

Fabricius-Hansen, Behrens, Pitz & Helland (eds.)

Possessives in L2 and translation:
basic principles and empirical findings

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INTRODUCTION

BERGLJOT BEHRENS, CATHRINE FABRICIUS-HANSEN, HANS
PETTER HELLAND AND ANNELIESE PITZ

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The present special issue of *OSLa* presents preliminary outcomes of cross-linguistic and cross-institutional research on adnominal possessives viewed from the perspective of L2 acquisition. The following researchers participate in the project: Bergljot Behrens, Cathrine Fabricius-Hansen, Hans Petter Helland, Anneliese Pitz (all from ILOS, U Oslo), and Oliver Bott (U Tübingen), Barbara Mertins (TU Dortmund), Torgrim Solstad (ZAS, Berlin), and Katarzyna Stachowiak (U Warsaw). The *POSS* project is part of a broader research project on *Language as Product and Process/Språk som produkt og prosess (SPROSS)* under the leadership of Bergljot Behrens.¹

The first paper in the present volume (CATHRINE FABRICIUS-HANSEN ET AL.) gives an overview of adnominal possessive systems across a number of European languages and forms the background for our research project. The languages can be grouped relative to whether they distinguish between a reflexive and an irreflexive form. For the learner whose mother tongue does not distinguish between the two forms, acquisition of the more complex system is predicted to create difficulties, as they have to restructure their grammar to take account of the reflexivity parameter.

The predictions presented in the first contribution are further elaborated in the two following contributions: In the second paper, ANNELIESE PITZ ET AL. establish explicit hypotheses on learning difficulties related to the language pair German/Norwegian. On the one hand, errors in German learners of Norwegian are hypothesized to occur to a large extent due to the fact that Norwegian makes the reflexive/irreflexive distinction, whereas German does not. On the other hand, German and Norwegian are closely related languages, and cognates (here German *sein* and Norwegian *sin*) are shown to affect L2 acquisition for this language pair even further. Empirical data from translation between the two languages in both directions and by both groups of learners are presented to support the hypotheses presented. Section 4 of this paper furthermore reports on an offline experiment designed by Oliver Bott, Torgrim Solstad and Robin Hörnig, with contextualized sentences intended to test the interpretation of the reflexive versus the irreflexive

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

form by native speakers and learners. A discussion follows relating to general learner effects versus transfer effects.

The third paper, by HANS PETTER HELLAND, discusses L2 acquisition of the possessive systems for the language pair French/Norwegian. Norwegian has a morphologically more complex possessive system than French, yielding transfer effects both from L1 Norwegian and L1 French. Results from a number of comprehension, production and judgment tests conducted on French learners of Norwegian and Norwegian learners of French are presented which support a specific set of hypotheses.

The final paper in this volume takes a different perspective: two experiments on the processing of translation from English into Danish and Norwegian respectively are presented, in which possessives in different syntactic environments appear in the texts. English does not make the reflexive/irreflexive distinction, in contrast to Norwegian. The research question raised by BERGLJOT BEHRENS in this contribution is whether translation into Norwegian (the more complex system) is found to create problems even for L1 speakers of the target language. Discussion also revolves around a potential instability of the target system itself.

This volume as a whole is meant as preliminary to further studies on the cognitive mechanisms that are at work in foreign language acquisition. Well-grounded hypotheses have been developed here, which will form the basis for cognitively oriented experiments in the next step.

AN L2 PERSPECTIVE ON POSSESSIVES: CONTRASTS AND THEIR POSSIBLE CONSEQUENCES

CATHRINE FABRICIUS-HANSEN, HANS PETTER HELLAND,
 ANNELIESE PITZ
University of Oslo

ABSTRACT

The present paper presents the contrastive background and the basic objectives of a cross-linguistic research project (POSS) that takes an L2-oriented perspective on possessives in English, Norwegian, German, French and selected Slavic languages. Our paper focuses on L1/L2 pairs involving Norwegian as L2 or L1. Section [1] outlines the rationale behind our project. The morpho-syntactic ('core') systems of English, French, German, Norwegian and Russian third possessives are described and compared in section [2] while section [3] draws attention to dimensions of contrasts that fall outside the scope of our project. Section [4] specifically addresses the L2 issue, presenting for selected L1/L2 pairs our basic assumptions concerning challenges to the acquisition of the L2 possessive core system. Section [5] contains a concluding summary.

[1] INTRODUCTION: AN L2 PERSPECTIVE ON POSSESSIVES

Linguistic expressions of possession (in a wide sense) are a fairly well established topic of cross-linguistic research (see among others (Alexiadou 2007; Baron et al. 2001; Börjars et al. 2013; Chappell & McGregor 1996; Coene & D'hulst 2003; Heine 1997; Koptjevskaja-Tamm 2002, 2003; Manzelli 1990; McGregor 2009; Zifonun 2005)). To our knowledge, however, in-depth comparisons of related but somewhat different systems of possessives are scarce (but see Drewnowska-Vargáné & Zifonun (2011); Gunkel et al. (2017, B1.5.4); Ramm & Fabricius-Hansen (2012); Zifonun (2005)). Accordingly, little is known as to whether or how morpho-phonological or syntactic similarities and differences between L1 and L2 possessives¹ ('possessive contrasts') are reflected in native versus non-native acquisition, use and processing of such items, i.e. what role any influence from L1 — so-called transfer (Benati & Angelovska (2016, 31–58); Ellis (2008, 349–402); Jarvis & Pavlenko (2008);

[1] We use L2 as a cover term for L2 and foreign languages acquired after L2. In accordance with Zifonun (2005) we subsume under the category 'possessive' both possessive determiners like French *mon/ma/mes* 'my' and genitive forms of so-called personal pronouns like English *his*.

Meisel (2000); Odlin (2003)) – could play in this area. In fact, compared to their non-possessive counterparts, possessive pronouns seem to have been strangely neglected in psycholinguistic (L1 and L2) research (but see Marinis (2016)); for relevant L2 studies concerning non-possessive third person anaphoric pronouns (*he, she* etc.), including reflexives (*himself, herself* etc.), see e.g. Clahsen & Felser (2006); Felser & Cunnings (2012); Patterson et al. (2014); Roberts et al. (2008); Umesh et al. (2016) and further references therein. An important issue discussed in these and many other publications on L2 acquisition is the division of labor between what may be seen as specific L1 influence (transfer) and general L2 processing effects (so-called general learner effects). Our paper presents the cross-linguistic background and the basic objectives of L2-oriented research on adnominal possessives that may shed new light on this issue. Some preliminary empirical results are presented by Pitz et al. (2017), Helland (2017) and Behrens (2017).²

From a cognitive point of view, possessives seem more complicated than ordinary pronouns due to the fact that they are not only anaphoric (third person alone) or deictic but at the same time relational expressions: An anaphoric adnominal third person possessive like an ordinary anaphoric pronoun demands an *antecedent DP*; as a determiner or modifier (see section [3.1]) within a DP, it anchors the referent of its *host DP* to the referent of the antecedent DP by a relation of possession in a more or less broad sense (see references above), where the antecedent DP denotes the ‘owner’ (the *possessor*) and the host DP the ‘owned’ entity (the *possessum*). Thus, processing an anaphoric possessive in a given context involves the following subtasks:

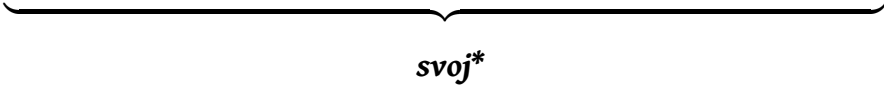
- (i) identifying (the lexical head of) its host DP,
- (ii) finding a proper antecedent (i.e. anaphoric resolution), and
- (iii) using that and the relational meaning of the possessive to establish a referent for the host DP.

In the case of first and second person and deictically used third person possessives, the possessor is provided by the non-linguistic context.

In this paper we are concerned with English, German, Norwegian (bokmål), French and Russian, which all distinguish formally between first, second and third person possessives, exhibiting two or more formally different words (lexical items) of the last category (Faarlund et al. (1997, 203–208); Huddleston & Pullum (2002,

[2] In addition to the authors of this paper the following persons participate in the (POSS) project, which is part of a broader research project on *Language as Product and Process* under the leadership of Bergljot Behrens: Bergljot Behrens (U Oslo), Oliver Bott (U Tübingen), Torgrim Solstad (ZAS, Berlin), Barbara Mertins (TU Dortmund), and Katarzyna Stachowiak (U Warsaw). We thank Bergljot Behrens, Oliver Bott, Katarzyna Stachowiak, Hildegunn Dirdal (U Oslo) and an anonymous reviewer for very useful comments on earlier versions of this paper.

Language	First person (possessor = speaker)	Second person (possessor = addressee)	Third person (poss. ≠ sp. and addr.)
English	<i>my; our</i>	<i>your</i>	<i>his, her, its; their</i>
German	<i>mein*</i> ; <i>unser*</i>	<i>dein*</i> ; <i>euer*</i> ; <i>Ihr*</i>	<i>sein*</i> ; <i>ihr*</i>
Norwegian	<i>min/mi/mitt/mine</i> ; <i>vår/vårt/våre</i>	<i>din/di/ditt/dine</i> ; <i>deres</i>	<i>sin/si/sitt/sine</i> ; <i>hans, hennes, dens</i> , <i>dets; deres</i>
French	<i>mon/ma/mes</i> ; <i>notre/nos</i>	<i>ton/ta/tes</i> ; <i>votre/vos</i>	<i>son/sa/ses</i> ; <i>leur</i> , <i>leurs</i>
Russian	<i>moj*</i> ; <i>nash*</i>	<i>tvoj*</i> ; <i>vash*</i>	<i>ego, eë; ich</i>



svoj*

TABLE 1: Adnominal possessives in English, German, Norwegian (bokmål), French and Russian.

470ff); Riegel et al. (2009, 288–290); Timberlake (2004, 240–256); Zifonun et al. (1997, 40f)). For convenience they are listed in table 1. The starred items in the German and the Russian columns represent sets of inflected forms: *mein, meine, meinen, meinem, meines, meiner; dein, deine* etc. (see section [2.3] and [2.5]); for the other languages all possible word forms are listed (for details see section [2]). In what follows, we concentrate on third person adnominal possessives.³

The choice between the different third person options is determined in part by properties of the antecedent DP (or the entity it refers to, i.e. the possessor). From a processing (comprehension) point of view, this means that a possessive provides grammatical or semantic cues governing the search for a suitable antecedent.⁴ However, the hierarchy and type of cues vary somewhat across languages, with the result that even phonologically similar and genetically related items like the possessives beginning with *s-* in German, Norwegian, French and Russian (henceforth: *s*-possessives; boldface in table 1) are cued differently (‘false possessive friends’, see section [4.6]).

In addition, the form of the possessive may vary by inflection according to morpho-syntactic features of its host DP, i.e. by so-called grammatical agreement, as is the case with the German and French possessives, with Norwegian *sin/si/sitt/sine*, and with Russian *svoj**; or it may be independent in this respect like

[3] Different from the Norwegian third person reflexive possessive *si**, the Russian reflexive possessive *svoj** is ‘impersonal’, i.e. neutral with respect to the distinction between first, second and third person possessor (see section [2.5]).

[4] Compare Umesh et al. (2016) concerning non-possessive reflexive pronouns.

the other possessives in Norwegian and Russian, and the English possessives as well. In the former case, then, processing a possessive involves checking for two sets of features: those relating to the antecedent and those pertaining to the head noun. For prenominal possessives this normally means ‘looking’ both to the left and to the right.

A preliminary comparison of English and French may illustrate the two types of contrasts and their intricate effects (see section [2] for more details). In English, the choice of possessive depends on the antecedent (referent) alone, as illustrated in (1).

- (1) a. ..._{[DP Peter]_i/[DP Anna]_j..._{[DP his_i/*_j/her_j/*_i dog]/[DP his_i/*_j/her_j/*_i dogs]...}}
- b. ..._{[DP Peter_i and Anna_j]_k..._{[DP their_k/*_i/*_j dog]/[DP their_k/*_i/*_j dogs]...}}
- (2) a. ..._{[DP Jean]_i/[DP Anna]_j..._{[DP son_i/_j chien]/[DP ses_i/_j chiens]}}
- b. ..._{[DP Jean_i et Anna_j]_k..._{[DP leur_k/*_i/*_j chien]/[DP leurs_k/*_i/*_j chiens]}}

In French, the choice between *son/sa/ses* on the one hand and *leur/leurs* on the other hand likewise is determined by the antecedent (singular versus plural), corresponding to *his/her* versus *their*, cf. (2). As for *son* (or *sa*) versus *ses*, however, it is the grammatical gender and number of the head noun (*chien* ‘dog’: masculine singular, *chiens*: plural) alone that counts; and likewise for *leur* versus *leurs*. That is, while *his* and *her* unambiguously demand a male (Peter) and a female (Anna) antecedent referent respectively, *son/sa* and *ses* are neutral in this respect: they may have either *Jean* or *Anna* as their antecedent, as illustrated in (2) for *son* and *ses*. And in contrast to English, French possessives, like adjectival modifiers, are marked for possessum number and — if singular — also gender, agreeing with their head nouns. In other words: *son*, *sa* and *ses* are different inflectional forms of one ‘stem’ or possessive lexical item, as are *leur* and *leurs*; and the two stems are marked for possessor singular and plural, respectively, while their different forms are possessum-dependent, agreeing with the head noun with respect to gender and number. The French possessives are not cued for possessor gender, whether natural (as in English) or grammatical (as in German); see section [2.3].

Viewed from the perspective of L2 acquisition, this complicated interplay between differences and similarities gives rise to the following general assumptions:

- (i) Achieving native-like fluency in the use and processing of L2 adnominal possessives (in the languages we are concerned with) is a task of varying complexity, depending in part on the degree of isomorphism between the possessive core systems of the specific L1/L2 pair involved.⁵

[5] This, of course, is a theoretical simplification. Transfer in L2 production and comprehension can occur from L1, but also from other foreign languages learnt before or along with the actual L2 (Westergaard et al. 2016), and, according to generative grammar, even from Universal Grammar (UG) (cf. Eide (2015)).

- (ii) For a given L1/L2 pair, some possessive contrasts may be more fundamental than others, impeding L2 performance of even quite advanced L2 learners.

Testing these and related hypotheses, to be refined somewhat in section [4], is the main direct objective of our POSS project. At a more general level, our investigations hopefully will contribute to the ongoing theoretical discussion concerning the role of transfer from L1 in L2 processing.

Our paper is structured as follows: Section [2] gives a contrastive overview of the (morphosyntactic) core systems of third person adnominal possessives in English, German, Norwegian, French and Russian, with a view to other Scandinavian and Slavic languages. In section [3], we briefly comment on additional dimensions of contrast that are also highly relevant from a L2 perspective but which have to be neglected in the present context. Our approach in these two descriptive sections leans partly on a model of comparison developed within the project *Grammatik des Deutschen im europäischen Vergleich* ‘The Grammar of German in European Comparison’ (Gunkel et al. 2017)⁶ and applied to possessive pronouns by Zifonun (2005) and Gunkel et al. (2017, B1.5.4) (see section [2]). In section [4], we outline for selected L1/L2 pairs what we, in view of the core systems described in section [2], take to be major obstacles to native-like L2 proficiency in the production and comprehension of possessives.⁷ Section [5] concludes by outlining the way forward for the POSS project.

A final terminological note: In what follows, we shall use the term *possessor* not only for the entity referred to by the antecedent DP (see above) but also for the linguistic expression (i.e. the antecedent DP) itself, when necessary specifying the intended meaning in a proper way. In a similar vein, the term *possessum*, introduced above for the entity denoted by the host DP (i.e. the entity that is identified as ‘belonging to’ the possessor), unless otherwise indicated will refer to the nominal head (*dog* etc.) of the host DP. Accordingly, grammatical and semantic properties of a possessive that are determined by the antecedent (referent) will be called *possessor-/antecedent-related* while grammatical (inflectional) features triggered by agreement with the head noun are *possessum-related*.

[2] CONTRASTING MORPHOSYNTACTIC (CORE) SYSTEMS OF POSSESSIVES

[2.1] Preliminaries

As mentioned in the previous section, in view of their twofold function adnominal possessives must contain cues to identify the possessor and have the means to anchor the possessum to this entity. It is with respect to marking these relations that the languages exhibit differences. To describe and contrast the systems,

[6] See also <http://www1.ids-mannheim.de/gra/abgeschlosseneprojekte/gde.html>.

[7] As far as Norwegian versus German and French is concerned, see (Pitz et al. 2017) and Helland (2017) for more detailed discussions.

we will make use of parameters presented in Zifonun (2005), Gunkel et al. (2017, B1.5.4) to account for the differing dimensions of the possessive systems across languages.⁸ We shall concentrate on the parameters that are of relevance for the languages to be considered here, that is, English (En), French (Fr), German (Ge), Norwegian (No) and Russian (Ru). Importantly, as stated above, we will be concerned with third person possessives alone.

The parameters differentiating between the core systems of the languages under consideration are the following: (i) the categorial (part of speech) status of the possessive, i.e. the question whether it may be classified as an inflectional (genitive) form of the personal pronoun or whether it constitutes a lexical item of its own, being inflected like determiners or adjectives; (ii) the morphological properties or categories establishing the relation to the possessor and the possessum, such as person, number and gender; and (iii) reflexivity, i.e. the question whether the language distinguishes formally between reflexive and non-reflexive possessor relations, where reflexive means that the antecedent of the possessive has to be found (as binder) in a local syntactic domain, like the antecedent of non-possessive third person reflexive pronouns (e.g. Norwegian *seg*, German *sich*).

To account for *reflexivity*, one usually turns to *Binding Theory* (BT) (Chomsky 1981). Reflexive uses obey principle A of BT, which states that ‘anaphors’, i.e. reflexives, must be locally bound within their binding domain. In technical terms, the binding domain is the smallest clause that contains the possessive DP and its co-indexed antecedent, generally a higher subject. This means that the reflexive possessive in (3) is (co-)referentially dependent on a nominal element that appears as the subject of the clause (M: masculine, R: reflexive).^{9,10}

- (3) Han_i fant igjen bilen sin_i/sin_i bil.
 he found again car.DEF.M.SG POSS.R.M.SG/POSS.R.M.SG car

Reflexive and non-reflexive possessives are in complementary distribution. For a language like Norwegian this contrast is formally marked: The non-reflexive – more precisely: *irreflexive* – possessive *hans* in (4) cannot be bound by the subject pronoun, i.e. (4) is deviant under the co-referential reading indicated by

[8] The languages she investigates are German, French, English, Italian, Polish and Hungarian (with a view to the Scandinavian languages, Dutch and Spanish). For a complete list of the parameters, see Zifonun (2005) and Gunkel et al. (2017).

[9] In the examples, co-referentiality is marked by co-indexation. In its standard formulation (see Chomsky (1981, 183–230)), the binding domain is defined with respect to C-command: A c-commands B iff (i) A does not dominate B and B does not dominate A. (ii) The first branching node dominating A also dominates B. The possessives in (3) are thus both c-commanded and co-indexed by their antecedents.

