

Cathrine Fabricius-Hansen (ed.)

Resolving Possessive Puzzles

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INTRODUCTION

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The present issue of *OSLa* is a follow-up to *OSLa* 9(2) (Fabricius-Hansen et al. 2017). Their common topic is adnominal possessive pronouns/ determiners (in short: *possessives*) in related European languages (English, German, Norwegian, French, Polish, Czech, ...), viewed from the perspective of Ln processing and interpreting or translating between Ln and L1.¹

As seen in Gunkel et al. (2017: 673–719), the systems of possessives differ across languages in various dimensions (so-called *Varianzparameter*); in particular, this holds of 3rd person possessives, which cannot refer to the speaker(s) or the addressee(s) and which may be structurally bound in the sense of Chomsky (1981).

The present issue covers the Ln/L1 pairs English/Polish, French/English, French/German, French/Norwegian, German/Norwegian and to a certain extent also Czech vs. German and Norwegian. It focuses on the following dimensions of 3rd person adnominal possessives:

- (i) How many different lexical items does the system of possessives comprise, and to what extent is the choice between them determined by the number and (natural and/or grammatical) gender of the antecedent – the *possessor*?
- (ii) Does the system distinguish between reflexive and non-reflexive (more precisely: irreflexive) possessives? Put differently: In how far are the possessives subject to structural constraints in relation to the *possessor* (Binding Principle A versus B in terms of Chomsky 1981)?²
- (iii) To what extent are the possessives inflected, agreeing in number, gender, case ... with their head noun – the *possessee*?

[1] Ln: L2 or an additional foreign language.

[2] *Reflexive* items are subject to Binding Condition A and consequently *anaphors* in Chomskyan terms. According to the same tradition *irreflexive* items, i.e. items which, obeying Binding Principle B, cannot refer to the subject of their own clause, are *pronouns*. In the contributions to the present issue, the terms *anaphor* and *pronoun* are used in a more traditional, wider sense.

Since we have to do with rather closely related (Indo-European) languages, there is an additional aspect to take into consideration:

- (iv) To what extent are possessive items belonging to different languages recognizable cognates, morpho-phonologically resembling each other?

The first three papers investigate the effects that interlingual variation in these areas may have on L_n comprehension and/or interpreting. Thus, BERGLJOT BEHRENS, CATHRINE FABRICIUS-HANSEN AND ANNELIESE PITZ specify the difficult task of acquiring the meaning of French possessives for English, Norwegian and German learners of French as a foreign language, and outline an experimental design intended to test learners on their spontaneous interpretation of the 3rd person singular possessive determiner in its three possessee-determined forms *son*, *sa* and *ses* ('his'/'her').

CATHRINE FABRICIUS-HANSEN, ANNELIESE PITZ AND HENRIK TORGENSEN investigate how Norwegian learners of German interpret the two German possessives *sein* ('his') and *ihr* ('her'/'their') under given referentially unambiguous conditions and, more specifically, whether the formal similarity between the binding-neutral *sein* and the Norwegian reflexive possessive *sin* may enhance or interfere with the Norwegian speakers' interpretation of *sein*.

KATARZYNA STACHOWIAK-SZYMCAK AND BERGLJOT BEHRENS report on an experiment investigating the use of possessives in an interpreting task from L2-English, whose possessives are binding-neutral, to L1-Polish, which – like Norwegian – has a reflexive possessive in addition to a set of non-reflexive possessives. The results show that interpreting from a simple system into a complex system yields errors, even by native speakers of the target language, but that the type of audience, as defined for the interpreter, affects the target wording.

In the fourth and final paper, BARBARA MERTINS presents findings from an offline (questionnaire) study of Czech native speakers' interpretation of reflexive vs. non-reflexive possessives. The results reveal that the informants surprisingly often choose a reflexive (local) interpretation of the non-reflexive *jeho* ('his') used cataphorically, indicating a strong uncertainty among Czech speakers concerning the constraints on the two types of possessives. The concluding section briefly discusses how this intralingual variation may affect the acquisition of L_n possessives when it comes to the language pairs involving Czech as L_n and Norwegian or German as L1, or vice versa.

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PROCESSING POSSESSIVES IN FRENCH AS A FOREIGN LANGUAGE: DESIGN OF AN EXPERIMENT

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ABSTRACT

The paradigm of possessive determiners differs in systematic ways across languages and causes cognitive resolution problems in the interpretation of a foreign language. Based on previous investigations into cross-linguistic influences (CLI) in learners' interpretation of possessive determiners, this article presents the design of an experiment for testing English, German and Norwegian adult learners of French. We specify two kinds of processing problems: a direction problem (orientation towards possessor vs. possessee) and a problem of lexical parasites ('false friends'). The experiment is directed at learners' spontaneous interpretation of the singular possessives *son*, *sa* and *ses*, on account of a partly false friendship with the possessive determiners in these learners' first languages.

[1] INTRODUCTION¹

The present paper specifies the particularly difficult task of acquiring the meaning of French possessives for English, Norwegian and German learners of French as a foreign language, and presents an experimental design intended to test learners on their spontaneous interpretation of the 3rd person singular possessive determiner in its three forms *son*, *sa* and *ses*.² The four languages of discussion all have possessive determiners/pronouns, but the systems differ in important respects: on the one hand some of the languages have partly false friends in their systems, like German *sein* and French *son*; on the other, the learners' L1s all use lexically (more or less) different singular possessives, depending on properties of the antecedent: English *his* and *her*, German *sein* and *ihr*, Norwegian *hans*, *hennes* and *sin/sitt/sine* (see Sect. 2). That is, the learners have to interpret the French possessives according to syntactic criteria that differ from the criteria of their mother tongue parallels.

[1] The paper is built on a version in Norwegian that we developed for a celebration of a colleague's 60

[2] Normally, Norwegian and German learners of French have English as their first foreign language, while for English learners French is probably their first (and only) foreign language; that is, in our context French is L_n with $n \geq 2$.

We are interested in establishing to what extent and in what ways lexical similarities and syntactic differences between learners' L1 and their target language (Ln) French affect their spontaneous interpretation of the target language.

L1 influence is clearer in L2 word processing than in syntactic processing. Of course, this does not negate a potential role of L1 influence in syntactic processing: It is possible that reliable evidence will emerge once methodologically reliable comparisons are conducted. What is interesting, however, is that this variability is not observed in L2 word processing. For words, learners seem to show reliable evidence of coactivation at the form and meaning level, despite differences in L2 dominance. This suggests that CLI [Cross-Linguistic Influence] may differentially affect lexical and syntactic processing.

(Lago et al 2020: 9)

The interpretation of 3rd person pronouns in Ln is generally treated as a syntactic problem in the literature; see e.g. Fabricius-Hansen et al. (in this volume) for a recent overview and further references. The question is whether the Ln learner can handle/ has acquired the syntactic restrictions of the pronouns in the relevant language and to what extent their processing is influenced by the system in their native tongue. To our knowledge, L1 priming – lexical transfer – of possessive determiners is scarcely treated cross-linguistically in the relevant literature. The topic is relevant for unequal pronoun systems in a wide sense across closely related languages. Our contribution here is therefore to specify linguistic and cognitive factors that may affect (mis)interpretations of French 3rd person possessives. We establish a set of hypotheses regarding the syntactic conditions for the understanding/interpretation of the possessives in the individual languages and develop a test design for further study.

[2] THE UNEQUAL SYSTEMS OF POSSESSIVES

French s-possessives, *son*, *sa* and *ses*, symbolized as *s** in the following, require a *possessor*, i.e. an antecedent *in the singular*, but are neutral with respect to its gender. This means that *son*, *sa* as well as *ses* in (1) and (2) must point to *Marie* or *Paul*, while reference to plural *les parents/enfants* 'the friends/children' is excluded. The choice between the various forms is exclusively determined by the grammatical gender of the *possessee*, i.e. the lexical head of the nominal introduced by the possessive. Thus, *son* is the possessive determiner in a nominal

phrase with a grammatically masculine singular noun, such as *dessert*, *sa* requires a feminine singular noun (e.g. *crêpe*), and finally, *ses* determines a plural noun (e.g. *sandwiches*). To refer to plural antecedents, e.g. *les parents* in (1) and *les enfants* in (2), a lexically different possessive is used: *leur/leurs*.

We note that the pattern of the singular possessives *son/sa/ses* follows the pattern of the definite determiners in French, *le/la/les*, although only partly since the masculine forms differ.

- (1) Pendant que les parents commande du vin, Marie mange son dessert_{m.sg.} / sa crêpe_{f.sg.} / ses sandwiches_{pl.}
 (‘While the parents order wine, Marie eats her / Paul eats his dessert/ crêpe/ sandwiches’)
- (2) Pendant que Marie commande les enfants mangent son dessert_{m.sg.} / sa crêpe_{f.sg.} / ses sandwiches_{pl.}
 Paul du vin, gent
 (While Marie/ Paul orders wine, the children eat her [Marie’s]/ his [Paul’s] dessert/ crêpe/ sandwiches’)

In contrast to the French *s** possessive, which does not distinguish between the gender of its singular possessor, but marks the gender of the possessee, the English possessives *his/her/their* mark the (natural) gender/number of the possessor, but not any gender or number of the possessee. Thus, for a correct interpretation of (2) above, an English native speaker learning French must understand that *son/sa/ses* all point to *Paul/Marie* and that *ses* cannot point to the plural subject *les enfants*. Due to the lack of gender in English there is also no agreement marking between the possessive and the possessee. For an English native speaker learning French, then, the cognitive mechanism must learn to orient towards the possessee as well as the possessor for the learner to interpret the French possessive determiner correctly.

The Norwegian system distinguishes lexically between an *s*-possessive, which points reflexively to the subject of the clause in which it appears, and possessives pointing back to a (non-local) nominal in a previous clause/the preceding clause. Moreover, the reflexive possessive agrees with the grammatical gen-

der/number of its possessee, resembling French in this respect, whereas the non-local ones, resembling the English possessives, are not inflected.³

(3) *Non-local reference*

- a. Mens *Marie_f* bestiller vin, spiser barna desserten_m
smørbrødet_n *hennes_f*
kakene_{pl}
(‘While Marie orders wine, the children eat her dessert/ sandwich/ cakes’)
- b. Mens *Paul_m* bestiller vin, spiser barna desserten_m
smørbrødet_n *hans_m*
kakene_{pl}
(‘While Peter orders wine, the children eat his dessert/ sandwich/ cakes’)
- c. Mens *foreldrene_{pl}* bestiller vin, spiser barna desserten_m
smørbrødet_n *deres_{pl}*
kakene_{pl}
(‘While the parents orders wine, the children eat their dessert/ sandwich/ cakes’)

For a correct Norwegian equivalent of (1), on the other hand, where the possessive can only point back to the subject of the clause in which it appears, the reflexive (local) possessive is required. The Norwegian *s*-possessive points to the local subject irrespective of its gender and number, but it is inflected in accordance with the gender and number of the possessee.

(4) *Local reference*

- Mens foreldrene bestiller vin, spiser *Marie/ Paul/ barna* desserten_m *sīn_m*
smørbrødet_n *sitt_n*
kakene_{pl} *si-
ne_{pl}*
(‘While the parents order wine, Marie eats her / Paul eats his/ the children eat their [own] dessert/ sandwiches/ cakes’)

Note that in English, the plural *their* in the English translations of (3c) and (4) refers ambiguously to the parents/the children. In Norwegian, different lexical items are chosen for the possessive depending on the local or non-local subject antecedent.

[3] Note that the adnominal Norwegian possessive mostly follows rather than precedes its head noun (see e.g. Faarlund 2019).

The reflexive *si** possessive in Norwegian has an obvious morpho-phonological resemblance to the French singular *s** possessive. For a native Norwegian learner of French, then, chances are that the French *s*-possessive is mistaken for a local interpretation only. Since the Norwegian *s*-possessive is also used for reference to a (local) subject/possessor in the plural, it seems reasonable to think that French *ses*, for example, which refers back to an antecedent in the singular only and does not distinguish between a local and a non-local antecedent, is mistaken for a local, plural-referring anaphor by Norwegian learners of French. We shall formulate our hypotheses in more detail in Section 4.

The German system falls between the other possessive systems we present here. Like English, but unlike French, it distinguishes lexically between a masculine and a feminine possessor: *sein**_{m.sg.} vs. *ihr**_{f.sg.}⁴ Moreover, like French but unlike English, the German possessives are inflected, marking the number, grammatical gender (and case) of the possessee. Like English and French, but unlike Norwegian, they are neutral with respect to the locality of the antecedent. This means that the possessive in (5) can refer to the masculine subject in the local clause or in the initial subordinate clause. Unlike the French possessive in (6) and (7), the German *sein* cannot refer to feminine antecedents like *Linda* or *Marie* in (5).

- (5) Während Paul (~~Linda~~) Cognac bestellt, isst Peter (~~Marie~~) *sein* Dessert.
'While Paul orders brandy, Peter eats his dessert.'
- (6) Pendant que Marie commande du cognac, Paul mange *son* dessert.
'While Marie orders brandy, Paul eats his/ her dessert.'
- (7) Pendant que Paul commande du cognac, Marie mange *son* dessert.
'While Paul orders brandy, Marie eats her/ his dessert.'

Since the German *sein** is morpho-phonologically very similar to French *son*, one may expect the native German learner of French to misinterpret this French possessive determiner to find its reference in a masculine, singular antecedent only.

Another problem, unique to German, is that *ihr**, the form for a feminine, singular possessor (English *her*), is also the form for possessor plural (English *their*). Thus, for an interpretation of (8), the native German learner of French may have a problem with the reference of the possessive: does it relate back to *Marie* or to *les parents*?

[4] Simplifying, we treat German as a two- rather than three-gender language (masc., neut., fem.).

- (8) Pendant que les parents commandent du cognac, *Marie* mange *ses* crêpes.
'While the parents order brandy, Marie eats her crêpes.'

We sum up the differences between the singular possessives in the four languages in Table 1 below.

In the following section we take a closer look at potential (mis)interpretations of Ln-FR possessives as a consequence of the various L1-conditioned processing strategies presented above (see also Fabricius-Hansen et al. 2017: 30–32; Helland 2017; 2019). We concentrate on syntactic conditions as exemplified in (1)–(2) and (6)–(7) above, and more systematically in Table 3 (Sect. 5).

	Possessive	Possessor-related features		
		Number	Gender	Reflexivity
FR	<i>son/sa/ses</i>	sing.	-	-
EN	<i>his/her</i>	sing.	masc./fem.	-
GE	<i>sein*/ihr*</i>	sing.	masc./fem.	-
NO	<i>hans/hennes</i> <i>sin/sitt/sine</i>	sing. -	masc./fem. -	irreflexive reflexive

TABELL 1: Possessives pointing to singular antecedents in French, English, German and Norwegian

[3] COGNITIVE CHALLENGES FOR LN LEARNERS

[3.1] *The direction problem*

First, the learner must understand the orientation of the French *s** forms *son/sa/ses*, i.e. that their grammatical forms point forward to the possessee in French and are not associated with the gender of their antecedent. This is considered cognitively a directional problem for all the different learners we discuss here, although possibly a greater problem for the English learners, since English has no grammatical gender marking on nouns and consequently no agreement between the determiner and the noun. But it also seems to be a problem for Norwegian and German learners of the French system since both languages distinguish lexically between reference to a feminine or a masculine possessor; cf. Helland (2017; 2019) for Norwegian/French and Dalmas & Vinck-

el-Roisin (2012), Fabricius-Hansen (2019) for German/French; cf. also Lago et al. (2018).⁵

Ln-internally, the *son/sa/ses* forms a regular pattern with 1st and 2nd person sg. possessives (*mon/ma/mes* and *ton/ta/tes*); cf. Dalmás & Vinckel-Roisin (2012). This gives reason to think that native speakers conceive of *son* as consisting of a ‘stem’, *s**, carrying the semantics of 3rd person possession, and an ending *-on* agreeing with a masc. sg. possessee. The endings on the possessives *sa* and *ses* correspond to the definite article endings (*la* and *les*), as mentioned above, whereas the masculine singular *-on* is specific for the possessive determiners. An immediate association from *sa/ses* to *la/les* as expressions for fem.sg. and plural respectively is therefore not unlikely for Ln-FR learners. However, could it be that the possessor-oriented gender/number differentiation so characteristic for EN *his/her/their*, GE *sein*/ ihr** and the Norwegian irreflexive possessives *hans/hennes/deres* (see Table 1) are erroneously transferred to *son/ sa/ ses*?

We believe that the learners we discuss here spontaneously mis-direct the gender (and number) marking on the French *s** possessive to an antecedent possessor during learning, and only analytically, which takes longer, interpret it correctly.

[3.2] *The problem of lexical parasites*

We follow Pavlenko (2009) and Lago et al. (2021) in assuming a strong connection between L1 and similar Ln words during the early and middle stages of acquisition. At early stages of acquisition, according to Pavlenko (2009: 142), ‘L2 words are more strongly connected to their L1 translation equivalents than to concepts [...] As proficiency increases, the links between L2 words and concepts become stronger’. Lago et al. formulate this phenomenon as a parasitic storage system:

Ln words are initially stored ‘parasitically’, such that their entries are associated with similar, already known words in learners’ L1, L2 or Ln lexicon. These known words function as ‘hosts’, and learners access the similarity between a host and a parasite subconsciously and on multiple levels, although initially they rely more on orthographic and phonological similarity (form level!) and only later – as their proficiency increases – on grammatical and conceptual similarity (frame and concept levels, respectively). Dur-

[5] Note, however, that since *sein** and *ihr** are inflected in agreement with the possessee, L1 German learners of Ln French will be familiar with ‘looking in both directions’ from their L1 (cf. Stone et al. 2020).

ing initial learning stages, the PM [Parasitic Model] predicts pervasive CLI in processing, as hearing or reading a Ln word should activate its host(s) in other languages. When a new word is successfully learned, its form, frame, and conceptual connections are severed, such that the parasite detaches from the host and its lexical access proceeds autonomously.

(Lago et al. 2021: 172)

For the English learner then, *his* and *her* would/could host French *son* and *sa* respectively, and the syntactic conditions of the (English) host would attach to the understanding of the French possessives, leading to the misdirected interpretation mentioned in 3.1; and likewise for *their* vs. *ses*.

For the Norwegian and German learners there are other parasitic relations: the French *s** possessives have (partly) false friends in these languages: phonologically/orthographically resembling words within the same semantic field of ‘possession’.

But in this context, what is actually meant by a ‘word’? Is it a lexeme – a stem or a root – in a more or less abstract, linguistic sense, or is it a specific form which can be, but does not have to be phonologically/orthographically identical with the stem or root, corresponding to a dictionary item in the traditional sense (see for example a relevant discussion in Lyons 1977: ch. 13, Bybee 1985 and Matthews 1991)? How exactly are so-called lexemes stored in a speaker’s ‘mental lexicon’?⁶

The question here is whether FR *son*, *sa* and *ses* are conceived of as independent lexical items by the Ln learner or simply as inflected forms of a lexical item ‘possessive’ (our *s**). How is such a lexeme represented in the learner’s mental lexicon? A parallel question may be raised with respect to Norwegian native speakers and their mental representation of *sin*, *sitt* and *sine*. Probably, the traditional dictionary item *sin*, rather than the stem *si**, is also the speaker’s mental representation, the item that ‘stands for’ the lexeme. German seems less problematic in this respect: we can assume that the word form *sein* (masc.sg.) for native German speakers also represents a stem/a lexeme (our *sein**).⁷

However problematic this question is, it seems reasonable to assume that German and Norwegian learners of Ln French in one way or another associate *son*, *sa*, and *ses* with their partly false friends in their mother tongue, and par-

[6] See Audring & Masini (2018) for a more general discussion. See also López (2020) for considerations in the frame of Distributed Morphology.

[7] The German form *sein* (possessee-oriented nominative, masc. sg.) is identical with the stem (*sein**), while *son* and *sin* is built on a stem (*s** resp. *si**) combined with a possessee related marker of masc.sg.

ticularly for *son/sein*(*) and *son/sin*, in which the final consonants also correspond. Lexical transfer from L1, then, during the interpretation of a Ln-FR s-possessive in a given syntactic environment, means that the Ln possessive – the parasite – gets the same interpretation that the mother tongue s-possessive (the host) would get under the same syntactic conditions.

As a consequence, L1-NO learners of French, as opposed to French native speakers, may understand *son* – perhaps also *sa* and *ses* – reflexively in example (2). As GE *sein*(*) is marked possessor-oriented masculine singular, it is also reasonable to think that a German learner of French will associate *son* in (6) with *Paul* and neglect the possibility that the local subject *Marie* is a potential referent.

[4] HYPOTHESES ON OUR LEARNERS' INTERPRETATION OF THE FRENCH POSSESSIVES

With the above description of the possessive systems in the four languages, we can now make predictions with respect to the three L1 groups' interpretation of possessive determiners in their learner language French. The learners we have in mind have reached the proficiency level B1 or B2 according to CEFR standards.

To formulate the predictions, we need a set of complex sentences like (2) above, spelled out as independent examples (9) to (12) below:

- (9) Pendant que *Marie* commande du vin, *Paul* mange *son* dessert.
'While Marie orders wine, Paul eats his/her dessert.'
- (10) Pendant que *Marie* commande du vin, *Paul* mange *sa* crêpe.
'While Marie orders wine, Paul eats his/her crêpe.'
- (11) Pendant que *Paul* commande du vin, *Marie* mange *son* dessert.
'While Paul orders wine, Marie eats her/his dessert.'
- (12) Pendant que *Paul* commande du vin, *Marie* mange *sa* crêpe.
'While Paul orders wine, Marie eats her/his crêpe.'

Since the French possessive does not distinguish between the gender of the antecedent, each example is ambiguous between two readings: the possessive may refer to either Marie or Paul. Other research on pronoun resolution indicates that native speakers tend to resolve the pronoun locally, i.e. they choose the closest available (subject) referent if nothing speaks against it (see e.g. Fox 1998; Patterson et al. 2014; Pitz et al. 2017: 65–66). For our examples, then, we would expect native speakers to preferably interpret *son* and *sa* in (9) and (10) as referring to *Paul*, and in (11) and (12) to *Marie*.

On the parasitic model of foreign language learning, combined with the fact that all the learners' L1-languages have separate lexical items for masculine and feminine singular possessor-oriented possessives, we can formulate the following preliminary hypotheses on the learners' interpretations of the four sentences above:

- (i) *Hypothesis 1*: All groups will interpret *son* to refer to a masculine antecedent more often than to a feminine antecedent in this construction.
- (ii) *Hypothesis 2*: All groups will interpret *sa* to refer to a feminine antecedent more often than to a masculine antecedent in this construction.

This means that we expect native-like responses to (9) and (12), irrespective of what strategy has been used to arrive at these responses (so called positive transfer), but we expect non-native like responses to (10) and (11) for the very reason that the relevant groups will tend to confuse possessee agreement in French with the possessor gender orientation in their native languages (negative transfer).

We also expect (partly overlapping) differences in the responses from the three learner groups, based on the partly false friends in German and Norwegian.

- (iii) *Hypothesis 3*: English and German learners will demonstrate much the same pattern of errors due to their morphological distinctions between masculine and feminine singular possessor-oriented possessives. They will tend to correlate FR *son* with *his/sein**, FR *sa* with *her/ihr** and FR *ses* with *their/ihr**.
- (iv) *Hypothesis 4*: German learners will tend to score better than English learners when there is a masculine singular antecedent in the test sentence, due to the phonological resemblance between FR *son*, *ses* and GE *sein**.
- (v) *Hypothesis 5*: Norwegian learners will have more local interpretations irrespective of possessor gender than the other two groups due to the morpho-phonological resemblance between the French *son/sa/ses* and the Norwegian reflexive *sin/sitt/sine*.

Provided our hypotheses on the learners' possessor-orientation are correct, we also expect erroneous interpretations of plural *ses*. Consider the following example:

- (13) Pendant que les parents commandent du vin, *le garçon* mange *ses* olives.
 'While the parents order wine, the boy eats his olives.'

Due to the reflexive possessive system in Norwegian, Norwegian learners will associate *ses* with the highly similar (possessee-)plural reflexive *sine* and end up with positive transfer in the interpretation of (13) above. German and English learners will more often than Norwegian learners interpret *ses* as pointing to the plural subject of the subordinate clause, i.e. as possessor-related plural.

The same error distribution is not expected to result when the plural subject appears in the main clause as in (14), since all groups, although for different reasons, are expected to misinterpret the possessive and erroneously relate *ses* to *les parents*.

- (14) Pendant que *le garçon/ la fille* achète une glace, les parents mangent *ses* sandwiches.
 'While the boy/ the girl buys an ice cream, the parents eat his/her sandwiches.'

Finally, it must be added that the language internal similarity of *la/sa* and *les/ses* may affect the learners' responses:

- (vi) *Hypothesis 6*: The learners will be more uncertain with respect the resolution of *sa* and *ses* than of *son*, due to the close Ln internal resemblance between *la/les* and *sa/ses*. The resemblance will affect the learners' attention to *s**: *s** will be disregarded and responses will be mainly pragmatic. We thus expect candidates to take longer to answer questions on possible possessors under examples of *ses* in particular.

[5] HOW TO TEST OUR HYPOTHESES: THE DESIGN OF AN EXPERIMENT

To test the hypotheses we have arrived at above, we suggest a *reading experiment* in which the *experimental items/ target items*, like our examples in the preceding sections, are versions of an initial subordinate temporal clause followed by a main clause in which the possessive occurs in a syntactic object. The examples A–D in (15) represent (four) different *item classes* in the sense that they vary with respect to the initial subjunction and the activities described in the two subclauses (in italics).

- (15)
 A *Quand* les parents *commandent du vin*, Paul *mange sa crêpe*.
 'When the parents order wine, Paul eats his crêpe.'

- B *Tandis que la fille achète une glace, les garçons cachent son iPad.*
 ‘While the the girl buys an icecream, the boys hide her iPad.’
- C *Pendant que le père fait les courses, les garçons nettoient son bureau.*
 ‘While the father is shopping, the boys clean his apartment.’
- D *Alors que Pierre travaillait dans le jardin, Marie gardait ses chats.*
 While Pierre worked in the garden, Marie took care of his/her cats.’

For each item class, we have three conditions in systematic variation: number/gender of the (non-local) subclause subject, number/gender of the (local) main clause subject, and number/gender of the s^* -possessive, i.e. *son* vs. *sa* vs. *ses* (note that the possessee noun will vary in number/gender in accordance with the possessive); cf. Table 2.

Subclause subject (non-local)	Main clause subject (local)	Possessive
PL(ural)	PL(ural)	son
M (asc. sg.)	M(asc. sg.)	sa
F(em. sg.)	F(em. sg.)	ses

TABLE 2: SETS OF CONDITIONS

Altogether, this gives $3 \times 3 \times 3 = 27$ different (combinations of) conditions. However, combinations with two masculine, two feminine or two plural subjects, or with *ses* and two singular subjects are dispensable for our purposes. Leaving them out, we end up with the 16 conditions exemplified in Table 3 (for item class C).

