicality of first and second persons, whose reference is largely determined by the context (Benveniste 1966; Kaplan 1989; and subsequent

17. The hierarchies in (21) and (22) do not do justice to the whole variety of person feature systems in spoken languages, which may distinguish more or less than three feature bundles corresponding to different person features. See Tvica (2017) and CLARIN-NL (2012) for an extensive overview of different feature systems in spoken languages. Nevertheless, for all spoken languages investigated so far, it seems to be true that third person is a default.

works). Third person, however, is unbound with respect to the context, hence its broader spectrum of referential possibilities and its default status. Among other examples supporting default status of third person, Ackema & Neeleman (2018) observe that whenever the subject referent has no person feature specification, the respective pronominal elements and/or verbal agreement assume third person. For instance, in Dutch impersonal constructions with null subject, as in (23), verbal agreement is third person by default, although there is virtually no overt controller present. See Section 6.1 for more instances of default feature valuation.

- (23) Nog jaren is/ *ben/ *bent/ *zijn naar een oplossing gezocht
 still years be.3SG/ be.1SG/ be.2SG/ be.PL for a solution searched
 ‘People searched for a solution for many years.’

(Dutch, Ackema & Neeleman 2018: 37)

Let us now see how the concept of semantic markedness can be adapted to the person feature system in SLs. In order to account for deficient first-person agreement, I suggest regarding first person (not third as in spoken languages) as the least semantically marked, default person feature. By analogy, this would imply that first person is specified for the core feature [person] only. As will be explained in Sections 5.2 and 5.3, this allows us to derive first-person subject agreement in non-finite complement clauses. Second- and third-person referents are also assumed to contain the core [person] feature. In addition to that, they are further specified for a [non-first] feature, thus capturing the opposition between the body-anchored first-person reference and unbound indexical pointing towards non-first persons in line with Meier (1990). In addition, the results in Section 4.4 suggest that there are reasons to assume that the frontal region (i.e., the region corresponding to second person, IX_2) has a less specific referential status than ipsi- and contralateral regions (i.e., third person pointings: $IX_{3a/b}$). We can capture this fact by suggesting that second person has a [person, non-first] specification, while third person is additionally marked by a [non-participant] feature. We thus get the following system of person features:

- (24) first person [person]
 second person [person, non-first]
 third person [person, non-first, non-participant]

Lastly, an important caveat should be mentioned. In this study, I focus on the default first person in the context of agreement deficiency in non-finite complement clauses (see Section 5.2 for details). However, I suggest keeping the notions of “default person” and “deficient agreement” apart. This will be particularly relevant for impersonal constructions analyzed in Section 5.3.2, where I argue that the verb is specified for a default first person because of the null impersonal pronoun

controller, which has a default person feature value. Both “default first person” and “deficient agreement” can result in first-person agreement inflection on a verb but the trigger for it is fundamentally different in these two cases: “default first person” is triggered by the default feature specification on the controller, while for “deficient agreement”, the trigger is a last-resort strategy to value an uninterpretable feature on non-finite T. As I show in Section 5.3.2, impersonal constructions combine both mechanisms, which results in the ungrammaticality of full agreement, while in the other cases, full subject agreement is still an option.

5.2 Deficient subject agreement in control complement clauses: default first-person feature analysis

As mentioned in Sections 2.3 and 4.4, the RSL predicates WANT, LOVE, TRY, BEGIN, and CAN take sentential complements with a phonologically null subject, whose reference is controlled by the matrix subject (I am grouping modal CAN with the other predicates for now, but see Section 5.3). The core finding of this study is that the embedded predicate in such constructions can either fully agree with the subject in person features or may exhibit a reduced paradigm of subject agreement limited to first-person marking. In all cases, object agreement seems to stay intact, although this observation still requires some further empirical support targeting different person features of the object. The possibility of deficient subject agreement is linked to the subordinate status of the complement clause, as I was able to demonstrate that it is not observed in the main clause.¹⁸

The fact that WANT, TRY, LOVE, and BEGIN all bear the semantics associated with canonical control predicates across spoken languages (Noonan 2007) suggests a control analysis. In this study, I adopt the Movement Theory of Control (MTC) for the analysis of the control construction (Boeckx et al. 2010; Hornstein & Polinsky 2010).¹⁹ According to the standard assumptions of the MTC, the phonological gap in the subject position of the embedded clause corresponds to a deleted copy of the matrix subject. Thus, the subject DP first merges into the subject position of the embedded clause, and subsequently moves to the subject position of the main predicate. This movement is triggered by the requirement on the matrix predicate to assign the subject theta role. Excluding finite control

18. Remember that CP complements (e.g., in constructions with utterance predicates like SAY or propositional attitude predicates like THINK) also do not exhibit deficient agreement (see Section 2.3).