[10] The Norwegian possessive may occur in post-head position or in the prenominal position of a determiner (Faarlund et al. 1997, 263ff). In the former case the head noun has a definite suffix (*-en* in the example) in (3), see section [3.3].

the subscripts (IR: irreflexive).¹¹

- (4) **Han*_i fant igjen bilen *hans*_i/*hans*_i bil.
he found again car.DEF.M.SG his.IR/his.IR car

Principle B of BT states that non-reflexive possessives must be free in their binding domain. The ungrammatical character of *han*_i...*hans*_i in (4) is therefore explained. Irreflexive *hans* is incorrectly bound by the subject pronoun *han*.

In contrast to the formally marked Norwegian possessive *si**, German *sein** (like *ihr**) and French *son/sa/ses* can, but do not have to, be locally bound by their antecedents, i.e. they may be used reflexively and non-reflexively; cf. (5) vs. (6)

- (5) a. *Peter*_i liest *sein*_{i/j} Buch.
'Peter reads his own/somebody else's book.'
b. *Pierre*_i lit *son*_{i/j} livre.
'Peter reads his own/somebody else's book.'
- (6) *Petter*_i leser *sin*_{i/*j}/*hans*_{j/*i} bok//boka *si*_{i/*j}/*hans*_{j/*i}.
'Peter reads his own/somebody else's book.'

Some additional general remarks are in order: According to [Zifonun \(2005\)](#) and [Gunkel et al. \(2017\)](#), *person* and *number* of the possessor have to be expressed. The Russian (more generally: Slavic) reflexive possessives are exceptions in this respect, however, since the third person reflexive (Russian *svoj**) may have first and second person antecedents, both singular and plural ([Timberlake 2004](#), 240–256). The encoding of possessor person, however, will not be discussed in this paper since we are concerned with third person possessives only. In addition to these obligatory categories, properties such as grammatical gender/natural gender or animacy of the third person singular possessor may be expressed if the language makes this distinction in the nominal domain. In the cases where the possessive can be analyzed as a genitive of the personal pronoun, additional inflectional morphology is likely to be precluded ([Zifonun 2005](#), 64).

[2.2] English

The English possessive system is the most straightforward one. The possessives *his/her/its/their* can be analyzed as genitive forms of the third person pronouns *he/she/it/they* [Huddleston & Pullum \(2002, 470ff\)](#), hence we do not expect possessum-related morphological markers (see [Zifonun \(2005, 64\)](#)). As personal pronouns distinguish between natural gender (male/female) and -human in the singular, the singular possessives will also express these properties of the possessor; cf. (7)–(10).

[11] The expressions *his*, *her*, *their* and *its* occurring in glosses should be understood as abbreviations for POSS.M.SG, POSS.F.SG, POSS.PL and POSS.NONHUM.SG respectively.

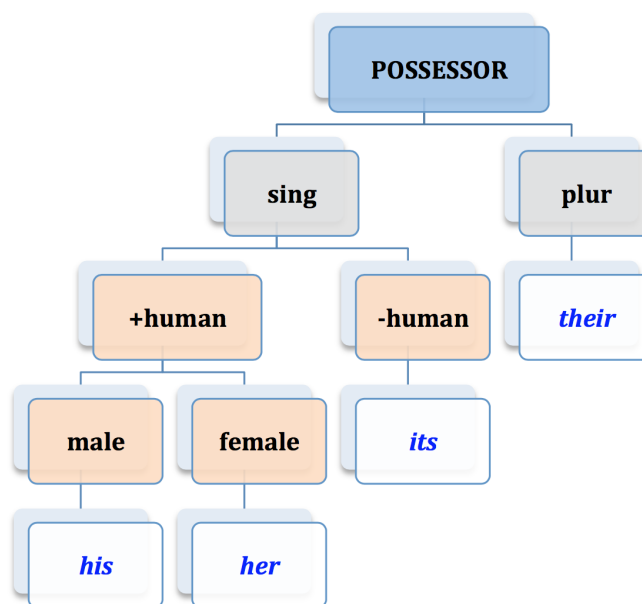


FIGURE 1: The English system of third person adnominal possessives.

- (7) REFLEXIVE USE
Anna_i/Henry_j loves *her_{i/*j}/his_{j/*i}* hat/cars.
- (8) NON-REFLEXIVE USE
Anna_i/Henry_j wore a hat/gloves. *Her_{i/*j}/His_{j/*i}* hat was green./*Her_{i/*j}/His_{j/*i}* gloves were green.
- (9) NON-REFLEXIVE USE
 Anna wore [*a hat*]_{*i*}. Henry didn't like *its_i* colour.
- (10) REFLEXIVE USE
 [*Anna and Henry*]_{*i*} love *their_i* car/cars.
- (11) NON-REFLEXIVE USE
 [*Anna and Henry*]_{*i*} have a car/two cars. *Their_i* car is red./*Their_i* cars are red.

The properties of the English possessive system can be represented as in figure 1. As indicated by the highest node, the choice of the possessive item depends exclusively on possessor properties, foremost on the possessor number. In the singular, a further possessor-related feature \pm human comes into play, providing just one form for -human (*its*), while for +human, the possessives vary according to natural gender (male/female) of the possessor.¹²

[12] Gray background: grammatical features; orange/yellow background: purely semantic features.

[2.3] French

In French, the possessive represents a determiner-like part of speech (Helland 2006, 155–158). The third person possessor number is expressed by stem variation (singular *son/sa/ses*, plural *leur*) while the gender of the possessor is not marked.¹³

As mentioned in section [1], the possessive in French agrees with the possessum in (singular gender and) number. French distinguishes between masculine and feminine gender nouns, and the possessive exhibits two morphological forms, *son* (masc.) and *sa* (fem.) expressing this distinction in addition to possessum number (sg.). Hence, with a singular possessum we get *son*, *sa* or *leur*, with a plural possessum *ses* or *leurs*, that is one common plural form for both possessum genders. Thus, *possessor number* is expressed by stem variation, while *possessum number* is expressed by inflection. Possessum gender is marked only in the possessor singular; cf. examples (12)–(13) and (14)–(15), which correspond in spirit to the English examples (7)–(8) and (10)–(11), respectively. Where relevant, nouns are annotated for gender and number (M: masc. sg., F: fem. sg., PL: plural).

- (12) REFLEXIVE USE
Anna_i/Jean_j aime *son_{i/j}* chapeau_M/*sa_{i/j}* casquette_F/*ses_{i/j}* chapeau_{XPL}.
 Anna_i/John_j loves POSS_{i/j} hat/POSS_{i/j} cap/POSS_{i/j} hats
- (13) NON-REFLEXIVE USE
Anna_i/Jean_j porte un chapeau/une casquette/des gants. *Son_{i/j}*
 Anna_i/John_j wears a hat/a cap/gloves POSS_{i/j}
 chapeau_M/*Sa_{i/j}* casquette_F est verte./*Ses_{i/j}* gants_{SPL} sont verts
 hat/POSS_{i/j} cap is green/POSS_{i/j} gloves are green
- (14) REFLEXIVE USE
 [*Anna et Jean*]_i aiment *leur_i* chien_M/*leur_i* voiture_F/*leurs_i* voiture_{SPL}.
 [Anna and John]_i love their_i dog/their_i car/their_i cars
- (15) NON-REFLEXIVE USE
 [*Anna et Jean*]_i ont un chien_M/une voiture_F/deux voiture_{SPL}. *Leur_i*
 [Anna and John]_i have a dog/a car/two cars their_i
 chien_M/voiture_F est noir/noire./*Leurs_i* voitures sont noires.
 dog/car is black/their_i cars are black

Table 2 and figure 2 summarize the French system: The possessor number determ-

[13] A note on the historical development might be in order. In the third person singular and plural, classical Latin had competing forms for non-reflexive and reflexive uses, *eius/suus* (third masc. sg.) and *eorum/sui* (third masc. pl.) (Peteghem 2012). In the evolution from Latin to French, the reflexive variant *suus* survived in the third person possessor singular, leading to French *son/sien*. In the third person plural however, the reflexive form *sui*, which competed with the genitive paradigm (*eius/eorum*), was replaced by French *leur*. This meant that French developed (historically) reflexive possessives (*son/sien*) and (historically) non-reflexive possessives (*leur*) with both reflexive and non-reflexive uses.

Possessor	Possessum		
	Sg. masc.	Sg. fem.	Plural
Sg. (<i>Anna/Jean</i>)	<i>son</i> (<i>chapeau</i>)	<i>sa</i> (<i>voiture</i>)	<i>ses</i> (<i>chapeaux/voitures</i>)
Plur. (<i>[Anna et Jean]</i>)	<i>leur</i> (<i>chapeau</i>)	<i>leur</i> (<i>voiture</i>)	<i>leurs</i> (<i>chapeaux/voitures</i>)

TABLE 2: The French system of third person adnominal possessives.

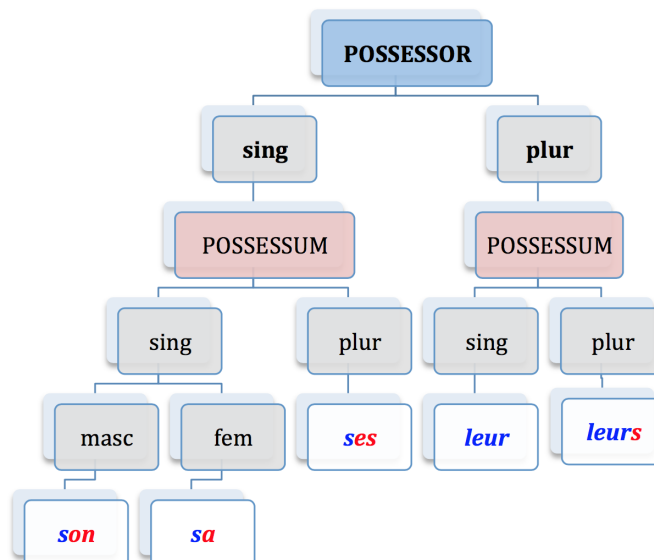


FIGURE 2: The French system of third person adnominal possessives.

ines the stem of the possessive. The remaining part of the system expresses properties of the possessum (agreement). The first distinction made by the possessum-related morphology is between singular and plural both for singular and for plural possessors. For the singular possessum, the possessive has a masculine and a feminine form.

[2.4] German

In German, too, the possessives belong to the category of inflected determiners. The possessor is identified by stem variation of the possessive: *sein** for both masculine and neuter singular antecedents, *ihr** for feminine singular and for plural antecedents. That is, the possessive *ihr** is ambiguous between possessor singular feminine and plural, and *sein** between possessor masculine and neuter singular.

Similar to other determiners, the possessive in German is subject to general agreement requirements within the DP. These conditions include gender and number agreement with the head noun, in addition to agreement in morphological

case marking; cf. (16)–(20), which in principle are comparable to (7)–(11) in section [2.2]. Where relevant, nouns are annotated for gender and number (M: masc. sg., F: fem. sg., N: neuter sg., PL: plural); for convenience, we have skipped case annotation).

(16) REFLEXIVE USE

- a. Anna_i liebt *ihren*_i Hut_M/*ihre*_i Mütze_F.
Anna_i loves her_i hat/her_i cap.
- b. Peter_j liebt *seinen*_j Hut_M/*seine*_j Mütze_F.
Peter_j loves his_j hat/his_j cap.

(17) NON-REFLEXIVE USE

- a. Anna_i trug einen Hut/eine Mütze. *Ihr*_i Hut_M/*Ihre*_i Mütze_F war
Anna_i wore a hat/a cap. Her_i hat/Her_i cap was
grün.
green.
- b. Peter_j trug einen Hut/eine Mütze. *Seine*_j Hut_M/*Seine*_j Mütze_F war
Peter_j wore a hat/a cap. His_j hat/His_j cap was
grün.
green.

(18) NON-REFLEXIVE USE

- a. Anna trug [*einen Hut*_M]_i/[*eine Mütze*_F]_j.
Anna wore [a hat]_i / [a cap]_j.
- b. Peter mochte *seine*_i/*ihre*_j Farbe_F nicht.
Peter liked its_{i/j} color not.
'Peter didn't like its color.'

(19) REFLEXIVE USE

- [Anna und Peter]_i lieben *ihr*_i Auto_N/*ihre*_i Auto_{PL}.
[Anna and Peter]_i love their_i car/their_i cars.

(20) NON-REFLEXIVE USE

- [Anna und Peter]_i haben ein Auto/zwei Autos. *Ihr*_i Auto_N ist
[Anna and Peter]_i have a car/two cars. Their_i car is
rot./*Ihre*_i Auto_{PL} sind rot.
red./Their_i cars are red.

Figure 3 illustrates the properties of the German third possessive system. The stem is dependent on possessor number and gender (if singular). As to the possessum-related features, the possessive inflects according to gender, number and morphological case (N: nominative, A: accusative, G: genitive, D: dative) of the host DP.

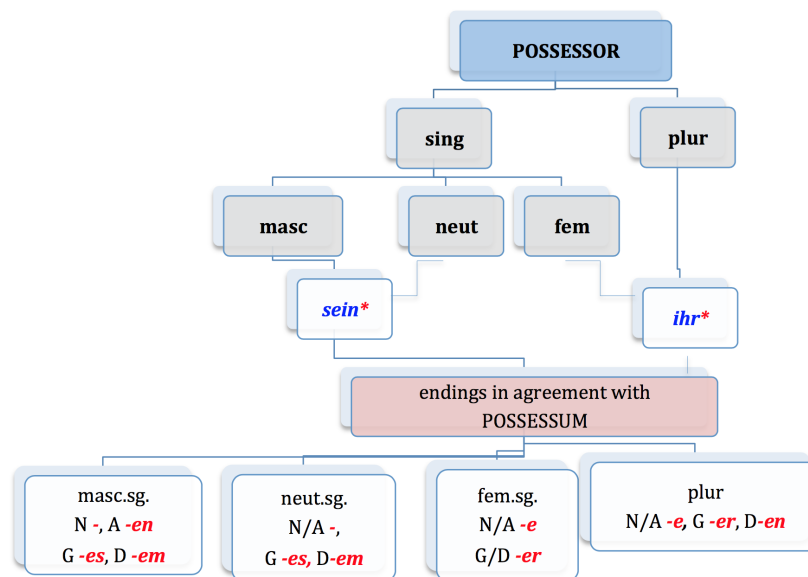


FIGURE 3: The German system of third person adnominal possessives.

[2.5] Norwegian (and other Scandinavian languages)

As mentioned in section [2.1], Norwegian distinguishes between reflexive and irreflexive possessives. The reflexive possessive *si** demands a third person antecedent but exhibits no stem variation relating to (other) properties of the possessor.¹⁴ It agrees in gender and number with the possessum (sg. masc. *sin*, fem. *si*, neut. *sitt*, pl. *sine*), as illustrated in (21) and (22). (Since Norwegian *bokmål* is developing into a two-gender language, feminine being ‘suppressed’ by masculine gender, we use the term ‘common gender’ for the latter. This is the term used in relation to standard Danish and Swedish, which are genuine two-gender languages.)

(21) REFLEXIVE

- a. *Anna_i/Petter_j* solgte bilen/kua *sin/si_{i/j}*.
 Anna/Peter sold car/cow.DEF.SG.COMM/FEM POSS.R.SG.COMM/FEM
 ‘Anna_i/Peter_j sold her_{i/*j}/his_{j/*i} car/cow.’
- b. *Anna_i/Petter_j* solgte huset *sitt_{i/j}*.
 Anna_i/Petter_j sold house.DEF.SG.NEUT POSS.R.SG.NEUT
 ‘Anna_i/Peter_j sold her_{i/*j}/his_{j/*i} house.’
- c. *Anna_i/Petter_j* solgte maleriene *sine_{i/j}*.
 Anna_i/Petter_j sold painting.DEF.PL POSS.R.PL
 ‘Anna_i/Peter_j sold her_{i/*j}/his_{j/*i} paintings.’

[14] First and second person possessives are neutral with respect to reflexivity; see table 1.

- (22) REFLEXIVE
 [Anna og Petter]_k solgte bilen *sin*_k/kua *si*_k/huset
 [Anna and Peter]_k sold car their_k/cow their_k/house
*sitt*_k/maleriene *sine*_k.
 their_k/paintings their_k.

Like the English possessives, the *irreflexive* Norwegian possessives can be analyzed as genitive forms of third person personal pronouns *han* ‘he’, *hun* ‘she’, *den/det* ‘it’, *de* ‘they’. Here, the natural gender of the possessor (male vs. female), grammatical gender (common – or masc./fem. – vs. neuter) and the feature ±human play a role. Hence, we have +human sg. male possessive *hans* vs. female *hennes*, -human sg. comm. *dens* vs. neuter *dets* and, more straightforward, the plural possessive *deres*, which is unspecified in other possessor-related respects. As expected, these forms do not inflect. Being irreflexive, they cannot refer to the subject of the clause (see section [3.1] for a description of binding conditions); cf. (23)–(27) (IR: irreflexive).¹⁵

- (23) IRREFLEXIVE
*Anna*_i har en bil/flere malerier. *Petter*_j liker bilen/maleriene
 Anna_i has a car/several paintings. Peter likes car/paintings
*hennes*_{i/*j}.
 her_i
- (24) IRREFLEXIVE
*Petter*_j har et stort hus. *Anna*_i liker huset *hans*_{j/*i}.
 Peter_j has a big house. Anna_i likes house his_j
- (25) IRREFLEXIVE
 [Anna og Petter]_i har et stort hus. *Naboen*_j liker huset *deres*_{i/*j}.
 [Anna and Peter]_i have a big house. The neighbor likes house their_i
- (26) IRREFLEXIVE
*Terroren*_i og *dens*_i årsaker må undersøkes.
 [The terror]_i and its_i causes must be investigated
- (27) IRREFLEXIVE
*Selskapet*_i varsler at *dets*_i resultater blir dårligere enn
 [The company]_i warns that its_i results will be worse than
 forventet.
 expected

The properties of the Norwegian system are summarized in figure 4. The highest

[15] Since alternatives to possessives tend to be preferred with nonhuman antecedents *dens* and *dets* ‘its’ are rather infrequent, in particular in spoken language.

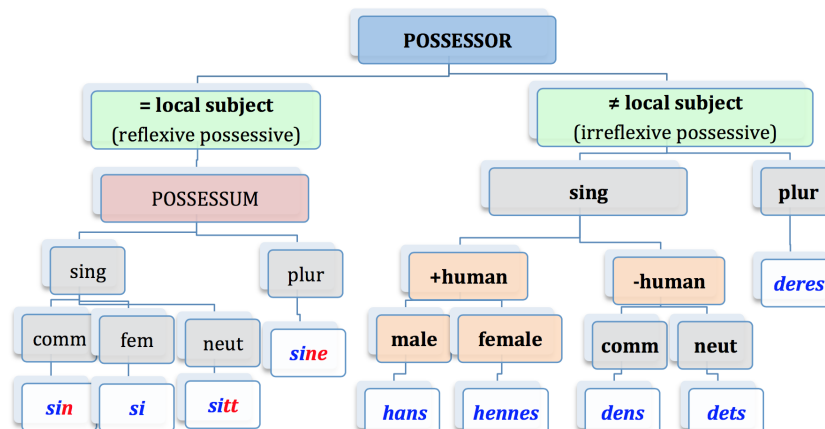


FIGURE 4: The Norwegian system of third person adnominal possessives.

distinction in the hierarchy is between reflexive and irreflexive possessives, where the reflexive has its own paradigm relating it to properties of the possessum while the irreflexive is a genitive form which reflects possessor properties alone.¹⁶

Norwegian shares the fundamental distinction between reflexive and irreflexive possessives with the other Scandinavian languages although there are differences in the details. Thus, the Danish reflexive possessive *sin/sit/sine* demands a singular antecedent while *deres* ‘their’ refers to a plural possessor independently of binding conditions; i.e. different from Norwegian, Danish *deres* is neutral with respect to reflexivity.¹⁷

[2.6] Russian (and other Slavic languages)

The Russian¹⁸ system is similar to the Norwegian system in distinguishing reflexive and irreflexive possessives. Also, the latter can be analyzed as genitive forms of the third person personal pronouns, differentiating possessor gender and number; as in German, however, there is a syncretism between the sg. masculine and the sg. neuter form: masc./neut. *ego*, fem. *eë*, pl. *ich*.