Condition	Test item
c1 M+PL+son	Pendant que <i>le père</i> fait les courses, les garçons nettoient <i>son</i> bureau.
c2 M+PL+sa	Pendant que <i>le père</i> fait les courses, les garçons nettoient <i>sa</i> chambre.
c3 M+PL+ses	Pendant que <i>le père</i> fait les courses, les garçons nettoient <i>ses</i> chambres.
c4 F+PL+son	Pendant que <i>la mère</i> fait les courses, les garçons nettoient <i>son</i> bureau.
c5 F+PL+sa	Pendant que <i>la mère</i> fait les courses, les garçons nettoient <i>sa</i> chambre.
c6 F+PL+ses	Pendant que <i>la mère</i> fait les courses, les garçons nettoient <i>ses</i> chambres.
c7 PL+M+son	Pendant que les garçons font les courses, <i>le père</i> nettoie <i>son</i> bureau.
c8 PL+M+sa	Pendant que les garçons font les courses, <i>le père</i> nettoie <i>sa</i> chambre.
c9 PL+M+ses	Pendant que les garçons font les courses, <i>le père</i> nettoie <i>ses</i> chambres.

c10	PL+F+son	Pendant que les garçons font les courses, <i>la mère nettoie son bureau.</i>
c11	PL+F+sa	Pendant que les garçons font les courses, <i>la mère nettoie sa chambre.</i>
c12	PL+F+ses	Pendant que les garçons font les courses, <i>la mère nettoie ses cham-</i> <i>bres.</i>
c13	M+F+son	Pendant que <i>Paul</i> fait les courses, <i>Marie nettoie son bureau.</i>
c14	M+F+sa	Pendant que <i>Paul</i> fait les courses, <i>Marie nettoie sa chambre.</i>
c15	F+M+son	Pendant que <i>Marie</i> fait les courses, <i>Paul nettoie son bureau.</i>
c16	F+M+sa	Pendant que <i>Marie</i> fait les courses, <i>Paul nettoie sa chambre.</i>

TABLE 3: Conditions and corresponding test sentences (item class C). Posses-
sives and acceptable antecedents in italics, unacceptable antecedents barred⁸

We envisage a Latin square design experiment in which item classes are varied with respect to conditions as shown in Table 3, and in which all the conditions are tested once in each group of informants but on different item classes. This means that each L1 group is split into four sub-groups whose test materials differ systematically with respect to the pairing of condition and item class; cf. Table 4.

Condition	Sub-groups			
	I	II	III	IV
c1	A	B	C	D
c2	B	C	D	A
c3	C	D	A	B
c4	D	A	B	C
c5	A	B	C	D
c6	B	C	D	A
...
c16	D	A	B	C

TABLE 4: Distribution of test items within group of informants

When the test persons have been presented with a sentence and given time to read it, they have to respond to a question with three alternative answers (*forced choice task*). The questions and answers are formulated in the target language (French). The informants' answers will show whether they have inter-

[8] *le père* 'the father', *la mère* 'the mother', *les garçons* 'the sons', *chambre* (f) 'room', *chambres* (pl) 'rooms', *fait/font les courses* 'is/are shopping', *nettoie/nettoient* 'clean(s)'.

preted the possessive correctly. The sentence they read is no longer available once they push a button to get to the question they are asked to answer. For example, the appearance of (16) – c4 in Table 3 – is followed by (16’), with the alternative answers in (16’’).

- (16) Pendant que la mère fait les courses, les garçons nettoient son bureau.
 (‘While the mother is shopping, the sons clean her apartment.’)
- (16’) *A qui appartient l’appartement?*
 (‘Whose apartment is it?’)
- (16’’) *la mère les garçons quelqu’un d’autre* (‘somebody else’)

Under conditions c1 through c12, where either the local or the non-local subject is a plural noun phrase, *native French* test persons are presumed to interpret all three possessives as referring to the singular nominal subject, irrespective of its gender and irrespective of its position in the main or subordinate clause: *le père* in c1–c3 and c7–c9, *la mère* in c4–c6 and c10–c12 (Tab. 3); the plural nominal *les garçons* is grammatically precluded as an antecedent. Under c13 through c16, on the other hand, both clause subjects are singular and consequently licensed as antecedents; that is, the possessive is referentially ambiguous. In such cases native French informants will probably prefer the local ‘candidate’, i.e. *Marie* in c13–c14 and *Paul* in c15–c16, if nothing in the context speaks against it (cf. Sect. 4).

We sum up our expectations for the three categories of learners:

As mentioned in Section 4, we assume that *English L1* informants will tend to interpret *son*, *sa* and *ses* as *his*, *her* and *their* respectively. That is, they will correctly relate *son* to *le père* in c1 (non-local) and c7 (local) and *sa* to *la mère* in c5 (non-local) and c11 (local) – like native French informants. And independently of binding conditions, they will prefer the masculine candidate (*Paul*) for *son* and the feminine candidate (*Marie*) for *sa* under the ambiguous conditions c13–c16. Under conditions that do not offer a masculine antecedent for *son* (c4, c10) or a feminine candidate for *sa* (c2, c8), however, we expect the English L1 informants to be more uncertain, opting more often for the (incorrect) *quelqu’un d’autre* ‘somebody else’. As for *ses*, we predict a certain amount of erroneous resolutions to the plural antecedent candidate (*les garçons*) under the relevant conditions (c3, c6, c9, c12), in particular when the plural candidate is the local subject (c3, c6).

By and large, we expect informants with *German L1* to follow the same interpretation pattern as the English-speaking learners, preferably relating *son* to a masculine, *sa* to a feminine and quite often (erroneously) choosing a plural an-

tedent for *ses*. On the other hand, phonological/orthographic similarity may lead them to associate *ses* with *sein**, i.e. a masculine possessor. Consequently, they might score better than the English informants under the conditions c3 and c9.

Norwegian L1 informants are expected to prefer a reflexive reading of *son*, not least when the local subject is masculine (c7, c15) but to some extent also when it is feminine (c10, c13) or plural (c1, c4); in the latter case the interpretation is wrong. As for feminine *sa*, the Norwegian informants will probably prefer a feminine referent (*la mère, Marie*), whether local (c11, c14) or non-local (c5, c16); but if none is present (c2, c8), they will tend towards a reflexive interpretation even when it is grammatically precluded (c2), or possibly reject both ‘candidates’. For *ses* we expect a similar distribution of (incorrect) plural interpretations – in particular when the local subject is plural (c3, c6) –, correct reflexive singular interpretations (c9: *le père*, c12: *la mère*) and rejection of both possessor candidates.

The experiment needs *fillers/distractors*. Fillers may be built on the same patterns as the target items, but for the sake of variation the order of the subordinate/main clauses may differ. The number of distractors should be at least as many as the target items. We suggest some examples in (17)–(19) below. – In the final set, the target items and the fillers must be randomized, and the order of the alternative answers to choose from must vary.

- (17) Parce que Paul a oublié l’anniversaire de Marie, il lui envoie un gros bouquet de fleurs.
 (‘Since Paul forgot Marie’s birthday, he sends (her) a large bouquet of flowers.’)
Qui reçoit des fleurs? (‘Who receives flowers?’)
Paul Marie quelqu’un d’autre
- (18) Le professeur envoie une bouteille de vin à la collègue qui vient de s’installer dans le bureau à côté.
 (‘The professor sends a bottle of wine to the colleague who just moved into the adjacent office.’)
Qui a déménagé? (‘Who moved?’)
le professeur la collègue tous les deux (‘both’)
- (19) Anna accompagne Pierre à la boutique et elle lui conseille d’acheter le manteau le plus cher.

(‘Anna joins Pierre to the store and advises him to buy the most expensive coat.’)

Qui achète le manteau le plus cher?

(‘Who buys the most expensive coat?’)

Pierre

Anna

tous les deux (‘both’)

[6] A COMMENT ON THE PRESENT DESIGN

The structure of our experimental items leans on Pitz et al. (2017: Sect. 4), who investigate L1-German learners’ interpretation of the Ln-Norwegian possessives *sin* (reflexive) and *hans* (irreflexive masc. sg.), which both correspond to German *sein** (cf. Sect. 2 above). However, our target sentences differ from theirs by having the possessive occur in the sentence-final main clause, i.e. after both possessor candidates: the possessive points ‘backward’, whether reflexively or anaphorically. By contrast, if the possessive occurs in the initial subordinate clause as in Pitz et al. (2017: 61–62), the choice stands between a (backward-pointing) reflexive and a forward-pointing (cataphoric) interpretation;⁹ cf. the Norwegian sentences in (20) and their referentially ambiguous German counterpart in (21) (from Pitz et al. 2017: 61–62; italics added).

(20)

- a. Mens *Emil*_{LOCAL} passer på [den lille hunden *sin*], klatrer *Magnus*_{NON-LOCAL} i den gamle eika.
(‘While Emil takes care of [the little dog *sin*], Magnus climbs on the old oak tree.’)
- b. Mens *Emil*_{LOCAL} passer på [den lille hunden *hans*], klatrer *Magnus*_{NON-LOCAL} i den gamle eika.
(‘While Emil takes care of [the little dog *his*], Magnus climbs on the old oak tree.’)

- (21) Während *Emil*_{LOCAL} auf *seinen* kleinen Hund aufpasst, klettert *Magnus*_{NON-LOCAL} in der alten Eiche herum.
(‘While Emil is taking care of his little dog, Magnus is climbing in the old oak tree.’)

Pitz et al. (2017) counterbalance the cataphoricity effect by introducing the competing referents, i.e. Emil and Magnus in (20)–(21), in a short pretext to the target sentence. This device ensures that the competitors are equally salient /

[9] For cataphoric pronoun interpretation, see e.g. Pablos et al. (2015), Drummer & Felser (2018).

both pre-mentioned when the interpreter starts processing the target sentence; in our case, however, it does not seem strictly necessary since the potential referents have been introduced sentence-internally before the possessive is encountered.

[7] CONCLUDING REMARKS

The present paper spells out the interpretation problems English, German and Norwegian learners of French are expected to have when they read. We have formulated specific hypotheses relating to differences that can be expected according to the learner's L1. We have furthermore designed an experiment that can be used irrespective of the informants' first language and give evidence for or against the hypothesized parasitic effects of the individual L1s. More advanced learners may well distinguish correctly, so our test applies mainly to the intermediate level. However, we believe that even relatively advanced learners will spend more time than the native French speakers to assign correct reference. With an extension of core examples according to our pattern, the test should be ready for execution with instructions for the test candidates to read each sentence according to his/her own pace, press a button to get to the question, and press the one out of three buttons (marked on the keyboard) that corresponds to their understanding of the sentence. As for fillers, we believe that a rich variety will prevent the test person to guess what the test is out to investigate, and thus guarantee more spontaneous responses. Our hope is that their answers give clear evidence of our hypothesized L1 transfer

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LEXICAL INTERFERENCE IN NON-NATIVE RESOLUTION OF POSSESSIVES?

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ABSTRACT

Research on non-native pronoun resolution has predominantly been concerned with (i) ‘ordinary’ 3rd person pronouns/anaphors like En. *he, she, they* or *himself, herself, themselves*, (ii) language pairs involving English as the native (L1) or the foreign (L2) language, and (iii) the role that binding constraints and syntactic structure in general play in L2 versus L1 processing. The present paper – a follow-up study to Pitz et al. (2017) – deviates from this trend in all three respects: We investigate how L1-Norwegian learners of L2-German interpret the two German possessive pronouns/determiners *sein* (≈ his) and *ihr* (≈ her or their), arguing that lexical divergence between the possessive systems, and in particular the formal similarity between binding-neutral L2-German *sein* and the L1-Norwegian reflexive possessive *sin*, may enhance or interfere with L2 comprehension, depending on the structural conditions.

In Section 2 we briefly present the two possessive systems. Section 3 summarizes relevant research on pronoun resolution, with a special view to possessives. Sections 4–6 present a pilot study on L1-Norwegian learners’ grammaticality judgments of *sein* and *ihr* in simple sentences (Sect. 5) and a forced-choice resolution experiment involving a group of L1-Norwegian learners with a background two or three years’ teaching of L2-German at high-school level and a control group of native speakers of German (Sect. 6). The final Section 7 provides a summary and concluding discussion of our findings.

[1] INTRODUCTION

Possessives – e.g. determiner-like pronominal items like English *his, her, its, their*, or French *son, leur* and German *sein, ihr* – vary in interesting ways across even quite closely related languages (Gunkel et al. 2017: 672–719). They consequently pose different kinds of challenges to L2 acquisition, depending on the

specific L1/L2 pair (see Sect. 3.2 below).¹ The present paper – a follow-up study to Pitz et al. (2017) – is concerned with the pair L1-Norwegian/L2-German, focusing on L1-Norwegian learners' comprehension of the German 3rd person possessives *sein** and *ihr**, each of which may correspond to either the reflexive possessive *si** or an irreflexive possessive in Norwegian.² In addition to being neutral with respect to reflexivity like *sein**, *ihr** is ambiguous between (possessor) singular fem. and plural. Our study aims at testing (i) in how far the similarity between *sein** and *si** may enhance or disturb L1-Norwegian learners' interpretation of L2-German *sein** under conditions where a reflexive reading from a grammatical point of view is either demanded or excluded, and (ii) how they resolve *ihr** under similar conditions, given the fact that a summative plural interpretation (in the sense of Kamp & Reyle 1993: 341-342) is also possible.

The paper is organized as follows: In Section 2 we give a brief contrastive presentation of the systems of pronominal possessives in the two languages. Section 3 summarizes relevant empirical research on pronoun and anaphor resolution, with a special view to non-native resolution and differences between possessives versus 'ordinary' pronouns. Section 4 presents the objectives and general assumption underlying two experiments that aim at testing how Norwegian 1st year students of L2-German master the abovementioned one-to-many correspondence between possessive items in L2 grammaticality judgment (Sect. 5) and offline resolution (Sect. 6). Finally, in Section 7, we summarize the results and present some ideas for further research.

[2] CONTRASTIVE BACKGROUND

The distribution of the German 3rd person possessives *sein** and *ihr** is determined by grammatical properties of their antecedent (*possessor*) DP: *sein** demands a singular masculine or neuter possessor DP, otherwise – i.e. with singular feminine and with plural antecedents – *ihr** is used. Some examples are given in (1)–(3).

-
- (1) a. [*Peter*]_{masc.sg.} hat *sein* Haus verkauft.
'Peter has sold his house.'
- b. [*Das Kind*]_{neut.sg.} hat *sein*-e Mütze verloren.
'The child has lost its cap.'

[1] In line with a widespread practice, we use the term L2 for a language that a person starts learning after childhood and after having acquired the core properties of his/her native language(s). For native speakers of Norwegian, German will normally be at least the second foreign language (L3), following after English.

[2] The star is meant to indicate that the lexical items in question are inflected in context. That is, *sein**, *ihr** and *si** each represent a set of inflected forms (morphological words).

- (2) a. [*Lisa*]_{fem.sg.} hat *ih*r-en Wagen verkauft.
 ‘Lisa has sold her car.’
 b. [*Die Wand*]_{fem.sg.} hat *ih*r-e Farbe verloren.
 ‘The wall has lost its colour.’
- (3) a. [*Die Nachbarn*]_{pl.} haben *ih*r-e Pferde verkauft.
 ‘The neighbours have sold their horses.’
 b. [*Die Wände*]_{pl.} haben *ih*r-e Farbe verloren.
 ‘The walls have lost their colour.’

The examples illustrate the typical adnominal function of German possessives. In this use, possessives act like determiners: They are confined to the initial – functional head – position of their host DP, they inflect like determiners, agreeing with their head (*possessee*) noun with respect to number, gender and case; and they make their host DP semantically definite – like, e.g. English possessives (Gunkel et al. 2017: 672–719, Fabricius-Hansen et al. 2017: 12–14).

In Norwegian (*bokmål*), adnominal possessives have two positional options: They may occur DP-initially, as in German and English, making the DP semantically definite despite the indefinite form of the head noun; mostly, though, they are post-nominal, triggering overt definiteness marking of the preceding head noun (phrase).

Leaving differences of the inflectional systems aside, it is with respect to the nature of the possessive items and the conditions determining their use that the Norwegian and the German system of possessives differ most conspicuously (Fabricius-Hansen et al. 2017). Thus, Norwegian has a specific *reflexive* possessive *si** which, roughly speaking, must be used when the possessive is *locally bound*, i.e. c-commanded by an antecedent inside the local clause (typically the clause subject).³ Like the 3rd person reflexive pronoun *seg* (German *sich*; ‘his-/herself, themselves’), *si** is neutral with respect to semantic/ grammatical number and gender of its antecedent; and like articles, *si** is inflected, agreeing in number and gender with its head noun. Examples are seen in (4)–(6), the Norwegian counterparts of (1)–(3): *sin*, *si*, *sitt*, *sine* are the singular masc./commune, singular feminine, singular neuter and plural forms of *si**, respectively, agreeing in number and (singular) gender with the head noun, which, when preceding the possessive, exhibits corresponding forms of the definite article.

[3] Principle A in Chomsky’s (1981) Binding Theory.

- 
- (4) a. [Petter]_{masc.sg.} har solgt [hus-et **si-tt**] / [**si-tt** hus].
 ‘Peter has sold his house.’
 b. [Barnet]_{neut.sg.} har mistet [lua **si**] / [**si-n** lue]
 ‘The child has lost its cap.’
- (5) a. [Lisa]_{fem.sg.} har solgt [bil-en **si-n**] / [**si-n** bil].
 ‘Lisa has sold her car.’
 b. [Veggen]_{comm.sg.} har mistet [farg-en **si-n**] / [**si-n** farge]
 ‘The wall has lost its colour.’
- (6) a. [Naboene]_{pl.} har solgt [hest-ene **si-ne**] / [**si-ne** hest-er]
 ‘The neighbours have sold their horses.’
 b. [Veggene]_{pl.} har mistet [farg-en **si-n**] / [**si-n** farge]
 ‘The walls have lost their colour.’

With non-local possessors, Norwegian uses genitive forms (*hans* ‘his’, *hennes* ‘her’, *dens/dets* ‘its’ and *deres* ‘their’) of 3rd person non-reflexive – or more precisely: *irreflexive* – pronouns as possessives.⁴ As with German *sein** and *ihr**, the choice between these items depends solely on properties of the possessor DP/referent, albeit with respect to more syntactic-semantic dimensions (Fabricius-Hansen et al. 2017: 14–16). Thus, *hans* and *hennes* are used with singular human male and female possessors, corresponding to English *his* and *her* respectively; *dens* and *dets* with singular non-human possessors, corresponding to English *its* but differing in grammatical gender (commune vs. neuter); and *deres* demands a plural possessor, like English *their*. Examples with post-nominal *hans*, *hennes* and *deres* are given in (7); for *dens* and *dets*, which tend to be avoided in present day colloquial Norwegian, we refer the reader to Fabricius-Hansen et al. (2017).

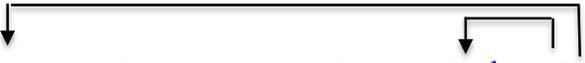
- 
- (7) a. Mens [Jon] var borte, passet Anna katt-ene **hans**.
 ‘While John was away, Anna cared for his cats.’
 b. Mens [Anna] var borte, brukte Jon bil-en **hennes**.
 ‘While Anna was away, John used her car.’
 c. Mens [barna] var borte, malte Jon romm-et **deres**.
 ‘While the children were away, John painted their room.’

[4] That is, these possessives obey Chomsky’s (1981) Binding Principle B.

By contrast, the German possessives *sein** and *ihr** may be locally bound, as in (1)–(3) above, or not, as in (8) below, i.e. they are neutral with respect to binding conditions (reflexivity); and the choice between them depends solely on the grammatical gender and number of the possessor DP. – Note that in (8b, c), *ihr** also has a plural reading (‘their’); see below.

- 
- (8) a. Während [*Johan*] weg war, pflegte Anna *sein*-e Katzen.
 ‘While John was away, Anna cared for his cats.’
 b. Während [*Anna*] weg war, benutzte Johan *ihr*-en Wagen.
 ‘While Anna was away, John used her car.’
 c. Während [*die Kinder*] weg waren, malte Johan *ihr* Zimmer.
 ‘While the children were away, John painted their room.’

In suitable contexts, then, the German possessives may be ambiguous between a reflexive (locally bound) and non-reflexive (non-locally bound) interpretation, like English possessives. This is the case with *sein* in (9) below, which may be bound by the singular masc. subject (*Paul*) of its own clause (reflexive use, local binding) or refer to the singular masc. DP *Peter* occurring in the preceding clause (non-reflexive use, non-local ‘binding’);⁵ that is, the host DP *sein* *Auto* ‘his car’ may refer to either Paul’s or Peter’s car.

- 
- (9) Während *Peter* verreist war, reparierte *Paul* *sein* Auto.
 ‘While Peter was away, Paul repaired his car.’

Likewise, *ihr* in (10) may be understood reflexively, referring to Lisa, or non-reflexively, referring to Anna. Moreover, *ihr* in (10) – and *ihren* in (8b) – may receive a possessor plural reading (‘their’), referring to the set made up by the two different singular referents introduced in the context: Lisa + Anna in (10) and Anna + Peter in (8b). In other words, the car in (10) may belong to Lisa (full short arrow), Anna (full long arrow) or the two together (dashed arrows). Henceforth, we shall use the term *summative plural* interpretation for cases like these, where the plural possessor is not introduced by a single plural DP, as in (3) and (8c), but ‘construed over’ two or more separate, non-coordinated DPs occurring in the context (see Kamp & Reyle 1993: 341–342).

[5] In the latter case, the possessive in fact is co-referent with rather than bound by its antecedent in the strict, technical sense of the term.

- (10) Während *Anna* verreist war, reparierte *Lisa* *ihr* Auto.
 ‘While Anna was away, Lisa repaired her/their car.’
-

Ambiguities like the ones illustrated by full arrows in (9) and (10) do not arise in Norwegian – at least not in simple clauses like those discussed here:⁶ Co-reference between the possessive (*si**) in the main clause and the subject of the subordinate clause is blocked in (11a-c) (Binding Principle A); conversely, *hans* ‘his’, *hennes* ‘her’ and *deres* ‘their’ in (12a-c) cannot refer to the subject of their own clause (Binding Principle B). Note however that *deres* in (12c) also allows for a summative plural interpretation, combining the referents of the two (plural) possessor ‘candidates’ into one (dashed arrows).

- (11) a. Mens *Jon* var borte, fikset *Paul* bil-en *si*-n.
 ‘While John was away, Paul fixed his (own) car.’
 b. Mens *Anna* var borte, fikset *Lisa* bil-en *si*-n.
 ‘While Anna was away, Lisa fixed her (own) car.’
 c. Mens *barna* var borte, planla *foreldrene* ferie-en *si*-n.
 ‘While the children were away, the parents planned their (own) holiday.’
-

- (12) a. Mens *Jon* var borte, fikset *Paul* bil-en *hans*.
 ‘While John was away, Paul fixed his (Peter’s) car.’
 b. Mens *Anna* var borte, fikset *Lisa* bil-en *hennes*.
 c. Mens *barna* var borte, planla *foreldrene* ferie-en *deres*.
 ‘While the children were away, the parents planned their (the)’
-

[6] In fact, things are not that neat in actual use. So-called long-distance binding is not ruled out, and on the whole, the principles governing the choice between *si** and the irreflexive possessives are somewhat blurred, varying across dialects, sociolects and medium (spoken and written language); see e.g. Fabricius-Hansen et al. (2017: 20–22) and references therein. In addition, even under hard-core conditions, ‘errors’ are not infrequent, in particular with plural possessors, i.e., *deres* occurring instead of ‘correct’ *si** or vice versa.

children's or the children's and the parents' joint) holiday.'

In short, given a +human possessor DP, whose grammatical gender reflects the natural gender of its referent: Then *sein** (+sing. male/masc.) is equivalent to *si** (+refl[exive]) or *hans* (-refl, +sing. male), depending on \pm local binding; and *ihr**, being compatible with sing. fem. and plural possessors, is equivalent to *si** (+refl), *hennes* (-refl, +sing. fem.) or *deres** (-refl, +plural); cf. Figure 1.



FIGURE 1: German \rightarrow Norwegian lexical divergence in 3rd person possessives with human possessor

As historical cognates, German *sein** and Norwegian *si** exhibit a morpho-phonological similarity observed in many other lexical pairs, as for instance the 1st and 2nd pers. singular possessives *mein*/mi** 'my' and *dein*/di** 'your (sing.)'. Lexical divergence, then, makes *sein** if not a downright 'false' so an 'unreliable friend' viewed from the perspective of L1-Norwegian users of L2-German: it may or may not be equivalent to its cognate *si**.⁷ German *ihr**, on the other hand, bears no resemblance to any of its three lexical counterparts within the system of Norwegian possessives; in addition to being neutral with respect to binding conditions/reflexivity, however, *ihr** exhibits a gender-number ambiguity without parallel in the Norwegian system.

Studies conducted by Bie-Lorentzen (2012) and Pitz et al. (2017) have shown that the lack of isomorphism between the two possessive systems, as would be expected, causes problems for not very advanced Norwegian learners of L2-German when translating between the two languages, whether into or from L2. The experiments presented in Sections 4–6 aim at shedding some light on how they cope with the abovementioned divergence and unreliable morpho-phonological similarity in offline comprehension and grammaticality judgments of L2-German possessives.

[7] According to Jarvis (2009: 107) 'false friends' may be defined as 'cross-linguistic word pairs that are (1) formally the same or similar and (2) semantically similar or dissimilar (but not the same)'.

[3] EMPIRICAL RESEARCH ON PRONOUN RESOLUTION

[3.1] 3rd person pronouns in general

The referential interpretation of 3rd person pronouns and other anaphoric expressions – *pronoun* or *anaphoric resolution* – is a well-established topic in theoretical linguistics (see e.g. Geurts 2011 for an overview) as well as experimental psycholinguistic investigations, a central question being how different kinds of constraints on pronouns (including reflexives) interact in native and non-native production and comprehension of pronouns (see e.g. Nicol & Swinney 1989; Garrod 1998; Garrod & Terras 2000; Garnham 2000; Badecker & Straub 2002; Kennison 2003; Sturt 2003; 2013; Koornneef 2008; Arnold 2010; Cunnings & Felser 2013; Chow et al. 2014; Jäger et al. 2015; Patil et al. 2016; and, concerning non-native processing, e.g. Clahsen & Felser 2006a, b; Roberts et al. 2008; Felser & Cunnings 2012; Cunnings & Felser 2013; Patterson et al. 2014; Colonna et al. 2014; Schimke et al. 2015; 2018; Drummer & Felser 2018; Felser 2019; Schulz et al. 2019).⁸ By and large, however, possessives have got little attention (see Sect. 3.2).

A key issue in the psycholinguistic discussion is the status of structure-sensitive – binding – constraints as opposed to other possible constraints on pronouns, including feature agreement between pronoun and antecedent. Do binding constraints act as a filter in native comprehension in the sense that salient but structurally inaccessible (inappropriate, illicit) antecedent candidates are immediately discarded as antecedents whether or not they match the pronoun in relevant (gender, number, ...) features (see e.g. Nicol & Swinney 1989; Sturt 2003)? Or is a parallel cue-based resolution mechanism more plausible – a processing strategy in which ‘multiple weighted constraints (including constraints on binding) simultaneously influence the net activation of a candidate during preselection stages of antecedent evaluation’ (Badecker & Straub 2002: 748)? According to Badecker & Straub (2002), Jäger et al. (2015), Patil et al. (2016), among others, evidence on the whole seems to favor models of the latter kind.

Another question concerns resolution preferences when the context offers more than one accessible and feature-matching antecedent candidate for the anaphor, i.e. when the pronoun is referentially ambiguous. Under such conditions, local resolution (binding by Principle A) is assumed to be the preferred

[8] Note that we use the terms pronoun and anaphor in a wide sense, covering both reflexive and non-reflexive items. According to the theory of Government and Binding (Chomsky 1981), however, *pronouns* by definition are subject to Binding Condition B, *anaphors* to Condition A. In this tradition, then, lexical reflexives like *him-/herself* and German *sich* ‘him-/herself, themselves’) are anaphors, while *he/him, she/her* etc. are pronouns; see e.g. Badecker & Straub (2002).

choice – if structurally warranted, as for instance with *sein*/ihr** in (9)/(10) (Fox 1998; Heim & Kratzer 1998; Patterson et al. 2014). In any case, however, the interpretation in the end relies heavily on semantic, pragmatic and discourse-related cues, including the possibility of anaphoric competitors to the pronoun in question (see e.g. Bosch et al. 2007; Roberts et al. 2008; Arnold 2010; Baumann et al. 2014; Colonna et al. 2014; Schimke et al. 2015; 2018; Bader & Portele 2019; Schulz et al. 2019).