19. MTC is given preference over a traditional PRO analysis (Landau 2013) in this study because MTC better adheres to recent views in Minimalism (Chomsky 1995; Boeckx & Hornstein 2004), which lift the ban on double theta role assignment (Chomsky 1981).

cases, which are postponed to Section 6, embedded T in control clauses generally cannot enter into an Agree relation with the subject by virtue of being non-finite, which leads to the lack of subject agreement on the embedded predicate. At the same time, non-finite T does not directly affect object agreement, as it is assigned lower in the structure (see Section 2.2 for details). Therefore, object agreement can be fully realized despite non-finiteness. Yet, we cannot immediately extend this analysis to RSL control clauses because:

- a. even though the embedded verb in RSL control clauses occurs in a non-finite context, it still displays some form of subject agreement inflection, which, however, is often limited to first person;
- b. although first-person agreement in non-finite contexts can be considered the dominant strategy in constructions with WANT/TRY/LOVE/BEGIN, full agreement with the subject is still an option for most signers;
- c. there is no observable semantic difference between control clauses with full vs. deficient subject agreement in RSL.

In order to account for the RSL facts, I assume that control predicates can select for two types of T, one of which, T [φ -full], can fully agree with the subject, whereas the other, T [φ -def(icient)], cannot.²⁰ The crucial assumption here is that T [φ -def] hosting deficient agreement is the one where Agree cannot be instantiated. Still, given that we observe deficient agreement instead of a complete lack thereof, I suggest that T [φ -def] possesses an uninterpretable person feature, which must be checked.²¹ In order to prevent the derivation from crashing, T [φ -

20. Features [φ -full] and [φ -def] could in principle be labeled as [+/-finite]. The motivation for preferring the label [φ -full/def] is twofold. First, the notion of finiteness is notoriously opaque with respect to finite control and raising. It remains debated whether these constructions can be considered as truly finite or whether their apparent finiteness is only superficial. The latter option is suggested for Brazilian Portuguese in order to explain how an embedded subject in finite control and hyperraising clauses can circumvent the Activity Condition (Chomsky 2000, 2001), and hence can be A-moved out of the finite clause (see Nunes (2008) for details). Consequently, I refrain from equating full agreement with finiteness, although I do suggest that the reduced agreement paradigm may point toward non-finiteness. Therefore, T [φ -def] is sometimes referred to as “non-finite T” in the text for simplicity. Second, the notion of finiteness is even less transparent for SLs, which lack consistent morphosyntactic TAM marking. Insofar as this study is concerned with the agreement side of finiteness only, I am cautious not to make any strong claims about other aspects related to finiteness in SLs, hence I keep the label of the feature distinguishing the two types of T heads as narrow as possible.

21. The available data cannot offer any motivation for what exactly prevents the phi-probe on T [φ -def] from accessing the features of the subject. Tentatively, one may attribute this to the lack of Case on T [φ -def], which is assumed to be a necessary prerequisite for Agree (cf. Baker

def] is forced to resort to the least conflict-prone option, which, following the line of argumentation in Section 5.1, is the default first-person. The derivation of deficient subject agreement in (16a) and its linearization is illustrated in Figure 10. In line with the MTC approach, I assume that the subject DP first merges in the embedded clause and further moves to the matrix clause, where it first targets the external theta-position (i.e., Spec, vP) and subsequently moves to Spec, TP in order to satisfy the Extended Projection Principle (EPP) feature on T.