While the irreflexives lack possessum-related features, the reflexive possessives are inflected for gender, number and morphological case in agreement with the possessum.

Consequently, *svoju* in (28) can only refer to the clause subject whereas *ego* and *eë* in (29) must find their antecedent in the preceding context; and likewise for

[16] Green background: syntactic feature of possessor.

[17] This means that possessor number has a higher position than reflexivity in the Danish hierarchy of relevant dimensions.

[18] In the present paper, we use Russian as a representative of Slavic languages exhibiting the distinction between irreflexive and reflexive possessives – whatever the latter are called in the grammatical tradition of each specific language. In practice, our project will be concerned with Czech and Polish rather than Russian.

svoju vs. *ich* in (30) and (31) (M: masculine, F: feminine, A: accusative).

- (28) REFLEXIVE
 Pjotr_i/Anna_j ljubit *svoju*_{i/j} sobaku.
 Peter_i/Anna_j loves POSS.R_{i/j}.F.SG.A dog.F.SG.A
 ‘Peter loves his (own) dog./Anna loves her (own) dog.’
- (29) IRREFLEXIVE
 ...Pjotr_i/Anna_j ... Dmitri_k/Marja_l ljubit *ego*_{i/*j/*k/*l}/*eë*_{j/*i/*k/*l} sobaku.
 ...Peter_i/Anna_j ... Dmitri/Mary loves POSS.IR.M.SG/POSS.IR.F.SG dog
 ‘...Dmitri/Mary loves Peter’s dog./Dmitri/Mary loves Anna’s dog.’
- (30) REFLEXIVE
 [Pjotr i Anna]_i ljubjat *svoju*_i sobaku.
 [Peter and Anna]_i love POSS.R_j dog.
 ‘Peter and Anna love their (own) dog.’
- (31) IRREFLEXIVE
 ...[Pjotr i Anna]_i ... [Dmitri i Marja]_j ljubjat *ich*_{i/*j} sobaku.
 ...[Peter and Anna]_i ... [Dmitri and Mary]_j love their_{i/*j} dog.
 ‘... Dmitri and Mary love Peter’s and Anna’s dog.’

In contrast to Norwegian, the Russian reflexive possessive *svoj** is not restricted to third person subjects but may take first and second person antecedents as well, competing with the regular Indo-European first and second person possessives *moj** ‘my’, *tvoj** ‘your_{sing}’, etc. (see table 1); cf. (32) and (33).

- (32) Ja_i ljublju *svoju*_i/*moju*_i sobaku.
 ‘I love my dog.’
- (33) Ty_i ljubish *svoju*_i/*tvoju*_i sobaku.
 ‘You love your dog.’

This means that the Russian reflexive possessive is not cued for any inherent (semantic or grammatical) properties of the possessor, in contrast to the possessives in the languages considered so far; it only marks the structural position or syntactic function of the possessor. The Russian third person core system – including the ‘impersonal’ *svoj** – is summarized in figure 5. Figure 6 shows the inflection of the reflexive *svoj** (N: nominative, A: accusative, G: genitive, D: dative, I: instrumental, P: prepositional case).

[2.7] Summary of contrasts

In this section we have described the (third person) possessive systems of English, French, German, Norwegian and Russian in terms of possessor- and possessum-related properties. First, quite generally, the *possessor number* determines the

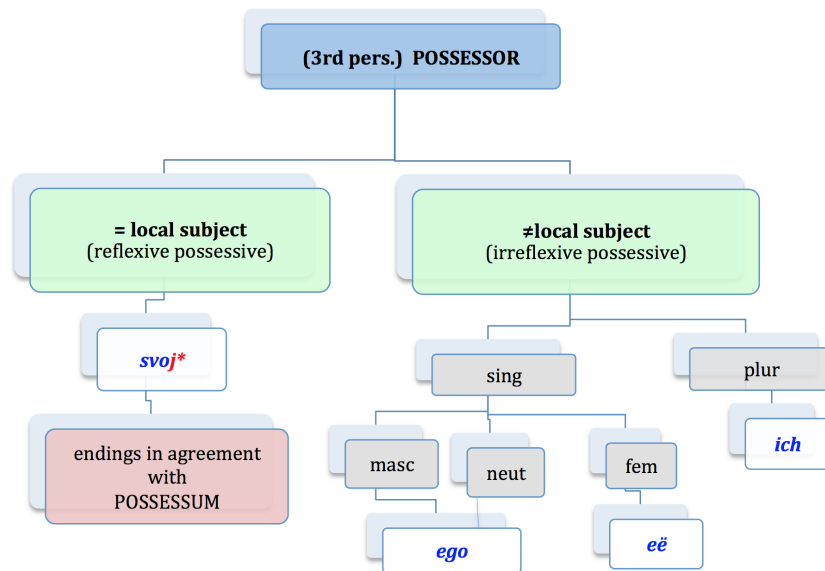


FIGURE 5: The Russian system of adnominal possessives with third person possessor.

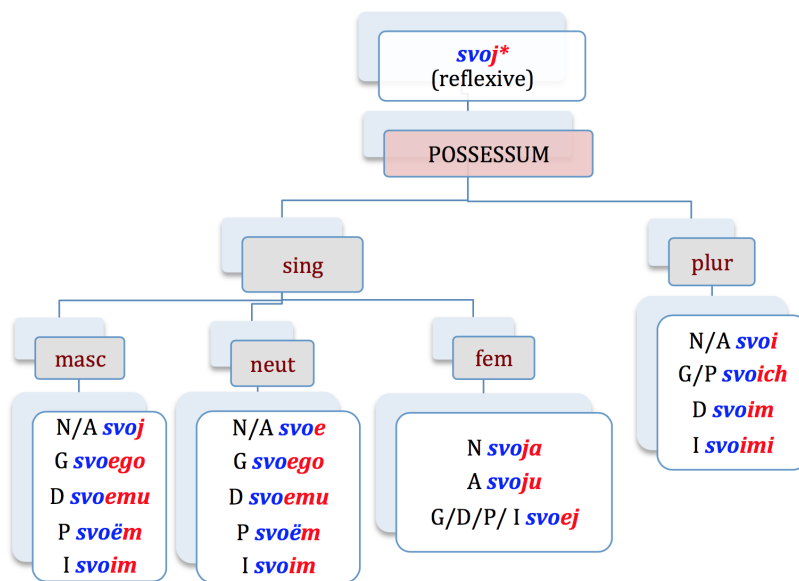


FIGURE 6: Possessum-dependent inflection of the Russian reflexive possessive *svoj**.

stem of the possessive, whether this is a genitive form as in English, Norwegian (irreflexives) and Russian (irreflexives) or has its own determiner-like inflectional paradigm as in French and German. The Norwegian and Russian reflexive possessives, however, are exceptions in this respect, being underspecified with respect to possessor number.

Next, as a general property, the head noun of the host DP — the *possessum* — by agreement determines the inflection of the possessive unless the latter is a genitive form prohibiting further morphological marking. Hence the (sub)systems of genitive forms (English possessives, Norwegian and Russian irreflexive possessives) exhibit possessor features only. They do, however, express more intricate semantic features of the possessor such as \pm human (English and Norwegian irreflexives *hans/hennes* vs. *dens/dets*), natural gender (English *his* vs. *her* and Norwegian *hans* vs. *hennes*), features which are left unspecified or underspecified in the other (sub)systems. The following summarizes the main contrasts concerning (lack of) specification in the various dimensions.

- (i) The non-Slavic languages except Norwegian are underspecified with respect to reflexivity, i.e. local versus nonlocal binding.¹⁹
- (ii) English possessives express semantic properties of the possessor such as \pm human and natural gender while possessum-related properties are left unspecified.
- (iii) French possessives are underspecified with respect to all possessor properties except for number.
- (iv) German exhibits idiosyncratic ambiguities with respect to possessor gender and number, presenting a syncretism between singular masc. and neuter (*sein**) on the one hand and between singular fem. and plural (*ihr**) on the other hand.
- (v) The Norwegian reflexive subsystem is underspecified with respect to possessor properties other than (local) binding but specified for possessum number and grammatical gender (in the singular). In the irreflexive subsystem, semantic possessor properties such as \pm human and natural gender are distinguished, but possessum-related features are not marked.

Viewed from a comprehension perspective, then, it appears that the languages with reflexivity permit the best identification of the possessor. Although the

[19] English, German and French do have means to avoid corresponding referential ambiguities in natural discourse, e.g. the demonstrative genitive forms *dessen* (masc./neut.sg.) and *deren* (sg. fem./plur.) in German, which preferably take a non-subject antecedent (see Bosch & Umbach (2007)). Demonstrative alternatives tend to be stylistically marked, however, and will not be considered here.

reflexive subsystem is underspecified with respect to possessor properties, the possessor is still unambiguously identified as the subject of the clause.

Note, finally, that even closely related languages exhibit differences in their systems (e.g. German vs. Norwegian, English vs. German), while languages from different language families may exhibit important similarities (e.g. Norwegian and Russian with respect to the reflexive/non-reflexive distinction).

[3] OTHER DIMENSIONS OF POSSESSIVE CONTRAST: SYNTAX, SEMANTICS, USAGE

In this section we briefly present some non-morphological dimensions of contrast that are relevant with respect to our object languages but which we do not yet plan to take up in our L2-oriented empirical research.

[3.1] *Binding properties*

Norwegian possessives are not complex for the reasons mentioned in the preceding section alone. They also, in some variants of Norwegian, display binding properties that go well beyond the standard cases mentioned in section [2.1]. According to principle A of Binding Theory, reflexive possessives ought to be bound within their binding domain, which normally corresponds to the smallest clause that contains the possessive DP and its co-indexed antecedent; see examples (21)–(22) in section [2.5]. For some speakers of Norwegian though, binding across a clause boundary, called long-distance binding (LDB), is still quite acceptable. In the ScanDiaSyn survey, for instance, reported in [Lundquist \(2014a,b\)](#) and [Julien \(2015\)](#), among others, sentences containing reflexives within embedded clauses were tested. Recall that binding into the embedded finite clauses should normally be forbidden (by principle A of BT):

- (34) *Regjeringen*_i regner ikke med at forslaget
 Government.DEF.SG count not with that proposal.DEF.SG.NEUT
*sitt*_i vil få flertall.
 POSS.R.SG.NEUT will get majority
 ‘The government do not expect that its proposal will get majority.’

The reflexive possessive (*sitt*) of the embedded clause subject in (34) is tested for reflexive binding from the matrix subject (*regjeringen*). These kinds of sentences are rejected by most speakers in the ScanDiaSyn-survey, and also by the Norwegian author of this paper, but, strikingly, informants from some parts of Norway, especially central parts (Sør-Trøndelag and Nord-Trøndelag) and even some Northern parts, are much more liberal with respect to their acceptability. In general, sentences like (35) containing an irreflexive possessive in the embedded subject position are more readily accepted by the wide majority of speakers:

- (35) **Regjeringen**_i regner ikke med at forslaget
 Government.DEF.SG count not with that proposal.DEF.SG.NEUT
dens_i/**deres**_(i) vil få flertall.
 POSS.IR.NONHUM.SG.NEUT/POSS.IR.PL will get majority
 ‘The government do not expect that its proposal (the proposal of the gov-
 ernment)/their proposal (the proposal of the members of the government)
 will get majority.’

As stated by [Lundquist \(2014b, 500\)](#),

it is however worth pointing out that sentence #156 [our (35)] gets higher scores than sentence #157 [our (34)] in the area where L(ong)-D(istance)B(inding) in general is quite acceptable (Sør-Trøndelag, Møre og Romsdal, northern Oppland and northern Hedmark).

Thus, we have to accept that the already complex distribution pattern of Norwegian reflexive and non-reflexive possessives in normative cases are further complicated by the existence of LDB in varieties of Norwegian. In [Julien \(2015\)](#), we find many cases of binding into embedded clauses, in subject (37) or non-subject position (36), with a surprisingly high rate of acceptability, for example:

- (36) **Hun** føler at noe mangler i livet **sitt**.
 she feels that something lacks in life.DEF.SG.NEUT POSS.R.SG.NEUT
 ‘She feels that something is lacking in her life.’
 (Rejected by only 10 out of more than 90 informants in [Julien \(2015\)](#).)
- (37) **Hun** mente at **sin** egen plan var best.
 she found that POSS.R.SG.COMM own plan.SG.COMM was best
 ‘She found that her own plan was the best one.’
 (Rejected by 28 out of 90 informants in [Julien \(2015\)](#).)

It could be added to this that binding ‘errors’ under standard conditions are also easily found, even in written texts, for example from newspapers:

- (38) **Den 26-årige bokdebutanten Shani Boianiju**_i drar nå verden rundt og promoterer boka ***hennes**_i (**√si**_i)
 Lit.: ‘The 26 year old novice writer Shani Boianiju now travels around the globe and promotes her book.’ (Dagbladet 2013)

Since it is her own book Shani Boianiju wants to promote, the reflexive possessive *si** is called for while in the next example, the reflexive *si** would refer to the authorities (the clausal subject), which of course is not intended:

- (39) Svenske myndigheter fratok i går **Mijailo Mijailovic**_i ***sitt**_i (**√hans**_i) svenske statsborgerskap.

Lit.: ‘The Swedish authorities yesterday deprived Mijailo Mijailovic (of) his Swedish nationality.’ (Aftenposten 2004)

Such complexities in the grammar(s) of Norwegian should be borne in mind when we discuss L2 acquisition challenges involving Norwegian as L2 (section [4.6]).

[3.2] *Possessives vs. definites: (in)alienable possession, and ‘external’ possessives*

There are further highly interesting questions about the distribution of possessives in our languages that we mention *en passant* without going into details. Thus, as we saw in section [1], ‘our’ possessives combine definite reference (anaphoric or deictic) with a relational meaning of possession in the broad sense (hierarchy, property, kinship, part-whole, and so on) (Baron et al. 2001; Heine 1997; Koptjevskaja-Tamm 2002; Zifonun 2005). In this respect, the type of relation marked by a possessive DP is typically *alienable*. *My house* is a type of (concrete) object that I may own for possibly a very long period, but I may also sell it. Alienable possession is contrasted with *inalienable possession*, which encodes parts – typically body parts – that are intrinsically linked to the ‘possessor’. Inalienable possession is of course not possession in the strict sense. I do not *own* my arm, leg, nose and so on, but the parts of my body are inherent parts of me. Inalienability is thus related to inclusion and dependency. What is in the part is necessarily in the whole and the whole includes the part (Kleiber 2008). Since all human beings in principle have the same body parts, inalienable possession is typically marked as presupposed or given information. This is why some languages tend to express this type of relation by a definite determiner, cf. (40).²⁰ On the ontology scale of Kleiber (2008), humans have the largest amount of inalienable parts and properties the least: Humans > animals > concrete objects > events > properties.

- (40) a. NORWEGIAN
 Da han endelig snudde *hodet* og så på meg, hadde han tårer i *øynene*.
 (BHH1N.3.3.s94)
 Lit.: ‘When he finally turned *the head* and looked me, he had tears in *the eyes*.’
- b. FRENCH
 Et lorsqu’ il a enfin tourné *la tête* pour me regarder, il avait les larmes *aux yeux*.
 (BHH1TF.3.3.s97)
- c. GERMAN
 Als er endlich *den Kopf* bewegte und mich ansah, standen ihm Tränen *in den Augen*.
 (BHH1TD.3.3.s92)

[20] The following examples are taken from the Oslo Multilingual Corpus (OMC, see <http://www.hf.uio.no/ilos/english/services/omc/>). In each set, the first example comes from the source text, the others are target text versions from authorized translations. Possessives are blue and in italics, ‘inalienable DPs’ containing a definite article instead are black and regular throughout.

The head and the eyes are integrated (body) parts of the subject referent. Hence the use of definites in both Norwegian, French and German. However, there are cases where the explicit marking of inalienables differ from language to language:

- (41) a. NORWEGIAN
 [...] og jeg rakte *armen* ut og fikk et slangebitt så overdådig at jeg skrek høyt. (BHH1N.1.1.s56)
 Lit.: ‘...and I stretched *the arm* out and got a snakebite so sharp that I screamed loudly.’
- b. FRENCH
 [...] En guise de réponse, j’avais tendu *mon bras*, puis senti une morsure de serpent si violente que j’avais poussé un grand cri. (BHH1TF.1.1.s56, s57)
- c. GERMAN
 [...] und ich streckte *den Arm* aus und erwischte einen so heftigen Schlangenbiß, daß ich laut aufschrie. (BHH1TD.1.1.s53)

In a case like (41), one might ask why possessive marking should be necessary in French in contrast to Norwegian and German. Whenever the speaker feels the need to establish the possessive (in the wide sense) referential link with the antecedent in an explicit manner, a possessive may be used. This tendency seems to be stronger for English and French than Norwegian (Woldsnes 2013),²¹ and also stronger for German than Norwegian. In fact, more generally, our languages exhibit differences of usage in this area, which we cannot pursue further in the present paper:

- (42) a. NORWEGIAN
 Og *hun* ville rope på *mora*, kjenne henne inntil seg. (HW1N.1.s5, s6)
 √Og *hun* ville rope på *mora si*, kjenne henne inntil seg.
 Lit.: ‘And she wanted to call for the mother/her mother, feel her against her.’
- b. FRENCH
 Elle aurait voulu appeler *sa mère*, la sentir tout près d’elle. (HW1TF.1.s5)
 #Elle aurait voulu appeler *la mère*, la sentir tout près d’elle.
- c. GERMAN
 Und *sie* wollte nach *der Mutter* rufen, sie nahe bei sich haben. (HW1TD.1.s7)
 √Und *sie* wollte nach *ihrer Mutter* rufen, sie nahe bei sich haben.

We will not be concerned with usage preferences between possessives and def-

[21] See also Hasselgård (2012) concerning possessive absolutes in English and Norwegian.

inites in our object languages. We do have to take into consideration, though, that the grammatical possessive system for a language like Norwegian is highly complex in itself, opening up for dialectal and idiolectal variation. This makes it hard to acquire even for native speakers of Norwegian. These points should be borne in mind when investigating the acquisition of e.g. German and French L2 by Norwegian L1-speakers and the acquisition of Norwegian as a foreign language.