As for non-native pronoun resolution, it is still an open question to what extent learners of a foreign language can acquire the resolution strategies and obtain the efficiency exhibited by native speakers. Studies presented by Clahsen & Felser (2006a), Felser et al. (2009), Felser & Cunnings (2012) and Patterson et al. (2014) indicate that L2-learners, even at an advanced level, more often consider (during processing) or even prefer (in the final interpretation) structurally inaccessible DPs as antecedents than do native comprehenders. Apparently, then, structure-sensitive constraints (Binding Principles A vs. B) do not play the same decisive role in non-native as in native pronoun resolution. Possibly, structural processing is impoverished in L2 comprehension in general. This is suggested in Clahsen & Felser (2006a), Felser & Cunnings (2012) and Clahsen & Felser (2006b). However, as documented e.g. by Gast & Haas (2008) and Patterson et al. (2014) (and as we shall see below), properties of L1 – transfer in a more or less strict sense – may also play a role. Taking stock, Felser (2019) argues that trying to reduce L1/L2 processing differences to a single cause might seem misguided.

What is called for instead is a more careful investigation of how different types of constraint and information sources interact during L2 comprehension, taking into account what linguistic cues need to be extracted from the input or need to be re-accessed in order for a given constraint to be applied. This should provide us with a more nuanced picture of how the relative weighting or timing of constraints or information sources might differ in L2 in comparison to L1 processing.

(Felser 2019: 59)

It should be added that studies on pronoun resolution predominantly concern cases where the so-called antecedent is indeed an antecedent, as in (1)–(15), linearly preceding the pronoun – that is, *anaphoric* pronouns in yet another sense of that term (cf. fn. 8). Resolution of *cataphoric* pronouns, which linearly precede their ‘antecedent’, has been studied less intensively; but see Gompel & Liversedge (2003), Pablos et al. (2015), Drummers & Felser (2018) and further

references there. Online cataphoric resolution involves waiting or looking forward for – perhaps predicting – a feature-matching DP that semantic-pragmatically fits into the pronoun’s context. However, in order for co-reference to be established between the two, they must belong to the same sentence; and according to Chomsky’s (1981) Binding Condition C, the candidate DP may not be structurally bound by the pronoun. Thus Principle C prevents the main clause subject *he* in (13a) from being resolved to the subordinate clause subject (*the lord*). On the other hand, as part of a DP, *his* in (13b) does not c-command *the lord*, nor can the subordinate clause subject *he* in (14a,b) bind a DP within the following main clause; consequently, co-reference with *the lord* is possible in these three cases.

- (13) a. **He**_{*i*/*hi*} got depressed when *the lord*_{*j*} married the duchess.
 b. **His**_{*i*/*hi*} butler got depressed when *the lord*_{*i*} married the duchess.
 (Drummer & Felser 2018: 98; indices added)
- (14) a. When **he**_{*i*/*hi*} was depressed, *the lord*_{*j*} invited the duchess for a drink
 b. When **he**_{*i*/*hi*} was depressed, the duchess invited *the lord*_{*j*} for a drink
 (Drummer & Felser 2018: 98; indices added)

Experiments conducted by Drummer & Felser (2018) indicate that condition C plays the same role in native and non-native (Russian/German bilingual) comprehension but ‘does not prevent inaccessible antecedents from being considered during the initial bonding stage’, its application apparently being more ‘bottom-up driven than previously thought’ (Drummer & Felser 2018: 112).

[3.2] 3rd person possessives

Studies on the resolution of possessive pronouns are surprisingly scarce in view of the fact that possessives represent somewhat different processing challenges from ordinary personal pronouns:⁹

First, since possessives are determiners or modifiers in DPs, binding constraints work differently under cataphoric conditions than they do for ordinary pronouns; cf. Drummer & Felser (2018) and Section 3.1 above.

Second, the two pronominal subsystems – ordinary and possessive 3rd person pronouns – are not always isomorphic, as in Norwegian, but may differ in number of items and the nature or distribution of constraints. This is the case

[9] For native resolution see e.g. Kennison (2003) on (*him*,) *his* and *her*, Jäger et al. (2015: Sect. 4) on the Swedish possessives *sin* and *hans*, and Drummer & Felser (2018) on the interpretation of cataphoric pronouns and possessives in subject DPs.

in German, which has a number- and gender-neutral 3rd person reflexive pronoun *sich* ‘him-/her-/itself, themselves’ in addition to the three number/gender-specified (irreflexive) personal pronouns (*er* ‘he’, *es* ‘it’, *sie* ‘she/they’) on the one hand and on the other hand only two possessive items (*sein** and *ihr**), which are specified for possessor number/gender but unspecified for reflexivity (Binding Conditions A vs. B); see Sect. 1.2. English is another case in point (Kennison 2003: 337), cf. *Peter_i knows himself_{i/j}* and *Peter_i knows him_{j/n}* vs. *Peter_i knows his_{i/j} wife*; and in French (as in other Romance languages), possessives differ from non-possessive anaphors by being underspecified not only for reflexivity but also for antecedent gender (see e.g. Helland 2017; Lago et al. 2018).

Third, in many languages, including German and e.g. French but with English as a prominent exception, adnominal possessives exhibit feature (number, gender, case, ...) agreement with the head noun of their host DP (the possessee), in addition to being specified for antecedent features. Beside searching for an antecedent (the possessor), then, comprehenders must ‘keep an eye’ on the possessee noun (phrase) too, checking for the relevant features; as pointed out by Lago et al. (2018), however, possessee agreement is probably a bigger problem in production than in comprehension.¹⁰

As far as challenges to L2 acquisition are concerned, then, the grammar of adnominal possessives opens up for more variation across L1/L2 pairs than ordinary pronouns – including the relative order of possessive and possessee (cf. Sect. 1.2 above). And (the few) empirical/experimental studies on L2 production and/or comprehension of possessives indicate that even quite advanced L2 learners’ performance may be influenced by their L1 possessive system in ways and to a degree that, at least in part, reflect cross-linguistic (dis)similarities in the different dimensions of possessive variation.

Santesteban et al. (2010), Foucart et al. (2011) and Antón-Méndez (2011), for instance, found that L1 speakers of a Romance language, where possessives encode gender agreement with the possessee alone, quite often use L2-English *his* and *her* in agreement with the possessee rather than the intended antecedent (e.g. producing *Peter loves her sister* when meaning ‘Peter_i loves his_i sister’), while native speakers of Greek or Dutch master the distribution of *his* and *her* like L1-English speakers, in accordance with the fact that possessives in their L1 encode gender agreement with the possessor, like English.¹¹

[10] In addition to the factors mentioned above, the relational meaning potential of possessives, which varies somewhat across languages (cf. e.g. Baron et al. 2001; McGregor 2009; Gunkel et al. 2017: 672–719), may be a complicating factor.

[11] Pozzan & Antón-Méndez (2017) explain corresponding agreement errors made under elicited production by L1 Mandarin learners’ of L2 English as resulting from a general tendency to establish local (pos-

As for non-native comprehension of possessives, Lago et al. (2018) investigated whether multilingual speakers with either L1-English/L2-Spanish or L1-Spanish/L2-English differ in their sensitivity to possessor agreement violations in German as an ‘additional’ non-native language (‘La’), depending on whether possessor gender agreement is present in their L1 (English) or not (Spanish). Using context-free German sentences like (15a-d) in a speeded acceptability judgment and an implicit reading experiment, they found that (i) the L1-Spanish participants, as expected, showed less sensitivity than the L1-English group towards possessor-possessive mismatch as displayed in (15c-d);¹² (ii) high L2 proficiency may have helped L1-Spanish/L2-English in La-German but did not influence the performance of L1-English/L2-Spanish participants; (iii) contrary to their expectations, gender mismatch between possessive and possessee (*Mutter* ‘mother’), as displayed in (15b,c) did not affect the L1-Spanish learners’ performance in any significant way.¹³

- (15) a. *Frau Schmidt* küsste *ihre Mutter* bei dem letzten Familientreffen.
 ‘Ms. Schmidt kissed her mother at the last family reunion.’
 b. *Herr Schmidt* küsste *seine Mutter* bei dem ... Familientreffen.
 ‘Ms. Schmidt ... his mother ...’
 c. *Frau Schmidt* küsste *seine Mutter* bei dem ... Familientreffen.
 ‘Ms. Schmidt ... his mother ...’
 d. *Herr Schmidt* küsste *ihre Mutter* bei dem ... Familientreffen.
 ‘Ms. Schmidt ... her mother ...’

Lago et al. (2018) conclude that both the L1 grammar and the grammar of a L2 may influence multilinguals’ comprehension of possessives in La and that when an agreement constraint is absent in L1, comprehenders have more difficulty deploying it in La.

The observation that L2 learners have difficulties deploying L2 constraints on possessives that are not present in their L1 is corroborated by Helland (2017), Pitz et al. (2017) and Saad et al. (2019) with respect to the structure-sensitive binding constraints (Condition A vs. B) that characterize reflexive vs. irreflexive possessive markers.

sessive-possessee) agreement. But this hypothesis cannot account for the abovementioned difference between L1-Romance and L1-Dutch or Greek learners’ performance; cf. Lago et al. (2018).

[12] Note that (15c) and (15d) are ungrammatical only under a locally bound/ reflexive reading of the possessive.

[13] It might have played a role that the Spanish 3rd person (singular) possessive *su* ‘his, her’, in contrast to 1st and 2nd person possessives, is in fact neutral with respect to possessee gender; see the discussion in Lago et al. (2018).

Saad et al. (2019) investigated how well multilingual speakers whose first (majority) language (Austronesian Alor Malay) has binding-neutral 3rd person possessive marking master the distinction between reflexive and irreflexive 3rd person possessive marking in their second (minority) language (Indonesian Abui). They found that (pre-)adolescents did not fully master the distinction, whether in production or comprehension, and that the tendency was to over-generalize the irreflexive prefix to reflexive contexts rather than the other way around, arguably because the former, being less restricted, is considerably more frequent in natural discourse.¹⁴ Notably, possessive marking in L1-Malay bears no morpho-phonological resemblance to either the reflexive or the irreflexive possessive marking in L2-Abui.

Turning to Norwegian versus German (Bie-Lorentzen 2012; Pitz et al. 2017) or French (Helland 2017), things become more complicated since (i) possessive systems in Norwegian and German or French differ with respect to feature-agreement constraints in addition to the structure-sensitive binding constraint, and (ii) in particular because the Norwegian reflexive *s*-possessive (*sin/si/sitt/sine*) is an ‘unreliable friend’ of its binding-neutral *s*-cognates in German (*sein**; see Sect. 1.2) and French (*son/sa/ses*; Helland 2017). Consequently, incorrectly assigning a non-local antecedent to L2 *si**, whether in production or comprehension, may be due to more or less shallow (negative) transfer – priming – from L1-German *sein** (or L1-French *s**) rather than insufficient mastering of the binding constraints on the L2-Norwegian possessives.¹⁵ Likewise, when L1-Norwegian learners of L2-German understand German *sein** as locally bound (reflexive) under conditions that grammatically preclude such an interpretation, or erroneously use *sein** instead of *ihr** under local binding, this may be due to interference from *si** rather than insufficient mastering of agreement constraints or nominal gender in German.

The results of translation tests (L1→L2 and L2→L1) conducted by Bie-Lorentzen (2012) and Pitz et al. (2017) indicate that the cross-linguistic divergence of *sein** into *si** and *hans, hennes, deres* and the divergence of *si** into *sein** and *ihr**, as expected, constitute an obstacle for L1-German learners of L2-Norwegian and L1-Norwegian learners of L2-German, respectively, and that ‘[i]n both cases, there seemed to be a tendency to translate on the basis of the L1 system although morpho-phonological priming cannot be ruled out’ (Pitz et al. 2017: 69). The study presented below, however, is the first to investigate L1-Norwegian learners’ comprehension of the L2-German possessives *sein** and *ihr** in tasks that do not involve translation.

[14] It may be asked whether the forced choice task intended to test comprehension is indeed a comprehension task rather than some kind of restricted elicitation task.

[15] See e.g. Jarvis (2009); ZhaoHong & Tarone (2014); and Yu & Odlin (2016) on the notion of transfer.

[4] THE PRESENT STUDY: AIM AND GENERAL ASSUMPTION

We have seen that the German possessives *sein** and *ihr** (with a +human antecedent) pose at least three potential challenges to Norwegian learners:

- (i) They are unspecified with respect to binding conditions and consequently may exhibit a type of referential (reflexive/non-reflexive) ambiguity that, at least under ‘hard-core’ conditions (see fn. 6), is excluded for Norwegian possessives (Sect. 1.2).
- (ii) Being binding-neutral but morpho-phonologically similar, *sein** is an ‘unreliable friend’ of the Norwegian reflexive possessive *si** (cf. Fig. 1)
- (iii) Beyond being binding-neutral, *ihr** is ambiguous between (possessor) singular fem. and plural (cf. Fig. 1).

Our study focuses on Norwegian learners’ interpretation of *sein** and *ihr** under conditions where *sein** according to the rules of German grammar in the given (empty) context either must be or cannot be locally bound, as for instance in (1)–(2) and (8) respectively; and likewise for *ihr** if understood as singular. That is, leaving locality-ambiguities caused by (i) aside, we are specifically interested in the possible effects of (ii) and (iii) on Norwegian speakers’ grammaticality judgments and, in particular, (off-line) comprehension of L2 *sein** and *ihr**. The learners we are concerned with are 1st year L1-Norwegian university students of German who have had two or three years’ non-immersed teaching of German as a foreign language at high school level, corresponding to level B1 and B2 respectively of the CEFR (Common European Framework of Reference for Languages). They all had English as their first foreign language.

Due to (ii) and in line with Pitz et al. (2017), we assume that Norwegian learners of L2-German at this level of proficiency tend to associate *sein** more strongly with *si** than with *hans*. Consequently, they should be more prone to wrongly understand and judge unambiguously non-locally bound *sein** as locally bound ($\approx si^*$) than to understand and judge unambiguously locally bound *sein** as non-locally bound ($\approx hans$). This is one of the main assumptions underlying the experiments presented in Sections 5 and 6.

Due to (iii), we expect the pattern of interpretation and grammaticality judgment among Norwegian learners – and native speakers of German as well – to be more diffuse/ less skewed for *ihr** than for *sein**.

As for the inherent reflexive/non-reflexive ambiguity of *ihr**, Pitz et al. (2017) speculate that the morpho-phonological dissimilarity between *ihr** and its reflexive Norwegian counterpart *si**, which contrasts with the *sein*/si** pair,

may ‘push’ the Norwegian learners towards associating *ihr** more strongly with its irreflexive Norwegian counterparts *hennes* (sing. fem.) and *deres* (plur.) than with *si**. In that case, they would be expected to misinterpret and judge unambiguously locally bound *ihr** as non-locally bound (\approx *hennes* or *deres*) more often than the other way around – and more often than would be expected for *sein**. It may be asked, however, whether the effect is counteracted by a default preference for the local candidate under locality-ambiguous conditions (cf. Sect. 3.1).

The singular/plural ambiguity of *ihr** is restricted to contexts that offer a structurally accessible singular female and an accessible plural possessor candidate as well, as in (8c), or two or more singular candidates that can be cumulated into a plural possessor and at least one of which is female, as in (8b) and (10). Under both conditions pragmatics undoubtedly will play a major role in the resolution process. It seems plausible, however, that unless there are very good semantic-pragmatic reasons for the opposite, *ihr** will preferably be resolved to a singular female possessor candidate if the alternative is a summative plural interpretation. Our resolution test (Sect. 6) also addresses this assumption.

[5] PILOT STUDY ON GRAMMATICALITY JUDGMENT

As a pilot study we conducted a rather simple grammaticality judgment experiment with Norwegian students of German.

[5.1] Test design

Materials

The test comprised a list of 24 test sentences with possessive pronouns, interspersed with 26 distractors containing different types of determiners. The test items were context-free one-clause sentences containing an occurrence of *sein** or *ihr** as part of a complement DP. The subject being the only antecedent candidate in the sentence, the possessive should be understood as locally bound and under that reading be judged grammatical or ungrammatical depending on whether it matches or mismatches the subject with respect to number and gender. Examples of the relevant variations are given in (16) and (17), distractors are exemplified in (18). There were 12 items with *sein**, 6 grammatical and 6 ungrammatical, and 12 items with *ihr*, 4 of each type illustrated in (17), i.e. 8 grammatical and 4 ungrammatical.¹⁶

[16] It is an interesting question – which we did not pursue – how native speakers of German would judge or react to the ‘ungrammatical’ items.

- (16) a. Der Opa begleitet *seinen* Enkel zum Kindergarten. *sein** match
 ‘Grandpa escorts his grandson to the kindergarden.’ (gender)
- b. *Die Studentin findet *seinen* Platz nicht. *sein** mism.
 ‘The (female) student doesn’t find his place.’ (gender)
- c. *Die Berliner sind stolz auf *seine* Stadt. *sein** mism.
 ‘The Berliners are proud of their town.’ (number)
- (17) a. Katrin hat Diskussionen mit *ihren* Kollegen. *ihr** match
 ‘Katrin has discussions with her colleagues.’ (gender)
- b. *Der Nachbar erzählt nie von *ihrem* Job. *ihr** mism.
 ‘The (male) neighbor never talks about her job.’ (gender)
- c. Alle Kinder sind mit *ihren* Eltern angekommen. *ihr** match
 ‘All (the) children arrived with their parents.’ (number)
- (18) a. Paul verbringt *die* meiste Zeit in der Bibliothek.
 ‘Paul spends most of the time (lit: the most time) in the library.’
- b. *Kristine bestellt immer *die* teuerste Gericht.
 ‘Kristine always orders the most expensive food.’

We did not conduct a vocabulary test. However, in the formulation of test items and fillers, an attempt was made to keep both the vocabulary and the type of constructions at an everyday conversational level, i.e. a level one could expect the students to have reached.

Participants

The participants were 41 Norwegian students at the end of their first term of German studies at university level. Their L1 was Norwegian and they largely had the same background concerning German, i.e. German at high school level.

Task

The test sentences were presented in a classroom setting on paper, with the task formulated in German on the top of the page: Determine the grammaticality of the italicized determiners and pronouns in the following examples. The answer alternatives were given in Norwegian – *riktig/ feil/ vet ikke* (‘[grammatically] correct/ [grammatically] incorrect/ don’t know’) – in boxes underneath each sentence. To avoid misunderstandings and prevent disturbing questions, the participants were instructed orally to read the sentence once without dwelling on the example, i.e. to make their judgment without analyzing, and then go on to the next sentence. They were told explicitly not to focus on in-

flectional endings but to interpret the sentence in the given (empty) context. The time allotted to the whole test was 30 minutes, thus a little more than 30 seconds for each sentence.

[5.2] Hypotheses

In accordance with the assumptions outlined in Sect. 4 we had the following hypotheses:

- H1-1 The grammaticality of *sein** is more often judged incorrectly under the (ungrammatical) mismatch than under the (grammatical) match condition.
- H1-2 Under the match condition, the grammaticality of *ihr** is more often judged incorrectly than the grammaticality of *sein**.
- H1-3 Under the mismatch condition, the grammaticality of *sein** is more often judged incorrectly than the grammaticality of *ihr**.

H1-1 relates to fact that *sein** is neutral with respect to binding but morphophonologically similar to the Norwegian reflexive possessive *si**; cf. (ii) in Sect. 4. The similarity is expected to enhance a correct judgment of the match cases, where a reflexive interpretation of *sein** is indeed grammatically licensed, but may conversely prevent the learners from realizing that *sein** cannot correctly refer to a non-matching local subject.

The rationale behind H1-2 and H1-3 is that as far as *ihr** is concerned, there is no cross-linguistic similarity to trigger comparable – positive or negative – effects on the judgment. That is, everything else being equal we would expect the ratio between correct and incorrect judgments to differ less across conditions than with *sein**.

[5.3] Results

We measured the results in terms of what we shall call the *error rate*, i.e. the frequency (percentage) of positively wrong judgments relative to the total number of judgments that are either correct or wrong, excluding missing and don't-know judgments, i.e. uncertain responses. Under the *uncertainty rate* we understand the frequency of the latter relative to the total number of judgments, i.e. the number of items of the relevant type multiplied by the number of responding participants. The results are presented in Table 1.

As far as H1-1 is concerned, there were altogether 192 correct, 40 wrong and 14 uncertain judgments for grammatically correct, number-gender-matching *sein**, i.e., items of type (16a). This yields an error rate of 17.2%. The uncertainty rate was 5.7%. Under the mismatch condition, i.e. with ungrammatical *sein**, the

error rate was significantly higher (27.1% vs. 17.2%), $\chi^2(1, N = 461) = 5.9, p = .015$. The uncertainty rates did not differ significantly (6.9% vs. 5.7%), $\chi^2(1, N = 492) = 0.14, p = .71$. All in all then, H1-1 may be considered corroborated.

Possessive	Condition (Item type)	Judgments						Error rate	
		Total n	Correct n	Correct %	Wrong n	Wrong %	Uncertain n		Uncertain %
<i>sein</i> *	Match (16a)	246	192	78.0	40	16.3	14	5.7	17.2%
	Mismatch (16b,c)	246	167	67.9	62	25.2	17	6.9	27.1%
<i>ihr</i> *	Match (17a,c)	328	228	69.5	82	25.0	18	5.5	26.5%
	Mismatch (17b)	164	83	50.6	64	39.0	17	10.4	43.5%

TABLE1: Results of grammaticality judgment test

With grammatically correct, number-gender-matching *ihr**, i.e. items of type (17a, c), there were 228 correct, 82 wrong and 18 undecided judgments, giving an error rate of 26.5% and an uncertainty rate of 5.5%. Compared to the error rate for *sein** under the match condition, *ihr** fared significantly worse (26.5% vs. 17.2%), $\chi^2(1, N = 542) = 5.9, p = .015$, thus weakly corroborating H1-2.

As for the ungrammatical *ihr** items of the type illustrated in (17b), the results show a an error rate of 43.5% and an uncertainty rate of 10.3%. In other words, under the mismatch condition the error rate for *ihr** is considerably higher than under the match condition – and significantly higher than for *sein** (43.5% vs. 27.1%), $\chi^2(1, N = 376) = 10.2, p = .014$. H1-3, then, is not corroborated.

[5.4] Discussion

Our results may be summarized as follows:

- (i) The error rate is higher for *ihr** than for *sein** under the match as well as the mismatch condition. This may indicate that as far as grammaticality judgment is concerned, *ihr** on the whole represents a more difficult case than *sein**.
- (ii) For both *sein** and *ihr** the error rates are higher under mismatch than under match. Evidently, it is easier to correctly judge the grammaticality of a possessive occurring in a locally bound position when the possessive matches than when it does not match its (intended) local binder.
- (iii) As far as our unreliable friends *sein** and Norwegian *si** are concerned, their similarity may have enhanced correct judgment of

*sein** (as compared to *ihr**) under the match condition, where the reflexive interpretation inherent to *si** is in fact grammatically licensed for *sein** ('positive transfer'). Under the mismatch condition, the reflexive reading of *sein** is not grammatically licensed while *si** would still be correct in Norwegian. However, we cannot tell whether or to what degree the poorer result under mismatch is due specifically to interference ('negative transfer') from *si** rather than a generally lower ability to correctly judge ungrammatical possessives or structures in L2; cf. (ii).

- (iv) The fact that *ihr** seems to present a more difficult case could be ascribed to several factors. First, although the informants were told not to focus on morphological endings, it is impossible to tell in how far their judgments actually were influenced by the latter. Expressions such as *ihr Studium*, *ihr Pensum* might appear odd without a morphological ending. Furthermore, the form *ihr* is homophonous with the singular dative form of the number-ambiguous 3rd person pronoun *sie* 'she/they'. Thus, the combination of *ihr* and a neutral noun, as for instance *ihr Studium*, might seem wrong altogether. In addition, some test persons may have associated *ihr** with irreflexive *hennes* or *deres*, disregarding the possibility of a reflexive interpretation (cf. Sect. 4).

Some of the uncertainties concerning the judgments might have been resolved by following up the test with an interview. Still, we consider the results to give some indication of the type of problems facing Norwegian learners in relation to L2-German possessives. While there appear to be numerous challenges concerning *ihr**, the results for *sein** are compatible with our assumption of transfer from L1-Norwegian.

[6] RESOLUTION EXPERIMENT

[6.1] Preliminaries

Whereas the previous section was concerned with L1-Norwegian participants' grammaticality judgments on locally bound occurrences of *ihr** and *sein**, the test presented in this section investigates their ability to identify the possessor under unambiguously local or non-local binding of the possessive (in the somewhat sloppy sense of the term binding; see fn. 5). Our main assumption concerning *sein** still encompasses the notion of transfer – or so-called cross-linguistic influence (CLI) – in that we expect the L1-Norwegian participants to

wrongly understand non-locally bound *sein** reflexively, in the sense of locally bound *si**, rather than to interpret locally bound *sein** as non-locally bound (ir-reflexive) *hans*. For the correct/incorrect judgment of *ihr** we presented in Sect. 5.4 a list of factors that might interfere; the one of importance to interpretation is the assumed association with the irreflexive Norwegian possessive *hennes* (singular) or *deres* (plural) even in cases of local binding. A related matter, suited for comparison with native speakers, is the Norwegian learners' interpretation of *ihr** as either singular or (summative) plural.

[6.2] Test design

Material

The test material comprises a set of 32 *experimental items* interspersed with 32 fillers. Each experimental item is a context-free complex sentence consisting of a main clause and a subordinate adverbial clause (with *während* 'while') in that order; both clause subjects are singular gender-specific proper names but differ in gender; and one of the clauses contains a 3rd person possessive as part of a complement DP.¹⁷

The experimental items come in eight types, representing every combination of three binary conditions:

- (i) POSSESSIVE: *sein**, demanding a male singular possessor, vs. *ihr**, demanding a female singular or a plural possessor;
- (ii) MATCH/BINDING: The setup ensures that the possessive either matches or mismatches the subject of its own clause – the local subject – in (singular) gender. If the two match, a locally bound, i.e. reflexive, interpretation of the possessive is warranted (*Local Match/Binding*), since there is no pre-context; if not, the possessive will match the clause-external subject (*Non-local Match/Binding*), thus demanding a non-reflexive interpretation – cataphoric (forward-looking) or anaphoric (in the restricted sense of backward-looking, see Sect. 3.1) depending on its position in the sentence; cf. (iii).
- (iii) POSITION: The possessive either occurs in the first, main clause (*PossC1*) or in the second, subordinate clause (*PossC2*).

[17] The design is inspired by the offline comprehension experiment described in Pitz et al. (2017: 58–69), which concerned L1-German speakers' comprehension of the L2-Norwegian possessives *si** and *hans*. However, the order of subordinate and main clause is reversed; and the experimental items are context-free, primarily because a pre-context introducing the competing possessor candidates would blur the distinction between anaphoric and cataphoric use of the possessive.

Examples (19)–(22) illustrate the eight combinations, each of which is represented by four experimental items. Note, though, that the conditions were not manipulated within items (sentence contexts) but varied across the set of 32 individual experimental items.