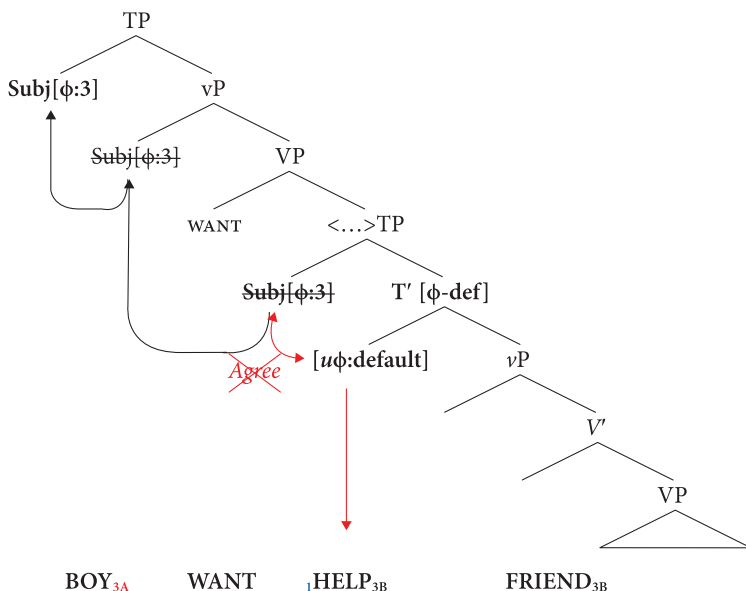


Figure 10. Derivation of deficient subject agreement in control clauses in RSL²²

Alternatively, control predicates can select for T [ϕ -full], which can fully Agree. There is then no need to resort to the default feature specification and,

2013). Such an analysis is consistent with the assumptions made for spoken languages, but may appear to be too far-fetched for SLs, for which overt case marking has never been identified.

22. It is generally assumed that control complement clauses also have a CP projection, while raising constructions, for instance, do not (Boeckx et al. 2010). In Figures 11 to 13, I do not represent the CP projection for the sake of simplicity, and also because our data do not provide any evidence for an embedded CP in control constructions.

therefore, full subject agreement is realized.²³ The corresponding derivation for (16b) and its linearization is given in Figure 11.

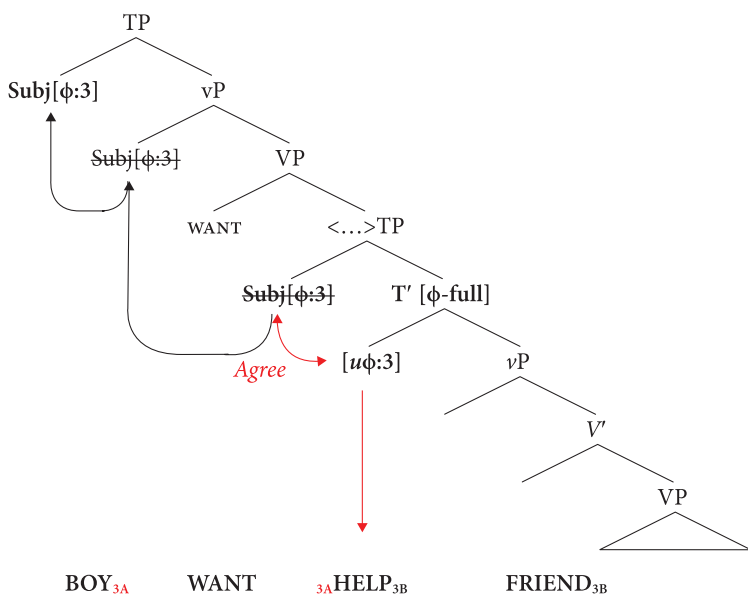


Figure 11. Derivation of full subject agreement in control clauses in RSL

The proposed account is applicable to passive control clauses like the one in (18) as well. In this case, the derived subject is merged as an internal argument of the control clause and further raises to its Spec, TP position. Subsequently, the same mechanisms apply as in Figures 10 and 11.²⁴

23. Control clauses with full subject agreement would pose a considerable challenge for a PRO theory of control (Landau 2013), since one would have to explain the licensing of PRO instead of an overt lexical subject despite a full ϕ -probe. Based on spoken languages such as Brazilian Portuguese, Landau (2013: 88–96) provides some solutions for full agreement in a control clause (i.e., [-T] on the I(nflectional) head), but whether these are applicable to SLs is subject to future research.

24. Backward predicates as in (17) also exhibit deficient subject agreement, which is realized on the end point of the movement accordingly. This implies that the grammatical subject of the backward verb enters into an Agree relation with T [ϕ -def]. This slightly contradicts Pfau et al.'s (2018) proposal that the location of the subject phi-probe in backward predicates is on the T head. However, the authors also acknowledge that agreement patterns in non-finite clauses could serve as a diagnostic for the location of the probes (Pfau et al. 2018: 26, footnote 33). I therefore suggest that future research can use the results of the current study to further refine the formal analysis of backward agreeing predicates.

With regard to those cases in which first-person object agreement on the embedded predicate blocks first-person subject agreement, as in (19), I suggest that the mechanism of default feature resolution is still at play. As long as object agreement precedes subject agreement, once first person is activated as referring to the object, it becomes unavailable as a default person feature for the subject. According to the person feature system in (24), the next least marked person feature value is second person. Consequently, it is chosen instead as a default.