Another means to express the inalienable relation between possessor and possessum is the use in some languages of so-called external possessors (Haspelmath 1999; Stolz et al. 2008; Zifonun 2005). In the external possessor construction, the possessor is realized as a constituent of its own, in German as a dative noun phrase called the possessive dative or *Pertinenzdativ* (Zifonun et al. 1997, 1337ff); cf. (43a) and (44) from (40c) above. In French, the external possessor appears as a clitic (43b). According to Lødrup (2009a), the external possessor in Norwegian (Icelandic, Swedish and Danish) typically appears as a PP with a locative preposition (45):

- (43) a. Ich habe *mir* die Finger verbrannt.
Lit.: ‘I have burnt me the fingers.’
‘I burnt my fingers.’
b. Je *me* suis brûlé les doigts.
- (44) *Ihm* standen Tränen in den Augen.
Lit.: ‘Him stood tears in the eyes.’
‘He had tears in his eyes.’
- (45) De måtte fjerne leveren på *ham*.
Lit: ‘They had to remove the liver on him.’
‘They had to remove his liver’.

Another construction strongly resembling the dative external possessor in German and French results from *possessor raising* in Norwegian (Lødrup 2009b) (46) – and English.

- (46) Hun slo *ham* i hodet.
‘She hit him in the head.’

This construction, however, differs from the dative external possessor construction in German by having the possessor as a direct object while in German, the possessor is realized as a dative and the possessum typically as an accusative, i.e. direct, object; and likewise for the French external possessor construction (Lødrup 2009b). A comparison of external possessors in Norwegian and German fiction in the OMC (see footnote 20) revealed that the German dative possessor occurs more often than the Norwegian external possessor PPs (Holthe 2016).

[3.3] *Categorial status and definiteness*

Typically, even in theoretically driven accounts (Alexiadou et al. 2007; Lødrup 2011; Peteghem 2012), possessive ‘pronouns’ may be viewed as either ‘determiners’ or ‘adjectives’. Their determiner-like behavior is easy to demonstrate. Thus for English, French, German and Norwegian, the prenominal possessive is in complementary distribution with genuine determiners, as witnessed in (47); more specifically, the possessive makes the DP semantically definite like a definite article (Zifonun 2005). Hence the definite D and the (prenominal) possessive D may be said to occupy the same slot in syntactic structure.

- (47) a. *the *his* book
 b. *le *son* livre
 c. *das *sein* Buch
 d. *den *hans* bok

This, of course, is a more general typological tendency (for cross-linguistic data, see Alexiadou et al. (2007, 566ff)) ruling out their co-occurrence. In general, languages don’t accept definites co-occurring with possessives in front of the head noun. At the same time, there are languages that do have definite — or even indefinite — determiners co-occurring with possessives. Italian is a case in point (Cardinaletti 1998), showing a definite determiner (*il*) preceding the possessive (*suo*) and the (expressed) noun:

- (48) *il suo libro*

The possessive in (48) (*suo*) exhibits adjectival properties. In a similar vein, French has possessives with adjectival morphology, which are necessarily preceded and followed by respectively a definite determiner and an elliptical head noun:

- (49) *le sien* (*livre)

In generative grammar, these issues have received much attention from the 1990s and onwards; see, e.g. Julien (2005) and Alexiadou et al. (2007) for an overview. They have also been framed as a distinction between *strong*, *weak* and *clitic* forms (Cardinaletti 1998). The main idea of this type of approach is that all possessives, whether they are determiner-like or adjectival-like, share the same base position. Assuming a fine-grained elaborate structure of the nominal projection (= DP), the possessive starts out as a specifier of a lower constituent within the extended DP, for example the nP. This corresponds to the *strong* position of the possessive in Cardinaletti’s terms. Adapting her framework slightly, the nominal head will move from the low NP into the head position of the nP and then further up to the head position of a functional projection (FP) above and to the left of the possessive:

(50) [DP [D la [FP macchina [NP SUA [N macchina] NP macchina]]]]

While the strong possessive, as in (50), remains in its base position, *weak* possessives move further up the tree, to a higher (functional) specifier position:

(51) [DP [D la [FP sua [macchina]] [NP sua [N macchina] NP macchina]]]]

Besides being preceded by a definite article, weak possessives in Cardinaletti's system are thus *deficient*. However, they still occupy a specifier position (of FP). This property distinguishes them from fully grammaticalized clitics. The French system is given as an example in Cardinaletti's treatment of a *clitic* possessive, adjoining to the head position of D as in (52):

(52) [DP [D sa [FP sa [voiture]] [NP sa [N voiture] NP voiture]]]]

The strong-weak-clitic-treatment of possessives – and more generally of personal pronouns (Cardinaletti & Starke 1999) has been quite influential, but it has mainly been applied to Romance.²²

For our purposes, we will not make use of the strong-weak(-clitic) distinction. It should be noted however that the Norwegian system is particularly complex from a syntactic viewpoint since Norwegian has both prenominal (53a) and postnominal (53b) possessives. In this respect Norwegian differs from Danish, where possessives are restricted to the prenominal position.

(53) a. *hans bil*
his car
b. *bilen hans*
car.DEF his

As for the French and German case (see above), we treat the prenominal possessive as a kind of determiner, or at least as occupying a head position, possibly of a possessor phrase, high in the extended nominal projection. The postnominal possessive of Norwegian however behaves quite differently since it combines obligatorily with a definite noun: (53c) is ungrammatical.

(53) c. **bil hans*
car his

[22] Attempts have been made, though, to adapt it to Germanic. Lødrup (2011), for instance, takes Norwegian postnominal possessives to be weak and Norwegian prenominal possessives to be strong, contrary what one would expect in view of Cardinaletti's hypothesis for Romance. In Norwegian, only prenominal possessives can be coordinated (*mitt og hennes hus* 'my and her house') and focused (*dette er bare MITT hus* 'This is only MY house'). And even if postnominal possessives may also easily be focused (*bilen MIN, ikke DIN* 'my car, not yours'), this is not taken by Lødrup (2011) as an argument for necessarily treating them as strong.

This means that the postnominal possessive in Norwegian cannot adjoin to the D-position like the French possessive determiner in Cardinaletti's treatment. It should rather be seen as a specifier of a lower nominal projection, either the nP (Cardinaletti 1998) or the NP (Julien 2005).

[4] L2 ACQUISITION CHALLENGES IN THE CORE SYSTEMS: GENERAL ASSUMPTIONS

[4.1] *Preliminaries*

As mentioned in section [1], we assume that

- (i) achieving native-like fluency in the use and processing of L2 possessives (in the languages we are concerned with) is a task of varying complexity, depending in part on the degree of isomorphism between the possessive core systems of the specific L1/L2 pair involved; and
- (ii) for a given L1/L2 pair, some possessive contrasts may be more fundamental or pervasive than others, impeding L2 performance of even quite advanced L2 learners.

It should be stressed, though, that *production* and *comprehension* (*interpretation*) are very different tasks (Zeevat 2014) and, accordingly, that features of L2 which cause problems in L2 production may represent less of an obstacle in interpretation tasks, and vice versa (see e.g. Jarvis & Pavlenko (2008, 15ff)). Also, when measuring L2 proficiency, it is important to distinguish between the outcome of a production or interpretation task, i.e. the *product*, on the one hand and what we shall call the *process*, i.e. processing itself, on the other hand.²³ In our context, this means that ideally, hypotheses concerning the acquisition or command of L2 possessives should be specified along these different dimensions and tested in adequate offline and online experimental settings.

In addition to free production and interpretation of written or spoken L2, foreign language learners are often faced with the task of explicitly *translating* between L1 and L2 (both ways). Accordingly, we consider (product and process) data from translation tasks to be relevant in our context as well, despite the special character of such tasks. Notably, translation involves either L1 comprehension and L2 production or L2 comprehension and L1 production, depending on whether L2 is the target or the source language. Consequently, one might expect form-based priming between the two languages to be more frequent in translation tasks than in non-translational L2 production or comprehension; cf. Pitz et al. (2017), Helland (2017) and Behrens (2017).²⁴

[23] We prefer the term *process* since *processing*, as used in psycholinguistic literature, seems to be used partly in a very general sense but also more specifically for the 'decoding' (comprehension) process.

[24] Relevant German literature makes a convenient terminological distinction between *Hin-Übersetzung* (L1 to L2) and *Her-Übersetzung* (L2 to L1).

L1	L2				
	Norwegian	German	French	English	Russian
Norwegian		No1/Ge2	No1/Fr2	No1/En2	No1/Ru2
German	Ge1/No2		Ge1/Fr2	Ge1/En2	Ge1/Ru2
French	Fr1/No2	Fr1/Ge2		Fr1/En2	Fr1/Ru2
English	En1/No2	En1/Ge2	En1/Fr2		En1/Ru2
Russian	Ru1/No2	Ru1/Ge2	Ru1/Fr2	Ru1/En2	

TABLE 3: L1/L2 pairs involving Norwegian, German, French, English and Russian.

Our set of five languages generates 20 different L1/L2 pairs (table 3). Note, though, that English is the first foreign language for No1 speakers, and probably for most Ge1 and Fr1 speakers as well (column 4), while No2, Ge2, Fr2, and Ru2 in most cases will be a second (or later) foreign language.

In the sections [4.2] through [4.5] we summarize what we take to be the main possessive challenges of English, German, French and Russian as L2; section [4.6] is concerned with Norwegian as L2 (first column of table 3), and in particular with the possible effects of the distinction between reflexive and irreflexive possessives.

At present the research questions we pursue in ongoing and planned empirical investigations focus on the boldface pairs in table 3, which have Norwegian as L2 or Norwegian as L1 with German or French as L2, in part for practical reasons (availability of data and test persons), in part because these three languages are underrepresented in L2 research, as compared to English. In addition, experimental research concerning Czech vs. German and Polish vs. English possessives is being conducted in Dortmund and Warsaw, respectively.

[4.2] *English as L2*

The fairly simple English possessive systems may be assumed to represent less of a L2 challenge to Norwegian, German, French and Russian learners than the other way round. Note however that genuine restructuring (Jarvis & Pavlenko 2008; McLaughlin 1990; Pashler 1999) is demanded from *French* learners of English: In the possessor singular they will have to replace their possessum-oriented gender-number distinction (*son/sa/ses*, see figure 2) by the possessor-oriented distinction between *his*, *her* and *its*, which is of a semantic nature in the sense that it reflects properties of the possessor referent (\pm human, natural gender); cf. figure 1.²⁵ That is, viewed from the L2 production perspective of a French En2 learner, each of the three L1 items *son*, *sa* and *ses* may correspond to either *his* or *her* (or *its*) in the

[25] Note, though, that French does exhibit possessor-oriented stem variation with respect to the categories person (first, second, third) and number (cf. table 1).

L2, depending on (the \pm human feature and) the natural gender of the (singular) possessor; *leur* and *leurs*, on the other hand, ‘converge’ to L2 *their*; cf. examples (12)–(16) in section [2.3].

Since *Norwegian* has the possessor gender and \pm human distinction built into its system, albeit at the lower hierarchical level of irreflexive possessives (cf. *hans* ‘his’, *hennes*, ‘her’ and *dens/dets* ‘its’) (figure 4), *Norwegian* learners of English, on the other hand, may be expected to acquire the English possessive system quite easily. This holds for *German* learners, too, due to the fact the possessives *sein** and *ihr**, which normally reflect the grammatical gender of the antecedent DP (if singular), may be used deictically referring to a male, female (or human plural) possessor, respectively; similarly for the *Russian* irreflexive possessives *ego*, *eë* and *ich*.

[4.3] *German as L2*

As far as German possessives are concerned, their complicated inflection, based on number, gender and case agreement with the head noun, is a well-known problem for Ge2 learners, more or less independently of their L1 – and for Ge1 acquisition as well. Being common to German determiners in general (apart from some details), however, it is of less interest in our context than two possessor-related characteristics of the German possessive system: the fact that the choice between *sein** and *ihr** is determined by number and grammatical rather than natural gender of the antecedent DP; and the fact that *ihr** is underdetermined between (possessor) plural and feminine singular (see section [2.4] and figure 3).²⁶

Thus *Norwegian* and *English* Ge2 learners will have to substitute a possessor-related distinction of grammatical gender for their native semantic distinction and in addition adapt to an idiosyncratic possessor-related ambiguity. The latter, notably, may be more of a problem in Ge2 interpretation than in Ge2 production: No1 *hennes* (irreflexive possessor singular feminine), *deres* (irreflexive possessor plural) – and (reflexive) *si** with a singular feminine or plural possessor – ‘converge’ to Ge2 *ihr** (production perspective) while Ge2 *ihr** may correspond to No1 *si** (reflexive), *hennes* (irreflexive singular feminine) or *deres* (irreflexive, plural) (comprehension perspective).

French Ge2 learners face a similar restructuring challenge as with *En2* (see above), possibly complicated by the phonological similarity between German *sein* (possessor singular masculine) and French *son* (possessor singular, unspecified possessor gender; possessum singular masculine). Consequently one might expect *French* Ge2 learners to use *sein** instead of correct *ihr** more often than the other

[26] Ordinary third person pronouns distinguish between masc. *er** and neuter *es* in the singular while *sie** like the possessive *ihr** may take a sg. fem. or a plural antecedent. Note also that the word form *ihr* in addition to (possessum) sg. masc. nominative and sg. neut. nominative/accusative of the possessive *ihr** represents the dative of the third person fem. sg. pronoun *sie** ‘she’ and the nominative of the second person plural pronoun, i.e. ‘you’ (plural).

way round. In a similar vein, *Norwegian* and

Like Norwegian Ge2 learners, *Russian* Ge2 learners — even when aware of the systematic differences — may tend to associate *sein** with their native reflexive s-possessive (*si** and *svoj**, respectively), resulting in a skewed distribution of error types in Ge2 production (*sein** used instead of correct locally bound *ihr** more often than vice versa) and Ge2 comprehension (*sein** more often than *ihr** erroneously understood as locally bound, i.e. interpreted reflexively); for No1/Ge2 see [Pitz et al. \(2017\)](#).

[4.4] *French as L2*

Turning to L2 French, we assume that *English*, *Norwegian* and *Russian* learners may tend to erroneously equate the possessor-dependent gender-number distinction between their possessives — English *his*, *her*, (*its*) *their*, Norwegian irreflexives *hans*, *hennes*, (*dens/dets*) and *deres*, and Russian irreflexives *ego*, *eë* and *ich* — with the possessum-related gender-number distinction between *son*, *sa* and *ses*, ignoring the French possessor-plural possessive *leur(s)*.

Likewise, *German* Fr2 learners will have to replace their possessor-dependent gender-number distinction (*sein*/ihr**) by the French possessum-dependent gender-number distinction (*son/sa/ses*); and due to the greater phonological similarity, we might expect that they wrongly equate *son/ses* with *sein** (ignoring that e.g. *son père* is ambiguous between *sein Vater* and *ihr Vater*, as is *ses enfants* between *seine Kinder* and *ihre Kinder*). On the other hand, since *sa* corresponds to the sg. fem. form *la* of the definite article, Fr2 learners may tend to equate *sa* with the feminine possessor *ihr**, ignoring the ambiguity of *sa mère* between *ihre Mutter* — *seine Mutter*. Like German Fr2 learners, Norwegian and Russian Fr2 learners will have to ‘deactivate’ any associative bond between the French s-possessive and their native reflexive s-possessive (*si** and *svoj**, respectively); for No1/Fr2 see [Helland \(2017\)](#).

[4.5] *Russian as L2*

As for Russian as L2, we assume — abstracting from inflectional complications — that *English*, *German* and *French* Ru2 learners encounter the same kind of problems with the reflexive possessive (*svoj**) vs. irreflexive third person possessives (*ego*, *eë*, *ich*) as they may be expected to have when learning Norwegian (see section [\[4.6\]](#)) while *Norwegian* Ru2 learners should come to master the choice between *svoj** and an irreflexive third person possessive — and the obligatory reflexive (locally bound) interpretation of *svoj** — quite easily.

[4.6] *Norwegian as L2: reflexivity and (potentially) false possessive friends*

Abstracting from the inflectional complexities of German and Russian, the Norwegian core system is evidently more complex than any of the other possessive

systems presented in section [2], primarily due to the distinction between reflexive and irreflexive possessives but also because singular irreflexive possessives are differentiated according to both natural and grammatical gender of the possessor (figure 4).²⁷ Acquiring Norwegian possessives, then, would seem to demand more complicated restructuring from L1 speakers of *German*, *French* or *English* than the other way round since the reflexivity parameter introduces a type of possessor-related distinction (possessor cue) at the highest ‘decision’ level which is absent in their L1 (compare figures 1, 2, and 3 to figure 4).²⁸

The result is lexical L1-L2 divergence involving Norwegian *si**: In production, No2 learners have to choose between *si** and some irreflexive alternative (*hans/hennes/...*), depending on the syntactic (binding) circumstances, irrespective of which L1 possessive — if any (see section [3.2]) — would be adequate in the given context. As for comprehension, *German* and *French* No2 learners conversely face the challenge that the Norwegian *si** variants (*sin*, *si*, *sitt*, *sine*) are also under-determined in the sense of being unmarked for possessor-related features that determine the choice between lexical alternatives in their L1, i.e. *sein** vs. *ihr** in German and the *s-* vs. the *leur-* possessive in French. Thus the Norwegian, German and French possessives beginning with *s-* — and in particular the specific forms *sin* (Norwegian), *sein* (German) and *son* (French) — constitute what may be termed (partly or potentially) ‘false friends’: they are morpho-phonologically similar but cued differently in relation to the possessor.

We expect the No2 performance of German and French learners to reflect the hierarchical importance of the reflexivity contrast in general and the false-friend relation between No2 reflexive possessives and L1 *s-* possessives in particular. More specifically, we assume that not too advanced No2 learners tend to prefer Norwegian *si** over irreflexive alternatives under conditions calling for an *s-* possessive in their mother tongue and to interpret Norwegian *si** in accordance with its (partly false) possessive friend in their L1, whether or not this a correct solution to the production or comprehension task at hand. Specifically, this seems to be a plausible hypothesis for translation tasks (into or from No2), where the actual presence of an *s-* item in the L1 or No2 source text may prime for the possessive (but potentially false) friend in the target language. And we assume that the possessive performance of otherwise quite advanced No2 learners tends to be somewhat impeded in related ways as compared to the performance of No1 speakers.

As for *Russian* No2 learners, on the other hand, we do not expect them to have particular problems with the reflexivity distinction in Norwegian while the twofold differentiation of singular irreflexive possessives (*hans* vs. *hennes* and *dens* vs. *dets*)

[27] An additional complexity is the prevailing postnominal position of Norwegian possessives; cf. Anderssen & Westergaard (To appear).

[28] Note though that the reflexive-irreflexive distinction is present in the non-possessive pronoun systems of these languages (cf. German *sich*, French *se*, English *himself/...*).

may represent a challenge here (compare figure 5 and 4) – and perhaps for French and German No2 learners as well.

[5] SUMMARY AND OUTLOOK

The present paper set out to present the contrastive background and the basic objectives of a cross-linguistic research project (POSS) that takes an L2-oriented perspective on third person possessives in English, Norwegian, German, French and selected Slavic languages, focusing on L1/L2 pairs involving Norwegian as L2 or L1 but with a view also to pairs including Czech or Polish.