- sein** *Local Match/Binding*
- (19) a. *Jakob* legt das Gemüse in *seinen* Korb, während Siri an der Kasse wartet. PossC1
 ‘*Jakob* puts the vegetables in *his* basket while Siri is waiting at the checkout.’
- b. Brigitte räumt die Wohnung auf, während *Daniel* an *seiner* Abhandlung arbeitet. PossC2
 ‘Brigitte tidies the apartment while *Daniel* works on *his* thesis.’
- Non-local Match/Binding*
- (20) a. Siri legt das Gemüse in *seinen* Korb, während *Jakob* an der Kasse wartet. PossC1
(cataphoric)
 ‘Siri puts the vegetables in *his* basket while *Jakob* is waiting at the checkout.’
- b. *Daniel* räumt die Wohnung auf, während Brigitte an *seiner* Abhandlung arbeitet. PossC2
(anaphoric)
 ‘Daniel tidies the apartment while Brigitte works on *his* thesis.’
- ihr** *Local Match/Binding*
- (21) a. *Siri* legt das Gemüse in *ihren* Korb, während Jakob an der Kasse wartet. PossC1
 ‘*Siri* puts the vegetables in *her* basket while Jakob is waiting at the checkout.’
- b. Daniel räumt die Wohnung auf, während *Brigitte* an *ihrer* Abhandlung arbeitet. PossC2
 ‘Daniel tidies the apartment while *Brigitte* works on *her* thesis.’
- Non-local Match/Binding*
- (22) a. Jakob legt das Gemüse in *ihren* Korb, während *Siri* an der Kasse wartet. PossC1
(cataphoric)
 ‘Jakob puts the vegetables in *her* basket while *Siri* is waiting at the checkout.’
- b. *Brigitte* räumt die Wohnung auf, während Daniel an *ihrer* Abhandlung arbeitet. PossC2
(anaphoric)

'*Brigitte* tidies the apartment while Daniel works on *her* thesis.'

Note also that under all conditions, *ihr** in principle is ambiguous between a singular (locally or non-locally bound) reading and a summative plural interpretation ('their'), referring to the two subject DPs.

The 32 fillers served to test reading comprehension at a general level and to distract the participants from the possessives. They all consisted of two clauses – mostly a main and a *während*-clause – with proper name subjects differing in gender; and the majority contained the locally bound (reflexive) pronoun *sich* or a non-locally bound 3rd person personal pronoun referring to the non-local subject; cf. (23). The rest were of the contrasting type illustrated in (24).

- (23) a. Siri füllt eine Thermoskanne mit Tee, während *Peter sich* ein Käsebrot macht.
'Siri fills a thermos with tea while *Peter* makes *himself* a sandwich.'
- b. Weil Anna *ihm* Schokolade geschenkt hatte, brachte *Magnus* Nüsse vom Supermarkt mit.
'Because Anna gave *him* chocolate, *Magnus* brought nuts from the supermarket'
- c. *Oskar* wäscht zwei Äpfel, während Luise *ihm* ein Lachsbrötchen macht.
'Oscar washes two apples while Luise makes *him* a salmon sandwich'
- (24) Ella ist 48 Jahre alt, während Hans gerade 47 geworden ist.
'Ella is 48 years old while Hans recently turned 47.'

With some exceptions among the fillers, the vocabulary and syntactic complexity of the test items were adapted to the proficiency level of the L2-participants.

Participants

31 Norwegian learners of L2-German (*L2 group*) and a control group of 16 native speakers of German (*L1 group*) participated in the experiment. As in our pilot study (Sect. 5), the Norwegian participants were students of introductory-level German courses at Norwegian universities at the time of testing; 18 (group *L2-a*) had had two years' and 13 (group *L2-b*) three years' teaching of German at high school level. The L1-participants were exchange students from a German-speaking country, with an average age of 26 years. The majority of the participants were female.

Participant group	Proficiency in German	n	Age range
L2	Norwegian 1 st year students of German at Norwegian university	31	19–30
L2-a	with 2 year's German at high-school	18	19–25
L2-b	with 3 year's German at high-school	13	19–30
L1	Native speakers of German	16	19–49

TABLE 2: Participants in the resolution experiment

Procedure

The test items (experimental items and fillers) were shown on a computer screen to one participant at a time, being presented one by one in random order. All participants were confronted with all 64 items. For each item, they had to press a button to indicate that they had finished reading. Having done so, they were prompted to answer a *wh*-question in German relating to the content of the item. With experimental items they were asked to identify the referent of the possessive pronoun, i.e. the ‘possessor’ of the entity denoted by the DP containing the possessive. The answer was given by pressing a specific button: **M** for the male referent, **F** for the female referent and **B** (‘both’) for the (sum-mative) plural referent. For instance, (19a) is followed by (25), the correct response being **M**. For each participant, the reading time and the reaction time – the time taken to submit an answer – were recorded. Only a single answer was permitted per question; in the case of *ihr**, then, the participants had to choose between a female singular and a plural interpretation. In other words: the co-reference resolution task presented to the participants involved *forced choice interpretation*.

- (25) *Wem gehört der Korb?* (‘Who owns the basket?’)
 Press F for Siri Press M for Jakob Press B for Both

[6.3] Hypotheses and questions

Our central hypotheses concern the possible effects of POSSESSIVE, MATCH/BINDING and LANGUAGE (L2- vs. L1-German) on the resolution of *sein** and *ihr** in complex sentences of the kind specified in the previous section:

- H2-1 On average, the Norwegian learners resolve the possessives correctly less often than the German-speaking control group.

H2-2 Specifically the Norwegian learners more often resolve the possessives incorrectly under Non-local than under Local Match/Binding, the difference being more substantial for *sein** than for *ihr**.

H2-3 The Norwegian learners resolve *sein** to the subject of its own clause (i.e. reflexively) significantly more often than they do with *ihr**.

We also wanted to see (i) whether POSITION might have an effect on the two groups' resolution performance, and (ii) whether there might be a general preference for resolving *ihr** to the accessible singular female (F button) rather than understanding the possessive as a summative plural (B button).

Throughout, it should be borne in mind that since the items with *ihr** in principle allow both a singular and a plural interpretation while there is only one correct answer (the M button) to the *sein** items, the chances of answering correctly when choosing randomly are twice as high for *ihr** as for *sein** items. Accordingly, we would expect the proportion of questions answered correctly to be generally higher for *ihr** than for *sein**.

In the analysis, a χ^2 -test was used to test combinations of conditions against each other in 2x2 contingency tables with one dimension representing the given condition and the other the number of successfully and unsuccessfully answered items. Every condition was tested across the other conditions, with primary focus on POSSESSIVE (*sein** vs. *ihr**), MATCH/BINDING and LANGUAGE.

[6.4] Results

Overview (H2-1)

All participants responded adequately to all 32 experimental items, yielding a total of 512 responses from the L1 and 992 from the L2 group.

Table 3 (for L1) and Table 4 (for L2) show how the responses are distributed over the three given options – M[ale referent], F[emale referent] and B[oth, i.e. the two referents together] – across the different item types (combinations of conditions; see Sect. 6.2). Numbers/ percentages of grammatically licensed ('correct') resolutions are blue, numbers/ percentages of grammatically illicit ('wrong') resolutions in italics and red.

Note that, abstracting from the plural option for *ihr**, the condition Local Match/Binding demands a reflexive interpretation of the possessive, whether the latter occurs in the first or second clause of the complex sentence (PossC1 vs. PossC2). With Non-local Match/Binding, on the other hand, the possessive is non-reflexive and *cataphoric* (PossC1) or *anaphoric* (PossC2); see Section 6.2.

Condition	Resolution/ Response						Total 100%	Success rate	
	M		F		B				
	n	%	n	%	n	%			
<i>sein*</i>	Local	115	90 %	4	3 %	9	7 %	128	90 %
	PossC1	57	89 %	1	2 %	6	9 %	64	89%
	PossC2	58	91 %	3	5 %	3	5 %	64	91%
	Non-Loc.	112	88 %	13	10 %	3	2 %	128	88 %
	PossC1	51	80 %	10	5 %	3	16 %	64	80 %
	PossC2	61	95 %	3	5 %	0	0 %	64	95 %
	Total	227	89 %	17	7 %	12	5 %	256	89%
<i>ihr*</i>	Local	2	2 %	121	95 %	5	4 %	128	99 %
	PossC1	0	0 %	60	94 %	4	6 %	64	100 %
	PossC2	2	3 %	61	95 %	1	2 %	64	97 %
	Non-loc.	4	3 %	88	69 %	36	28 %	128	97 %
	PossC1	3	5 %	35	55%	26	41 %	64	95 %
	PossC2	1	2 %	53	83 %	10	16 %	64	98 %
	Total	6	2 %	209	82 %	41	16 %	256	98 %
Poss Total	233	45 %	226	44 %	53	10 %	512	93 %	

TABLE 3: Overview of L1 resolution results. *Local* and *Non-loc.* short for *Local Match/Binding* and *Non-local Match/Binding*, respectively.

The two tables also show the *success rate* (henceforth also: *SR*), i.e. the number of correct responses as percentage of the total number of responses under the given condition. Note that the success rate is based on M-responses in relation to *sein** but on the sum of F- and B-responses in relation to *ihr*.

With an overall SR of 78%, (Table 4, bottom right), the L2-learners evidently were less successful in resolving the possessive correctly than was the L1-control group (general SR 98%, Tab. 3, bottom right). A χ^2 -test showed the difference to be significant: $\chi^2(1, N = 1504) = 61.6, p < .001$. This finding is in accordance with hypothesis H2-1 (Sect. 6.3)

	Condition	Resolution/ Response						Success rate	
		M		F		B			Total (100%)
		n	%	n	%	n	%		
<i>sein*</i>	Local	223	90 %	10	4 %	15	6 %	248	90 %
	PossC1	109	88 %	7	6 %	8	6 %	124	88 %
	PossC2	114	92 %	3	2 %	7	6 %	124	92 %
	Non-loc.	105	42 %	125	50 %	18	7 %	248	42 %
	PossC1	50	40 %	61	49 %	13	10 %	124	40 %
	PossC2	55	44 %	64	44 %	5	4 %	124	44 %
	Total	328	66 %	135	27 %	33	7 %	496	66 %
<i>ihr*</i>	Local	13	5 %	162	65 %	73	29 %	248	95 %
	PossC1	7	6 %	81	65 %	36	29 %	124	94 %
	PossC2	6	5 %	81	65 %	37	30 %	124	95 %
	Non-loc.	50	20 %	91	37 %	107	43 %	248	80 %
	PossC1	29	23 %	28	23 %	67	54 %	124	77 %
	PossC2	21	17 %	63	51 %	40	32 %	124	83 %
	Total	63	13 %	253	51 %	180	36 %	496	87 %
Poss Total	391	39 %	388	39 %	213	21 %	992	78 %	

TABLE 4: Overview of L2 resolution results; *Local* and *Non-loc.* short for *Local Match/Binding* and *Non-local Match/Binding*, respectively

*sein** versus *ihr** and effects of MATCH/BINDING (H2-2 and H2-3)

As seen in Table 4 and, more easily, in Table 5 (bottom row), the L2-group performed significantly better with *ihr** (SR 87%) than with *sein** (SR 66%).

	Condition	Success rate					
		<i>sein*</i>		<i>ihr*</i>		Total	
		L2	L1	L2	L1	L2	L1
1	Local Match/Binding	90%	90%	95%	98%	92%	94%
1a	PossC1	88%	89%	94%	98%	91%	95%
1b	PossC2	92%	91%	95%	100%	94%	94%
2	Non-Local Match/Binding	42%	88%	80%	97%	61%	92%
2a	PossC1 (cataphoric)	40%	80%	77%	95%	58%	88%
2b	PossC2 (anaphoric)	44%	95%	83%	97%	64%	97%
3	Total	66%	89%	87%	98%	77%	93%

TABLE 5: L2 (dark red) vs. L1 success rates for *sein** and *ihr**

The difference between the two success rates is substantial ($\chi^2(1, N = 992) = 61.0, p < .001$), in contrast to the weaker but still significant trend observed in the L1-group, where the success rates were 98% (*ihr**) and 89% (*sein**), respectively ($\chi^2(1, N = 512) = 14.8, p < .001$); Table 5, bottom.

Table 5 (rows 1 vs. 2) also shows that the Norwegian learners master possessive resolution better under Local Match/Binding, as in (26), than under Non-local Match/Binding, as in (27). The difference is highly significant for *sein** (SR 90% vs. 42%, $\chi^2(1, N = 496) = 123.2, p < .001$). For *ihr**, the effect is less pronounced (SR 95% vs. 80%) but still significant ($\chi^2(1, N = 496) = 23.6, p < .001$). The findings are in accordance with H2-2, showing a significant interaction between POSSESSIVE and MATCH/BINDING.

- (26) a. Brigitte wartet an der Kasse, während *Daniel* Gemüse in *seinen* Korb legt.
 ‘Brigitte is waiting at the checkout while *Daniel* puts vegetables in *his* basket.’
 b. Daniel wartet an der Kasse, während *Brigitte* Gemüse in *ihren* Korb legt.
- (27) a. *Daniel* wartet an der Kasse, während Brigitte Gemüse in *seinen* Korb legt.
 b. *Brigitte* wartet an der Kasse, während Daniel Gemüse in *ihren* Korb legt.

Under Local Match/Binding, the Norwegian comprehenders in fact perform native-like, achieving a success rate of 90% with *sein** and 95% with *ihr** (Tab.5, row 1). Under Non-local Match/Binding (Tab. 5, row 2), their SR for *ihr** is still quite high – with 80% almost twice as high as for *sein** (42%) – but significantly lower than the control group’s 97% ($\chi^2(1, N = 256) = 18.6, p < .001$).

By contrast, MATCH/BINDING (Local vs. Non-local) had no significant effect on the L1-comprehenders’ performance for either *sein** (SR 90% vs. 88%, $\chi^2(1, N = 256) = 0.16, p = 0.69$) or *ihr** (SR 98% vs. 97%, Fischer’s Exact test $p = 0.68$). That is, the interaction between POSSESSIVE and MATCH/BINDING is conditioned by LANGUAGE as predicted by H2-2.

Note, however, that while the L1-participants with very few exceptions resolve *ihr** in accordance with the rules of German grammar, whether the possessive is locally bound or not, their 89% success rate for *sein** deviates significantly from the 100% one would expect ($p < .001$ according to Fischer’s Exact test). It is difficult to say what may have caused the various wrong answers – apart from lack of attention (fatigue) or a preference for top-down reading

based on pragmatic expectations rather than linguistic form.¹⁸ Notably, though, it is the non-local cataphoric condition that causes most problems, exhibiting a success rate of only 80%; cf. Table 5, row 2b. We return to the cataphoricity issue below and in Section 5.5.

H2-3 predicts that the Norwegian learners – rightly or wrongly – understand *sein** reflexively, i.e. as referring to the local subject, significantly more often than they do with *ihr** (Sect. 6.3). Under our experimental set-up (see Sect. 6.2) a reflexive (i.e. local) interpretation is warranted for half of the experimental items: the 16 items showing Local Match/Binding. A reflexive interpretation of *sein** amounts to correctly responding with M (*Daniel*) in cases like (26a) (Local Match/Binding) and incorrectly responding with F (*Brigitte*) in cases like (27a) (Non-local Match/Binding); and the other way around for *ihr**, i.e. choosing F (*Brigitte*) under Local Match/Binding (26b) and M (*Daniel*) under Non-local Match/Binding (27b).

The data presented in Table 4 above show that 90% (n = 223) of the 248 L2-resolutions of *sein** under Local Match/Binding were correctly reflexive/local. Of the 248 L2-resolutions of *sein** under Non-local Match/Binding, 50% (n = 125) were incorrectly reflexive/local. The corresponding figures for *ihr** are 65% (n = 162) and 20% (n = 50), respectively. Under both conditions, the reflexivity difference between the two possessives is significant: $\chi^2(1, N = 478) = 106.6, p < .001$ and $\chi^2(1, N = 496) = 12.4, p < .001$, respectively. (Note, incidentally, that the L1-participants also under Non-local Match/Binding strongly prefer the reflexive (female) singular to the non-reflexive plural interpretation; see below and Tab. 3 above).

Obviously, the lower frequency of reflexive/local L2-resolutions of *ihr** may have to do with the fact that the summative plural interpretation is a licensed alternative to the female singular. Thus if we leave the B responses out of the counting for both possessives, their reflexivity rates (*sein** 93%, *ihr** 96%) do not differ significantly under Local Match/Binding, where the reflexive/local resolution is correct. Under Non-Local Match/Binding, however, *ihr** still exhibits a significantly lower rate of (incorrectly) reflexive/local resolutions than *sein**: 35% (50/141) vs. 54% (125/230), $\chi^2(1, N = 371) = 11.8, p < .001$. Altogether, then, we may consider H2-3 corroborated.

*Effects of POSITION and the singular-plural ambiguity of ihr**

In our experimental items, the possessive either occurs in the second clause (PossC2), as in (26)–(27) above, or in the first clause (PossC1), as in (28)–(29) be-

[18] L1 speakers may also have been unfamiliar with a proper name like *Siri* (female in Norwegian).

low. Under Non-local Match/Binding, PossC1 and PossC2 amount to cataphoric (29) and anaphoric (27) use of the possessive, respectively.

- (28) a. *Jakob* legt das Gemüse in *seinen* Korb, während Siri an der Kasse wartet.
 'Jakob puts the vegetables in his basket while Siri is waiting at the checkout.'
- b. *Siri* legt das Gemüse in *ihren* Korb, während Jakob an der Kasse wartet.

- (29) a. Siri legt das Gemüse in *seinen* Korb, während *Jakob* an der Kasse wartet.
- b. Jakob legt das Gemüse in *ihren* Korb, während *Siri* an der Kasse wartet.

As shown in Table 5 above, the success rates in both the L2- and the L1-group are somewhat higher with PossC2 than with PossC1 under Local Match/Binding (rows 1a vs. 1b) than under Non-local Match/Binding (rows 2a vs. 2b). On the whole, however, the differences are too small to be significant. The greatest numerical contrast is found for L1 with respect to cataphoric vs. anaphoric *sein** (SR 80% vs. 95%), Fischer's Exact test: $p = .14$.

Turning to the question of how the L1 and L2 participants performed with respect to the singular-plural ambiguity of *ihr** (Sect. 4), Table 6 shows the distribution of (female) singular (F) and summative plural (B) resolutions in relation to the total number of grammatically licensed (F or B) resolutions of *ihr**.

		Correct resolutions/ responses for <i>ihr</i> *										
Condition		L1			L2							
		F		B		F+B		F		B		F+B
		n	%	n	%	(100%)	n	%	n	%	(100%)	
1	Local	121	96%	5	4%	126	162	69%	73	31%	235	
1a	PossC1	60	94%	4	6%	64	81	69%	36	31%	117	
1b	PossC2	61	98%	1	2%	62	81	69%	37	31%	118	
2	Non-loc.	88	71%	36	29%	124	91	46%	107	54%	198	
2a	Cataphoric	35	57%	26	43%	61	28	29%	67	71%	95	
2b	Anaphoric	53	84%	10	6%	63	63	61%	40	39%	103	
Total		209	84%	41	16%	250	253	58%	180	42%	433	

TABLE 6: L1 vs. L2 distribution of fem. sing. (F) versus summative plural (B) resolutions of *ihr**: F responses as percentage of correct (F or B) resolutions of *ihr**.
Local: Local Match/Binding, *Non-loc.*: Non-local Match/Binding

As can be seen, the L1-participants clearly prefer the F response unless *ihr** is used cataphorically. By contrast, the L2-participants show a only moderate bias towards the female singular resolution (69%, $\chi^2(1, N = 471) = 16.7, p < .001$) under Local Match/Binding, where it amounts to a reflexive interpretation. Under the anaphoric condition, where the matching female singular candidate occurs in the preceding clause, the 61% bias towards that candidate is insignificant because of the lower number of correct (F+B) responses ($\chi^2(1, N = 207) = 2.2, p = .14$). Under the cataphoric condition, however, only 29% of the resolutions fell on the female singular candidate; that is, here the preference is significantly inverted to the summative plural option (71%, $\chi^2(1, N = 191) = 7.6, p < .01$).

In short: with the exception of the cataphoric condition, where the possessive precedes the only matching singular candidate, the structure of our experimental items generally favours resolving *ihr** to the only accessible female singular candidate rather than to the sum of both candidates, in particular among the L1-participants.

From the results presented in tables 5 and 6 we conclude that POSITION – whether the possessive occurs in the first or the second clause of the experimental structure – has an effect only in combination with Non-local Match/Binding.

Effects of L2-proficiency

As would be expected, the L2-participants with three years' German at high-school level (L2-b, $n = 18$) performed better in most relevant respects than the group with only two years' high-school German (L2-a, $n = 13$). Specifically, their SR for *sein** was significantly higher (72% vs. 62%, $\chi^2(1, N = 496) = 5.3, p = 0.02$), while the difference was insignificant with *ihr** (90% vs. 85%, $\chi^2(1, N = 496) = 1.8, p = 0.18$); cf. Table 7. The contrast between the two levels is most marked for *sein** under Non-local Match/Binding, where L2-a responded correctly with a frequency of only 35% against 53% in L2-b ($\chi^2(1, N = 248) = 7.4, p < 0.01$).

Condition	Success rate					
	L2-a			L2-b		
	<i>sein*</i>	<i>ihr*</i>	Total	<i>sein*</i>	<i>ihr*</i>	Total
Local Match/Binding	89%	94%	92%	91%	95%	93%
Non-local Match/Binding	35%	76%	56%	53%	85%	69%
Total	62%	85%	74%	72%	90%	81%

TABLE 7: L2-a vs. L2-b success rates for *sein** and *ihr** across MATCH/BINDING

It may be added that the plural interpretation of *ihr** (B response), which may indicate uncertainty, also has a higher relative frequency among the L2-a participants than in the L2-b group, in particular under the cataphoric condition.

[6.5] *Summary and discussion*

First, our three central hypotheses (Sect. 6.3) were all supported: In accordance with **H2-1**, the Norwegian learners of L2-German altogether were less successful in resolving the possessives correctly than the L1-German control group. However, their performance varied considerably across conditions. Like the L1-group, they achieved higher success rates with *ihr** than with *sein** across conditions – not surprisingly in view of the fact that the *ihr** items have two correct resolution options against only one with *sein**. Different from the L1-group, however, they had significantly lower success rates when the possessive referred to the subject of the preceding or following clause (Non-local Match/Binding) than when a reflexive interpretation was licensed (Local Match/Binding); and in accordance with **H2-2**, the contrast was significantly more marked for *sein** than for *ihr**; see Table 5. More specifically: Under Non-local Match/Binding, *sein** showed a significantly higher rate of (incorrectly) reflexive/local resolutions than *ihr** (see Sect. 6.4 for details). Thus, **H2-3** too is supported.

Second, the L1-group preferred the female singular to the summative plural interpretation of *ihr**, the preference being very pronounced under Local Match/Binding, somewhat less so under the anaphoric and insignificant under the cataphoric condition (Table 6). Singular was preferred by the L2-group, too, but the bias was less marked and under the cataphoric condition the plural resolution prevailed (Table 6). Now, since plural is a generally acceptable interpretation of *ihr** in our experimental items, it may be chosen so as to avoid deciding between the local and the non-local singular candidate. This would explain why it has a higher frequency in the L2 than in the L1 responses.

Third, POSITION had a substantial effect on the resolution only under Non-local Match/Binding, i.e. when the possessive according to the rules of German grammar cannot be understood reflexively: In both the L2- and the L1-group, the cataphoric structure triggered more plural resolutions of *ihr** than the anaphoric structure (Tab. 6); and the L1-group showed a lower success rate with cataphoric than with anaphoric *sein** (Tab. 5). In view of the possible fallback function of the summative plural, these findings indicate that our cataphoric condition represents a resolution challenge (even) to native speakers of German.¹⁹ The L2-participants, too, perform worse with cataphoric than with ana-

[19] In fact, some L1-participants commented on cataphoric (*sein**-) items as being ‘incorrect’.

phoric *sein** but their success rate in the latter case is already very low (Tab. 5).²⁰

Note here that the experimental items all consisted of a main and a subordinate clause in that order, with the possessive occurring in either the first or the second clause (Sect. 6.2). Consequently, our anaphoric and cataphoric conditions differ in two respects: The anaphoric possessive e.g. in (30) refers back from a subordinated to a matrix clause DP while the cataphoric possessive in (31) refers forward from the matrix to the subordinate clause. And as mentioned in Section 3.1, cataphoricity of that kind is more severely constrained than forward dependencies from a subordinate clause to its matrix clause. On this background, the abovementioned results may not be too surprising.

- (30) a. *Daniel* wartet an der Kasse, während Brigitte Gemüse in *seinen* Korb legt.
 b. *Brigitte* wartet an der Kasse, während Daniel Gemüse in *ihren* Korb legt
- (31) a. Brigitte legt Gemüse in *seinen* Korb, während *Daniel* an der Kasse wartet.
 b. Daniel legt Gemüse in *ihren* Korb, während *Brigitte* an der Kasse wartet.

Accordingly, one would expect a more successful performance when the cataphoric dependency goes from a preposed subordinate clause to its matrix clause, i.e. under conditions that license cataphoric use of ordinary pronouns (see Sect. 3.1). A natural follow-up to our resolution test, then, would be based on experimental items that differ from the present ones with respect to the order of subordinate and main clause but otherwise follow the same pattern of variation (see Sect. 6.2), i.e. pairs like (32) and (33) for anaphoric vs. cataphoric use of the possessive.²¹

- (32) a. Während *Daniel* an der Kasse wartet, legt Brigitte Gemüse in *seinen* Korb.
 b. Während *Brigitte* an der Kasse wartet, legt Daniel Gemüse in *ihren* Korb.

[20] Drummer & Felser (2018: 98) assume that '[r]esolving cataphoric dependencies might be particularly challenging for non-native [...] speakers because they may have more difficulties anticipating upcoming referents compared to native (L1) speakers'. Evidently, nothing in our L2-group's performance under the cataphoric condition contradicts that assumption.

[21] We originally intended to include these variations in our experiment but for practical reasons had to give up the idea.

- (33) a. Während Brigitte Gemüse in *sein*en Korb legt, wartet *Daniel* an der Kasse.
 b. Während Daniel Gemüse in *ih*ren Korb legt, wartet *Brigitte* an der Kasse.

Fourth, concerning L2-PROFICIENCY/LEVEL, we found a significant difference in success rates between L2-learners with 2 years of high-school German (group L2-a) and those with 3 years' training (group L2-b). This indicates the fruitfulness of formal training both with regards to mastery of possessive systems that are in very nuanced ways different from one's L1 and with regards to handling the negative cognacy effects of false friends.

[7] CONCLUSION AND OUTLOOK

The primary objective of our enterprise was to find out how L1-Norwegian learners of L2-German at a low or moderate level of proficiency (see Sect. 5.1 and 6.2) cope with the 3rd person possessives *sein** and *ihr** in comprehension, given the lexical divergence holding between the two binding-neutral German possessives on the one hand and their respective binding-sensitive counterparts in Norwegian on the other hand and, in particular, the morpho-phonological similarity between *sein** and the Norwegian reflexive possessive *si** (see Sections 1 and 3).