The account outlined in this section presumes that control predicates in RSL can take two types of clauses, one with a deficient φ -probe and one with a full φ -probe as in a matrix clause. Note that the proposal is built upon control constructions with SVO order only but is applicable to any word order. As illustrated in Section 2.4, control clauses in RSL may also be center-embedded (i.e., SOV), which distinguishes them from full CP complements. Due to the limitations of the experimental design, grammaticality of deficient and full subject agreement in control constructions with center-embedding remains unexplored. Considering that the availability of center-embedding has previously been associated with control and raising in other SLs (Section 2.3.2), constructions with center-embedding may provide further independent support for distinguishing two clause types in control constructions in RSL once they have been examined with different agreement patterns. At the same time, the present study establishes that deficient agreement is allowed in SVO control constructions, that is, in clauses with the same word order as in full CP complements. Consequently, even if SOV in control constructions in RSL appears to be associated with some aspect of non-finiteness, it will still not be strictly necessary to license deficient subject agreement. The theoretical challenge for the future analysis will thus be to incorporate word order flexibility and agreement optionality into the formal account, which is notoriously challenging within the Minimalist framework (Miyagawa 2011; Bošković 2013).

5.3 Constructions with modal CAN

5.3.1 *Subject agreement in constructions with CAN*

As mentioned in Sections 4.3 and 4.5, sentences with CAN exhibit deficient subject agreement on a par with the other predicates we focused on, but the distribution of deficient vs. full subject agreement is slightly different in these constructions. Thus, while constructions with WANT, TRY, LOVE, and BEGIN tend to co-occur with the deficient subject agreement on the embedded predicate, constructions with CAN featuring full subject agreement are viewed as more acceptable. Still, both types of predicates can in principle co-occur with both agreement paradigms.

The observed difference in agreement patterns can indicate structural differences between constructions with *CAN* and *WANT*-type predicates. The obvious modal semantics of *CAN*, as opposed to the lexical meaning of *WANT*-type predicates, should also be taken into account. I therefore invoke the raising analysis of modal constructions proposed by Wurmbrand (1999), according to which modal constructions share structural properties with raising constructions and, therefore, have an argument structure different from that of control predicates. Similar to control predicates under MTC, raising predicates involve A-movement of the subject from the embedded complement clause into the matrix clause. Contrary to control predicates, however, raising predicates do not assign an external theta-role, as evidenced by the possibility to merge an expletive in this position (e.g., *John seems to be nice* → *It seems that John is nice*). Therefore, the movement of the external argument into the subject position of the matrix clause is triggered not by theta-related reasons, but by an unvalued phi-probe on the matrix T. As a result, it targets the matrix Spec, TP directly. The derivation for both deficient and full subject agreement in constructions with modal *CAN*, as in (10a,b), is given in Figures 12 and 13, respectively.

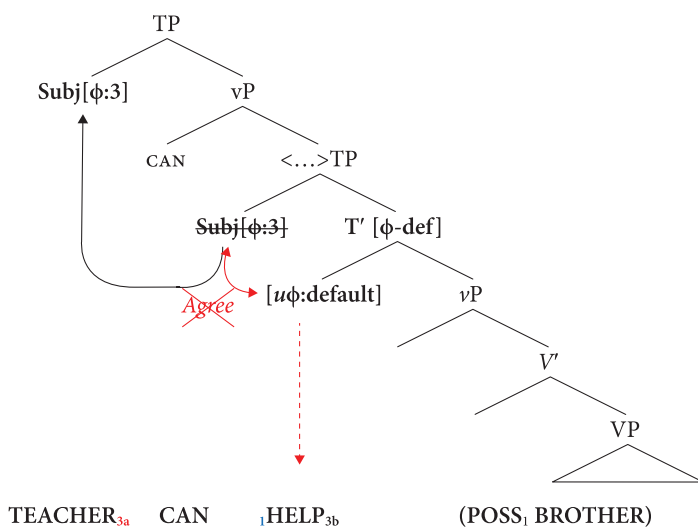


Figure 12. Derivation of deficient subject agreement in raising constructions with modal *CAN* in RSL

Assuming that the argument structure of *CAN* is different from the argument structure of *WANT*-type control predicates, it is not surprising that the selectional properties of *CAN* are different as well, which leads to the difference in dominant strategies concerning the implementation of embedded agreement. Nevertheless,