In the first, descriptive part of the paper we first compared the various morpho-syntactic ('core') systems of possessives, Russian representing the Slavic group (section [2]), and then briefly presented other – purely syntactic, semantic, or usage-oriented – dimensions of contrasts that go beyond the immediate scope of our project (section [3]).

Section [4], finally, addressed our main research question: What impact – if any – may the contrasts laid bare in section [2] have on the acquisition, processing and use of L2 possessives across our object languages? To what extent and in what ways may the acquisition or command of possessives in L2 be impeded or enhanced by the specific properties of the possessive system in L1?

Our basic assumption is that the challenges a L2 learner faces in relation to L2 possessives depend in part on the degree of isomorphism between the possessive core systems of her/his L1 and the L2 in question. Specifically, the reflexive-irreflexive bifurcation of Norwegian (and Slavic) third person possessives is based on a purely syntactic distinction (local versus non-local binding by the possessor) at the top level of the dimensions determining the choice of third person possessive in production and the search for an antecedent in comprehension. Acquiring this system, then, demands high-level possessive restructuring by German, French and English learners, whose L1 lacks that distinction in the possessive system – although reflexivity is explicitly encoded in the system of 'ordinary' third person pronouns (cf. German reflexive *sich*, French *se*, English *her-/himself* etc.). On the other hand, English, German, Norwegian (and Slavic) learners of French have to adapt to the fact that possessor gender, an important dimension in their L1 possessive systems, is irrelevant in the French system (cf. figure 3 and section [4.3]).

We assume that even when L2 learners are fully aware of such important contrasts, i.e. have successfully restructured their explicit knowledge of possessives, their actual L2 performance may still be somewhat hampered as compared to native speakers of the language in question. That is, we assume that automatization may lag behind even for quite advanced L2 learners, in particular – or at least in particular ways – where false possessive friends are involved (e.g. Norwegian *si** versus German *sein** and French *s** (*son/sa/ses*), German *sein** versus French *s**).

The issues discussed in this paper bear on very basic problems of L2 acquisition and proficiency (Roberts et al. 2008): what is traditionally labeled *transfer* of features from the learner's L1 into her/his interlanguage variety of L2 (IL2) (see e.g. Benati & Angelovska (2016, 31–58); Eide (2015); Ellis (2008, 349–402); Jarvis & Pavlenko (2008, 61ff); Meisel (2000); Odlin (2003)) and the role of L1 influence as opposed to *general learner effects* in L2 processing, including online pronoun resolution by L2 comprehenders (see e.g. Clahsen & Felser (2006); Felser & Cunnings (2012); Patterson et al. (2014); Roberts et al. (2008)).

Ellis (2008, 353f) distinguishes five types of methodological approaches to transfer:

- (i) Type 1: Comparison of the use of a particular feature in the IL2 and L1.
- (ii) Type 2: Comparisons of the use of a particular feature in the IL2, the L1 and the L2.
- (iii) Type 3: Comparisons of the use of a particular feature in the IL2 of learners from two or more different L1 backgrounds.
- (iv) Type 4: Comparisons of the use of a particular feature in the IL of learners who have two L1s (i.e. are bilingual).
- (v) Type 5: Two-way comparisons involving learners with different L1s, each learning the other's L1 as an L2.

Our research evidently relates to type 1, type 2 as well as type 5 in Ellis' classification

The notion of transfer, its conditions and manifestations, is an object of ongoing debate, which has been made even more complicated during the later years by (more and more) seriously taking into account that L2 acquisition and fluency – the development of an IL2 – may be influenced not only by L1 but also by other languages learnt before or along with the L2 in question (De Angelis 2007; Westergaard et al. 2016). This is a complication we have neglected here (cf. footnote 5). Even so, though, we take it that empirical investigations confirming or refuting our assumptions will help understand whether and how the relationship between comparable subsystems of L1 and L2 may influence L2 acquisition by speakers of L1. Specifically, since the possessive systems differ across 'our' languages in more interesting ways than the systems of ordinary pronouns and since these two systems differ with respect to the reflexivity parameter within some but not all of 'our' languages, further research along the lines suggested above may shed new light on the division of labor between L1 influence (transfer) and general learner effects in L2 acquisition.

To that end, however, our assumptions must be spelled out in specific, testable hypotheses along the lines indicated in section [4.1], i.e. differentiating between *production* (free production and translating from L1 into L2) and *comprehension/interpretation* (including translating from L2 into L1) on the one hand, and between *product* and *process(ing)* on the other hand. Learner language studies of the more traditional kind – e.g. studies of L2 learners’ use of possessives in written L2 essays and translations into L2 – belong to the production-product category while investigations of how L2 learners understand possessives occurring in L2 texts are of the interpretation-product type. Process-oriented hypotheses in their turn, whether relating to production or comprehension, call for online experiments involving or eliciting the use of possessives; see e.g. Felser & Cunnings (2012); Patterson et al. (2014); Roberts et al. (2008); Schimke et al. (2015) and further references therein for experimental studies on so-called anaphoric resolution of non-possessive anaphors (third person pronouns). In addition, testing L2 learners’ explicit grammatical knowledge of L2 possessive will be needed. Relevant preliminary investigations relating to German vs. Norwegian and French vs. Norwegian are presented in Pitz et al. (2017) and Helland (2017) while Behrens (2017) looks at translation from En2 into No1.

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AN EMPIRICAL L2 PERSPECTIVE ON POSSESSIVES: GERMAN/NORWEGIAN

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ABSTRACT

The present paper reports on two empirical studies concerning the acquisition of possessive systems by L2 learners of Norwegian and German respectively. The first study investigates comprehension and production in written translation while the second study is a set of offline experiments testing the interpretation of possessives by both native speakers and German learners of Norwegian. Norwegian distinguishes between reflexive and irreflexive possessives, while German does not. The reflexive stem form *si** is phonologically similar to German *sein**, but may correspond to *ihr**, a feminine or plural possessor, as well. These differences make the acquisition of Norwegian and of German as a foreign language a complex procedure of restructuring both at the phonological and the grammatical level. Results of the study indicate that the only partly overlapping forms and structural constraints on possessives in the two languages are cognitively demanding in L2 acquisition and subject to transfer effects.

[1] INTRODUCTION

When grammatical systems diverge, there is reason to expect L2 learner difficulties. As shown in the overview paper by [Fabricius-Hansen et al. \(2017\)](#), the possessive systems of German and Norwegian exhibit crucial differences that will require a certain amount of cognitive restructuring by the L2 learner in order to be fully acquired. This leads to the assumption that before full restructuring is automatized, *transfer effects* will result from the L1 or another of the learner's languages in both comprehension and production of the L2. The goal of the present paper is to spell out these general assumptions on the basis of the systemic and morpho-phonological contrasts between German and Norwegian and test them against (*production and comprehension*) data collected in two different studies. The first study (section [3]) is based on translation from German and Norwegian L2

learners of their respective languages. The second study (section [4]) takes a comprehension perspective, investigating interpretation of the possessives in L1 and L2 German through offline multiple choice tests. Our hypotheses are primarily based on studies on cross-linguistic influence (CLI) phenomena (see for instance Ellis (2008); Jarvis & Pavlenko (2008); Meisel (2000); Odlin (2003); Weinreich (1953)), and restructuring theory (McLaughlin 1990) as presented in Fabricius-Hansen et al. (2017).

The paper is organized as follows: In section [2], we will give a brief contrastive presentation of the systems of pronominal possessives in the two languages and formulate our basic assumptions. In section [3.1] we present the empirical basis for the translation study. Precise hypotheses on production and comprehension, based on work by Bie-Lorentzen (2012) and Fabricius-Hansen et al. (2017), are formulated in section [3.2] (for Norwegian as L2) and in section [3.3] (for German as L2), against which translation data is analyzed. Section [3.4] gives a short summary of the findings.

Section [4] takes a *comprehension* perspective on possessives for this language pair. We report on three offline experiments that have been conducted in order to test how native German learners interpret Norwegian reflexive and irreflexive possessives, based on a single finite structure varying the possessive item. The design of the experiments is described in section [4.2]. Results of the learners' comprehension (section [4.5]) as compared with control group responses by native Norwegians on the one hand and German native speakers' responses on the same structures in their mother tongue on the other (sections [4.3] and [4.4]), are summed up and discussed briefly in relation to transfer in section [4.6]. Section [5] sums up the studies and presents plans for ways in which the results of the present studies can be furthered to get deeper into an understanding of the accommodation and assimilation required to restructure and automatize a grammatical system that diverges from that of a foreign language learner's mother tongue.

[2] PRELIMINARIES: CONTRASTS AND GENERAL ASSUMPTIONS

Tables 1 and 2 below summarize the properties of the German and the Norwegian third person possessive systems (from Ramm & Fabricius-Hansen (2012)).¹

The problematic areas (divergence-convergence of forms) described in Fabricius-Hansen et al. (2017, section 4.1 and figure 3 vs. 4) can be represented, somewhat simplified, as in figure 1.

Obviously, the German learner of No2 has to deal with many more possessive items than the Norwegian Ge2 learner due to the reflexive-irreflexive distinction and the additional possessor-related feature \pm human. On the other hand, the

[1] The possessives *si**, *sein** and *ihr** are inflected for possessum number, gender, and case (*sein**, *ihr** alone). The unstarred possessives – genitive forms of third person pronouns – cannot be (further) inflected; see Fabricius-Hansen et al. (2017) for details.

Inherent properties of antecedent (possessor) DP/referent	Possessive	Reflexivity (Binding condition)
Sg. masc./neut.	<i>sein*</i>	} Neutral (±local binding)
Sg. fem.	} <i>ihr*</i>	
Plur.		

TABLE 1: German third person possessives

Inherent properties of antecedent (possessor) DP/referent	Possessive	Reflexivity (binding condition)
No restrictions	<i>si*</i>	Reflexive (local binding)
Sg. masc. human	<i>hans</i>	} Irreflexive (non-local)
Sg. fem. human	<i>hennes</i>	
Sg. comm. nonhuman	<i>dens</i>	
Sg. neut. (nonhuman)	<i>dets</i>	
Plur.	<i>deres</i>	

TABLE 2: Norwegian third person possessives

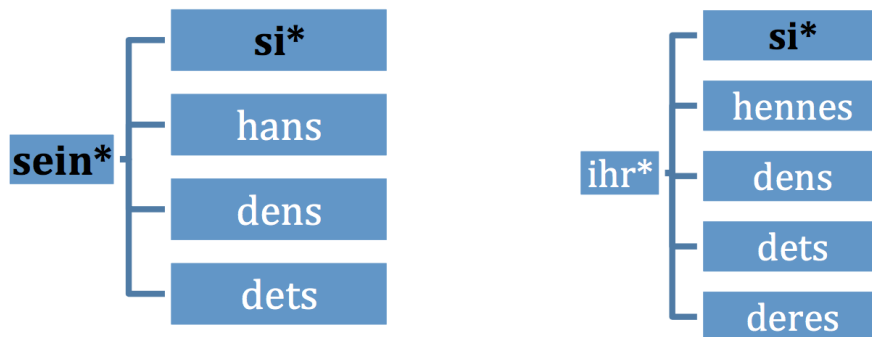


FIGURE 1: German-Norwegian divergence-convergence (Bie-Lorentzen 2012, 44).

Norwegian learner of Ge2 has to keep in mind that the Norwegian reflexive *si** may correspond to either *sein** or *ihr**, depending on the grammatical gender of the possessor. These observations lead to the following general assumptions concerning L2 production and comprehension by our two groups of L2 learners:

- A1 *German No2 learners* have difficulties choosing correctly between the Norwegian reflexive possessive *si** and the irreflexive possessives (*hans/hennes/dens/dets/deres*) in No2 production tasks (*A1-production*). *German No2 learners* show a grammatically less constrained interpretation of Norwegian reflexive and irreflexive possessives than No1 interpreters. More specifically, these learners' errors reflect the underspecification of their L1 system with respect to binding conditions, which may give rise to interpretations inconsistent with Norwegian grammar (*A1-comprehension*).
- A2 *Norwegian Ge2 learners* have difficulties choosing correctly between the German possessives *sein** and *ihr** in Ge2 production tasks (*A2-production*). *Norwegian Ge2 learners* are confused by the ambiguity of *sein** between *si** and *hans/hennes/dens/dets*. They will tend to restrict the interpretation of *sein** to *si** and of *ihr** to *hennes* (*A2-comprehension*).
- A3 For *both groups of learners*, the phonological similarity between *si** and *sein** leads to a skewed distribution of error types: We expect (i) *si** to be wrongly 'equated with' *sein** more often than with *ihr** in Ge2 production and No2 comprehension by the two learner groups; likewise in the other direction, we expect (ii) *sein** to be wrongly 'equated with' *si** more often than with any of the irreflexive alternatives in No2 production and in Ge2 comprehension by the same groups.²

As for A3, it should be noted that the morpho-phonological similarity between *sein** and *si** at one level may favor semantic-functional overgeneralization, i.e. extending the meaning/function of the L2 item to all areas covered by its morpho-phonological counterpart in L1; under certain conditions such a restructuring failure will surface as lexical errors in *production* and referential misunderstanding in *comprehension*. On the other hand, even if the learner has successfully restructured to the L2 core system, the morpho-phonological similarity may hamper automatization, priming for a potentially false lexical choice independently of semantics, so to speak. Such 'shallow' priming effects would seem particularly plausible in *translation* tasks involving an *s*-possessive in the source text, be it translation into the foreign language, i.e. so-called *Hin-Übersetzung* (in our case:

[2] Depending on the circumstances, the expression 'equated with X' means 'translated as X', 'referentially understood as X' or 'used in the sense of X under the given binding conditions'.

Ge1→No2, No1→Ge2) or – notably – into the mother tongue, i.e. *Her-Übersetzung* (Ge1←No2, No1←Ge2).

On the basis of A1–A3 we present in section [3] a set of more precise hypotheses relating primarily to translation alone (in both directions and for both L1/L2 pairs), along with – admittedly preliminary – learner language data that, by and large, seem to corroborate these hypotheses.

Section [4] targets the comprehension issue alone. Here we present three offline experiments testing (i) whether No1 speakers under specific syntactic conditions actually do interpret No1 *si** vs. *hans* in accordance with the reflexivity (local vs. non-local binding) parameter; (ii) whether or not Ge1 speakers under the same conditions exhibit a bias for a reflexive (locally-bound) interpretation of referentially ambiguous *sein**; and (iii) how German No2 learners under the same conditions interpret No2 *si** vs. *sein**. The experiments have been conducted as pretests to online (visual-world) experiments designed to test specific comprehension hypotheses derived from A3 above.

Sections [3] and [4] both focus on (translation, comprehension) *products* as opposed to *processing*. We shall briefly take up the latter issue in the concluding section [5].

Note finally that throughout we abstract from the inflectional possessum-related features since they are to some extent present in both languages, although far more complicated by morphological case marking in German, which is a well-known cause of learning problems.

[3] TRANSLATION DATA (L1→L2, L1←L2)

[3.1] *Empirical basis*

Our translational data are based on two preliminary investigations: A master thesis by [Bie-Lorentzen \(2012\)](#) and a follow-up study conducted 2013 (henceforth FU 2013).

[Bie-Lorentzen \(2012\)](#) has shown that mastering the possessive system of the L2 (in translation) is not an easy task, whether for Norwegian learners of German or for German learners of Norwegian. His investigation was based on translation data from 53 participants (27 No1 and 26 Ge1). The informants were students of German and Norwegian at the University of Oslo, the Humboldt University and the University of Vienna, respectively. All students were at a comparable, advanced level of proficiency in their L2. For both groups of informants, the tasks consisted in the translation of two texts, one into their learner language, the other in the opposite direction, i.e. into their native tongue. The texts were put together from excerpts from the Internet and constructed sentences in such a way as to contain

the relevant possessives in different environments.³ The testing time was limited to 30 min and the translations were done by hand (not typed). As a matter of fact, the time allocated to the task turned out to be too short, with the result that more than one third of the Norwegian test persons translating into their mother tongue, left their translations unfinished.

In an attempt to engage a larger group of informants, and to pursue the investigation at a deeper level, we conducted a follow-up investigation (FU 2013) that largely confirmed the findings in [Bie-Lorentzen \(2012\)](#). 27 Ge1 and 29 No1 participated, with a comparable level of proficiency. The task was the same as in the previous study although new texts were compiled, this time presenting the same possessive environments for both groups of test persons. The translations were done on the computer and the time limit was extended to 45 min. In addition, more detailed data concerning the language background of the informants were collected.

In the following, we will use examples from both studies to illustrate the error patterns. Since the number of error possibilities crucially differs in the two studies, we will calculate the error rates when this seems necessary for comparing the two groups and the two translation directions. The procedure for the computation will be spelled out in the following section.

Some remarks concerning particular limitations of the design are in order, though. Certain recurring features of the texts/the test design seem to influence the results. One general feature that makes a rigorous evaluation of the actual proficiency level difficult is the possibility to either just drop the possessive or paraphrase the construction in the translation. Whether these solutions are means to circumvent the problem or results from the test person's judgment of idiomaticity or personal style is hard to establish. As we will propose in section [\[5\]](#), further investigations such as translation under eye tracking, key logging or other processing measurements could help provide an answer, along with post-test interviews. Elimination of the possessive may also be triggered by various factors. Clearly, one such factor is the somewhat forced accumulation of possessives in one text, another factor involves differences between the languages with respect to certain types of possessive relations, such as the inalienables; see [Holthe \(2016\)](#) and [Fabricius-Hansen et al. \(2017, section 3\)](#). A different type of problem is related to the structuring of the text with respect to cohesion as it seems that topicalization of the host DP may contribute to an erroneous identification of the possessor. All these are elements that cannot be controlled for in a free translation task.

[3] Unfortunately, Bie-Lorentzen manipulated the text length somewhat when it was presented to informants translating into their mother tongue, on the assumption that translation into L1 would pose less of a problem than translation into L2. The numbers of occurrences of possessives differ as a consequence of this manipulation. This crucially affects the (control) comparison between the two learner groups.

[3.2] Norwegian as L2 (Ge1/No2)

Translation into L2 (Ge1→No2)

As far as translation products are concerned, i.e. No2 target texts (T) based on Ge1 source texts (S), assumptions A1 and A3 in the previous section allow us to make the following more specific hypotheses:⁴

H1→No2 (A1) No2 translations from Ge1 show a relatively high frequency of translation errors concerning the choice between the reflexive possessive *si** and the irreflexive possessives *hans*, *hennes*, *dens*, *dets* and *deres*.

This hypothesis is corroborated by Bie-Lorentzen (2012) (and in fact, it was one of two hypotheses Bie-Lorentzen set out to test). In all translations into No2 with errors concerning possessives, (in 21 out of 24 translations), these errors were related to (ir)reflexivity. In 90% of the translations, the wrong choice between the two were the only errors, while only 10% contained inflectional errors relating to the possessum. Notably, 52% of the translations exhibited errors concerning third person singular and plural possessives, 43% only the third person singular and 5% the third person plural. These percentages reflect the complexity of the gender distinctions in third person singular.