As far as *sein** is concerned, our results seem to corroborate the assumption that the Norwegian L2-learners due to the *sein**/*si** similarity are more biased towards a reflexive interpretation than warranted by the general preference for locality that has been observed in prior research on pronoun resolution (see Sect. 3.1): While our non-native comprehenders by and large resolved unambiguously reflexive, i.e. locally bound occurrences of *sein** correctly, almost half of their resolutions of anaphoric or cataphoric *sein** were erroneously reflexive; in comparison, the German-speaking control group did not have serious resolution problems under either condition (Sect. 6.4; Tables 3, 4 and 5). Also, the (Norwegian) participants in the grammaticality judgment test had a higher error rate when *sein** did not than when it did match the subject of its local clause, i.e. its intended local binder (see 5.3-4). Being unspecified for possessor number and gender, the Norwegian reflexive possessive *si** would be grammatically licensed not only when *sein** matches but also when it does not match the subject of its local clause in gender, i.e. under the conditions where our L2-groups significantly often incorrectly chose a reflexive interpretation or erroneously judged sentences containing a mismatching *sein** to be correct. It seems reasonable, then, to ascribe the non-native resolution failures and misjudg-

ments of *sein** to interference from the unreliable possessive L1-friend *si** rather than to a general preference for local binding.²²

In line with this explanation, the L1-Norwegian comprehension of L2-German *ihr** offers quite a different picture: Under conditions licensing a reflexive (female singular) interpretation of *ihr**, our L2-comprehenders showed only a modest (65%) preference for that option – in contrast to the L1-group; and when the local subject did not match the possessive, their rate of (erroneous) reflexive resolutions was considerably lower for *ihr** than for *sein** even when we disregard the summative plural alternative (Sect. 6.4, Table 4). In addition, the L2-learners generally had more difficulties judging the grammaticality of *ihr** correctly than they had with *sein** (Sect. 5.3-4). Altogether these findings may indicate that our L2-learners, as suggested in Section 4, tend to lexically associate *ihr** with the irreflexive Norwegian possessives *hennes* ‘her’ and *deres* ‘their’ rather than with the reflexive *si** but that corresponding interference effects on L2-comprehension to a certain degree are levelled out by a general preference for local resolutions – and the context-dependent possibility of a (summative) plural interpretation.

The more general lesson to be drawn from our observations could be that L1/L2-specific relations of divergence and morpho-phonological similarity at the lexical level, at least at non-advanced stages of L2-learning, might play a more important role in non-native resolution of pronouns than has hitherto been acknowledged.

It might be objected that our study for various reasons does not allow any far-reaching conclusions. The number of experimental items is rather restricted in both experiments; some of the items in the resolution experiment are pragmatically biased towards one or the other licensed interpretation; the number of L1-participants is too small; and the experimental procedures may not have been optimal. Still, we find the results interesting enough to warrant follow-up studies in different directions, in part along the lines suggested in Section 6.5 but also – and perhaps most importantly – investigations into L1-Norwegian learners’ online processing of L2-German possessives compared to ordinary 3rd person pronouns (cf. Sect. 3.2 and Pitz et al. 2017: 58–69) and their resolution preferences under locality-ambiguous conditions, where the referential issue cannot be settled by grammatical cues (cf. Sect. 4).

[22] Note here that the clause subjects in our comprehension experiments were gender-specific proper nouns, making insufficient command of grammatical gender or agreement rules in German a less plausible explanation.

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PROCESSING POSSESSIVES IN SIMULTANEOUS INTERPRETING FROM ENGLISH TO POLISH

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ABSTRACT

The present paper reports on an experiment in which the use of possessives is investigated in an interpreting task from English to Polish. The English possessive determiner system is neutral with respect to the syntactic position of the antecedent possessor, while Polish distinguishes lexically between locally bound – i.e. reflexive – and non-reflexive possessive modifiers. The interpreter therefore has to ‘compute’ mentally the syntactic position of the antecedent possessor in order to make the correct choice in Polish as the target language. The study shows that this is cognitively a very demanding task in simultaneous interpreting, as many errors as well as self-corrections occur. The study furthermore shows that interpreters adapt their language to their audience, and adequate omissions, as well as correct form of the possessive occur more often when they have a group of engineers in mind than when they interpret for language specialists. We understand this to mean that the cognitive complexity of solving the cross-linguistic asymmetry in the possessive system causes more errors when the interpreter stays closer to the source text in speaking to language specialists.

[1] INTRODUCTION

The present study investigates linguistic effects in interpreting English to Polish. The study is a contribution to a larger project (SPROSS) investigating learner (cognitive) effects of an asymmetric grammatical feature of European languages: the system of possessives.¹

Most West-European languages do not make a lexical distinction between reflexive and non-reflexive possessives. This means that a brief example like *Peter liked his car*, viewed in isolation, is ambiguous with respect to whose car is referred to: Peter’s own car or somebody else’s, and likewise for its equivalents

[1] See <https://www.hf.uio.no/ilos/english/research/projects/language-as-product-and-process/index.html>

in e.g. German, or a Roman language like French, Spanish or Italian. Some languages that also have a determiner system, such as the Scandinavian languages, make a distinction: If Peter (the subject of the clause) is the owner, the reflexive possessive determiner (SIN) is used (within the same clause), if he is not, the non-reflexive possessive *hans* 'his' is the only correct choice.

While East-European languages are recognised not to have proper determiners, they do distinguish between reflexives and non-reflexives, and would make the same distinction as in the Scandinavian languages to express the possible relationships:

- (1) a. *Peter lubi swój samochód.*
'Peter likes his (own) car.' (The reflexive *swój* points back to Peter, the syntactic subject of the clause.)
- b. *Peter lubi jego samochód.*
'Peter likes his car.' (The non-reflexive possessive *jego* points to somebody else's car.)

The broader context will normally contribute to the disambiguation of the English possessive. In translation and interpreting, the disambiguation is central for the choice of possessive marker in Polish, and misunderstanding may occur if the wrong choice is made, or it is dropped altogether. Previous studies of advanced learners of a foreign language which makes the distinction but whose mother tongue does not, have shown that acquiring native-like competence is extremely difficult (see e.g. Helland 2017 for a study on French learners of Norwegian). One hypothesis proposed to explain this is that the 'double' system (like the Scandinavian languages and Polish) is extremely complex: not only are there two forms, but correct choice involves a number of morphological, syntactic and semantic factors (for an overview, see Fabricius-Hansen et al. 2017).

Although interpreters generally have native-like competence in their two working languages, the question we raise here is whether the already extremely complex task of interpreting in any way affects the processing of possessives when the systems are asymmetric. Our question is motivated by the cognitive complexity of the two tasks. Interpreting involves the processing of dynamic, interlingual, linguistic transfer of meaning, style, register and intent. In the process of transferring information from English to Polish, for example, correct choice involves deciding whether the possessive determiner in the source language has a reflexive or a non-reflexive interpretation, depending on the syntactic position of the possessor (its antecedent) in the target language.

Our study investigates possible grammatical transfer in conference interpreters interpreting for different target audiences (sections 3 and 4 give our

motivation for this division). More specifically, we primarily ask whether there is a priming effect related to possessives in simultaneous interpreting. Secondly, we ask if different briefings affect this potential priming, one group interpreting for (Polish) language specialists, the other for a group of engineers. As an addition, we consider independent judges' quality ratings of the interpreters' production and whether the ratings in any way correlate with grammatical correctness.

The paper is structured as follows: First, the possessive systems of English and Polish are delineated. Secondly, the complexity of interpreting is discussed together with its perceived quality, and the rationale for the study. Finally, the experimental section presents the study itself, followed by a discussion of the results and implications for future research and teaching.

[2] THE POSSESSIVE SYSTEMS IN ENGLISH AND POLISH

As the study tests interpreters working with English and Polish, it seems indispensable to delineate the differences in the possessive systems of these two languages. English weak possessives (*my, your, his, her, our, their*) are functional equivalents of articles playing the role of definite determiners. Weak possessive pronouns and definite articles are mutually exclusive in reference to what they determine, yet in many contexts they are grammatically and semantically substitutable. For instance, in the following sentence the possessor's (i.e. Lily's) car can be both described as *her* and preceded by *the*:

(2) Lily looked in the rear mirror of **her/the** car.

Importantly, the presence of either a possessive pronoun or an article determining a noun is necessary for a correct grammatical structure. This is not the case in Polish, which does not have the functional equivalent of the definite article and often allows the omission of possessives.

The Polish language distinguishes between two types of possessives: the personal, non-reflexive possessive pronoun (*mój* 'my', *twój* 'your' (sg.), *jego* 'his', *jej* 'her', *nasz* 'our', *wasz* 'your (pl.)', *ich* 'their') and the reflexive (*swój*), presented in Table 1 below.

For the clarity of exposition, in the remainder of the present paper we shall call the reflexive, locally bound, possessive 'the reflexive', while the personal possessive pronouns, non-locally bound, will be designated 'the non-reflexive'.

Per- son	Non-reflexive possessive	Reflexive possessive
1 st sg	<i>mój</i> (m.)/ <i>moja</i> (f.)/ <i>moje</i> (n.)*	
2 nd sg.	<i>twój</i> (m.)/ <i>twoja</i> (f.)/ <i>twoje</i> (n.)*	
3 rd sg.	<i>jej</i> (for fem. possessor) <i>jego</i> (for masc./neuter possessor)	<i>swój</i> (m.)/ <i>swoja</i> (f.)/ <i>swoje</i> (n.)*
1 st pl.	<i>nasz</i> (m.)/ <i>nasza</i> (f.)/ <i>nasze</i> (n.)*	
2 nd pl.	<i>wasz</i> (m.)/ <i>wasza</i> (f.)/ <i>wasze</i> (n.)*	
3 rd pl.	<i>ich</i>	

TABLE 1: The Polish system of possessives; *m., f. and n. refer to different masculine, feminine and neuter forms depending on the gender of the *possessee* (irrespective of two distinct forms for the 3rd person sg. dependent on the gender of the *possessor*).

Non-reflexive possessives are used when the owner (possessor) is not the same as the subject of the sentence, as in (3):

- (3) *Bardzo lubię **wasze** dzieci.*
'I like **your** children very much.'

This is also the choice in subordinate clauses in which the unexpressed subject co-refers with the subject of the main clause:

- (4) *Opiekując się **ich** psem, Anna zdecydowała, że też adoptuje jakiegoś zwierzaka.*
'While taking care of *their* dog, Anna decided to adopt a pet as well.'

In contrast, the reflexives, *swój* (m.), *swoja* (f.), *swoje* (n. and pl.) are used when they co-refer with the subject of the clause they occur in. The reflexives take endings in accordance with the gender, number and case of the *possessee* but are neutral as to the grammatical person, number and gender of the *possessor*. Thus, it is correct to use the reflexive *swój* as in (5), indicating that the subject (implicit in Polish) is painting his own flat.²

- (5) He_i is painting **his**_i flat.
*Maluje **swoje**_i mieszkanie.*

This is what has been termed local binding. The non-reflexive possessive *jego* in the same context would indicate a favour the subject does to someone else by

[2] _i is an index showing the co-reference.

painting this other person's house. *Swój* is also the only explicit option in (6), as it would be impossible for Jola to have devoted someone else's life to art (similarly to cases of selling personal property, abstract terms related to emotions, etc.).

- (6) *Jola poświęciła **swoje** życie sztuce.*
 'Jola devoted **her** life to art.'

Similar to other Slavic languages, e.g. Russian, the possessives (whether reflexive or non-reflexive) are frequently subject to omission, as the ownership is very often inferable from context. In other words, when context is clear, omitting a possessive is highly acceptable from a grammatical point of view. In reference to Russian (and similarly to Polish), Ioffe (1985) proposes that null possessives are marked with a certain assumption that the possessor is in direct relation with the possessee. In more general terms, the possessive would be most frequently dropped when the possessee clearly and unambiguously belongs to the possessor (see a similar description in Comer 2009). This clarity is usually context-driven, as in (6) above, where Jola devotes her own life to art, but may be also logically, culturally, gender or socially bound, etc. as in (7), where the reader would assume that the teddy belongs to the little girl.

- (7) *Mała dziewczynka przytuliła misia.*
 'The little girl hugged teddy bear.'

In contrast to Polish, English possessives may not be dropped in most cases, while they are sometimes replaced by the definite article.

The main difficulty that arises for a Polish learner (and interpreter) of English is rooted in the asymmetry of the English and Polish systems: While the interpretation of a possessive is pragmatics-driven in English, it is grammar-driven in Polish, and this may cause confusion. In Polish, local binding always demands the selection of a reflexive, rather than the non-reflexive pronoun, as in (8), where *their* is locally bound to *leaders*.

- (8) *Większość przywódców_i motywuje **swoich**_i pracowników poprzez zachęty.*
 'Most leaders_i motivate **their**_i employees by giving them incentives.'

By the same token, in the course of translating or interpreting pronouns from English into Polish, the interpreter/translator usually decides upon selecting a

reflexive or a non-reflexive possessive based on the local/non-local binding distinction³.

In interpreting from English into Polish, the need for selection means that occasionally pronouns with local binding can be erroneously rendered as non-reflexive possessive modifiers (*mój/ twój/ jego/ jej/ nasz/ wasz/ ich*) instead of the reflexive (*swój*).⁴ In the process of learning, English possessive determiners are usually presented to students as direct equivalents of the non-reflexive possessives (*mój/ twój/ jego/ jej/ nasz/ wasz/ ich*), the reflexive as a direct equivalent often being neglected. For this reason, interpreting and translating possessive pronouns with local binding may be subject to negative transfer. Also, due to the complexity of interpreting itself, the cross-linguistic transfer of possessives might turn out to be problematic in interpreting. Finally, there seems to be a tendency to overuse non-reflexive possessives in Polish, as opposed to the reflexive *swój*, which is prescriptively ill-founded.⁵

In both learning and interpreting, erroneous rendering may lead to misunderstanding. In a very simplified scenario typical of non-advanced learners, the interlocutor would be misinformed about who the possessor is. In turn, interpreters usually speak for native audiences when working into Polish and using an incorrect pronoun may be deemed unprofessional.

[3] THE COMPLEXITY OF SIMULTANEOUS INTERPRETING

Simultaneous interpreting includes concurrent listening and speaking in two languages, in addition to executive processing as well as a number of other sub-processes (Lederer 1981; Gile 2009). Recent studies (e.g. Seeber 2017) add to the complexity by including visual and motor processing in the simultaneous interpreting task.

Most importantly, simultaneous interpreting involves bilingual language activation and requires that the interpreter can keep a balance between the appropriate levels of this activation of the two (source and target) languages. Unlike in many other bilingual scenarios, interpreters do not suppress one language while the other is active. Even in the consecutive mode, where production follows listening, interpreters have been observed to be characterised by

[3] Unless there are other factors influencing the choice, such as context, or intent, e.g. the willingness to underline that the possessee belongs to the possessor, for instance in: *I will take care of my (own) child on my own, and it's not for you to interfere*, where the narrator's intent is to emphasize that the child is indeed his or her responsibility. In such cases (equivalent in Polish), both possessives and reflexives would be prescriptively correct, while in general the reflexive is the grammatically determined pronoun of choice.

[4] Unless otherwise indicated, *swój* (m.sg.nominative) represents the whole set of inflected forms of the reflexive possessive; and likewise for *mój, twój, nasz, wasz*.

[5] According to personal communication with the Polish Language Centre (Centrum Języka Polskiego).

non-selective language access, and to take notes in two (or even three) working languages (de Groot and Christoffels 2006).

By the same token, interpreters are prone to inter-lingual priming and transfer. The constant balancing between language activation and suppression calls for extremely good focus, attention management and monitoring, exerting great cognitive load on the interpreter's mind. (Hervais-Adelman et al. 2014). At the same time, multitasking itself under extreme time pressure, especially in the simultaneous mode, adds difficulty to the task. In consequence, one of the sub-processes (e.g. production) of interpreting may be (temporarily) mismanaged, resulting in target text production with elements of the source language.

Linguistic transfer can be of a syntactic nature, as reported by Hartsuiker et al. (2004), who observed that bilinguals use Spanish-like syntactic structures in English, having heard a Spanish sentence. It may be semantic, as reported in Aparicio and Lavaur (2018), who found semantic priming in trilinguals conducting a translation task. Or it may be phonological: Cho and Park (2006) observed phonological transfer of (mother tongue) Korean features in English, during interpreting. The reverse has also been observed: Stachowiak (2018) reported prosodic priming in interpreters working from English into their (mother tongue) Polish.

At the same time, interpreters are expected to be resistant to inter-lingual priming and transfer. The bidirectional interpreter shall be able to demonstrate that he or she possesses, somehow difficult to delineate, proficient linguistic skills and competences in both languages. In other words, they 'shall demonstrate the required linguistic ability in their working languages based on nationally or professionally accepted standards of language proficiency' (ISO 18841:2018). Although determining these standards has raised discussion, it is vital, for the purpose of the present paper, to underline the importance of syntactic and grammatical competence of the simultaneous interpreter, including the applied knowledge of possessives in a broad sense which the study presented here is about.

According to Pöchhacker (2001: 421) and Bühler (1986), interpreting quality is primarily related to the accurate rendition of the source text. At the same time, it also requires adequate target text expression, equivalent intended effect and successful communicative interaction. All these elements lead to [good] interpreting service and product (see Fig. 1).

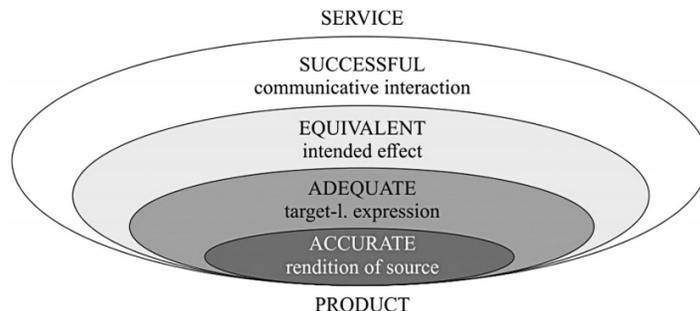


FIGURE 1: Quality standards in interpreting (Adapted from Pöchhacker 2001: 413)

Central for quality assessment, then, is accurate rendition of the source. We would therefore assume that (in)correct selection of reflexive and non-reflexive possessives affects the quality raters' assessment.

[4] THE EXPERIMENTAL STUDY

[4.1] *Aim and research questions*

The study is aimed at providing answers to the following research questions:

1. Will there be cross-linguistic transfer of possessives observable in the simultaneous interpretation of possessives from English into Polish?

The question is rooted in research on transfer discussed in the theoretical part of this article. We aim to verify whether English possessive determiners will be erroneously rendered as non-reflexives in Polish.

2. Will the correctness of interpreting possessives or other pronouns/determiners into Polish be associated with the particular target group (i.e. depending on condition: briefing 1 vs. briefing 2)?

The literature on bilingual communication has demonstrated that speakers adapt their speech to the interlocutor (see Section 3 above). In view of the fact that interpreters in the simultaneous mode talk to an audience and do not engage in real bi-directional dialogue, do they still adjust their speech according to a projected interlocutor? And if they do, will it affect grammatical correctness? We assume that the closer the accuracy of form, the likelier it is that grammatical transfer, and consequently more errors, will occur in the selection of the correct possessive (reflexive or non-reflexive).

3. Can cross-linguistic transfer of possessives be associated with the subjectively perceived level of correctness rated by independent judges?

We mentioned in Section 3 that there is some controversy with respect to a correlation between grammatical correctness and subjectively perceived interpreting quality. Moreover, according to Kurz (2001), interpreters or interpreting teachers might have different expectations and perceptions of the target text than the actual audience or target client. With 40 independent judges assessing the interpreters' production in our experiment, we consider the validity of the disparate claims in the literature.

[4.2] *Study design*

This is a typical between-subject design study, where two groups of participants are compared in two conditions (briefing 1 vs. briefing 2). Therefore, target group, i.e. the type of audience (Polish language specialists – briefing 1 vs. engineers – briefing 2) constitutes the main independent variable in this study.

Conditions, i.e. briefings, differed in instructions delivered to the participants:

Briefing 1 included the following instructions: 'You are interpreting at a leadership and work management course organised within a larger international conference. An English coach will be speaking to your audience, a group specialising in Polish language studies. Interpret the text from English into Polish.'

Briefing 2 included the following instructions: 'You are interpreting at a leadership and work management course organised within a larger international conference. An English coach will be speaking to your audience, a group specialising in mechanical engineering. Interpret the text from English into Polish.'

The dependent variables included in the experiment were as follows:

- Possessive interpreting accuracy: number of correctly rendered possessives in the target product,
- Degree of target text quality rated by independent judges.

[4.3] *Participants*

The study sample included 40 professional interpreters (21 males, 19 females). The inclusion criterion was having worked as a simultaneous interpreter for at least 100 working days (understood as 100 days during which an interpreter

worked in any mode of interpreting, irrespective of whether an assignment lasted 3 or 8 hours).⁶

All the participants had Polish as A language in their language combination (i.e. their mother tongue) and English as their B language, i.e. their active language (AIIC 2016).⁷ All the professional interpreters who participated in the study were bidirectional interpreters, in other words: they interpret from their language A into B and vice versa on a daily basis. Detailed information on the interpreters is provided in Table 3.

Interpreters	
Age [years]	$M = 31.8; SD = 6.14$
Experience [years]	$M = 8.1; SD = 5.23$

TABLE 3: Mean age and experience in two experimental groups

[4.4] *Materials*

In the experiment, each participant simultaneously interpreted a speech from English into Polish. The speeches were both about leadership and work management and similar in structure and length. To achieve maximum ecological validity, the texts were prepared as natural, motivational speeches by an external coach, then verified by the authors of the study and then recorded by a female, by means of the Praat software developed by Paul Boersma and Vincent van Heuven (2001), the rationale being to have a semi-controlled, yet natural speech. Each speech lasted ten and a half minutes. Speech 1 was rendered at a pace of 91.9 words per minute (wpm) and Speech 2: 93.1 wpm.

Out of each text, 40 possessives were selected for the subsequent analysis. 38 of them were locally bound in semantically and grammatically unambiguous sentences. A correct rendition of each of the 38 locally bound possessives in Polish would require the use of a reflexive or pronoun omission (see: Section 2). The texts are included in the Appendix.

Finally, the independent judges were given a questionnaire related to the lexical, grammatical, syntactic and phonological correctness of the target text.

[6] This criterion was based on the fact that major professional interpreter organizations such as the International Association for Conference Interpreting (AIIC) require more than 100 working days (150 in the case of AIIC, 100 e.g. in the case of the Polish Association of Conference Interpreters) from applicants for membership.

[7] see: <https://aiic.net/page/4004/what-are-working-languages-to-a-conference-interpreter/lang/1>

[4.5] *Software and apparatus*

The Audacity 2.0.5. software was used to record the interpretations for further analysis of number interpreting accuracy. IBM SPSS Statistics 24 software was used to perform inferential statistics tests.

[4.6] *Procedure*

The experiment took place in a room where the interpreter sat inside an interpreting booth. The participants were equipped with a microphone and a headset. At the beginning of the experimental session the participants were informed about the procedures of the experiment. Prior to the interpretation, they were asked to sign an informed consent form specifying that the project involved the cognitive aspects of simultaneous interpreting. Next, they were asked to interpret a speech in the simultaneous mode. There were two different experimental conditions, referred to in the present paper as briefing 1 and briefing 2. The speeches (speech 1 and speech 2) were counterbalanced across the conditions, i.e. some participants interpreted Speech 1 according to Briefing 1 (for language specialists) and Speech 2 according to Briefing 2 (for engineers) and some – the other way round. The study was followed by a debriefing session to inform the participants in detail about study objectives and research questions.

Finally, the interpreting output was played to 40 independent judges (where each recording was rated by five judges, and the order of presentation was counterbalanced across the judges) to rate the quality of the output according to a 7-point Likert scale. Each judge could listen to each output more than once. The judges were randomly selected out of the population aged 28-60 years and approached by personal contact. They were also tested for the level of their Polish and English language skills to verify if there was any association between their skills and their scores.

[4.7] *Data Analysis*

First, the interpreting accuracy was analysed based on a simple self-designed grading scale. According to this scale, 1 point was given for each correct rendition of a possessive (which meant selecting the correct possessive or omitting the possessive in Polish) and 0 points – for an incorrect rendition. 0.5 points was given for self-correction. For instance, 0 points was given when the interpreter resorted to a possessive pronoun when a reflexive should be produced, which resulted in a semantically incorrect sentence, as in the following example, where the solutions in b. and c. are both correct translations and given 1

point, while d. would incorrectly refer to somebody else's hair, and consequently is given 0 points:

- (9)
- | | | |
|----|--|----------------------------|
| a. | John had his hair trimmed. | (Original sentence) |
| b. | <i>John obciął swoje włosy.</i> | (Reflexive possessive) |
| c. | <i>John obciął włosy.</i> | (Omission of possessive) |
| d. | <i>John obciął jego włosy.</i> | (Non-reflexive possessive) |

Importantly, not every single target sentence was as a linear, exact equivalent of the original (English) one. In many cases, a single source sentence was split into two in interpreting. That is because simultaneous interpreters derive and form meaning based on context and general sense, rather than rendering texts in a verbum pro verbo manner. Clearly, testing or analysing interpreting in a sentence-by-sentence experiment would be ecologically invalid, if not impossible. By the same token, in this study, interpreters would resort to different grammatical structures and not every pronoun was found (if at all) in the position corresponding to the original one. For the analysis, therefore, we divided the original text and the target texts into corresponding fragments we called 'ideas of interest', after Holmqvist et al (2015). In other words, we verified which fragments of the target texts corresponded to the source text fragments we were interested in. Each idea of interest included a possessive in the original text (in fact, often constituting a phrase or a sentence), e.g. as in (10):

- (10)
- | | |
|----|--|
| a. | [04:53]: Authentic leaders are not afraid to expose their weaknesses ... [05:08] (the English source) |
| b. | [04:57]: <i>Co robią autentyczni przywódcy? Pokazują swoje słabości. Nie boją się tego robić.</i> [05:15] (reflexive possessive)
'What do authentic leaders do? They show their weaknesses. They are not afraid to do so.' |

The English clause forms one idea of interest, lasting 15 seconds, and is expressed as three sentences in Polish, where the central sentence constitutes the key element we were interested in. The correctness of each single idea of interest in the target texts was rated in a manner explained above. The maximum score for each text was 40 points. We then calculated the judges' ratings.

We also calculated the chi-square coefficient to test correlations between the type of briefing and the interpreters' accuracy score, as well as between the type of briefing and the judges' correctness score. $p < .05$ was considered statistically significant.

[4.8] *Results*

The mean number of possessives (whether reflexive or not) used was equal to 19.7 ($SD = 12.5$) under briefing 1 and 17.5 ($SD = 11$) under briefing 2. Within the areas of interest that were identified, the interpreters used 478 possessives when interpreting for language specialists and 334 possessives when interpreting for engineers (Figure 2 shows these numbers, together with the number of omissions). Paired-samples t-tests showed that these differences were statistically insignificant ($p > .05$). On the other hand, another Paired-samples t-test produced a statistically significant result ($p = .022$) for the difference in the number of omissions that was higher under briefing 2 ($M = 12.55$; $SD = 5.5$) than in the briefing 1 group ($M = 6.5$; $SD = 4.5$). Sections 4.8.1 and 4.8.2 present details on the number of possessive use and its accuracy.

Cross-linguistic transfer of possessives

Figure 2 illustrates the number of times an English possessive (*his/her/their*) was interpreted correctly (as *swój/swoja/swoje*), omitted (which also is a correct rendition into Polish) or interpreted incorrectly (as *jego/jej/ich*) into Polish. The number of self-corrections is also included.