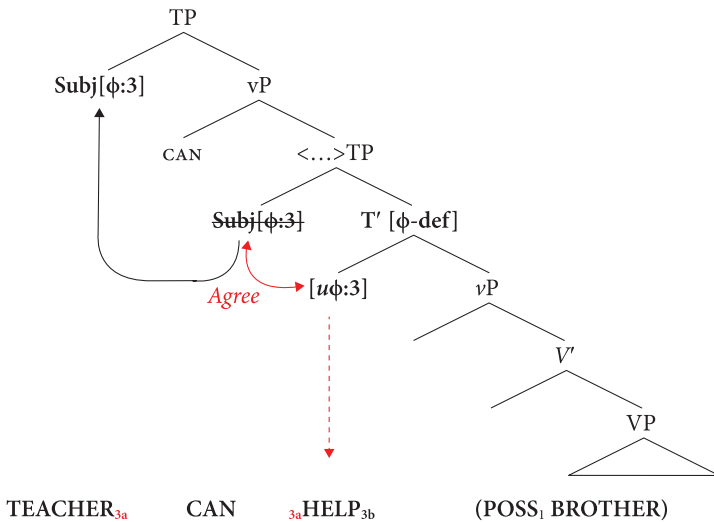


Figure 13. Derivation of full subject agreement in raising constructions with modal *CAN* in RSL

the exact factors influencing the choice between full and deficient agreement in these constructions are subject for future research.²⁵

5.3.2 A note on impersonal constructions with *CAN*

Another property of constructions with *CAN* is that they can be impersonal.²⁶ Contrary to constructions with specific subject referents, full agreement in impersonal constructions is disfavored, as shown in (25).

- (25) a. $\frac{\text{brow raise}}{\text{CAR NEED}} // (\text{IMP.PRO})_1 \text{ CAN } {}_1 \text{BORROW}_{3b}$
 b. $\frac{\text{brow raise}}{* \text{CAR NEED}} // (\text{IMP.PRO})_1 \text{ CAN } {}_{3a} \text{BORROW}_{3b}$
 ‘(If) one needs a car, one can borrow it.’

25. As mentioned in Section 2.3.2, a radically different approach would be to treat constructions with *CAN* as mono-clausal (cf. Pfau & Quer (2007) for DGS and LSC; Brunelli (2011) for LIS). Under this approach, it is predicted that different orders of the modal and lexical predicates should influence the agreement properties of the lexical predicate (see Brunelli (2011) for the exact implementation). A satellite study revealed that this is not the case in RSL: lexical agreeing predicates can precede *CAN* – for example, *BOY*_{1/3} *HELP*₃ *FRIEND CAN* – but the ordering does not influence the acceptability of different agreement patterns, which remains high for both full and deficient agreement (mean scores 3.83 and 3.73, respectively). Therefore, the mono-clausal analysis of modal constructions is rejected.

26. See Kimmelman (2018) for a detailed description of various types of impersonal constructions in RSL.

Following standard assumptions, I analyze impersonal constructions like the one in (25a) as containing a null generic inclusive pronoun *IMP.PRO* akin to English *one* (Moltmann 2006; Polinsky 2017; Ackema & Neeleman 2018; Fenger 2018). Under a feature-geometry approach, impersonal pronouns such as *one* are claimed to possess the core [person] feature only, and therefore trigger default third-person agreement – for example, *One is/*am/*are always happy when the sun is shining*. If this is the case for our null pronoun in (25), then the embedded agreeing predicate is expected to have a deficient subject agreement irrespective of the [φ -def/full] feature on T. Thus, if T is [φ -def], subject agreement takes the deficient first-person form according to the mechanism proposed in the beginning of this section. Otherwise, if T is [φ -full], T agrees with the null impersonal pronoun and, again, takes default first person, because that is what the controller is specified for. In other words, the form of the embedded predicate in impersonal construction is always the same (i.e., first-person subject agreement as in (25a)), but the reason for this can be two-fold: either deficiency of agreement in T [φ -def] or agreement with the controller specified for a default person feature in T [φ -full].

If the proposed analysis is on the right track, one may expect default person agreement in non-embedded contexts where the subject lacks person feature specification. This can be the case for non-referential expressions (e.g., negative indefinites such as *nobody*) or clausal subjects (see Ackema & Neeleman 2018). The present study, however, cannot provide sufficient empirical support for these claims. Future research must further examine how different semantic types of subject arguments (e.g., indefinite, non-referential, etc.) interact with subject agreement in the simple sentence.