H2→No2 (A3ii) In No2 translations from Ge1 non-locally bound *sein** is erroneously translated as the reflexive possessive *si** more often than locally bound *sein** is erroneously translated as irreflexive *hans*.⁵

The two error types — *si** for *hans* and *hans* for *si** — are illustrated in (1) and (2) respectively (both from Bie-Lorentzen (2012)).

- (1) S (Ole Einar Bjørndalen_i ist ein norwegischer Biathlet. Zum Biathlonsport kam er_j durch seinen vier Jahre älteren Bruder Dag.) Sein_j kleiner Bruder Hans Anton_i begann auch später mit Biathlon.
Lit. 'Ole Einar Bjørndalen is a Norwegian biathlete. He_i came to the biathlon through his older brother Dag. His_i little brother Hans Anton started later also with biathlon.'
- T *Sin_i (√hans_j) lille bror Hans Anton_i begynte også med skiskyting.

[4] In the following discussion, problems relating to the non-locally bound *dens* and *dets*, referring to a non-human masculine and neuter possessor respectively, will not be taken up although they clearly constitute a challenge to Ge1 No2 learners who do not have the human/non-human distinction in their native system.

[5] Note that the German possessives are inherently underdetermined with respect to local vs. non-local binding and consequently open for corresponding referential ambiguity in practice. The expression 'locally/non-locally bound *sein*/ihr**' used in this and the following hypotheses then should be read as 'an occurrence of *sein*/ihr**' that in the given (source) context must be understood as locally/non-locally bound'.

- (2) S *Er_i* konnte aber den Leistungen *seiner_i* beiden Brüder nicht gerecht werden.
Lit. ‘He could however not live up to the performances of his older brothers.’
- T *Han_i* kunne ikke leve opp til prestasjonene til **hans_i* (*√sine_i*) eldre brødre.

As witnessed by (1) and (2) both types of errors occur. The erroneous use of *si** for the non-locally bound *sein* illustrated in (1) occurs more often than the use of *hans* for locally bound *si**, in Bie-Lorentzen’s (2012) data with an error rate of 13% versus 4% — albeit not in FU 2013 (see below).⁶

A note on the notation practice seems in order: Although we mark both the erroneous occurrence of *si** in (1) and *hans* in (2) by *, there is a difference: only (1) is ungrammatical exhibiting a reflexive possessive without a local binder while (2) is ungrammatical/erroneous only as a translation of the source text. In both instances, however, we suspect a lexical error and not an interpretation problem since there is no alternate referent in the context that the possessive could refer to. While priming by the possessive in the source text can be responsible for the error in (1), in (2) such priming could only be induced by the subject pronoun *han* ‘he’.

H3→No2 (A1, A3i) Locally bound *ihr** (with a feminine singular possessor) is erroneously translated as (irreflexive) *hennes* more often than non-locally bound *ihr** (with a feminine singular possessor) is erroneously translated as (reflexive) *si**.

The two error types — *hennes* for *si** and *si** for *hennes* — are illustrated in (3) (from the FU 2013) and (4) (from Bie-Lorentzen (2012)), respectively.

- (3) S *Merkel_i* ist bekannt für *ihre_i* gute Beziehung zu Jens Stoltenberg.
Lit. ‘Merkel is known for her good relationship with Jens Stoltenberg.’
- T *Merkel_i* er kjent for **hennes_i* (*√sitt_i*) gode forhold til Jens Stoltenberg.
- (4) S (Magdalena) *Neuners_i* Erfolge lösten ein großes Medieninteresse aus und steigerten binnen kurzer Zeit *ihre_i* Popularität in Deutschland.
Lit. ‘Magdalena Neuners success initiated a big interest from the media and rapidly increased her popularity in Germany.’
- T Suksessene til Magdalena *Neuner_i* førte til en stor medieinteresse og forstørret populariteten **sin_i* (*√hennes_i*).

[6] The error rate is calculated by dividing the number of actual errors concerning a possessive by the total of error possibilities for this possessive, i.e. the number of occurrences in the text multiplied by the number of candidates (Fabricius-Hansen 1981, 68–72).

Hypothesis H3→No2 seems confirmed by both studies: there are more cases where *hennes* erroneously is chosen for (locally-bound) *ihr** than *si** for non-locally bound *ihr** (six out of 23 test persons versus two in Bie-Lorentzen (2012), nine out of 27 test persons versus four in the FU 2013). In either case, a misinterpretation of the source text can be ruled out, there being no other candidate as a binder in the context. We interpret the low number of errors of the type in (4) to mean that the Ge1 No2 learner transfers the gender distinction in the German possessive system (*sein** for masculine vs. *ihr** for feminine) to the No2 (*hans* vs. *hennes*).

H4→No2 (A1) In No2 translations from Ge1, locally bound *ihr** (with a plural possessor) is erroneously translated as (irreflexive) *deres* more often than non-locally bound *ihr** (with a plural possessor) is erroneously translated as (reflexive) *si**.

The example sentences (5) and (6), taken from Bie-Lorentzen (2012), illustrate the erroneous use of the irreflexive *deres* instead of locally bound *si** and of *si** for *deres*. The error depicted in (5) was made by ten test persons while the error in (6) only occurred in two translations (out of 24), hence corroborating the hypothesis.

- (5) S Zusammen mit *ihren_i* jeweiligen Teamkollegen gelten *sie_i* bei der dies-jährigen Biathlon-WM als Favoriten.
Lit. ‘Together with their respective team colleagues they count as favorites in this year’s biathlon WM.’
T *De_i* er favoritter i årets skiskyting-VM sammen med **deres_i* (√*sine_i*) teamkollegaer.
- (6) S [*Neuner* und *Bjørndalen*]_i gehören zu den erfolgreichsten Biathleten der letzten zehn Jahre und allein *ihre_i* Weltcupstatistik zählt über 130 Einzelsiege.
Lit. ‘Neuner and Bjørndalen are among the most successful biathletes of the last decade and their world cup statistics counts over 130 individual medals.’
T [*Neuner* og *Bjørndalen*]_i er blant de mest suksessrike biatleter de siste ti årene og bare **sine_i* (√*deres_i*) verdenscupstatistikk teller mer enn 130 enkeltseire.

Example (6), lacking a local binder for the reflexive possessive, is ungrammatical, while (5) is erroneous with respect to the source text.⁷ In section [3.1], we briefly mentioned that topicalization of the possessive phrase might obscure a local binding relation. Considering the translation T in (5), however, topicalization may

[7] Unfortunately, (5) was not part of the translation intended for No1 speakers and can therefore not answer the question whether the context – and especially the adjective *respective* – might provoke a *distributive* reading which eventually could explain the use of the irreflexive *deres*.

not be what is at stake: *deres* is used although the phrase containing the possessive follows the local binder.

Summarizing our observations, the follow-up study (FU 2013) confirms the general assumptions A1 and A3 (section [2]) and the findings of [Bie-Lorentzen \(2012\)](#): 26 out of 27 test persons made at least 3 possessive-related errors. In 19 out of 26 (73%) translations, all errors are related to the (ir)reflexivity distinction, corroborating H1→No2.

At the face of it, the FU 2013 data do not seem to confirm H2→No2, the error rate for the erroneous use of *si** for *hans* being 22% and for *hans* for *si** 30% (where the error rate is calculated only for non-locally bound *sein**). A closer examination of the contexts in which the possessives occur reveals that there is one occurrence of (non-locally bound) *sein** with only one erroneous possessive in the translation while the other two instances of (non-locally bound) *sein** give rise to a larger number of deviant constructions. More specifically, nearly all mistakes are made in the first two occurrences of the possessive *sein**, while the only instance of erroneous *si** for *hans** is found towards the end of the text. As to why these three examples in particular give rise to problems, we may suggest that the context is to blame: the third occurrence of non-locally bound *sein** stands by itself in an environment of feminine *ihr** – while the others are embedded in a sequence of sentences with six occurrences of *sein** with different binding relations, i.e. local and non-local, possibly leading to confusion. Yet another matter may have had an influence on the outcome: among the 27 test persons, six do not use *si** at all while one test person does not use *hans**, a solution that could be taken as a learner strategy of handling/avoiding problematic constructions. If we eliminate these from the count, we get an error rate of 27% in the *si** for *hans** examples and of 24% in the *hans** for *si** occurrences, which would corroborate the hypothesis.

As to H4→No2, there are no instances of *si** erroneously used for *deres* in the translation of non-locally bound *ihr** (referring to a plural possessor) in the FU 2013 corpus, while 14 out of 27 test persons erroneously use *deres* (instead of *si**) for the locally bound *ihr** plural. Hence, hypothesis H→No2-4 seems corroborated as well.

It seems plausible that not too advanced German No2 learners in non-translational production tasks make errors of the same kind as those specified by H1→No2 through H4→No2, i.e. that they tend to neglect the reflexivity distinction in Norwegian, using *si** for any possessive relation with a male or neuter possessor and *hennes* or *deres* under conditions demanding *ihr** with a singular fem. or plural possessor, respectively. This assumption, however, will have to be tested. As a matter of fact, it is possible that free production, as opposed to translation, does not involve priming effects or at least does so to a smaller degree. Transfer from the L1, though, is still expected.

Translation into L1 (Ge1←No2)

The main problem for the Ge1 No2 learner translating into their mother tongue consists in the divergence of *si** into *sein* and *ihr** (feminine or plural possessor) (see figure 1). The convergence of *hans* and *si** into *sein** and of *hennes/deres/si** into *ihr**, on the other hand, does not have to be of any concern to this group in this translation direction; at least misinterpretation will not reveal itself as an error. In fact, it appears impossible to tell whether the test person has understood the source sentence correctly in such cases. In the case of *si** diverging into *sein** and *ihr**, however, the learner has to decide on the gender of the possessor to make a correct choice in the translation, which means that an erroneous interpretation can be detected, for instance as a gender clash as in (7) below. As a consequence, relevant hypotheses will only be formulated with respect to the divergence of *si**.

Relating our assumptions A1 and A3 (section [2]) to translations from No2 into Ge1, we may derive H1←No2 and H2←No2 as counterparts of H1→No2 and H2→No2:⁸

H1←No2 (A3) Ge1 translations from No2 show a relatively high frequency of errors involving the possessives *sein** versus *ihr**.

H2←No2 (A3i) In Ge1 translations from No2 the Norwegian (reflexive) possessive *si** (with a singular possessor) is (erroneously) translated into the singular (masc./neut.) possessive *sein** more often than *si** is (erroneously) translated as the singular (fem.)/plural possessive *ihr**.

The error type *sein** for *ihr** is illustrated in (7) (from [Bie-Lorentzen \(2012\)](#)), where apparently the divergence of *si** into *sein** (male possessor) and *ihr** (female or plural possessor) is ignored. Example (7) might, of course, be an instance of ‘shallow priming’ (see section [2]) since in the absence of another referent a misinterpretation of the sentence is rather unlikely. (8) is constructed since errors of the type *ihr** for *sein** do not occur in our data.

- (7) S Vamp er et norsk band fra Haugesund. **Bandet**_i har fått mange tilhengere gjennom **sin**_i folk-inspirerte musikk og sine_i norske tekster. Lit. ‘Vamp is a Norwegian band from Haugesund. The band has had many fans due to their folklore-inspired music and their Norwegian texts.’
- T Vamp ist eine norwegische Band aus Haugesund. Durch ***seine**_i (**vi**hre_i) volksnahe Musik und ***seine**_i (**vi**hre_i) norwegischen Texte hat **die Band**_i viele Anhänger.

[8] Of course, translating *si** as *sein** may be caused by phonological association/priming in Ge1 target text production rather than by misunderstanding the No2 target text.

- (8) S Mens Eva er bortreist maler Petter_i huset sitt_i.
 Lit. Lit. 'While Eva is away Petter paints his house.'
 T Während Eva verreist ist, streicht Petter_i **ihr*_i (√*sein*_i) Haus an.

Four out of 25 Ge1 test persons produced the error in (7) which, although the number is low, is still somewhat astonishing: Quite generally, we assume that a native speaker knows his/her L1. For the Ge1 speaker specifically, we might assume that the awareness of the gender distinction reflected in both determiners (*der**/*die**/*das**) and possessives (*sein**/*ihr**) of the L1 grammar overrules the erroneous binding suggested by the source text possessive, thus counteracting possible priming by *si**. (For comparison: ten out of 27 No1 speakers produced a gender error in the example, two of these, however, using the neuter determiner for the possessor DP; see below in section [3.3.1].⁹) As yet an explanation for the Ge1 speakers' somewhat strange choice of *sein* referring to *die Band* (7), it might be worth mentioning that there seems to be a tendency in German to overuse the masculine/neuter possessive *sein** for collective nouns in general (Zifonun 2005, 94).

As to the lack of error examples of *ihr** for *sein** in the translation of *si**, as illustrated in (8), the morpho-phonological resemblance between *si** and *sein** as well as the morpho-phonological difference between *si** and *ihr** might make the choice of *ihr* (establishing *Eva* as the possessor) rather unlikely. A misinterpretation of the reflexive *si** as referring to *Eva* in (8) could only be induced by a serious effort of making the sentence coherent: What has *Eva*'s trip to do with *Petter* painting the/his house?

Such pragmatic considerations, however, do seem to play a role in the choice of possessive. In the following example the error could be explained by the test persons' choice of a salient referent (*Toft*) in the context as the binder:

- (9) S Avslutningen på Tofts karriere som vokalist ble markert med et samlealbum. *Bandet*_i bevarte likevel *sitt*_i særpreg på de neste albumene.
 Lit. 'The end of *Toft*'s career as a singer was marked by a compilation album. The band nevertheless kept its special features.'
 T Das Ende von *Tofts* Karriere als Vokalist wurde mit einem Compilation Album markiert. *Die Band*_i bewahrte trotzdem **seine*_i (√*ihre*_i) Eigenart.

Again, as in (7) above, the correct choice of the feminine determiner for the possessor DP *Band* would seem to rule out any problem concerning the gender distinction. (Five out of 25 Ge1 test persons and nine out of 27 No1 Ge2 learners made

[9] The same argument, i.e. awareness of the gender distinction in the Ge1, can be advanced for the apparent lack of problems with respect to the distinction *hans/hennes*, giving clues to the gender distinction roughly corresponding to *sein**/*ihr**.

the error.) Of course, morpho-phonological priming cannot be excluded, neither (at least for the Ge1) the abovementioned tendency to use masculine/neuter *sein** for collective nouns.

Note that H2←No2 above relates to the reflexive with a singular possessor. A plural parallel to H2 could be formulated on the observation that the use of *si** with a plural possessor in Norwegian may erroneously translate into *sein** more often than would the plural irreflexive *deres*. We disregard here the possible priming of Norwegian plural *deres* into the German demonstrative pronoun *deren*, due to their phonological similarity.¹⁰

[3.3] *German as L2 (No1/Ge2)*

Translation into L2 (No1→Ge2)

According to [Bie-Lorentzen \(2012\)](#), errors involving possessives were found in 20 out of 27 No1→Ge2 translations. In 13 out of the 20 translations with errors, these concerned the choice between *ihr** (referring to a feminine possessor) and *sein** (referring to a masc./neuter possessor).

As far as translation products are concerned, i.e. Ge2 target texts (T) based on No1 source texts (S), our assumptions A2 and A3 in section [2] lead to the following more precise hypotheses:

H1→Ge2-1 (A2) In translations from No1 into Ge2, (reflexive) *si** with a singular binder/possessor is erroneously translated as *sein** more often than *si** with a singular binder/possessor is erroneously translated as *ihr**.

Note that H1→Ge2 for Norwegian Ge2 learners corresponds to H2←No2 for German No2 learners. Example (10) from the FU (2013) illustrates the – presumably dominant – error type *sein** for *ihr**. Both groups of learners translated the same sentences, however, as expected, the Ge1 speakers did not produce the error illustrated in (10) although a few made the mistake (*sein** for *ihr**) in a similar example sentence (7) in [Bie-Lorentzen \(2012\)](#). Notably, in (10) there is no non-local binder available, so the sentence is ungrammatical. As was the case for the Ge1 No2 learners, there are no error examples of *ihr** for *sein** in the corpus, so (11) is constructed and corresponds to (8).

- (10) S [Nina Hagerup](#)_i opptrådte ofte sammen med mannen [sin](#)_i.
Lit. ‘Nina Hagerup performed often with her husband.’
T [Nina Hagerup](#)_i trat oft mit *[seinem](#)_i (√[ihrem](#)_i) Mann auf.
- (11) S Mens Eva er bortreist maler [Petter](#)_i huset [sitt](#)_i.
Lit. ‘While Eva is away Petter paints his house.’

[10] *Deren* is a genitive (singular or plural) form of the demonstrative pronoun *der/die/das* that can be used instead of the possessive in contexts where misunderstandings are likely to occur.

T Während Eva verreist ist, streicht **Petter**_i ***ihr**_i (√**sein**_i) Haus an.

Note that the type of error in (11) is rather unlikely for No1 speakers: we expect the No1 speaker to understand the sentence and pick the local binder for the reflexive *si**. A production error is not very likely either once the possessor is identified.

H2→Ge2 (A3i) (Reflexive) *si** with a plural binder/possessor is erroneously translated as *sein** more often than (irreflexive) *deres** (with a plural binder/possessor) is erroneously translated as *sein**.

The error types described in the hypothesis are illustrated in the examples (12) and (13), both from the FU 2013 study.

(12) S På Troidhaugen blir det også arrangert konserter med **band**_i fra både inn- og utland som kommer til Bergen med **sine**_i tolkninger av Griegs sanger.

Lit. 'On Troidhaugen concerts were arranged with bands from both Norway and abroad who come to Bergen with their interpretations of Grieg's songs.'

T An Troidhaugen wird es auch Konzerten mit **Banden**_i von In- und Ausland arrangiert, die_i kommen nach Bergen mit ***seiner**_i (√**ihren**_i) Interpretationen.

(13) S I 1867 giftet [Grieg seg med Nina Hagerup]_i som faktisk var hans kusine. **Deres**_i eneste barn døde bare 13 måneder gammel.

Lit. 'In 1867 Grieg married Nina Hagerup who actually was his cousin. Their only child died only 13 months old.'

T In 1867 heiratete [**Grieg**_i sich mit **Nina Hagerup**]_j_k, die eigentlich seine Kusine war. ***Sein**_k (√**ihr**_k) einziges Kind starb nur Monate alt.

There are four (out of 29 translations) occurrences of the error type illustrated in (12) and two of the type in (13). Note that the erroneous choice of *sein** for *ihr** in (13) could have a pragmatic explanation, *Grieg* being the prominent referent in the context. Hence, the sentence is not ungrammatical, it just does not correspond to the source sentence.

Translation into L1 (No1←Ge2)

According to **Bie-Lorentzen (2012)**, No1 Ge2 learners have more difficulties when translating from the L2 into their L1 than Ge1 learners of No2 have, seemingly confused by the lack of (ir)reflexivity in the new possessive system and the ambiguity of *sein** between local and non-local binding as well as the ambiguity of *ihr** between singular and plural. In other words, it seems that *divergence* (of *sein** into *si** and *hans*, and of *ihr** into *hennes* and *deres* for the No1 interpreting Ge2) is more

difficult to handle than *convergence* (of *si** and *hans* into *sein** for the Ge1 speaker interpreting No2). As mentioned in section 3.2, the Ge1 speakers are confronted with one instance of divergence as well, i.e. the divergence of *si** into *sein** and *ihr**. The difference in the percentage of errors is small, though: 39.13% versus 36% of erroneous choice. However, as noted by Bie-Lorentzen (2012), the No1 Ge2 learners were expected to do better since they had been exposed to the L2 for a longer period. The following hypotheses based on our assumptions A2 and A3 (section [2]) attempt to describe the problems for No1 Ge2 learners more precisely.