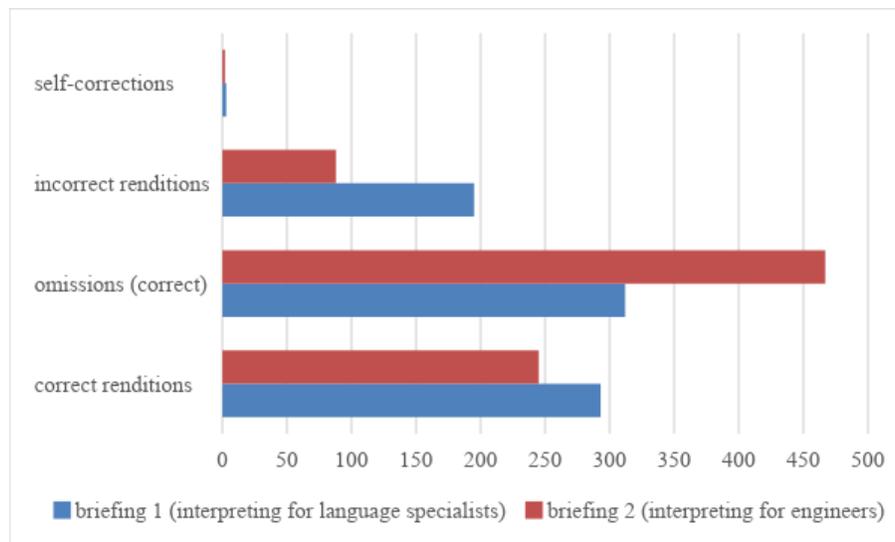


FIGURE 2: Number of correct possessive renditions (including omissions), incorrect renditions and self-corrections.

Possessive Interpreting Accuracy

While the results above relate to overall correctness, Figure 3 below presents the accuracy of interpreting English possessives into Polish, on a scale from 0 to 40 (see Section 4.7). The accuracy is displayed for two briefings: interpreting 'for language specialists' (briefing 1) and 'for engineers' (briefing 2).

There was also an observable association between the type of briefing (hence the type of 'audience': Polish language specialists vs. engineers) and the possessive interpreting accuracy score. More specifically, the correlation between the type of briefing and the interpreter's accuracy score reached statistical significance for:

- briefing 1 ($\chi(1) = 0.332, p = .0251$),
- briefing 2 ($\chi(1) = 0.421, p = .0271$).

At the same time, paired-samples t-tests further showed that in the briefing 2 group ($M = 35.65; SD = 6.13$) the accuracy rates were significantly ($p = .016$) higher than in the briefing 1 group ($M = 30.33; SD = 4.73$).

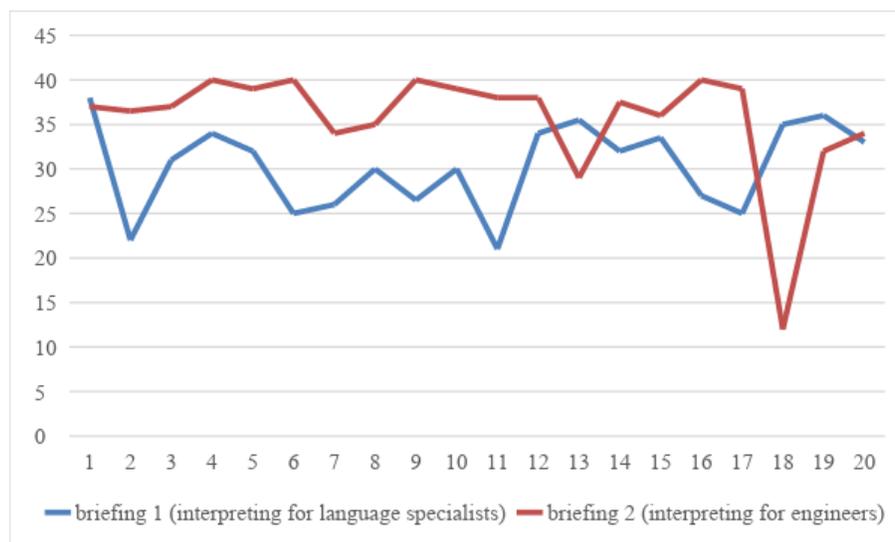


FIGURE 3: Number of correctly rendered possessives (y-axis; including omissions) from English into Polish, in the briefing 1 and briefing 2 groups (x-axis shows participant number; 20 in each group)

Cases

This section presents examples of possessive use and omissions in the target text. We comment on several of them in the attempt to illustrate grammatical and lexical choices interpreters made. Each of these examples includes the original sentence as well as sample target text renditions by interpreters.

- (11) This example presents a grammatical structure where the underlying subject in the infinitive clause co-refers with the subject of the higher clause.

Source sentence	Authentic leaders are not afraid to expose their weaknesses.
Omission (correct)	<ol style="list-style-type: none"> 1. <i>Autentyczni przywódcy nie boją się okazywać słabości.</i> 'Authentic leaders are not afraid to expose weaknesses.' 2. <i>Autentyczny lider nie boi się pokazać słabości.</i> 'Authentic leader is not afraid to show weakness.' 3. <i>Autentyczny przywódca nie boi się pokazać się od wrażliwszej strony ...</i> 'Authentic leader is not afraid to show the weaker side'
Reflexive possessive (correct)	<ol style="list-style-type: none"> 1. <i>Liderzy cechujący się autentycznością nie boją się swoich słabości i tego, że ktoś je zobaczy.</i> 'Leaders characterised by authenticity are not afraid to expose their (refl.) weaknesses and that someone will see them.' 2. <i>Przywódca, który jest autentyczny, nie boi się okazywać swoich słabości ...</i> 'An authentic leader is not afraid to expose his (refl.) weaknesses ...' 3. <i>Ci przywódcy, którzy są autentyczni nie boją się swoich własnych słabości ...</i> 'Leaders who are authentic are not afraid of their (refl.) weaknesses'
Non-reflexive possessive (incorrect)	<ol style="list-style-type: none"> 1. <i>Autentyczni przywódcy nie boją się okazywać ich słabości.</i> 'Authentic leaders are not afraid to expose *their (non-refl.) weaknesses.' 2. <i>Autentyczny przywódca okazuje ... okazuje jego słabości.</i> 'An authentic exposes ... exposes his (non-refl.) weaknesses.' 3. <i>Prawdziwy przywódca nie boją się okazywać jego słabości.</i> 'An authentic leader is not afraid to expose his (non-refl.) weaknesses.'

- Self-correction 1. *Prawdziwy przywódca nie boją się okazywać **jego** ... Nie boi się okazywać **swoich** słabości.*
 ‘An authentic leader is not afraid to expose *his (non-refl.) ... is not afraid to expose his (refl.) weaknesses.’

(12) The understood subject of the infinitival complement co-refers with the understood subject of the imperative.

- | | |
|--------------------------------------|---|
| Source sentence | Do not be afraid to show your weaknesses and your fears. |
| Omission (correct) | 1. <i>Nie można bać się okazywać lęków i słabości.</i>
‘One should not be afraid to show fears and weaknesses.’ |
| Reflexive possessive (correct) | 1. <i>Nie bójmy się okazywać swoich lęków i słabości.</i>
‘Let us not be afraid to show our (refl.) fears and weaknesses.’
2. <i>Nie bójcie się okazywać swoich lęków i słabości.</i>
‘Do not (2 nd pers. pl.) be afraid to show your (refl.) fears and weaknesses.’
3. <i>Nie bój się okazywać swoich lęków i słabości.</i>
‘Do not (2 nd pers. sing.) be afraid to show your (refl.) fears and weaknesses.’ |
| Non-reflexive possessive (incorrect) | 1. <i>Nie bójmy się okazywać naszych lęków i słabości.</i>
‘Let us not be afraid to show our (non-refl.) fears and weaknesses’
2. <i>Nie bójcie się okazywać waszych lęków i słabości.</i>
‘Do not (2 nd pers.pl.) be afraid to show your (non-refl.) fears and weaknesses’ |
| Self-correction | 1. <i>Nie bójcie się okazywać waszych ... swoich lęków i słabości.</i>
‘Do not (2 nd pers.pl.) be afraid to show your (non-refl.) ... your (refl.) fears and weaknesses.’ |

(13) The possessive constitutes part of the direct object in this simple sentence. Its antecedent in the subject is the generally referring ‘you’.

- | | |
|------------------------|--|
| Source sentence | You have to predict your future commitments ... |
| Omission (correct) | 1. <i>Trzeba przewidzieć przyszłe zobowiązania ...</i>
‘One needs to predict future commitments ...’
2. <i>Musimy zawsze wiedzieć, co będziemy robić ...</i>
‘We always have to know what we are going to do ...’ |

Reflexive (correct)	1. <i>Trzeba przewidzieć swoje przyszłe zobowiązania ...</i> 'One needs to predict one's (refl.) future commitments ...' 2. <i>Musimy przewidywać swoje zobowiązania.</i> 'We should predict our (refl.) commitments.'
Non-reflexive (incorrect)	1. <i>Trzeba zawsze przewidzieć nasze przyszłe zobowiązania ...</i> 'We/one needs to predict our (non-refl.) future commitments ...' 2. <i>Musimy przewidywać nasze zobowiązania.</i> 'We should predict our (non-refl.) commitments.'
Self-correction	1. <i>Trzeba przewidywać nasze ... swoje zobowiązania.</i> 'We/one needs to predict our (non-refl.) ... our (refl.) future commitments.'

- (14) The possessive constitutes part of the direct object. Its antecedent in the subject is the generic 'people'.

Source sentence	People usually see their whole week or year ahead of them ...
Omission (correct)	1. <i>Zazwyczaj widzi się cały tydzień albo rok ...</i> 'One usually sees the whole week or year' 2. <i>Zazwyczaj widzimy cały tydzień albo rok ...</i> 'We usually see the whole week or year'
Reflexive possessive (correct)	1. <i>Zazwyczaj ktoś ma po prostu cały swój tydzień przed oczami ...</i> 'One usually has the whole week in front of his/her (refl.) eyes// imagines his/her whole (refl.) week'
Non-reflexive possessive (incorrect)	1. <i>No i mamy na przykład cały nasz tydzień ...</i> 'So we have our (non-refl.) whole week'
Self-correction	1. <i>Zazwyczaj ludzie wyobrażają sobie całe ich tygodnie ... całe swoje lata ...</i> 'People usually imagine their (non-refl.) whole weeks ... their (refl.) whole years'

Interestingly, based on observations only (in contrast to conducting a proper statistical analysis), we also saw that structures whose subject was in the 1st person singular or plural generated frequent errors in that many informants selected the non-reflexive possessive instead of the reflexive one, e.g. in rendering (15a) into Polish, the non-reflexive was used by 5 interpreters, as in (15b).

- (15) a. (I make sure that) I am clear about **my** task and what I want to achieve.
 b. *Znam **moje** cele.*
 ‘I (1st sing.) know my (non-refl.) goals.’

While this by itself does not constitute a clear tendency, our observation may be interesting for further research. An opinion we obtained from Centrum Języka Polskiego (the Polish Language Centre) confirmed that non-reflexive pronouns frequently occur to exemplify or underline the possession of items, or closeness to a family member, e.g. in *I love my mum*, or mark comparative-ness, e.g. in *I am feeding my dog, not yours*, while they are prescriptively incorrect. The non-reflexive pronoun is used when the subject role can no longer be attributed to the possessor. This is in contrast to e.g. Russian (as described by Fabrcius-Hansen et al. 2017:17) where the non-reflexive and reflexive compete in reference to the 1st and 2nd person and are bound both contextually and textually.

Finally, to illustrate the extent to which the grammatical architecture of the source text was changed (which itself is a positive phenomenon in interpreting, as discussed below), we present more target text renditions of the source sentence shown in (15) a. Interpreters rendering the text that included the above sentence for language specialists (briefing 1), produced, for instance:

- (15) c. *Muszę zdawać sobie sprawę, jakie są **moje** cele ... co chcę osiągnąć, i co mam zrobić.*
 ‘I need to be aware of what **my** (non-refl.) goals are ... what I want to achieve and what I have to do.’
 d. *Muszę wiedzieć, na czym polega **moje** zadanie... jakie są **moje** cele.*
 ‘I need to know (inf.) what **my** (non-refl.) task is ... and what **my** (non-refl.) goals are.’

The possessive relationship is retained, yet in both cases as a modifier to the subject of a subordinate clause, in which the non-reflexive possessive is the only correct choice.

However, when the same sentence appeared (as a result of counterbalancing) in briefing 2 (interpreting for engineers), interpretations included:

- (15) e. *Upewniam się, że wiem, co robić i co chcę osiągnąć.*
 ‘I make sure that I know what to do and what I want to achieve.’
 f. *Wiem, co robię i jakie są cele.*
 ‘I know what I do and what the goals are.’

These examples show that at least in briefing 2, meaningful items such as *my goal* and *my task* were restructured into verbal expressions such as *osiągnąć* ('to achieve') in (15) e. In our qualitative analysis we observed that the interpreters tended to resort to deeper structural changes under briefing 2, although quantifying that tendency would call for a separate analysis.

Target text correctness rated by judges

Figure 4 presents the independent judges' ratings of the subjectively perceived quality of interpreting possessives (on a scale from 0 to 10) from English into Polish, in the two groups of participants.

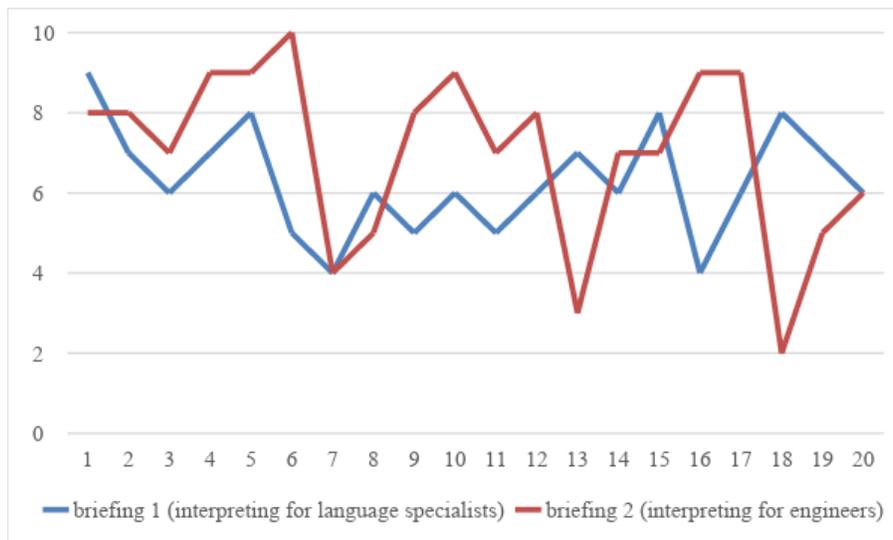


FIGURE 4: Ratings, 0-10 (the y-axis) of quality in the briefing 1 and briefing 2 groups (x-axis shows participant numbers 1-20 for each group)

In contrast to the associations shown above, the correlation between the type of briefing and the judges' scores did not reach the level of statistical significance for:

- briefing 1 ($\chi(1) = 0.127, p = .0755$),
- briefing 2 ($\chi(1) = 0.214, p = .0648$).

Moreover, we failed to observe a statistically significant between-group difference with respect to the rating of quality of the briefing 1 group ($M = 6.3$; $SD = 1.31$) and the briefing 2 group ($M = 7$; $SD = 2.14$).

[5] DISCUSSION

First and foremost, data on the number of (non)reflexive possessives show that their use in Polish was less frequent than in English. While statistically insignificant (perhaps due to individual differences), a difference between the use of these possessive markers in briefing 1 and 2 was also observable. In briefing 2, interpreters omitted the possessives more frequently than in briefing 1, and the effect was significant. This points to possible differences in parsing under different briefings, which we discuss below.

We have found an observable number of mistakes (see Figure 1, ‘incorrect renditions’) committed by both target groups while interpreting. ‘Mistakes’, as they were referred to above, mean incorrect renditions of non-reflexive possessives when they should be rendered as reflexive possessives. There are several possible explanations of this phenomenon.

First, there could have been grammatical transfer from English, i.e. a language that does not distinguish morphologically between reflexive (subject relating, locally bound) and non-reflexive possessives. In other words, it seems plausible that the ‘simpler’ system was as if translated into an equivalent ‘simple’ system with non-reflexive possessives only. The over-representation of this correspondence in textbooks, mentioned in the introduction, may have an effect.

Furthermore, a frequency effect should also be taken into account. As seen in Table 4 below, the frequency of *m. sing. swój* is higher than that of *jego* in Polish, while other non-reflexive determiners display a higher frequency than *swoja* (*f. sing.*) and *swoje* (*n. sing.*).

High word frequency triggers faster word recognition and recall than other words in language perception and production (Smilek et al. 2014). The frequency effect, strengthened by the immediate correspondence at word level, may well be partially responsible for the errors.

In complex structures, however, erroneous renderings may have been triggered by insufficient parsing. To give an example, the experimental sentence (16a), being a complex grammatical structure, needs reformulation in Polish.

- (16) a. My friend often says this helps him see **his** whole plan and to know the full range of **his** activities.

Polish possessive	Person	Word	Count per million		English equivalent
	1 st sg.	<i>mój/moja/ moje</i>	1574.8		<i>my</i>
Non-refl. (possessor- dependent gender in 3 rd pers.)	2 nd sg.	<i>twój/twoja/ twoje</i>	623.84		<i>your</i>
	3 rd sg. (m./n.)	<i>jego</i>	1065.29	7601.59	<i>his/ its</i>
	3 rd sg. (f.)	<i>jej</i>	920.53		<i>her</i>
	1 st pl.	<i>nasz/nasza/ nasze</i>	2008.08		<i>our</i>
	2 nd pl.	<i>wasz/wasza/ wasze</i>	193.15		<i>your</i>
	3 rd pl.	<i>ich</i>	1215.9		<i>their</i>
Reflexive (possessee- dependent gender on- ly)		<i>swój (m.)</i>	2117		<i>my/ your/</i>
		<i>swoja (f.)</i>	29.76	2560.83	<i>our/ his/</i>
		<i>swoje (n.)</i>	414.07		<i>her/ its/ their</i>

TABLE 4: Frequency of Polish non-reflexive and reflexive possessives (calculated for all cases: in Nom., Gen., Dat. Acc., Instr., Loc, Voc.)

High word frequency triggers faster word recognition and recall than other words in language perception and production (Smilek et al. 2014). The frequency effect, strengthened by the immediate correspondence at word level, may well be partially responsible for the errors.

In complex structures, however, erroneous renderings may have been triggered by insufficient parsing. To give an example, the experimental sentence (16a), being a complex grammatical structure, needs reformulation in Polish.

- (16) a. My friend often says this helps him see **his** whole plan and to know the full range of **his** activities.

For instance, a correct interpretation based on deep parsing and thorough paraphrasing, given by one of the interpreters, was as follows:

- (16) b. *Mój przyjaciel, często mówi, że dzięki temu widzi **swój**, cały plan ... i może zaplanować sobie wszystkie czynności ...*

'My friend_i often says that due to that, [he_i] sees (3rd sg. PRES) his_i whole plan and can plan all activities.'

The interpreter's reformulation in (16 b.) yields a main clause structure with a 3rd person sg. verb *widzi*, i.e. the subject referent is 3rd person sg., and the reflexive correctly points back to the subject (local binding).

The following incorrect sentence was rendered by another interpreter:

- (16) c. *Mój przyjaciel_i często mówi, że to pomaga mu_i mieć ogłąd na cały jego_i plan.*
'My friend_i often says that this helps him_i see **his_i** whole plan.'

(16c) constitutes a grammatical and lexical calque. Firstly, *jego* in the sentence cannot point back to the subject but incorrectly points to some external referent. Secondly, although *to pomaga mu* constitutes a correct word collocation on its own, it cannot further collocate with *mieć ogłąd*, i.e. 'to see' (literally 'to have an overview' in Polish). Two phonologically very similar verbs for English *help* in Polish, *pomagać* and *pozwalać*, have different selection restrictions, only the second one taking an indirect object functioning as the experiencer subject of the following verbal situation (see *his plan* in the sense of *understanding*).

Incorrect choice of verb, then, along with the wrong choice of possessive, indicates that the interpreter has not fully parsed the sentence, but transferred word-by-word. The incorrect choice of possessive strengthens this speculative explanation.

Shallow parsing, or chunking, means that only local or small grammatical structures are processed before reformulated in the target language. It involves the identification and translation of e.g. nouns as nouns, adverbs as adverbs, verbs as verbs, etc. Though shallow parsing may encompass structures bigger than single words, it triggers word-by-word translation or interpretation rather than deep restructuring. In turn, word-by-word, or horizontal processing, also referred to as transcoding, has often been observed in conference interpreters. In other words, they frequently have 'readymade' equivalents of small structures in their working languages, producing them without vertical processing.

Figure 5 presents two routes of processing in interpretation: transcoding, illustrated by means of horizontal arrows between two languages: source and target ones (SL and TL respectively), and the so-called conceptually mediated interpreting, marked with vertical arrows towards processing on the conceptual level. Christoffels' model above seems to accurately illustrate the direct connection between particular levels of processing, including grammatical pro-

cessing, that may be related to or trigger word-by-word processing and shallow parsing.⁸

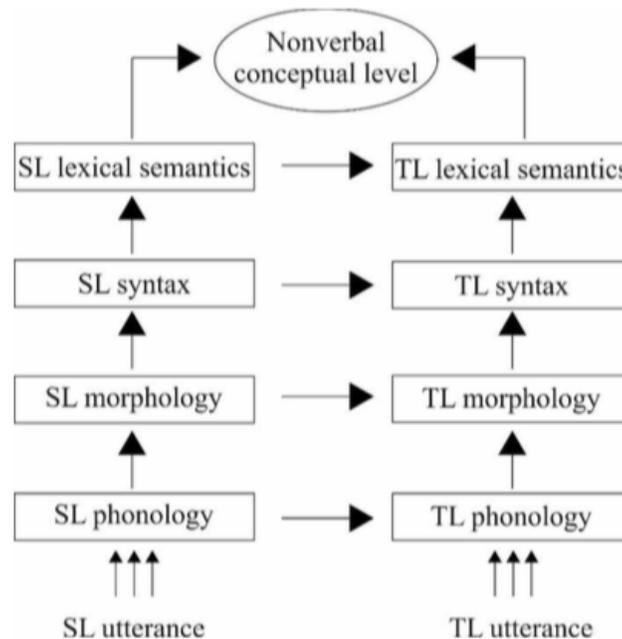


FIGURE 5: Transcoding (horizontally) and conceptually mediated (vertically) routes of processing in interpretation (after Christoffels 2004: 14)

Admittedly, erroneous renderings of locally bound possessive determiners in our data may not be explained by a single cause, especially since we used complete texts instead of isolated items for our study material, which limits the controllability of the study and makes variable manipulation less precise.

It now seems important to comment on the fact that, contrary to what was expected, interpreting accuracy was higher in briefing 2 (engineers) than briefing 1 (language specialists). While at first counterintuitive, this result is also explainable. The tasks of interpreting for language specialists vs. engineers seem to have caused different strategies, such as opting for a structurally closer rendition when the target audience specializes in language. This strategy puts more load on working memory and can easily cause more mistakes. Moreover, plain language is characteristic of technical interpreting, hence the strategy of

[8] The model represents the conceptual equivalence between a SL and a TL expression, while our discussion relates to the process of interpreting, in which the right hand arrows should point downwards.

generating simpler sentences generated more omissions, resulting in fewer errors. While there may not be a linear correspondence between the two, it may be said that omitting the possessive simply limited the risk of making a mistake, as the reformulations did not require a choice to be made between a non-reflexive and reflexive possessive. In either case, however, our experiment has shown that the 'double' possessive system in Polish, even for native speakers of the language, is hard to get right in translation/interpretation from English.

When it comes to quality as perceived by independent judges, their scores did not align with our accuracy scores. This lack of alignment may be partially explained by the outcomes of studies conducted by Kurz (e.g. 2001), mentioned briefly at the beginning of Section 4 above. Linguistic accuracy, considered required by Pöchhacker (2001) (see Section 3 above), has turned out secondary to target language idiomaticity by the independent judges in their quality assessment, thus giving credit to Kurz's frequent observation that interpreters' generally very high expectations of accuracy do not correlate with the quality assessment of the audience.

[6] CONCLUSIONS, LIMITATIONS OF THE STUDY, AND FURTHER RESEARCH

The present paper has reported on the results of an experimental study of interpreters working from English to Polish, with special attention to their (in)correct choice of possessives. The study was motivated by the fact that, in contrast to English, interpreters have to consider the syntax in choosing between the reflexive and the non-reflexive form in Polish. Correct interpretation and choice of form require awareness of structure, as choice of the reflexive is dependent on a locally bound relation between the possessive and its antecedent (subject). While our study clearly demonstrates that interpreting from a simple system into a complex system yields errors, even by native speakers of the target language, our study design cannot give us clear insights into the linguistic processing that causes such errors. We have speculated that several of the errors are due to shallow parsing. For a clearer understanding of the cognitive complexity of processing possessives in linguistically asymmetric systems, follow-up studies are needed with structurally varied sentence types tested in more controlled experiments.

However, our experiment has shown that the type of audience, as defined for the interpreter, affects the target wording. While this has resulted in fewer errors in the use of possessives for one group, the material we have collected is a rich resource that invites independent studies of other linguistic aspects to

specify characteristics of the language chosen for the two types of audience. Such studies, however, lie outside the scope of the present paper.

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APPENDIX: TEXTS

Text 1: How to be a great leader?

One of the most foundational characteristics leaders possess is personal integrity. Integrity is a set of values about which you would never compromise, no matter the circumstances. My former leader in the company I worked in always said that he needs to know he has a strong handle on **his** values, as it is critical to the basis of loyalty. It allows people to choose **their** leaders.

Similar to the way in which people decide to align themselves with **their** favourite brands such as Nike, Starbucks, Apple, or various other companies, people look for cues that allow them to identify with **their** peer or superior who they would accept to extend their personal brand.

People must associate the leader with **their** own values; only then can they determine whether or not the leader will earn **their** time and trust.

In **his** talk, 'Make Integrity the Cornerstone of Your Leadership', General Hugh Shelton tells a story about this cornerstone value of leadership and the effects that it can have on a team.

He states that before adopting the behaviours of a leader, it's important to understand the core values of a Leader Worth Following. These leaders have a foundation of **their** common values that consistently guide the way they act.

I remember the leader I mentioned previously. He was a military general. He once told me that he happened to be managing a project which he at that time treated as **his** priority. I remember him saying: 'I had been working very hard all day long, getting "Death by PowerPoint". It was finally about 6:30 or 7 p.m. in the evening and I thought "I can't take it anymore." I just wanted to get to **my** bed and sleep a bit. So I took **my** two catalogue briefcases full of **my** almost-made slides and presentations that I had to watch the following day and started out of **my** office toward home.'

But as he walked out of **his** office, he saw there's a thunderstorm, and he forgot **his** umbrella. The driver, a young sergeant, pulled the vehicle under the overhang. He got out, saluted sharply and waited for General to get in. But the General said, 'Pete, you know the regulations prohibit me from taking a government vehicle from home to work and vice versa.' And with that he stepped into the rain, carrying **his** two briefcases.

The next day, the word had spread to the other employees that the General made the decision; that the General had done the right thing versus the wrong

thing. I often wonder what message that would have sent if he had taken the car.

We watch **our** leaders very carefully. We take cues from the leaders' actions. We mirror similar behaviours in **our** lives. Possessing a great representation of integrity sets a critical foundation for your leadership.

The authentic leader is one who sets out to provide a genuine picture of who he or she is. Authentic leaders are not afraid to expose **their** weaknesses or to be vulnerable in some of the toughest situations. Saying 'I don't know' is real. People respond more positively to a leader with whom they can identify as being human versus someone who appears too perfect.

The behaviour of authenticity results in people who are much more willing to follow **their** leader through thick and thin. It makes the leader more approachable and that usually results in having a more accurate picture of **their** teams and state of the organization.

In 'Trust - Leading by Example', Patrick Lencioni highlights the actions of an authentic leader. The leader has to be the one that strips down and dives into that pool naked before anyone else will.