6. Discussion

The formal analysis proposed in Section 5 aims at providing a modality-independent account of subject agreement in control and modal constructions in RSL. Although operating by general principles of agreement via feature-checking in combination with the MTC, the proposed analysis displays properties that may at first sight appear typologically uncommon: (i) agreement deficiency licensed by syntactic subordination (i.e., T[φ -def]); (ii) full agreement in control and raising constructions (i.e., T[φ -full]); and (iii) first person as a default person feature. For properties (i) and (ii), I argue that these are also attested in spoken languages and hence are not unique to RSL. Section 6.1.1 thus illustrates property (i) in Hebrew, where subjects of control clauses can only bear default person feature specification. Section 6.1.2 puts finite control and raising constructions under

the spotlight, by providing examples from Brazilian Portuguese. In Section 6.2, I offer a discussion of property (iii).

6.1 Insights from typology

6.1.1 Agreement deficiency in control clauses: Hebrew

As mentioned in Section 5.1, cases of default agreement are well-attested across languages in a variety of contexts. example (23) already illustrated one such context, namely impersonal constructions with a null subject in Dutch. In addition, default valuation of person features on T is proposed for sentential subjects (e.g., *To be polite is/*am/*are always nice*), where the subject can have no person features by virtue of not being a DP, and in long-distance agreement such as in English *there*-expletives (e.g., *There is a book on the table*), where the subject remains low in the structure and therefore cannot value the person feature on T. In this section, however, we are interested in those cases where default feature valuation can be licensed by syntactic subordination, specifically by control and raising. This seems to be much less wide-spread, since these constructions in spoken languages generally either completely lack agreement morphology (e.g., infinitives in Germanic and Romance) or exhibit a full agreement paradigm (e.g., finite control in Balkan languages and Brazilian Portuguese; see Section 6.1.2). Nevertheless, there is at least one language which patterns with RSL in marking control constructions by restricting person features, namely Hebrew. Control constructions in Hebrew, like the one in (26), are limited to third-person subjects and therefore to third-person subject agreement on the embedded predicate (Landau 2004).

- (26) Hem_i kivu —_{i/*j} yelxu ha-bayta mukdam
 3PL hope.PST.3PL — go.FUT.3SG.PL home early
 ‘They hoped to go home early.’ (Hebrew, adapted from Landau 2004: 816)

The parallel between control constructions in Hebrew and RSL is not perfect, because first- or second-person subjects are simply not possible in control clauses in Hebrew. If one constructs a first- or second-person equivalent of (26) – for example, *I/You hoped to go home early* – the sentence would not receive a control interpretation because the subject of the embedded clause may or may not refer to the matrix subject in this case (see Landau (2004) for details). Therefore, in contrast to RSL, in Hebrew control clauses, there is no mismatch between the person features of the subject and embedded agreement as control constructions in this language simply do not exist without third person subjects.²⁷ Neverthe-

27. Full analogy with RSL would be achieved if Hebrew control clauses maintained third-person subject agreement with first- and second-person subjects contrary to fact.

less, we can potentially attribute the third-person restriction in Hebrew control constructions to the default status of third person. In contrast with RSL, however, Hebrew may appear to be more sensitive to the mismatch in person features between matrix and embedded agreement domains, thus disallowing non-third-person matrix subjects.²⁸

6.1.2 *Finite control and (hyper)raising: Greek and Brazilian Portuguese*

Full agreement in finite control is often associated with subjunctive mood in the embedded clause. Consider the Greek example (2), repeated in (27), where the control clause is marked by the subjunctive particle *na*.

- (27) I Maria prospathise na divasi
 the Maria try.PST.3SG SUBJ read.3SG
 ‘Maria tried to read.’ (Greek, adapted from Terzi 1997)

However, subjunctive mood is not a prerequisite for finite control to occur. Indicative finite control and raising clauses are found in Brazilian Portuguese, where both types of clauses exhibit a full paradigm of subject agreement regardless of unambiguous independent evidence for control and raising in these constructions (Nunes 2008). Thus, example (28) indicates that the null embedded subject can only be coreferential with the immediate matrix subject *Pedro’s father*, which is diagnostic of obligatory control.