H1←Ge2 (A3ii) Translations from Ge2 into No1 show a relatively high frequency of errors involving *si** versus *hans/hennes/dens/dets/deres*.

H2←Ge2 Norwegian Ge2 learners erroneously translate non-locally bound *sein** as (reflexive) *si** more often than they erroneously translate locally bound *sein** as (irreflexive) *hans*.

The following examples (from FU 2013) illustrate the errors predicted by the hypothesis. Bie-Lorentzen's data did not contain a non-locally bound occurrence of *sein**.

- (14) S **Der Staatsminister**_i und **sein**_i Land hätten verstanden, dass Frieden und Freiheit nicht durch Abschottung zu erreichen sind.
Lit. 'The Prime Minister and his land had understood that peace and freedom could not be attained by isolation.'
- T **Statsministeren**_i og ***sitt**_i (√**hans**_i) land har forstått at fred og frihet ikke oppnås gjennom isolasjon.
- (15) S Stoltenberg war im Januar in der Bundeshauptstadt, wo **er**_i den Willy-Brandt-Preis für **seine**_i Antwort auf die Anschläge in Oslo bekommen hat.
Lit. 'Stoltenberg was in the capital in January where he received the Willy-Brandt reward for his answer for the attacks in Oslo.'
- T I januar var Stoltenberg i hovedstaden, hvor **han**_i mottok Willy-Brandt-prisen for ***hans**_i (√**sitt**_i) svar på angrepene i Oslo.

FU (2013), however, does not corroborate the hypothesis as only two No1 Ge2 learners (out of 29) erroneously chose *hans* for *si** in (15) and none *si** for *hans* in (14). While non-locally bound *sein** results in mainly correct translations/interpretations (*hans/hennes*) for No1 Ge2 learners, these are the cases where Ge1 No2 learners make (production) mistakes (cf. section [3.2.1]): 12 test persons (out of 21) use *si** for *hans* in (14) and 7 *hans* for *si** in (15). Again, it seems that translating into the L1 is rather straightforward once the sentence is understood correctly. And in (15) it seems clear that nobody receives a prize for somebody else's deed.

So for the German No2 learners, the problem most likely is confusion concerning the ambiguity of *sein** although priming by the subject pronoun *han* ‘he’ cannot be ruled out. The argument is the same as the one we proposed for the error in (2).

H3←Ge2 (A2) Locally bound *ihr** (with a feminine singular binder/possessor) is erroneously translated as (irreflexive) *hennes* more often than non-locally bound *ihr** is translated as (reflexive) *si**.

In (16), identical to (3), the irreflexive possessive *hennes* is wrongly used to translate locally bound *ihre*. There are no examples in Bie-Lorentzen (2012) or in FU (2013) where non-locally bound *ihr** (with feminine singular possessor) erroneously is translated as *si** by No1 Ge2 learners. Example (17), repeated from (4) illustrates the error as it was made by Ge1 No2 learners.

- (16) S *Merkel_i* ist bekannt für *ihre_i* gute Beziehung zu Jens Stoltenberg.
Lit. ‘Merkel is known for her good relationship with Jens Stoltenberg.’
T *Merkel_i* er kjent for **hennes_i* (√*sitt_i*) gode forhold til Jens Stoltenberg.
- (17) S (Magdalena) *Neuners_i* Erfolge lösten ein großes Medieninteresse aus und steigerten binnen kurzer Zeit *ihre_i* Popularität in Deutschland.
Lit. ‘Magdalena Neuners success initiated a big interest from the media and rapidly increased her popularity in Germany.’
T Suksessene til Magdalena *Neuner_i* førte til en stor medieinteresse og forstørret populariteten **sin_i* (√*hennes_i*).

*ihr** in (16) can, of course, refer to a non-local feminine possessor, but not so in this context, i.e. being known for somebody else’s property, hence the translation is (semantically) ungrammatical.

Since the hypothesis above also describes the problem Ge1 No2 learners encounter in their production (see H3→No2 (A1, A3i)), it is interesting to compare the numbers of erroneous structures in the two groups: nine out of 29 No1 Ge2 learners (erroneously) translated *ihre* as *hennes* in example (16) while eight out of 27 Ge1 No2 learners did, i.e. nearly one third in each learner group chose to translate *ihr** with a feminine singular possessor as the irreflexive *hennes*. Again, we do not suspect a misinterpretation of the possessive relation.

The following example can also be taken as support for H3←Ge2 although the source sentence is ambiguous with respect to the binding relation (that is, ambiguous between non-locally bound singular and locally bound plural):

- (18) S (Merkel_i ist bekannt für ihre gute Beziehung zu Jens Stoltenberg.) In *ihrer_{i/j}* Amtszeit haben *beide_j* sich mehrmals getroffen.
Lit. ‘Merkel is known for her good relations to Jens Stotenberg. In her/their term they both have met several times.’

T I **deres_j* (√*sin_j*/√*hennes_i*) regjeringstid har *de_j* truffet hverandre ofte.

ihrer (*Amtszeit*) in (18) can be interpreted as non-locally bound by the subject (Merkel) in the previous sentence, an interpretation which would result in the irreflexive *hennes*. Alternatively, it can refer to the subject *beide/de* (both/they) and will then require the reflexive *si**. What is not acceptable is the irreflexive *deres*. Although ambiguous examples should be avoided, (18) may reveal something about the preferences in the different groups. Nine out of 27 Ge1 No2 and 14 out of 29 No1 Ge2 learners chose the irreflexive *hennes* (acceptable under the interpretation that *ihrer* refers to Merkel) while only 1 out of 27 Ge1 No2 learners and seven out of 29 No1 Ge2 learners translated *ihrer* by the reflexive *si**. Among the Ge1 speakers, 15 (wrongly) chose the irreflexive *deres* as opposed to eight No1 speakers, thus confirming H1→No2 (section [3.2.1]).

Considering the different responses to sentences such as (18), it seems clear that a more careful choice of test sentences is required. In addition to ambiguities of the kind described in connection to (18), sentences with two possessives or in consecutive sentences related to the same binder should be avoided since these are conditions which seem to favor a freer translation/paraphrases without possessives. This concerns especially translations into the L1.

[3.4] Summary

Our hypotheses concerning the problems with restructuring to the L2 system are, to some extent, corroborated by the data: Ge1 No2 learners tend to neglect the (ir)reflexivity distinction (from their perspective the divergence of *sein** into *si** and *hans*, *hennes*, *deres*) while No1 Ge2 learners overlook the gender distinction in the L2, i.e. the divergence of *si** into *sein** and *ihr**. In other words, the problems reported can be regarded as transfer effects from the L1.

Still, for both groups of learners a priming effect of the *s*-possessives seems to be involved, i.e. the cross-linguistic morpho-phonological resemblance of the *s**-possessives favors the erroneous constructions. On the other hand, in the absence of formal resemblance, there are far less and in some cases no error examples at all relating for instance the *si** possessive to *ihr**, *deres* to *sein** or *sein** to *deres*.

As to interpretation products, or more precisely: translation into the L1, we note far less errors. This result can be explained by the general observation that learners do know their L1. Furthermore they are competent readers, and know about cohesion and coherence. This is important for the No1 Ge2 learners in handling the divergence of *sein** into *si** and *hans*. The errors that occur will most likely have to do with specific words or contexts rather than deficiencies in their choice of possessives in their mother tongue. Of course, the absence of errors is no guarantee that the binding relation is correctly understood. Regarding the

partial ‘false friends’ *si** and *sein** it seems clear that adequate translations of either *si** as *sein** or vice versa are not sufficient evidence that the learner has actually internalized the new system.

[4] L2 COMPREHENSION DATA: NORWEGIAN AS L2

[4.1] *Introductory remarks*

This section presents experimental data from three experiments investigating the offline interpretation of Norwegian reflexive and irreflexive possessives. The experiments compared the interpretation of Norwegian possessives by Ge1 No2 learners with that of a control group of native speakers of Norwegian. We investigated the comprehension aspect of Assumption A1 (*A1-comprehension*), here repeated for convenience.

A1-comprehension Ge1 No2 learners show a grammatically less constrained interpretation of Norwegian possessives than No1 interpreters. More specifically, learners’ errors reflect the underspecification of reflexivity in the German possessive system that gives rise to ambiguities in No2 comprehension inconsistent with Norwegian No1 grammar.

The experiments were designed in such a way that the possessive could either refer to the subject referent within the same finite clause (= local referent) or to a referent outside the clause (= non-local referent). Furthermore, the constructions were chosen in such a way that their German counterparts, even though ambiguous, strongly biased the interpretation towards resolution to a particular possessor, here the local referent. The Norwegian stimuli were unambiguous due to the use of a reflexive (*sin*) versus an irreflexive form (*hans*). The logic underlying our experimental study was that interpretation errors due to transfer (see e.g. [Benati & Angelovska \(2016\)](#); [Ellis \(2008\)](#); [Meisel \(2000\)](#); [Odlin \(2003\)](#), and the references therein) are especially likely when the encoding of reflexivity in Norwegian enforces an interpretation that goes against the preferred interpretation of the respective possessive expression in German. In order to test *A1-comprehension* we conducted three offline experiments. Here is a summary of the experimental findings to be reported below.

- (i) EXPERIMENT 1: For No1 speakers, the distinction between irreflexive and reflexive possessive pronouns is fully grammaticalized as far as the construction under investigation is concerned. To study this, we tested whether reflexivity is a grammatical constraint as strong as gender – at least for the construction under investigation.

A comparison with Norwegian L1 data is especially important because Norwegian reflexive and irreflexive possessives show more complex interpretation

possibilities than what would be expected on the basis of Binding Theory (Chomsky 1981, 1986). We refer the reader to Fabricius-Hansen et al. (2017, section 3.1) for a discussion of the exceptional binding properties of Norwegian possessives.

- (ii) EXPERIMENT 2: In the construction under investigation Ge1 speakers have a clear preference for a local interpretation of German possessives but their non-local interpretation is still possible, that is the German equivalents of the Norwegian possessives in the construction under investigation exhibit ambiguity.
- (iii) EXPERIMENT 3: Advanced Ge1 No2 learners at least at a level of B1 (Council of Europe 2011) have gained explicit knowledge about the encoding of reflexivity in the Norwegian system, yet in their interlanguage the feature of reflexivity is not fully grammaticalized comparable to gender, which is also encoded in their own possessive system (*sein* versus *ihr*).

The predicted errors could be persistent and still be present in even more advanced learners (No2 at least at the level of B2).

The No2 interpretation of reflexive and irreflexive possessives relates to existing psycholinguistic work on the application of the binding principles in L2 syntax. The L2 processing and interpretation of reflexive pronouns and personal pronouns has been investigated in a number of psycholinguistic studies (see Felser & Cunnings (2012); Patterson et al. (2014) and the references therein). One finding is that during online processing in the L2 – but not in the L1 – the binding principles (Chomsky 1981) do not act as an immediate filter on the set of possible referents. Felser & Cunnings (2012) showed that highly proficient German L2 speakers of English violated Binding Condition A during their online comprehension of reflexive pronouns: in their initial interpretation they considered non-local antecedents for reflexive pronouns (type A expressions; in Chomsky’s (1981) terminology ‘anaphors’). Similarly for Binding Condition B, Patterson et al. (2014) provided eyetracking evidence that highly proficient German L2 speakers of English initially considered local referents for personal pronouns, i.e. type B expressions that must not be interpreted locally. However, in offline reference choice tasks similar to the one employed in our study, advanced German learners of English did not differ significantly from a control group of native English participants. Thus, even though the product of the interpretation process was essentially the same, the interpretation process differed between L2 and L1 processing. Felser & Cunnings (2012), and Patterson et al. (2014) employed the *Shallow Syntax Hypothesis* put forward by Clahsen & Felser (2006) and interpreted the observed difference between L2 and L1 processing in terms of a general learner effect with impoverished syntactic representations in the L2.

The experiments reported below investigated transfer effects on L2 interpretation (Benati & Angelovska 2016; Ellis 2008; Odlin 2003). We hypothesized that negative transfer from the German possessive system to the Norwegian system would result in comprehension errors. Furthermore, we were interested to see whether these errors persist across different levels of linguistic proficiency. Even very advanced Ge1 No2 comprehenders might still experience a cross-linguistic influence from their L1. Evidence for these assumptions comes again from investigations on anaphora resolution. Roberts et al. (2008) conducted an experimental study explicitly addressing L1 influences on the interpretation of Dutch personal pronouns. They investigated the online processing as well as the offline interpretation of L2 Dutch by comparing a group of German learners with a group of Turkish learners. The offline interpretation data showed that the group of Turkish learners chose different referents for personal pronouns than the German learners who patterned with a Dutch L1 control group. The interpretation of Dutch personal pronouns by the Turkish group strikingly resembled the anaphora resolution expected for Turkish personal pronouns, which signal a different cognitive status (in the sense of Gundel et al. (1993)) than Dutch or German personal pronouns. Unlike Dutch or German, Turkish includes null pronominal forms in its pronominal system. Consequently, anaphora resolution of a Turkish personal pronoun does not involve the simplest pronominal form but involves a marked, inherently more complex expression than the null pronominal. The observed differences in interpretation possibilities point to a persistent L1 influence since the learners tested in the study were highly proficient L2 speakers of Dutch.

Another line of experimental research investigated L2 errors related to reflexivity. During the 1980s and 1990s second language acquisition researchers within the tradition of the Government and Binding Theory (Chomsky 1981, 1986) investigated whether the L2 is necessarily in accord with Universal Grammar, and whether the parameters responsible for cross-linguistic variation can be reset (cf. Fabricius-Hansen et al. (2017, section 4.1)) when adults acquire an L2 that differs from their L1 (for the Principles and Parameters approach to language learning, see, e.g. Chomsky (1991); Wexler & Manzini (1987)). The question whether parameters could be reset was investigated in a number of studies testing locality conditions for reflexive pronouns in L2 grammar contingent on the grammatical properties of their L1s (see e.g. Finer (1990); Finer & Broselow (1986); Hirakawa (1990); Thomas (1991); Yuan (1994)). Even though it is assumed to be a universal principle that reflexives (or rather anaphors) must be bound within their local domain, languages vary in two respects (see the proposal in Wexler & Manzini (1987)): They have different constraints on what can count as a binder in the first place, namely only the subject or other arguments, too. Secondly, locality conditions are themselves subject to cross-linguistic variation. While some languages allow long distance binding into an infinitive clause, this is prohibited in others.

The abovementioned studies suggest that some L2 learners are able to fully adopt a parametrically different system (but see Yuan (1994)). However, other participants in these experiments showed negative transfer from their L1 systems. Still others even developed an interlanguage different from both systems. What these studies and the present one have in common is the question whether learners can fully adapt to a grammatical system different from their own.

In the experiments reported below we used constructions in which local referents are clearly subject to locality conditions even under the most exclusive parameter settings since they are the subjects of a finite clause c-commanding the possessive. As a consequence, locality conditions are not at issue here. It is the encoding of reflexivity in the possessive system that we are interested in. This is by no means intended to imply that Ge1 speakers do not know about reflexivity at all. Interestingly, there is another domain where Ge1 and No1 speakers both have reflexivity built into their systems, i.e. the distribution of reflexive pronouns (Norwegian *seg* (*selv*) and German *sich* (*selbst*)) versus pronouns (*han/hun* and *er/sie*). We will come back to this when we discuss implications for planned work investigating the L1 vs. L2 online processing of reflexivity in section [5]. Whether the L2 parsing system can become fully native-like, transfer or not, is still an open issue that can only be resolved going beyond interpretation data and studying the online processing of grammatical features such as reflexivity (see e.g. Clahsen & Felser (2006)).

[4.2] *Designs and Materials used in the experiments*

The target sentences of the experimental items were constructed in the conditions (19) and (20). A sample item in the *sin* and *hans* conditions in Norwegian is illustrated in (19a) and (19b); (20) is the corresponding German item.

- (19) Det er en kald høstdag i skogen. Emil_{LOCAL} har på seg et skjerf og Magnus_{NON-LOCAL} har på seg lue.
 ‘It is a cold autumn day in the forest. Emil is wearing a scarf and Magnus is wearing a cap.’
- 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 hans], Magnus climbs on the old oak tree.’
- (20) Es ist ein kalter Herbsttag im Wald. Emil_{LOCAL} trägt einen Schal und Magnus_{NON-LOCAL} hat eine Mütze auf. ‘It’s a cold autumn day in the forest. Emil

is wearing a scarf and Magnus is wearing a hat.’

- a. Während Emil_{LOCAL} auf seinen kleinen Hund aufpasst, klettert Magnus_{NON-LOCAL} in der alten Eiche herum. ‘While Emil takes care of his small dog, Magnus is climbing in the oald oak tree.’

All items consisted of discourses with three sentences. The first two sentences set up the context and the third sentence was the target sentence. The first context sentence introduced a scenario without any mention of the referents. Two referents were then introduced in the second context sentence. This was always done using sentence coordination, which should make both referents equally salient. Furthermore, half of the items had coordinations with reference to the local referent (R_{LOCAL}) in the first conjunct while the other half introduced this referent in the second conjunct. The target sentences started with a subordinated *mens/während* (*while*) clause with R_{LOCAL} as the subject followed by a possessive phrase with either a reflexive possessive pronoun *sin* (*his/her own*) or an irreflexive possessive pronoun *hans* (*his*). In the German experiment, only the singular masculine form of the possessive (*sein*) was used. The matrix clause with the non-local referent ($R_{NON-LOCAL}$) as the subject followed the subordinated *while* clause. Within the target sentences reference to the non-local referent thus involved a cataphoric dependency, whereas the local referent preceded the possessive phrase and allowed for an anaphoric dependency. This should lead to a strong preference for local interpretations in the constructions used in our experiments. A consequence of this bias towards the local interpretation is that the experiments reported below were mainly aimed at testing Ge1 No2 comprehension errors with respect to Binding Principle B and not Principle A.

Two baseline control conditions were added to these conditions. The first baseline control condition added another disambiguation beyond reflexivity towards local binding of *sin*. The target sentence with *sin* was therefore split into two independent sentences. In the following we will refer to this condition as *unambiguous local* condition:

- (19) c. Emil_{LOCAL} passer på den lille hunden sin. I mens klatrer Magnus_{NON-LOCAL} i den gamle eika.
‘Emil watches [the little dog sin]. Meanwhile Magnus climbs on the old oak tree.’
- (20) b. Emil_{LOCAL} passt auf seinen kleinen Hund auf. Währenddessen klettert Magnus_{NON-LOCAL} in der großen Eiche herum.
‘Emil takes care of his little dog. Meanwhile Magnus is climbing in the old oak tree.’