One of my great mentors, Hannah, would always say there's that moment when she wanted just to pack **her** things and leave **her** workplace but she knew she had to go on. Asked whether she feels the need not to show her struggle to her employees, she often said: 'I can see **my** effort and I don't mind people see it too. I am not a superhuman.'

Hannah was a great mentor, a great colleague and a great worker. She was always well prepared. She had **her** lively presentations, **her** always promising results and ... **her** smile. She had **her** problems of course, but always tried to help other people.

The truth is, people will walk through fire for a leader who is true and human. They want to know that we, as leaders know **our** humanity. Vulnerability on a team starts with authenticity with the team. It may be uncomfortable at times, but it is an important step to leading a strong team.

Now, imagine you are to become a leader in a big facility, let's say a Google research centre. It's **your** first day at work and you have to fight **your** fears before you even enter the building. You take a deep breath, you glance at **your** lucky charm and you walk in.

The key to success is not to pretend you are a superhero. Do not be afraid to show **your** weaknesses and **your** fears. People will understand that. The worst thing we can do is to hide **our** drawbacks and pretend we are better than everyone else.

I have a strong feeling you will be great leaders. But remember – a team is a lively spirit, with **its** culture and habits. With **its** unique members and characteristics. Every team has **its** own dynamics I am sure you will have **your** successes and **your** failures. Good luck then, and enjoy **your** chance at being great.

Text 2: How to organize your time?

This guide offers you strategies to help you plan **your** time effectively, encouraging you to maximise **your** productivity and maintain optimum control over **your** activities. Effective time management creates, divides and allocates time - it is an active process.

First of all – plan. Planning is an essential part of being organised. You have to predict **your** future commitments and set aside enough time to meet them. Successful planning gives you confidence and purpose. So first read through **your** agenda to establish the demands that will be placed upon you. Once you have established **your** commitments, it might be useful to enter these on a plan or calendar.

There are several advantages to using a wall chart for this activity. People usually see **their** whole week or year ahead of them and are able to plan things effectively. They can see where **their** deadlines fall in relationship to each other.

My friend often says this helps him see **his** whole plan to know the full range of **his** activities.

If you already have plans in a calendar or diary, use these in the same way. Construct a visual image of a certain period ahead, one that you can scan quickly to refresh and review.

Now, everyone: Make filling in **your** plans an active process. Use colour and image to distinguish between different sorts of activities. For example, fill in deadlines in red, starting points in green. Use exclamation marks as warning signs or question marks to highlight vague commitments.

Continually review **your** longterm plans, assessing **your** achievements or adding further information as it arises.

Now, how do we proceed?

To begin taking control of **our** times, we will need to break it up into manageable chunks. Let's try the following strategies for planning each day a week at a time.

Let's first draw up a timetable for the week showing **our** days and each hour within a day. Now, we have to fill in **our** plans for the week ahead. This will give us a clear idea of the time we can allocate to other activities, showing us when

we have time and how much time is available. Finally, everyone has to begin to allocate time to **their** other activities.

Try to fit the right tasks to the right time slots. Don't try to write a presentation in half an hour at the end of the day if you know you will be tired. Move this activity to a more suitable time when you will have the energy to complete the task. Instead, attempt more mundane tasks such as organising notes.

When planning your week, remember to balance **your** long-term commitments with your short term ones. Effective time management involves doing the right thing at the right time.

As each new day approaches, review **your** week plan to make sure that it is up to date. Make a 'to do' list for each day if this will help focus your activities. People usually like this strategy a lot, and use it to manage **their** weekly and long-term schedules.

I remember that I used the strategy too. It has **its** drawbacks (for instance, you have to spend time on planning) but it also has **its** advantages. I like it for **its** clarity, and that it makes responsible for every second you spend on something.

I had some problems at the beginning though. I found that within a week I would need to tackle more than one task at a time. I had to find a way of putting **my** multiple tasks in order, establishing a list of priorities. I realized I can do something I call a priority graph, and I will show you how to do during the next session. I always have **my** priority graph with me, and it really helps me go through my agenda.

In turn, my girlfriend told me that it is particularly important to continually review **her** planning strategy to make sure that it is up to date. She would have **her** 'revision sessions' every Friday. She always took her agenda and a glass of wine and had a look at what is still a priority and what is not.

She also told me it was important for her to find ways of motivating **her** mind and stimulating **her** thoughts when working for an extended period. She found it difficult to stay constantly active during **her** long-term projects but that was the way she coped with it.

That means you should always remember to avoid passive behaviour. Work actively, pursuing goals, achieving targets and reaping rewards.

I myself begin a work session by making sure that the task is achievable in the time set. I split a task that's too big into smaller tasks. Also, I make sure that I am clear about **my** task and what I want to achieve. Setting clear, attainable goals improves **my** motivation considerably.

I set a definite end point - 'I know I will have finished when...' and I also set clear rewards - 'When I have finished I will ...'

If I have a few tasks that I don't enjoy doing, I try to do these at the beginning of **my** work session. I get them over and done with so that I can reward yourself with **my** more interesting work. Above all, I avoid putting them to the end of **my** 'to do' list - otherwise they will stay there forever!

Another friend of mine, Ian, makes sure that he introduces variety into **his** work. He avoids doing the same thing for hours on end. He breaks up long periods of activity with **his** quick sessions of jogging or by reviewing **his** objectives. He takes these opportunities to reward himself and rekindle enthusiasm.

So remember – time organization may be difficult but it's worth it. Everyone has **their** own way to do it and you also have to find **your** way of getting things done. Good luck!

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ON THE INTERPRETATION OF POSSESSIVES IN CZECH: AN EXPERIMENTAL APPROACH

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ABSTRACT

This paper presents first findings from an offline study of Czech native speakers' use and interpretation of reflexive and non-reflexive possessive pronouns. The study is part of a larger possessive project outlined by Fabricius-Hansen et al. (2017), leaning on the comprehension experiment presented in Pitz et al. (2017). The study encompasses questionnaire data collected from 259 informants who were tested under four different conditions on two competing pronouns: the **reflexive** possessive (*svůj*) and the 3rd person **non-reflexive** possessive (*jeho*). The results revealed that Czech native speakers show a strong uncertainty when interpreting constructions with a cataphoric non-reflexive possessive. This shows that even for native speakers, the establishment of the anaphoric and cataphoric relations under certain syntactic conditions is a challenging and highly complex task. With these results, several hypotheses are formulated in various target-source-language pairs concerning the processing of reflexive and non-reflexive possessives in L2.

MOTTO¹

It is necessary to interpret syntactic phenomena not only from the point of view of the author but also from the point of view of the reader (versus author), addressee, perceiver, i.e. not only from the perspective of forming expressions but *from the point of view of their interpretation*, as well. This is the only way for us to capture both the subjective and inter-subjective (i.e. objective in this field) language reality. Having this point in mind, the cases allowing multiple interpretations need explanation and clarification.

(Karel Hausenblas 2003 [1958]: 101 [emphasis in the original])

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[1] INTRODUCTION

Reflexivity in Czech represents a well-studied topic, which has been investigated both in traditional studies of the history of Czech and in international linguistic studies of Czech.² It is supported by an extensive body of literature (see for instance Panevová 1986; 1999; 2001; 2007; 2008; Kettnerová et al. 2014; 2015; Wagner 2011; 2014; Karlík 1999; Oliva 2000; 2001; Fried 2004; 2006; Skoumalová 2001; Hudousková 2009; Komárek 2001). Special attention within the research on reflexivity in Czech has been given to the question of the competition between reflexive and personal (non-reflexive) possessive pronouns (see mainly Bílý 1981; Panevová 1986; Daneš & Hausenblas 1962; Dočekal 2000; Karlík 1998; Čmejrková 1998; 2002; 2003; 2006; 2011; for a contrasting view of Czech and Russian material see Nedoluzhko 2016). This matter has been thoroughly described in both Czech studies as well as in general linguistic literature; however, it has not yet been subjected to systematic empirical research.

The present study is part of a larger cross-linguistic project on possessives presented by Fabricius-Hansen et al. (2017), and it leans on a comprehension experiment conducted by Pitz et al. (2017). In the present paper, the Czech language is added to this cross-linguistic project in order to broaden its linguistic diversity. Moreover, Czech has a full-fledged possessive system, for the use of which there are rules prescribed by the Czech grammar books. The current paper's objective is to detect Czech native speakers' preferences when interpreting reflexive and non-reflexive possessive pronouns, focussing on the third person singular.³ For this purpose, an offline comprehension study on Czech material was conducted with a rather big sample of Czech native speakers. Although the focus will be on Czech, we will consider the contrasting usage of possessive reflexives and non-reflexives in German and Norwegian (for more details, see Section 2). The paper is structured as follows: we will describe the experimental design and the methodology which has been used (Section 3) and subsequently present the results (Section 4), which will be discussed in Section 5, with possible hypotheses proposed for further research.

The approach of the current paper is comparative. A contrastive view allows us to see not only linguistic differences across different languages but also

[2] The author is aware of the extensive research on reflexivity, especially in the context of the Government and Binding Theory (Chomsky 1981). Since the focus of this paper is on the empirical validation of the use of possessives in Czech, a thorough theoretical discussion outside Czech literature will be kept to the minimum. An overview of the theoretical studies on reflexivity mainly within an Anglo-American context can be found in Fabricius-Hansen et al. (2017).

[3] The term speaker/speakers is used in the present article as a general term for language user (speaker, listener, reader, interpreter, etc.). Depending on the context, it is used indefinitely with reference to general population, or in reference to the participants in the experiment.

makes subtle differences in a given language system visible. This is especially true when looking at closely related languages like German and Norwegian that differ considerably in the area of reflexive/possessive pronouns. This paper is meant as the first step in creating a baseline for further research, in which the results from native speakers of a number of languages will form the grounds for experimental studies focused on second language acquisition (see Fabricius-Hansen et al. 2017). In addition to Czech, other languages are of great interest, belonging to three different typological groups – Germanic, Slavic and Romance. The languages investigated in the context of the larger research project include English, German, Norwegian, Polish, Russian, and French (see Helland 2017). The purpose of this extensively designed contrastive research is – generally speaking – to reveal how and to what extent the mother tongue (L1) affects the acquisition of the target-language system (L2), and up to what level this influence occurs. The starting point is the comparison of L1 speakers to L2 speakers for selected combinations of the language pairs specified above. For example, to what extent and in what aspects does the Czech system as L1 influence the acquisition of the German or Norwegian system and vice versa? Or, how can the acquisition strategies be mutually compared among the respective groups of L2 speakers?

As already stated above, the research on the various possessive systems of the abovementioned languages focuses on the acquisition of the specific sub-system of third person singular possessive pronouns because the relation between pronouns in the first and second person compared to the third person shows a system asymmetry (see Dočekal 2000: 47). We will pay attention to both reflexive/ reflexively used pronouns and personal non-reflexive/ non-reflexively used pronouns. In Czech, these pronouns in the third person may distinguish the entities possessing the object of a sentence (Čmejrková talks about referential distinctive validity, see Čmejrková 2011: 675). Compare for instance the difference between the following pair of sentences:

- (1) a. *Pavel, políbil svou, ženu.*
 ‘Pavel kissed his own wife.’
 b. *Pavel, políbil jeho, ženu.*
 ‘Pavel kissed somebody else’s wife.’

(For more details on these sentences and other examples, see Section 2.3.)

Before we begin comparing Czech to other languages, it is necessary to know how native speakers of a particular language interpret the use of possessive reflexive and personal pronouns since the use of reflexive and non-reflexive

pronouns may result in ambiguities shaped by various linguistic factors. This will be discussed in more detail below.

[2] REFLEXIVITY IN POSSESSIVE PRONOUNS IN NORWEGIAN, GERMAN AND CZECH

The language systems of Czech, German and Norwegian allow the use of various types of pronouns to express possession (for a contrastive point of view see Zifonun 2005; for Czech see Pi'tha 1992). In this section we will briefly illustrate the use of possessive reflexive and non-reflexive pronouns in Norwegian, German and Czech.

Pronouns may be defined as entities with the following typical feature sets: [personal], [reflexive] and [possessive] (compare Karlík et al. 2016, headword *Zájmeno* ('pronoun)). While first- and second-person pronouns refer to the discourse roles/participants 'speaker' and 'addressee' respectively, the referent – i.e. the possessor in the case of possessive pronouns – is different from both in the third person. Table 1 shows differences between German and Norwegian: While the pronoun system in Norwegian has pronouns available with features [personal], [possessive] and [reflexive] (see forms *sin/si/sitt/sine*), German does not distinguish formally between reflexive and non-reflexive possessives.

DISCOUR -SE ROLE	PER		REF		PER + POS		REF + POS	
	GE	NO	GE	NO	GE	NO	GE	NO
1 st per. (speaker)	<i>ich</i>	<i>jeg</i>	-	-	<i>mein*</i>	<i>mi*</i>	-	-
	<i>wir</i>	<i>vi</i>			<i>unser*</i>	<i>vår*</i>		
2 nd per. (addres- see)	<i>du</i>	<i>du</i>	-	-	<i>dein*</i>	<i>di*</i> ;	-	-
	<i>ihr; Sie</i>	<i>dere</i>			<i>euer*;</i> <i>ihr*</i>	<i>deres</i>		
3 rd per.	<i>er/sie/</i>	<i>han/hun;</i>	<i>sich</i>	<i>seg</i>	<i>sein*/ihr*</i>	<i>hans/hennes,</i>	-	<i>si*</i>
	<i>es;</i>	<i>den/det;</i>				<i>dens/dets;</i>		
	<i>sie</i>	<i>de</i>			<i>ihr*</i>	<i>deres</i>		

TABLE 1: Forms of pronouns in German (GE) and Norwegian (NO) described by the feature sets PER [personal], REF [reflexive], POS [possessive] (see Fabricius-Hansen et al. 2017); compare Table 2 for Czech⁴

[4] An asterisk (*) indicates that the possessive in question is inflected for number, gender, and case (GE) in agreement with the possessee; see Fabricius-Hansen et al. (2017) for details. The non-possessive, non-reflexive pronouns are represented by their nominative/subject form.

Let us now focus on the differences in the sub-systems of possessive pronouns in the third person in Norwegian and German, since the experimentally tested Norwegian and German examples have been the baseline for the formation of the stimulus material for our experiment applied to the Czech language material (see Section 3 *et seq.*). The situation in the respective languages will be illustrated by examples: We will start with Norwegian, in which ambiguities concerning reflexive versus non-reflexive reference do not occur, as opposed to German (and, as we shall see, Czech).

[2.1] *Norwegian*

The inventory of possessive pronouns in Norwegian is very complex in comparison to German and includes both system-reflexive possessives and non-reflexive possessives (see Table 1). This distinction has been described in terms of the Government and Binding theory, which distinguishes between the so-called local and non-local binding (Chomsky 1981). In Norwegian, it holds true that *si-* forms generally refer to a local subject, while non-reflexive possessives refer to a non-local subject (or a non-subject). Compare the following pairs of examples (2a) and (2b), illustrating the use of the possessive reflexive *sin* as opposed to the possessive non-reflexive *hans*:⁵

- (2) a. *Mens Petter_{i(local)} lekte med den lille hunden **sin**, klatret Jonas_{j(non-local)} i det store treet.*
 while Petter_i played with the little dog SIN_i, climbed Jonas_j in the big tree.
 ‘While Petter_i played with his_i little dog, Jonas_j climbed on the big tree.’ (Petter’s dog)
- b. *Mens Petter_{i(local)} lekte med den lille hunden **hans**, klatret Jonas_{j(non-local)} i det store treet.*
 while Petter_i played with the little dog HANS_j, climbed Jonas_j in the big tree.
 ‘While Petter_i played with his_j little dog, Jonas_j climbed on the big tree.’ (Jonas’ dog)

In example (2a), with the use of the reflexive possessive *sin*, the only possible referent is found in the grammatical subject (in this case, the antecedent *Petter*); hence the pronoun *sin* is bound locally. Cataphoric reference is excluded by the reflexive restriction on *sin*. On the other hand, in example (2b), the non-

[5] We look at the reflexives and non-reflexives solely in the adnominal position.

reflexive possessive *hans* (referring to a masculine human possessor in the singular) is used to refer cataphorically beyond the clause border to a non-local referent. Therefore, it is possible in these cases to unequivocally identify the referential relations in Norwegian. This finding was also confirmed by experimental research by Pitz et al. (2017), showing that Norwegian native speakers interpret the referential relations in such sentences (almost) unequivocally, in 98.2% of cases (i.e. practically a ceiling effect).

[2.2] German

German does not have an inventory of possessive reflexive pronouns. Its pronoun system includes only personal reflexive pronouns (see Table 1). If the possessor carries the grammatical feature of masculine or neuter singular, the lexical pronoun *sein** is used with case and gender marking in accordance with the possessum. Unlike in Norwegian, under certain conditions ambiguities may occur in the third person singular, compare example (3):

- (3) *Während Peter_i(local) mit **seinem**_{i/j} kleinen Hund spielte, kletterte Jonas_j(non-local) in dem großen Baum.*
 while Peter_i with SEINEM_{i/j} small dog played, climbed Jonas_j in the big tree.
 ‘While Peter_i played with his_i (own)/ Jonas’_j dog, Jonas_j climbed on the big tree.’

In example (3), the adnominal possessive *sein** may refer to either its antecedent (*Peter*) or postcedent (*Jonas*), thus leading to potential ambiguity. Pitz et al. (2017) tested the identification of referential relations by native speakers of German. The findings from a sample of 32 informants showed a clear preference – 90.9% – for the local, i.e. anaphoric⁶ interpretation. Subsequently, examples of this type have been transferred to Czech and tested as well (Section 3.2.1 below).

[2.3] Czech

Relevant aspects of the use of possessive pronouns in Czech shall be presented in more detail than in the case of Norwegian and German. Czech has a unique position compared to the other two languages because there is competition in the distribution of reflexive and personal possessive pronouns. This competition has repeatedly roused the interest of many researchers and has

[6] See Kolářová in Karlík et al. (2016), headwords *Nepřavá* and *Nepřesná anaphora* (‘false and inaccurate anaphor’).

been thoroughly described in specialized literature (see Section 1). In this research, many different single example sentences have been examined, illustrating the competition of personal and reflexive pronouns, and quite a number of linguistic factors contributing to this competition have been discussed. In the present paper, we will focus only on factors that are considered relevant to the current research. As in the above cases of German and Norwegian, we will focus on how the referential relations are in fact interpreted in Czech in the context of reflexive and personal possessive pronouns in the third person singular.

[2.3.1] *Reflexivization rule*

To compare the sub-system of pronouns in Czech to the systems of pronouns in Norwegian and German (specified in Table 1) consider Table 2. The pronouns *svůj** (reflexive) and *jeho* ('his', personal/non-reflexive) are the two main competing pronouns to look at.

DISCOURSE ROLE	PER	REF	PER + POS	REF+POS
1 st person (speaker)	<i>já</i> <i>my</i>		<i>můj*</i> <i>náš*</i>	
2 nd person (addressee)	<i>ty</i> <i>vy</i>	<i>se</i>	<i>tvůj*</i> <i>váš*</i>	<i>svůj*</i>
3 rd person (≠ speaker and addressee)	<i>on, ona, ono</i> <i>oni, ony, ona</i>		<i>jeho, její, jeho</i> <i>jejich</i>	

TABLE 2: Forms of pronouns in Czech described by feature sets PER [personal]; REF [reflexive]; POS [possessive]. Compare also Table 1.

As Table 2 shows, an asymmetry of relations of the first and second person to the third person is linked in Czech to the competition between the possessive reflexive pronoun *svůj** and its non-reflexive counterparts: the personal possessives *můj** ('my') and *náš** ('our') in the first person; the possessives *tvůj** ('your', sing.) and *váš** ('your', plur.) in the second person; and possessives *jeho* ('his, its'), *její* ('her') and *jejich* ('their') in the third person. The basic rule governing the use of the reflexive possessive *svůj** instead of its non-reflexive counterparts has been traditionally known in Czech linguistics as the so-called reflexivization rule, sometimes called the basic 'traditional' normative rule (Čmejrková 1998). This rule is most frequently formulated from a syntactic point of view: the referent of the possessive *svůj** is identical to the referent of the subject of the syntactic structure in which it appears (Karlík in Karlík et al. 2016, headword *Přivlastňovací zájmeno* ('possessive pronouns')). In other words,

in terms of co-reference the reflexive *svůj** primarily co-refers with the subject of the clause in which it appears (see e.g. Panevová 1986; Panevová in Karlík et al. 2016, headword *Koreference*; Nedoluzhko 2016).⁷

From a semantic point of view or from the point of view of a given sentence's meaning tier (see Dočekal 2000: 54), Daneš approaches the formulation of the reflexivization rule in *Mluvnice češtiny III (Czech Grammar III)* as follows: the rule states that a reflexive pronoun is used when 'something is possessed by the person/thing that is identical to the agent/patient of the action or state expressed in the given sentence' (Daneš et al. 1987: 699). Various researchers have pointed out that language users do not always follow this rule. Daneš & Hausenblas, in the introduction of their paper from 1962, state: 'It has been observed for a long time that this rule does not satisfactorily capture the real state in the language' (Daneš & Hausenblas 1962: 191). Following the same line of argumentation, Panevová remarks (1986: 48) that the usage often does not correspond to the normative rule. Our central research question is addressing the same issue.

[2.3.2] *Transparent and non-transparent cases of reflexivization*

In Czech studies, transparent cases of reflexivization are frequently presented when it is clear which element triggers the reflexivization. On the other hand, there has been extensive discussion about the cases where it is not quite clear which antecedent the reflexive possessive is referring to. Consider the following transparent case:

- (4) *Pavel_i políbil svou_i / jeho_j ženu.*
 'Peter_i kissed his own_i/his_j wife.'

According to the reflexivization rule, the reflexive possessive *svůj** refers to the expression standing in the subject position of the element (i.e. Pavel kissed his own wife), while the non-reflexive pronoun *jeho* refers to an expression having a different referent (i.e. Pavel kissed somebody else's wife, not his own).

When a reflexive pronoun is replaced by a non-reflexive pronoun, an asymmetry of 1st and 2nd person pronoun in relation to 3rd person is caused. This leads to the appearance of different referents in the 3rd person to which different respective expressions of a sentence can refer. When reflexive possessives and non-reflexive possessives compete with the feature of the 1st and 2nd person, this referential distinction does not occur.

[7] In fact, the same rule applies for reflexive possessive *svoj* in Russian, comp. Nedoluzhko (2016): 'the reflexive possessive "svůj/svoj" is basically coreferential with the subject'.

The transparent cases of the use of reflexivization also include the reduction of the set of possible referents given by grammatical agreement. Panevová (in Karlík et al. 2016, headword *Koreference* ('co-reference')) distinguishes grammatical coreference, when the use of coreferential means is governed by grammatical rules, and textual coreference, expressed by anaphoric and cataphoric means. Panevová emphasizes [vagueness] as a typical feature of these means and presents several examples to support her view. The key fact for the present experiment is that '[in] certain contexts certain meanings of these vague means are reduced by limitations given by agreement' (cited from Panevová 2016), compare example (5):⁸

- (5) *Tomáš_i se dohodl s Janou_j, že /Sb_{i/k}/ **ji**_{i/l} odveze na nádraží.*
 'Tomáš_i agreed with Jana_j to take her_{j/l} to the station.'
 (Panevová in Karlík et al. 2016)⁹

In example (5), the personal pronoun *ji* 'her' can be interpreted anaphorically as referring to *Jana* or it can refer to another person who is not mentioned in the example. In other words, the problem of examples such as (5) seems to be what is understood as subject (/Sb/) of the verb. The limitation given by agreement was considered in one of the conditions of our experiment (see Section 3.2.1).

The real challenge for Czech studies has been the non-transparent cases for which possible referential ambiguity is typical. Compare the cases traditionally presented in the Czech studies literature containing double predication (6)–(8):

- (6) *Slyším_i **tě**_j zpívati **svou**_{i/?/j?} oblíbenou píseň.*
 'I_i can hear you_j singing my/your_{i/?/j?} favourite song.'
 (Gebauer 1890, in Dočekal 2000: 49)
- (7) ***Profesor**_i požádal **asistenta**_j přednést **svůj**_{i/?/j?} referát (na konferenci).*
 'Professor_i asked the assistant_j to present his_{i/?/j?} paper (at the conference).'
- (Panevová 1986: 57)

[8] The acronym Sb represents the non-expressed agent/subject on the surface, and indexes (_{k, l}) refer to other referents than those to whom the expressions explicitly mentioned in the text refer.

[9] The lower index behind the example states from which study the example was taken over as well as the possible source of the example, e.g. from ORAL2006 corpus. In cases where we are not certain where the examples come from we use a question mark.

- (8) *Poradil_i jí_j zavolat svému_{i7/j7} učiteli.*
 ‘He_i advised her_j to call his/her_{i7/j7} teacher.’
 (Čmejrková 2011: 13)

These examples contain two actions expressed: one by the finite verb and one by the embedded infinitive. Therefore, in all cases, the sentences contain or imply two possible subjects. However, not even after applying the basic reflexivization rule, is it clear which of the two subjects is co-referential with the reflexive possessive, or, in terms of the Government and Binding theory, it is not certain whether it is a local or non-local interpretation in these cases.

Mluvnice češtiny III (1987) (*Czech Grammar III*) formulates the second, modifying rule in addition to the basic reflexivization rule:

In the sentence in which more participants are expressed (or are informed) to whom it is possible to possess something, the selection of the possessive pronoun is governed mostly not in relation to the participant expressed by the grammatical subject but in relation to the participant of the action / state whose interpretation stands closest¹⁰ to the expression of the person or thing being possessed in the dominance structure of the sentence.

(Daneš et al. 1987: 699–700)

Dočekal (2000) points out that this is rather a carefully formulated tendency than a rule in the strict sense of the word and adds that there are non-transparent cases in which the sentence structure contains only one predication and where it is still not obvious which antecedent the possessive – non-reflexive in this case – relates to.

Consider example (9), in which the non-reflexive possessive *jeho* may be bound both to the closest actant and to some other entity¹¹ known from the context or situation (for more details see Dočekal 2000):

- (9) *Já_i jsem šel do kina s Pavlem_j a s(e) svou_i // jeho_{j/k} ženou.*
 ‘I_i went to the movies with Pavel_j and my_i // his_{j/k} wife.’
 (Karlík in Karlík et al. 2016, headword *Přivlastňovací zájmeno*;
 Engl. Possessive pronoun)

In a similar manner, referential ambiguity occurs in examples (10) and (11), presented by Panevová (1986) and Nedoluzhko (2016):

[10] I.e. standing closest in the syntactic structure of the given sentence (cf. Daneš & Hausenblas 1962).

[11] Reference to this object is marked with the index (_i) in co-indexation.

- (10) *Jan_i slíbil Karlovi_j být pozván **svou_{i/j}** přítelkyní do kina.*
 ‘Jan_i promised Karel_j to be invited by his_{i/j} girlfriend to the movies.’
 (Panevová 1986: 54)
- (11) *Jan byl znepokojen chováním **svých**/***jeho** dětí v **jejich**/***svém** pokoji.*
 ‘Jan_i was worried by the behavior of his_{i/j} children in their/his room.’¹²
 (Panevová, in Nedoluzhko 2016: 62)

Dočekal (2000) draws attention to the fact that the transparent cases with only one predication and non-transparent cases with two predications have been described by Czech linguistics (reflexivization and modifying rules), while the cases of sentences with two predications in which the embedded predication is omitted (*Petr_i našel děti_j ve svém_{i/j} pokoji* ‘Petr_i found the children_j in their/his_{i/j} room’) present a challenge for further investigation (Dočekal 2000: 58). However, from the point of view of experimental psycholinguistics, all the different types require a thorough investigation. In our experiment, though, we leave non-transparent cases and cases with two predications aside and will focus on the cases that are deemed non-problematic.