- (28) o João disse que o pai do Pedro acha que vai ser
 the João say.PST.3SG that the father of-the Pedro think.3SG that go.3SG be
 promovido
 promoted
 ‘João_i said that [Pedro_j’s father]_k thinks that he_{k/*i/*j/**} is going to be promoted.’
 (Brazilian Portuguese, adapted from Nunes 2008: 85)

The case of Brazilian Portuguese patterns together with control and modal constructions with full subject agreement in RSL.²⁹ I therefore conclude that –

28. Being a proponent of PRO theory of control, Landau (2004) attributes third-person restriction in Hebrew control to the third person of PRO, which triggers third-person agreement on the embedded predicate and further excludes first- and second-person subjects in order to avoid the mismatch (also see Shlonsky (2009) for an alternative view). The third person of PRO is associated with its inherent non-referentiality, which is in line with the approach adopted in this study, suggesting that the default person, third person in spoken languages, must be the least specific one.

29. Although the verb *think* in example (28) is not associated with subject control in RSL (Khristoforova 2020), Nunes (2008) invokes Ferreira (2000, 2004, 2009) and Rodrigues (2002,

although the combination of particular components of the analysis in Section 5 is unique to RSL – separately, none of these properties by itself is exclusive to RSL, except for the value of the default person feature, addressed in the next section.

6.2 Modality-specific properties of the person feature system in sign languages

The previous section provided typological support for the claim that subject agreement in control and modal constructions in RSL is largely governed by modality-independent principles. Here, I focus on the only component of the proposed analysis which incorporates a modality-specific aspect, namely the value of the default person. Let us first briefly recapitulate the assumptions we made for the person feature systems in Section 5.1. There, I assumed the asymmetric properties of different persons to be related to their semantic markedness and hence the subset relations between different person features. Thus, we can visualize various arrangements of person features in different languages by using a subset metaphor. For English and Dutch, for instance, we can schematize their feature compositions (outlined in (22) and (23), respectively) as in the diagrams in Figure 14.

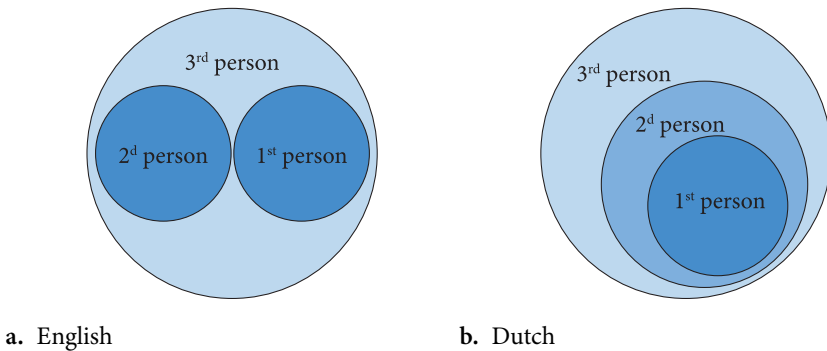


Figure 14. The person feature systems of (a) English and (b) Dutch

Figure 14 illustrates that for both Dutch and English, third person is the least semantically marked person feature, which is deprived of any feature specifications apart from the core [person] feature shared with second and first person.

2004) in arguing that null embedded subjects in (28) (example (3) in Nunes (2008)) “show all the diagnostics of obligatory control” (Nunes 2008: 85).

According to Zeijlstra (2015), English and Dutch differ in how first and second persons are related: in English, these are claimed to be unmarked with respect to each other, while in Dutch, the first person is marked with respect to the second person, hence the subset relation illustrated in Figure 14b.

For RSL, I suggest that the locus associated with deficient agreement marking (i.e., the one close to the signer's body) is not arbitrary and is related to first-person agreement, which has exactly the same surface form. I further argue that this points towards the first person being the least semantically marked, default person feature in SLs. Obviously, this contrasts with assumptions traditionally made for spoken languages, where third person is considered to be default. I also suggest that the portion of signing space associated with second person is unmarked with respect to the lateral regions invoked for third-person reference. The structure of the person feature system of RSL is illustrated in Figure 15.

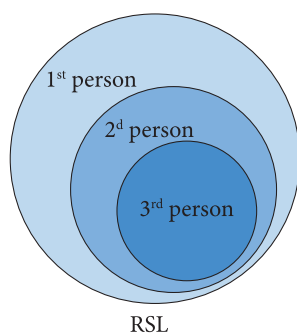


Figure 15. The person feature system of RSL

Although this may seem exotic from a spoken language perspective, the idea of first person having a special status in SLs reveals itself in different guises across different domains of SL research. First, as mentioned in Section 2.1, the tradition of distinguishing first and non-first person in SLs dates back to Meier (1990). One of the arguments in favor of this approach comes from the observation that first-person pronominal pointing is always fixed on the body of the signer, whereas both second and third person employ loci in the signing space, which can rely on the actual, physical position of the referent. Another potentially related phenomenon, described by Oomen (2017) and Oomen & Kimmelman (2019), are argument omission patterns observed with body-anchored predicates in RSL, DGS and NGT. These authors found that subject pro-drop in these SLs triggers a first-person interpretation of the subject in constructions with body-anchored verbs. They suggest that the first-person interpretation reflects an inherent [speaker] feature on body-anchored predicates, which is iconically motivated by the place of

articulation. It is thus tempting to suggest that the first-person interpretation of subject omission in body-anchored predicates and first-person marking in non-finite clauses are triggered by the same SL-specific fundamental principle, which makes reference to the body of the signer. This fundamental principle was first articulated in Meir et al. (2007) as “body as subject”, a manifestation of the link between an abstract notion of subjecthood and its representation by the signer’s body. Meir et al. (2007: 29) propose that “[t]he division of labor between the body and the hands in such signs suggests that we conceptualize an event in terms of a predicate which is predicated over the subject”.

Finally, the “body as subject” principle is currently widely discussed in research fields such as SL emergence and development. Without going into detail, I would like to draw the reader’s attention to a recent study by Kwok et al. (2020), who observed the effects of “body as subject” in reduced agreement paradigms of agreeing predicates in an emerging SL (i.e., Al-Sayyid Bedouin SL) and in the acquisition of agreeing predicates by late learners. In these cases, non-first subjects co-occur with agreement forms signed close to the signer’s body, which is reminiscent of first-person agreement (although a direct link between first-person and these emergent forms is not explicitly suggested in these studies).

All these rather different studies have one common theme: they highlight the exceptional referential properties of the signer’s body in SLs, while also exposing the typological variation in person feature systems across modalities.

7. Conclusion

This study investigated subject agreement patterns in embedded contexts in RSL. It was found that agreeing predicates embedded under the control predicates WANT, TRY, LOVE, and BEGIN as well as under modal CAN can display either full or deficient of subject agreement. The latter is identical to the first-person agreement form irrespective of the person features of the subject. The same phenomenon is observed in embedded backward predicates and embedded clauses with agent-backgrounding, but, crucially, only in subordinate contexts. In the simple transitive sentences, deficient agreement was judged as ungrammatical by the participants.

Modal and control constructions with deficient subject agreement are analyzed as complement clauses headed by a special type of ϕ -deficient T, which fails to access the features of the subject and therefore resorts to a default first-person feature specification. Modal and control constructions are, however, different in that modal CAN is slightly more likely to co-occur with full agreement than control predicates. In order to capture these differences, I propose to analyze modal

constructions in RSL as raising constructions, in line with Wurmbrand (1999). Crucially, the availability of deficient agreement in control and modal constructions and lack thereof in simple sentences immediately suggests a parallel with non-finiteness in spoken languages. Not only does this speak in favor of the grammatical status of SL agreement, it also provides evidence in favor of a universal asymmetry between syntactically subordinate and independent structures. In contrast to deficient subject agreement, clauses with full subject agreement (i.e., matching the person features of the subject) are considered to be headed by a T with an intact, complete φ -probe. The description of full subject agreement in control and modal constructions in RSL feeds into the discussion on finite control and hyperraising (e.g., in Greek, Brazilian Portuguese, and Hebrew), which remain theoretically challenging.

Although the suggested analysis of control and modal constructions is almost entirely modality-independent, the mechanism deriving deficient subject agreement has a modality-specific component, namely default first person. Specifically, I suggest that the first-person form of deficient subject agreement is entailed by first person being the default person feature in SLs, unlike spoken languages, where the third person is generally considered default.

I conclude that the patterns of subject agreement in control and modal constructions in RSL reflect the fundamental principles of SL structure, while also bridging the gap between signed and spoken languages in terms of agreement and finiteness. The next step is to address the following questions: are there any morphosyntactic, pragmatic, or discourse factors that may affect the seemingly free variation of T [φ -def] and T [φ -full]? Can we propose an analysis that would reconcile different dominant agreement strategies in constructions with modal CAN and control predicates? Can deficient subject agreement be found in other SLs? In addition, default subject agreement in simple sentences, for instance, with impersonal or negative indefinite subjects (e.g., NOBODY), may also provide some insights into the person feature system and agreement in SLs. All these issues are left for future research.

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