[2.3.3] Pragmatic aspects of reflexivization

Competition of reflexive and non-reflexive possessives is often explained using pragmatic aspects (Čmejrková 2002; 2003; Nedoluzhko 2016) in addition to the syntactic and semantic aspects (see the reflexivization rule and the modifying rule/tendency mentioned above).¹³ Dočekal (2000), referring to Daneš’s & Hausenblas’ article from 1962, points out that personal possessives are more frequent in colloquial Czech than reflexive possessives (see also Nedoluzhko 2016). Čmejrková (2011) and Dočekal (2000) present the following examples (12) – (16), demonstrating the use of the personal possessive instead of the reflexive possessive. These examples contain non-reflexive possessives with the feature of the first or second person. The majority of Čmejrková’s (2011) examples are taken from the spoken corpus ORAL2006:

- (12) *kdybych se zeptal toho **mýho** kamaráda*
 ‘If I asked that friend of **mine**’
 (Čmejrková 2011: 660; ORAL2006)

[12] The non-reflexive *jejich* can refer to the children or to another group of people not mentioned in the example. The reflexive *svých*, on the other hand, refers only to *Jan*, the subject of the sentence.

[13] A key article by Panevová from 1986 comments on this. Compare also Dočekal (2000).

- (13) *Tak jsem se bavil s **mym** bejvalym šéfem.*
 ‘So, I talked to **my** ex-boss.’
 (Čmejrková 2011: 660; ORAL2006)
- (14) *Během **mého** krátkého pobytu v Pembroke College (...) jsem se seznámil s **mou** budoucí ženou.*
 ‘During **my** brief stay at Pembroke College (...) I met **my** future wife.’
 (Čmejrková 2011: 663)
- (15) *A Puč mi **tvý** pero.*
 ‘Lend me **your** pen.’
 (Dočekal 2000: 52)
- (16) *Zavolej z **tvýho** telefonu.*
 ‘Call from **your** telephone.’
 (Čmejrková 2011: 671; ORAL2006)

In this type of structure (examples (12)–(16)), the personal possessive has the same reference as the reflexive possessive would have, and therefore this structure is tolerated as a sub-standard variant (Karlík, in Karlík et al. 2016, headword *Reflexivní zájmeno* (‘reflexive pronoun’)).¹⁴ In the case of example (14), Čmejrková admits the influence of English; it may be noted that the inter-language priming of the English possessive *my* and the Czech *můj* can play a certain role.

From the pragmatic point of view, the occurrence of the reflexive possessive instead of the personal possessive is often explained as signalling the speaker’s distance from the message: The speaker would tend to use the personal possessive when the speaker is fully identified with the respective antecedent and the speaker does not intend to express the distance (compare Čmejrková 2011).¹⁵ However, the situation is reversed in the third person in this respect: While the use of the reflexive *svůj** expresses identification of the speaker with the antecedent, abstaining from reflexivization expresses the speaker’s distance from the message. Daneš & Hausenblas (1962) say that in this case, the observation or evaluation of the content of the possessive combination comes ‘somehow “from the outside”’ (Daneš & Hausenblas 1962: 199); compare example (16), from the work of Božena Němcová:

[14] For the functional use of this construction to express the polite form of addressing and synthetic personalization see Čmejrková (2011).

[15] The same applies for the reflexives *svůj** competing with personal possessives in Russian (Nedoluzhko 2016).

- (16) *On nerozumí ničemu, než těm jeho lejstrám*
 ‘He understands nothing but **his** papers’
 (Němcová, in Daneš & Hausenblas 1962: 198)

The authors claim that this manner of expression is common in colloquial speech (Daneš & Hausenblas 1962: 199).

Last but not least, the interpretation of referential relations of reflexive and personal possessives may be pragmatically explained by the speaker’s world knowledge. Consider the following example from Čmejrková (2011):

- (17) *Soudce ho odsoudil za vraždu svého komplice.*
 ‘The judge sentenced him for murder of **his** accomplice.’¹⁶

Which criteria are applied in example (17) to allow for reflexivization? In addition to the semantic aspect (compare the dynamic character contained in the lexical meaning of the word *vražda* ‘murder’), it is certainly world knowledge: Judges usually do not commit murders. Čmejrková (2011) sees this structure as problematic from the point of view of grammatical correctness.

The questions regarding the competition between personal and reflexive possessives that were outlined above lead us to formulating hypothesis about the interpretation of referential relations by native speakers of Czech (see Section 3.2.2).

[3] RESEARCH QUESTION AND EXPERIMENTAL DESIGN

In our experiment, we focus on the use of possessive reflexives and non-reflexives in adnominal position, and – as mentioned above – we pay attention to transparent cases only. The main research question is how speakers determine the referential relations in sentences containing reflexive and non-reflexive (personal) possessives of the third person singular. Based on the theoretical description of the competition between reflexive and personal possessives, we assume that speakers will show uncertainty in certain types of structures concerning the interpretation of referential relations (for more details see the hypothesis in Section 3.2.2). The design applied here is in principle taken from the comprehension study by Pitz et al. (2017: Section 4), in which the interpretation of the Norwegian reflexive possessive *sin* and the personal possessive *hans* (3rd person singular, masculine) was tested in Norwegian native speakers.

[16] Note that *murder* is a nominal form of an action verb that has an underlying subject attached to it. This, however, holds true only for English and not for Czech. Here it is a regular noun.

[3.1] *Latin Square Design*

In our experiment, we used the so-called Latin square design, within which four different target conditions may be tested based on a 2×2 principle. The design type is shown in Figure 1

	c1	c2	c3	c4
i1	1	2	3	4
i2	2	3	4	1
i3	3	4	1	2
i4	4	1	2	3
i5	1	2	3	4
...

FIGURE 1: Latin Square Design; i = item, c = condition.

This type of design is based on three limitations, namely the following:

- (i) Limitation 1: to present each tested person with only one item;
- (ii) Limitation 2: to test each target item in each condition;
- (iii) Limitation 3: to test each condition with each participant equally often.

This design type has been chosen because the presence/ non-presence of two factors was observed: reflexivity (+/-) and disambiguation (+/-) (for more details see below).

[3.2] *Method and stimuli applied*

We tested 92 items in total, 32 of which were target items and 60 were distractors. Because of the Latin square design, each target item was tested in four different conditions. In accordance with the design, four different versions of questionnaires were prepared, differing in the distribution of the conditions in which the target items were presented. The respective types of conditions will be presented in Section 3.2.1 and shown using examples of the stimuli applied.

Each version of the questionnaire contained target items in randomized order that was different for each of the four questionnaire versions. Tested informants were always presented with the respective randomized version of the entire questionnaire in the same form.

Almost all participants completed the questionnaire via the internet, using the free software Onexp. Six questionnaires were submitted in printed form. The instructions participants received electronically can be found in Appendix I.

[3.2.1] Target items

The language stimuli were translated from Norwegian and/or German into Czech with the aim of preserving mutual comparability of the items in the respective languages as much as possible. Naturally, an absolute comparability cannot be attained because of the grammatical differences in the systems of these languages (e.g. possessive pronouns in Norwegian are generally placed in post-nominal position). It was also necessary to adapt the overall context to the Czech environment (culture and history etc.), as well. Nevertheless, the selected items in Czech, German and Norwegian are comparable to a great extent.

The respective items were prepared to form a short coherent discourse, which could also be used in a future experiment in combination with the eye-tracking method. The target items were construed in conditions (a/b/c/d), compare:

- (18) *Dnes je venku v lese velká zima. Petr/Jana má kolem krku uvázanou šálu a Martin má na hlavě čepici.*
 ‘It’s chilling outside in the woods today. Petr/Jana has a scarf around his/her neck and Martin is wearing a winter hat.’
- a. *Zatímco se Petr_i(local) honí kolem stromu se svým_i pejskem, vyleze Martin_j(non-local) na hromadu dříví.*
 ‘While Petr_i(local) plays chase around a tree with his_i dog, Martin_j(non-local) climbs a timber pile.’
- b. *Zatímco se Petr_i(local) honí kolem stromu s jeho_j pejskem, vyleze Martin_j(non-local) na hromadu dříví.*
 ‘While Petr_i(local) plays chase around a tree with his_j dog, Martin_j(non-local) climbs a timber pile.’
- c. *Petr_i(local) se honí kolem stromu se svým_i pejskem. Martin_j(non-local) zatím vyleze na hromadu dříví.*
 ‘Petr_i(local) plays chase around a tree with his_i dog. Meanwhile, Martin_j(non-local) climbs a timber pile.’
- d. *Zatímco se Jana_i(local) honí kolem stromu s jeho_j pejskem, vyleze Martin_j(non-local) na hromadu dříví.*
 ‘While Jana_i(local) plays chase around a tree with his_j dog, Martin_j(non-local) climbs a timber pile.’

As shown in example (18), each target item consisted of an introductory sentence establishing the situational context (Běličová & Uhlířová 1996: 184); this sentence contained only one predicate expressed by a *verbum finitum*. The second sentence unit introduced two referents on the scene referred to by proper names.¹⁷ These referents were introduced using coordination in order to provide for the same salience (compare Hajičová in Karlík et al. 2016, headword *Salience*). Both referents were either male, e.g. *Petr* and *Martin*, or one was male and the other female, e.g. *Jana* and *Martin*. The names used were typical Czech first names. The third sentence was the key sentence used in the experiment in four different conditions (a/b/c/d). This key sentence was introduced in conditions (a), (b) and (d) by the temporal connecting expression *zatímco* ('while, in the meanwhile'). The respective conditions contained reference to the specified referents (*Petr*, *Martin/Jana*) using possessive reflexive or personal pronouns (*svůj*/jeho*). All conditions presented transparent cases of the use of possessive pronouns, both reflexive and personal. The important features are: REFLEXIVITY (+/-) and DISAMBIGUATION (+/-). The value REFL (+) means that the reflexive pronoun *svůj** was used (in conditions a/c), while the value REFL (-) indicates the use of the personal pronoun *jeho* (in conditions b/d). Disambiguation means making the referential relations unequivocal in the given item by introducing an additional disambiguation feature. This feature DIS (+) helped to make the interpretation of the referential relations unequivocal, and it had two forms: division of the sentence unit into two separate sentences (condition c) and the use of agreement with the (first) name in feminine gender (condition d). Such an additional disambiguation feature was not used in conditions (a/b).

As shown in the example of the model item, condition (a) is called the 'local' condition: the pronoun *svůj** should refer to the expression in the subject position of the given sentence according to the reflexivization rule, i.e. locally to the expression *Petr*. This condition has the features REFL (+) and DIS (-) and is analogous to the condition in Norwegian in which local binding through the reflexive *si** is used (see example (1a) in Section 2.1). In contrast, condition (b) has the features REFL (-) and DIS (-), and, therefore, we call it the 'non-local' condition; here, the personal possessive *jeho* cataphorically refers to a non-local referent beyond the clause border, i.e. to the expression *Martin*. This condition is analogous to the non-local condition applying non-local binding using the non-reflexive possessive *hans* in Norwegian (see example (1b) in

[17] 'Sentence unit' means a section separated from another section by a period. The sentence unit used as a stimulus may consist of several (usually two) partial units that we call clauses (possibly independent and dependent sentence/clause).

Section 2.1). Condition (c) represents the so-called baseline condition testing the local binding in two separately standing and independent sentences and it has the features REFL (+) and DIS (+). Condition (d) has the features REFL (-) and DIS (+), and therefore we call it the ‘non-local and gender-disambiguated’ condition based on agreement with the feminine feature of the referent introduced in the scene.

In total, the following types of conditions were tested (COND):

- (i) COND (a): REFL (+), DIS (-)
- (ii) COND (b): REFL (-), DIS (-)
- (iii) COND (c): REFL (+), DIS (+)
- (iv) COND (d): REFL (-), DIS (+)

The target sentences in conditions (a/b/c/d) were followed by a question the participants had to answer:

- (19) *Čí je to pejsek?*
 ‘Whose dog is it?’
- a. *Petra*
 ‘Petr’s’
 - b. *Martina/Jany*
 ‘(Martin’s/Jana’s)’
 - c. *ničí*
 ‘nobody’s’

Only one out of three possible answers was correct. The third option (pronoun *ničí* ‘nobody’s’) was the same for all target items, and it was always given as the last option.¹⁸

To evaluate the experiment, the critical conditions (a) and (b) were evaluated against the so-called baseline, conditions (c) and (d), which did not allow two interpretations (see Section 4, Results).

[18] Instead of letters a), b), c), the tested informants saw empty ‘buttons’ on the screen which needed to be clicked on. The order of the referents in the answers was balanced evenly in terms of correct or incorrect answer. At the same time, the order in which the referents were introduced on the scene in the second introductory sentence of the given stimulus was also balanced.

[3.3.3] *Distractors*

We used 60 distractors in the questionnaire consisting of two or three sentences consisting of several clauses. As opposed to the target conditions, the referents were immediately introduced in the first introductory statement. We used three types of distractors followed by three types of questions, i.e. (1) ‘Who?’, (2) ‘Who whom (accusative)?’, (3) ‘Who to whom?’ Compare e.g.:

- (20) *Arnošt a Natálie byli na několik dní na výletě v Paříži. Večer zašli do kavárny. Arnošt si dal skotskou whiskey a Natálie si objednala výborné francouzské víno.*

‘Arnošt and Natálie went for a trip to Paris for a few days. They went to a café in the evening. Arnošt had Scotch whisky and Natálie ordered exquisite French wine for herself.’

Kdo si objednal víno?

‘Who ordered the wine?’

- a. *Arnošt*
- b. *Natálie*
- c. *nikdo*
‘nobody’

The other two types of distractors are specified in Appendix II.

[3.2.3] *Hypothesis*

Based on the theoretical description of the issues concerning the competition of personal and non-reflexive possessive pronouns, we hypothesized that native speakers of Czech will misinterpret referential relations in condition (b) specified above (in Section 3.2.1). At the same time Czech speakers will make very few or no mistakes in the other tested conditions.¹⁹

[3.3] *Informants*

259 speakers were tested, most (but not all) of which were university students. Students of Czech Language and Literature and/or General Linguistics were excluded from participating in this study.²⁰ The informants had to be native speakers of Czech. At least 48 informants completed each version of the

[19] We are aware of the fact that using the terms mistake, erroneous answer and error is not optimal since the actual use of possessive pronouns quite often deviates from the rules of the prescriptive grammar. One can doubt if the normative grammar describes the phenomena in the right way.

[20] Students of other philological fields were allowed to participate in the experiment.

questionnaire (see Table 3). Most informants were between 20 and 30 years of age. The age span of the tested informants was 18 – 78 years. All informants completed the test.

Questionnaire	Number of informants
Version 1	48
Version 2	102
Version 3	53
Version 4	49
Total	252

TABLE 3: Number of informants for the respective versions of the questionnaires.

[4] RESULTS

In total, 259 questionnaires were evaluated with eight answers for each condition. Experimental conditions were given by combining two factors: REFLEXIVITY (+/-) and DISAMBIGUATION (+/-). Therefore, there were 2016 items in total administered in each condition. Three answers were lost due to technical complications.

The crude results (to be discussed in the following sections) are presented in Table 4, showing the total number of erroneous answers for the respective conditions. We counted as erroneous answers cases differing from the rules prescribed by Czech grammar books as well as answers that were completely implausible as a response to the testing item.

Reflexivity	Disambiguation		Total
	-	+	
-	575 /COND (b)/	49 /COND (d)/	624
+	23 /COND (a)/	14 /COND (c)/	37
Total	598	63	661

TABLE 4: The number of erroneous answers given in the respective conditions

The results in Table 4 clearly show that the majority of erroneous or differing reactions were elicited in the non-reflexive condition without disambiguation.

For the purposes of a more detailed analysis, the data was processed using a binomial mixed model (logistic regression with random effects). This analysis

included disambiguation and reflexivity as fixed components; people and items were included as random components. This type of model allows us to check the variability between people and items, especially considering whether overall the answers are too strongly affected by only a few distinctively different people or items or not. The combination REFL (+) and DIS (+) (condition c) was set as a reference condition in the model. The results are summed up in Table 5.

	Estimate	OR	z value	p
Constant	-6.8412	0.001	-18.32	<0.001
Reflexivity	1.3227	3.75	4.10	<0.001
Disambiguation	0.5778	1.78	1.61	0.11
Interaction REFL vs. DIS	3.3822	29.44	8.32	<0.001

TABLE 5: The use of possessive pronouns in the relevant conditions

The significant main effect of reflexivity means that in comparison to the reference condition, the probability of error increases in the non-reflexive condition with disambiguation (REFL-/DIS+) (condition d). The effect of disambiguation is not statistically significant, i.e. the difference between 14 and 23 errors in the bottom line of Table 4 cannot be considered a reliable indicator. Significant interaction means that effects of both main factors do not simply add up, but they are distinctively stronger when combined. This corresponds to a distinctive increase in the number of errors in the condition REFL(-)/DIS(-) (condition b). The overall results of the model confirm the interpretation offered by the contingency table (Table 4), i.e. the combination REFL(-)/DIS(-) (condition b) differs significantly from the other combinations of conditions.

[5] DISCUSSION

In this paper, we observed preferences in the interpretation of reflexive and personal possessive pronouns in the third person singular in Czech. In order to answer the questions following after each stimulus was introduced, the informant needed to interpret the referential relations and decide which expression the reflexive or non-reflexive possessive referred to. Our starting point was that the rule formulated in the descriptive grammar books for the use/interpretation of possessive pronouns should manifest itself as a clear preference in speakers' choice. The results of the current study, however, reveal speakers' uncertainty when applying the rules for the identification of the 'correct' referent according to the reflexivization rule in condition (b) (see

Section 3.2.1), i.e. in cases where the non-reflexive possessive *jeho* is used, referring cataphorically (non-locally) beyond the clause border.

The empirical approach followed in the current study leads to a very different point of view on the interpretation of possessive pronouns: The preferences identified in this study provide evidence that the grammatical rules ascertained in the literature so far do not correspond to the actual use of the possessive pronouns by to-day's native speakers of Czech. In other words, the grammatical descriptions discussed at the onset of this article are not correct and do not reflect speakers' actual preferences.

Our findings disclosed that speakers made only very few mistakes in conditions (c) (separate sentence units) and (d) (limitations given by agreement), indicating that these mistakes were probably mostly due to lack of attention. The rate of 'incorrect' answers was also very low in condition (a) (local use of reflexive possessive *svůj**), with local interpretation prevailing. This proves, in our opinion, that speakers passively know the reflexivization rule and are able to interpret the referential relations correctly based on the rule.

On the other hand, condition (b) showed a significantly increased number of mistakes. This result clearly demonstrated that the Czech personal possessive *jeho* 'his' behaves differently than the personal possessive *hans* 'his' in Norwegian: While the possessive *hans* in Norwegian is understood as referring non-locally in almost 100% of the relevant cases (Pitz et al. 2017), speakers interpret the possessive *jeho* in Czech as a local reference in almost one third of the cases. This is a very interesting result because *hans* and *jeho* correspond to each other in terms of formal (grammatical) features. Nevertheless, we can see different limitations in each language: While usage and grammar correspond reasonably well to each other in Norwegian (see Fabricius-Hansen et al. 2017: 20–22 for details), this is obviously not the case in Czech. Based on these differences, a very inspiring question may be derived concerning language processing of possessive pronouns by non-native speakers: In the case of Czech native speakers acquiring Norwegian as L2, do they realize that, in spite of the formal similarity of *hans* and *jeho*, the Norwegian rule is more true to the actual interpretation of the non-reflexive *hans* than the Czech rule is to the referential interpretation of *jeho*?

Results in the tested condition (b) in comparison to the results under condition (a) lead us to considerations regarding whether the cataphoric reference beyond the clause border was too demanding for the speakers from a processing point of view. Does this type of sentence require a higher cognitive

effort to be processed successfully? Could it be that the referent pointed to by the pronoun in this sentence type is too distant?

Dočekal (2000) talks about delimitation between the sentence and higher units, referring to Václav Svoboda's article *Rozprava o užívání osobných, přisvojovacích a zvratných náměstek v souvětích zkrácených* ('discussion about the use of personal, possessive and reflexive pronouns in abbreviated clauses'), published in *Časopis českého muzea* (Journal of the Czech Museum) in 1880: 'Nevertheless, the subject of Svoboda's article is in fact the search for delimitation between the sentence and the higher units.' (Dočekal 2000: 48). Specification of what is and what is not a complex (and therefore more demanding) syntactic structure is non-trivial and ambiguous from the point of view of general linguistics, psycholinguistics and neurolinguistics.²¹ Similarly, compare example (21) presented by Čmejrková (2011):

- (21) *Ze svý^{ch} domovů evakuovali záchranáři tisíce občanů.*
 from their_{i/i} homes evacuate rescuers_i thousands citizens_i
 'Rescuers evacuate thousands of citizens from their homes.'
 (Čmejrková 2011: 657)

Could this extra demand be caused by the fact that the reference is too distant, which in turn affects the working memory capacity and the underlying processing? All this may have as a consequence an incorrect interpretation of such cases.

Dočekal (2000: 58) points out that the possessive *svůj** (in contrast to the personal possessive *jeho*) cannot bind across the sentence borders. Compare the author's examples:

- (22) a. **Dům_i měl červenou střechu. Svou_i střechu jsme viděli už z dálky.*
 'The house had a red roof. We have seen our roof from afar.'
 b. *Dům_i měl červenou střechu. Jeho_i střechu jsme viděli už z dálky.*
 'The house had a red roof. We have seen its roof from afar.'

Does the same hold for the use of a personal possessive referring cataphorically beyond the clause border? From the descriptive grammar point of view, this should not be the case. However, our data shows that speakers behave like this in almost one third of all the cases, preferring local over non-local interpretation, despite the existing normative rule.

[21] Compare de Blesser et al. in the monography on agrammatism: 'it is hard to figure out an uncontroversial definition of "syntactic complexity"' (de Blesser et al. 2012: 128).

For this reason, it would be desirable to observe how speakers interpret referential relations in simple sentences, like example (23):

- (23) a. *Petr_i šel do kina se **svou**_i ženou.*
 ‘Peter went to the cinema with his own wife.’
 b. *Petr_i šel do kina s **jeho**_j ženou.*
 ‘Peter went to the movies with his wife.’
 (Čmejrková 2011: 675)

The difference between the sentences in (a) and (b) is very obvious to a linguist but it may cause problems to common users of the language. Čmejrková draws attention to the fact that with the reflexive *svůj**, the message is clear, while with the simple possessive *jeho*, the circle of possible referents may be wider (compare Čmejrková 2011: *ibid*).

The results of our experiment cast doubt on the correctness of the interpretation given for many examples widely discussed in the Czech research on possessives. Consider examples from Daneš & Hausenblas (1962):

- (24) a. *Jan_i řekl Petrovi_j, aby odnesl Pavlův_k kabát do **jeho**_{i/k} auta.*
 ‘Jan_i told Petr_j to bring Pavel’s_k coat to **his**_{i/k} car.’
 b. *Jan_i řekl Petrovi_j, aby odnesl Pavlův_k kabát do **svého**_j auta.*
 ‘Jan_i told Petr_j to bring Pavel’s_k coat to **his**_j car.’
 (Daneš & Hausenblas 1962: 200)

According to the authors, in the first case the possessor is *Jan* or *Pavel* while in the second case, the possessor is *Petr*. The authors point out that the system of German does not allow such a distinction of meaning. However, is this identification of the possessors and the corresponding interpretation of the possessive relations certain from the point of view of Czech users? Could it be that examples such as 24(a) and 24(b) are the ‘examples allowing multiple interpretation’ – as specified in the heading of this article, in the motto borrowed from K. Hausenblas’ article?

Our speaker sample consisted mainly of students, none of whom studied Czech. They were mainly in the age range of 20 to 30, and for a large part were students of other philological subjects. They would almost certainly show similar preferences in the interpretation of referential relations in these and other structures as they did in condition (b) because it can be expected that such examples are the less transparent cases from the point of view of a Czech user. Similarly, consider the type of sentence presented by Panevová (1986; the example comes from Kratochvíl):

- (25) *Když X. uznal, že již dostatečně předvedl návštěvníkovi důležitost své práce, skončil.*
 ‘Recognizing that he had sufficiently demonstrated the importance of his work to the visitor, X finished.’

Compare *ibid.* an example from Bílý (1981)

- (26) *Zastihl ji při výběru knih pro své děti.*
 ‘He found her choosing books for his/her own children.’

and many other examples described in the Czech literature (for the richest evidence of the competition of personal and reflexive possessives in the third person plural and their description see Panevová 1986).

Interpreting these observations and considerations, the finding of the presented research clearly shows a pronounced uncertainty of the speakers in understanding and interpreting referential relation, even in the seemingly non-problematic cases presented by condition (b). Czech linguistics has for a long time drawn attention to the fact that the reflexivization rule does not satisfactorily represent the actual use. This was largely confirmed experimentally by investigating the interpretation of possessive pronouns by relatively young speakers of Czech.

What do our results mean for the results presented in Fabricius-Hansen et al. (2017) and in Pitz et al. (2017) for the acquisition of German as a second language? A possible hypothesis is that German native speakers acquiring Czech will prefer a local interpretation of *jeho* to a non-local interpretation. In the opposite direction, the comparison of the use of German possessive pronouns by Czech native speakers seems promising: A possible hypothesis here may be that Czech users of L2 German will be inclined towards a non-local cataphoric interpretation of German *sein** – an interpretation which is not preferred by German native speakers (see Pitz et al. 2017).

Finally, let us mention some limits of our research. The speakers in the online questionnaire did not have the choice of answering ‘I don’t know’, and therefore they were forced to opt for a single interpretation. Additionally, we could not exclude a possible influence of other languages acquired by the tested native speakers up to various levels of proficiency. Even though such an influence cannot be ruled out and/or controlled for, the clear majority of the speakers stated that they also have knowledge of English, which, however, does not include reflexive possessives in its pronoun inventory.

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APPENDIX I – INSTRUCTIONS FOR INFORMANTS (ENGLISH TRANSLATION OF THE CZECH ORIGINAL)

In the following pages, we will present you with short texts with questions to be answered separately for each of the texts by clicking on the selected response. Please, do not think about the answer too long, decide spontaneously and quickly, if possible. This experiment is a part of a larger study focusing on the interpretation of texts in various languages. The final output will be the mutual comparison of the languages.

APPENDIX II – TYPES OF DISTRACTORS

- (i) *Igor a Nad'a se seznámili na metalovém koncertě a odešli společně domů. Nadě byla zima, a tak ji Igor ještě pozval na čaj.*
 'Igor and Nad'a met at a metal concert and went home together. As Nad'a was cold, Igor invited her for a cup of tea.'

Kdo pozval koho na čaj?

'Who invited whom for tea?'

- a) *Igor Nad'u.*
 'Igor invited Nad'a.'
- b) *Nad'a Igora.*
 'Nad'a invited Igor.'
- c) *Nikdo nikoho.*
 'nobody invited anybody.'

- (ii) *Tobiáš a Andrea si šli večer zaběhat. Když běželi dolů po lesní cestě, Andrea zakopla a spadla, ale naštěstí se nijak nezranila. Tobiáš jí pomohl vstát a očistit oblečení.*

'Tobiáš and Andrea went jogging in the evening. When they jogged down the path in the woods, Andrea stumbled and fell down but fortunately, she did not get hurt. Tobiáš helped her to stand up and clean the clothes.'

Kdo komu pomohl očistit oblečení?
'Who helped whom to clean the clothes?'

- a) *Tobiáš Andreě.*
'Tobiáš helped Andrea'
- b) *Andrea Tobiášovi.*
'Andrea helped Tobiáš.'
- c) *Nikdo nikomu.*
'Nobody helped anybody.'

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