An *unambiguous non-local* condition was generated by manipulating the gender of

R_{LOCAL} and changing the male name to a female name throughout the discourse. (19d) and (20c) are discourses with gender-disambiguated reference to $R_{NON-LOCAL}$:

- (19) d. Mens Emma_{LOCAL} passet på [den lille hunden hans], klatrer Magnus_{NON-LOCAL} i den gamle eika.
 ‘While Emma watches [the little dog hans], Magnus climbs on the old oak tree.’
- (20) c. Während Emma_{LOCAL} auf seinen kleinen Hund aufpasst, klettert Magnus_{NON-LOCAL} in der alten Eiche herum.
 ‘While Emma takes care of his little dog, Magnus is climbing in the old oak tree.’

To summarize, the Norwegian experiments (EXPERIMENT 1 and EXPERIMENT 3) employed a 2x2 within design manipulating the factors *possessive* (*sin* vs. *hans*) and *baseline* (possessive form as the only disambiguating information vs. additional disambiguation). The German experiment (EXPERIMENT 2) employed a within design with three discourse conditions (ambiguous vs. unambiguous local vs. unambiguous non-local).

32 completely parallel items such as (19) and (20) were constructed in Norwegian and German. In addition, 70 filler discourses were constructed in a Norwegian and a German version. These fillers systematically distracted away from various properties of the items. The distractors used other types of pronouns than possessive pronouns, they differed in the number of referents and so forth.

A Latin square design was used to create four lists in the Norwegian experiments and three lists in the German experiment such that each participant received each item in only one condition and each item was tested equally often across conditions.

[4.3] Experiment 1: No1 speakers

Methods

Participants: 21 No1 speakers (mean age 35.3 years, range 22–67 years, 15 female) from the Oslo region participated in the experiment. The number of participants was comparable across lists: four participants in the first list, six in the second list, six in the third list, and five participants in the fourth list.

Procedure: The experiment was conducted over the internet. It was implemented using the freely available Onexp software. An experimental session started with written instructions and a collection of relevant participant data. Then the experiment followed with the 102 discourses in a single block. The texts were presented in individually randomized orders of presentation. All experimental materials including instructions were in Norwegian and participants were told that the experiment was part of a larger study including learners of Norwegian.

Condition	Local referent		Non-local referent		Total
<i>Sin</i>	168	(100.0%)	0	(0.0%)	168
Unambiguous local	167	(100.0%)	0	(0.0%)	167
<i>Hans</i>	3	(1.8%)	165	(98.2%)	168
Unambiguous non-local	1	(0.6%)	165	(99.4%)	166
Total	339		330		N = 669

TABLE 3: Absolute and relative number of local vs. non-local referent choices in EXPERIMENT 1.

Interpretations were measured using a forced choice referent selection task. Each discourse was presented together with three potential choices after a question asking for the possessor, e.g. *whose dog is it*: (i) R_{LOCAL} , (ii) $R_{\text{NON-LOCAL}}$, and (iii) *ingen av dem/keiner von beiden (neither of them)*. The alternatives were displayed below each other with *neither of them* always being at the bottom. The presentation order of the local and the non-local referent was counterbalanced across items. Each discourse was presented together with the question and the three answer alternatives on a single screen. After marking their choice by clicking on a radio button, participants moved to the next screen by clicking on a *go on* button. There was no time limit for providing an answer.

Data analysis: Choices of the local referent were coded as local judgments. Choices of the non-local referent or of *neither of them* were coded as non-local judgments. For the items, *neither of them* was chosen only 0.4% of the time. On three occasions the server failed to log an answer in the experimental trials. These were treated as missing values.

In this experiment and in the other two experiments the data were submitted to logit mixed effects model analyses including maximal random effects structures for participants and items (Barr et al. 2013; Jäger 2008). In case at least one cell in the contingency tables reported in the descriptive statistics in the tables below consisted of less than five cases, we computed Fisher's exact test on 2x2 contingency tables instead of logit-mixed-effects analyses.

Results and discussion

Participants chose the correct answer for the fillers 94.9% of the time. All participants scored above 88.0% correct showing that they paid attention to the task.

Table 3 presents the results for the possessive items. In both the *sin* and the unambiguous local condition there were 100% local judgments. In the *hans* and the unambiguous non-local condition there were 98.2% and 99.4% non-local judgments, respectively. Fisher's exact test revealed that the numerical 1.2% difference between these conditions was not reliable (one-tailed test: $p = 0.32$).

Condition	Local referent		Non-local referent		Total
Ambiguous	311	(90.9%)	31	(9.1%)	342
Unambiguous local	334	(97.9%)	7	(2.9%)	341
Unambiguous non-local	27	(7.9%)	313	(92.1%)	340
Total	672		351		N = 1023

TABLE 4: Absolute and relative number of local vs. non-local referent choices in EXPERIMENT 2

The results of EXPERIMENT 1 show that for the constructions used in our study reflexivity is in fact a strong grammatical constraint making binding/coreference between *sin* and a non-local referent and *hans* and a local referent impossible. The disambiguating effect of reflexivity without further gender disambiguation was as strong as the disambiguating effect of the two cues in combination.

[4.4] Experiment 2: Preferences in German

Methods

The German experiment employed the same methods as the previous experiment. All experimental materials including the instructions were in German.

Participants: 32 native German speakers (mean age 30.6 years, range 20–74 years, 20 female) from the region of Tübingen participated in the experiment. 10 participants were randomly assigned to the first list, and 11 participants were tested in the second and third list, respectively.

Results and Discussion

The filler trials were judged correctly 92.8% of the time and all participants judged at least 85% of them correctly. Thus, all participants paid attention to the task.

Table 4 presents the number of local versus non-local referent choices in this experiment. The unambiguous local baseline condition led to local referent choices 97.9% of the time. The unambiguous non-local baseline condition received on average 92.1% non-local referent choices. This implies that in 7.9% of all cases participants incorrectly chose a local female referent for a masculine possessive pronoun — clearly an error. The relatively high proportion of errors in this condition already indicates that establishing a non-local possessor relation to a referent not mentioned yet is highly dispreferred and can thus lead to errors.

The ambiguous condition with two male referents overwhelmingly led to local judgments. This shows that the tested materials have in fact a very strong bias towards local referent choices. The 9.1% non-local referent choices, on the other, suggest that the ambiguous condition is in fact ambiguous and that in line with our assumptions non-local possessor interpretations are possible. That the

difference between the ambiguous and the unambiguous local baseline control was reliable was confirmed by a significant fixed effect of condition in a logit mixed effects analysis. We analyzed the number of local referent choices in the ambiguous condition versus the unambiguous local baseline. The model equation of the computed glmer model in R syntax is provided in (30) (`lme4` package).

(21) `referent choice ~ condition + (1+condition|participant) + (1+condition|item)`

The analysis revealed a significant effect of *condition* (*estimate* = 2.50, *z-value* = 3.49, *p* < .01) due to significantly more non-local referent choices in the ambiguous conditions than in the unambiguous local baseline condition.

The analysis of the German data suggests that the German learners of Norwegian in EXPERIMENT 3 should experience difficulty in the *hans* condition. In this condition, Norwegian grammar requires them to interpret the possessive non-locally, even though in their L1 a local interpretation of a possessive pronoun is strongly preferred for the tested constructions.

[4.5] *Experiment 3: German learners of Norwegian* *Methods*

The methods were the same as those of EXPERIMENT 1 with the following modifications.

Participants: 25 native German learners of Norwegian enrolled in the department of Scandinavian Studies at the University of Göttingen (mean age 24.6 years, range 19–65 years, 20 female) participated in the experiment for payment of Euro five. Six participants completed the first, five participants the second, six participants the third, and eight participants the fourth list, respectively. Learners were recruited from two courses. Twelve of them attended the course *Norwegian III* requiring a level of Norwegian of at least B1 according to the European Reference System, and 13 attended *Norwegian V*, or a *literature course* with a level of Norwegian of at least B2, but also including three speakers with level C1.¹¹

The participant information data showed that the two groups clearly differed in their acquisition level. The B1 group had on average spent 1.4 years learning Norwegian, and the B2+ group had on average spent 3.1 years learning Norwegian (independent samples t-test: $t(23) = 5.25$, $p < .01$). Furthermore, the participants in the B1 group had on average only spent 1 month in Norway, the B2+ group had on average spent six months in Norway.

When asked after the experiment both groups of students of Scandinavian Studies were generally able to correctly state the rules governing the use of reflexive and irreflexive Norwegian possessives and documented that they had been

[11] According to their self-report and that of their course instructor, Victor Hansen (p.c.).

Condition	Local referent		Non-local referent		Total
<i>Sin</i>	198	(99.0%)	2	(1.0%)	200
Unambiguous local	199	(99.5%)	1	(0.5%)	200
<i>Hans</i>	18	(9.0%)	182	(91.0%)	200
Unambiguous non-local	2	(1.0%)	198	(99.0%)	200
Total	417		383		N = 800

TABLE 5: Absolute and relative numbers of local vs. non-local referent choices in EXPERIMENT 3.

taught about their proper use. Also, both groups were able to understand the vocabulary used in our experimental materials. This was confirmed by a vocabulary test asking for translations of the intuitively most difficult word of each of the items (B1: 87.5% correct, B2+: 91.4% correct).

Procedure: The first part of the experiment was identical to EXPERIMENT 1. After the main experiment a brief vocabulary test was added asking for translations for the most difficult 32 words used in the items (one word from each item). Participants were shown the word together with a list of four potential German translations with only one being correct.

After the vocabulary test participants were explicitly asked for grammatical rules that govern the correct use of the Norwegian possessive forms *sin*, *hans*, *hennes* and *deres*. They were also asked whether they had been taught about the proper use of Norwegian possessive forms.

Results and Discussion

The filler trials were judged correctly 90.3% of the time and all participants except for one (78% correct) judged at least 85% of them correctly. Thus, all participants paid attention to the task.

The performance was almost native-like for the experimental items, too. The *sin* condition and the local unambiguous baseline condition both received 99% local referent choices, Fisher's exact test revealed that the two conditions did not differ significantly from each other (one tailed test: $p = 0.50$). However, this result should not be surprising given the bias towards local referent choices in the constructions tested.

Performance in the *hans* condition showed that the learners were generally able to overcome this bias in accordance with the requirements of irreflexive Norwegian possessive pronouns. In more than 90% of the experimental trials they chose the non-local referent. However, they did so slightly less often than in the unambiguous non-local condition where 99% non-local referent choices were observed. A logit mixed effects model analyzing these two conditions revealed a

Level/condition	Local choices		Non-local choices		Total
B1					
<i>sin</i>	96	(100%)	0	(0%)	96
Unambiguous local	96	(100%)	0	(0%)	96
<i>hans</i>	6	(6%)	90	(94%)	96
Unambiguous non-local	1	(1%)	95	(99%)	96
B2+					
<i>sin</i>	102	(98%)	2	(2%)	104
Unambiguous local	103	(99%)	1	(1%)	104
<i>hans</i>	12	(12%)	92	(89%)	104
Unambiguous non-local	1	(1%)	103	(99%)	104
Total	417		383		N = 800

TABLE 6: Local vs. non-local choices in EXPERIMENT 3 contingent on linguistic proficiency.

marginally significant fixed effect of *condition* ($estimate = -6.27, z = -1.73, p = 0.08$), see (21) for the model equation. Thus, even though this happened only very rarely learners failed to apply Binding Principle B. This finding clearly contrasts with what we have observed for the Norwegian L1 speakers in EXPERIMENT 1 with absolutely no difference between the *hans* condition and the unambiguous non-local baseline control condition.

Finally, we looked into the number of local vs. non-local referent choices in the four conditions contingent on linguistic proficiency to investigate whether proportions of errors decrease with proficiency. Because the two groups were too small for inferential statistics only descriptive statistical analyses were conducted. The results are summarized in table 6. Both subgroups made errors. The B2+ group had even somewhat higher error rates than the B1 group. In summary, both groups showed an almost native like command of Norwegian possessive pronouns, but the rarely occurring errors concerning Principle B seem to be persistent across learner groups and can even be found in rather advanced learners. We would like to emphasize that this has to be considered a preliminary result. Larger samples are needed to validate these claims

[4.6] Summary: No2 interpretation by Ge1 comprehenders

In this section we have reported three experiments that provide evidence for transfer effects on the interpretation of No2 possessives by Ge1 No1 learners.

Only in case reflexivity enforced an interpretation inconsistent with their L1 preference for resolving the possessor argument of ambiguous possessives, the learners slightly deviated from the Norwegian system. These errors due to negative transfer from their L1 turned out to be rather small, though. The effect was a less than ten percent increase in error rates relative to the unambiguous irreflexive *hans* condition. This shows that overall learners were quite successful in acquiring the reflexivity feature of the Norwegian possessive system crucially absent in their L1.

We also compared the observed learner errors in the *hans* condition for the two learner subgroups. Even though the sample sizes are too small to draw firm inferences, the observed errors seem to be persistent across the two groups of different proficiency levels. Further experiments testing more participants and even more advanced learners ideally in immersion contexts are needed to confirm these first, preliminary results.

Why do we interpret the observed learner errors as a transfer effect instead of a general learner effect (in the sense of [Clahsen & Felser \(2006\)](#))? A general learner effect should probably affect the interpretation of both, reflexive and irreflexive possessives. However, errors were only observed for irreflexive possessives. We think that this asymmetry in the distribution of errors nicely fits the German system; cf. the preferences observed in EXPERIMENT 2. In addition, in our planned online study to be outlined in the next section we will distinguish more precisely between general learner effects, on the one hand, and effects of linguistic transfer, on the other. Studying the online interpretation of possessives opens up the possibility to separate these two prominent aspects of L2 processing from each other in a methodologically sound way.

[5] SUMMARY, CONCLUSION AND OUTLOOK

In this paper we have presented two types of studies on the acquisition of the possessive systems of Norwegian and German by speakers of German and Norwegian respectively. The first study consisted of an error analysis of translation data from and into the L1 against which we tested our hypotheses concerning the difficulties to be expected on the basis of the systemic differences. Our hypotheses were largely confirmed by the data (translation products): For the German learners of Norwegian, the divergence of *sein** into *si** and *hans*, *hennes*, i.e. the (ir)reflexivity condition of the Norwegian possessive, was shown to represent the greatest difficulty, while the divergence of the reflexive *si** into *sein** and *ihr** constituted the main obstacle for the Norwegian learners of German. In 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.

The second study (section [\[4\]](#)) employed an offline interpretation task and investigated the NO2 interpretation of possessives by Ge1 No2 learners. Referent

choices in NO2 were compared to the No1 and Ge1 interpretation. The results show that the interpretation of Norwegian possessives by German learners slightly differs from that of L1 speakers of Norwegian. Furthermore, the findings suggest that even quite advanced learners are still prone to errors. We interpreted the observed errors as effects of negative transfer from German to Norwegian because errors were restricted to the syntactic condition in which the preferences for German work in the opposite direction than the syntactic constraint on the interpretation of the irreflexive Norwegian possessives.

We think this is a likely interpretation. However, it must be emphasized that this interpretation goes well beyond what the presented data really show (see, e.g. Meisel (2000) and Roberts et al. (2008) for a discussion on the methodological challenges to distinguish transfer from other L2 effects). The present study can therefore only serve as a first step. Future research should extend the reported research in two directions.

First, No2 learners with different language backgrounds should be tested on the materials used in our study. In particular, learners with an L1 also marking reflexivity in its possessive system as, for instance, Russian (see Fabricius-Hansen et al. (2017)) would be a highly relevant sample for comparison. If our assumption is correct that the reported errors are in fact mainly due to language transfer, these learners should make fewer errors relating to local versus non-local binding than German No2 learners or even be indistinguishable from the No1 control group.

Secondly, instead of comparing different language samples we can compare different parts of the pronominal system even within the same sample of Ge1 No2 speakers. In our future research we will contrast the interpretation of Norwegian possessives by Ge1 No2 learners with the same speakers' interpretations of reflexive and personal pronouns. Importantly, the respective systems of ordinary pronouns are not subject to cross-linguistic differences and we would therefore expect to see no interpretation errors in this part of the (pro-)nominal system. This offers us the opportunity to study transfer in individual speakers by comparing application of the binding principles in two domains – the first subject to cross-linguistic differences versus a second domain that is cross-linguistically stable. We would like to note that for 'ordinary' reflexive and irreflexive pronominal forms exactly the same design can be used as the one employed in the experiments reported in the previous section:

- (22) Sarah und Maren haben sich gestern auf eine Tasse Tee getroffen. Während Maren_{LOCAL} eine Tasse Tee für sich zubereitete, schnitt Sarah_{NON-LOCAL} den Kuchen in Stücke.

Lit.: 'Sarah and Maren met yesterday to have a cup of tea together. While Maren was preparing a cup of tea for herself, Sarah cut the cake into pieces.'

- (23) Während Maren_{LOCAL} eine Tasse Tee für sie zubereitete, schnitt Sarah_{NON-LOCAL} den Kuchen in Stücke.
 Lit.: ‘While Maren was preparing a cup of tea for her, Sarah was cutting the cake into pieces.’

As mentioned in the course of the discussion, (free) translation as a test has its limits, since it allows informants to opt for solutions that may disguise his/her actual attainment of the foreign language. In order to avoid priming by the source text items, data from free production should be elicited. The offline interpretation study reported on in section [4] is a first approximation to test comprehension more systematically. This test design should be extended to include other carefully structured syntactic environments for the possessives in order to get a better picture of the learners’ acquired competence and the levels of restructuring attained. Structured monolingual production tests are needed to avoid the limitations inherent in offline translation tests.

From a cognitive point of view it would be highly welcome to complement our analyses of error rates with online measures sensitive to the interpretation processes during realtime interpretation (see, e.g. Clahsen & Felser (2006), for a discussion on online vs. offline L2 interpretation). The design used in the interpretation experiments reported above is also appropriate for experiments using the visual-world paradigm (cf. Cooper (1974); Huettig et al. (2011)). Currently, we are preparing these online experiments and the experiments from Section [4] will serve as point of comparison between online and offline interpretation data. Based on the results reported above and the literature on L2 processing we expect to find clear differences in the time course of native and non-native possessive interpretation. These differences will probably turn out to be much stronger than the rather subtle offline effects reported above. Translation under eye tracking and key logging is also an interesting testing ground to be developed for further study (see Behrens (2017) for such a study on the language pair English-Norwegian).

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AN EMPIRICAL L2 PERSPECTIVE ON POSSESSIVES: FRENCH/NORWEGIAN

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ABSTRACT

The main objective of this paper is to present empirical evidence for transfer effects between Norwegian (as L1 or L2) and French (as L1 or L2). We start out with theoretical assumptions from a contrastive-comparative treatment of possessives in European languages (Fabricius-Hansen et al. 2017) and develop hypotheses for L2-acquisition of possessive systems in Norwegian and French. The various degrees of complexity between the two linguistic sub-systems lead to different kinds of challenges in L2-acquisition based on morphological, syntactic and semantic criteria. Norwegian has a morphologically more complex possessive system than French. The French learner of Norwegian as L2 then has to acquire a system with more formal options than in her mother tongue, whereas the Norwegian learner of French as L2 acquires a system with less formal options. Based on empirical findings, the paper shows why some parts of the possessive L2 systems are harder or easier to handle than others.

[1] INTRODUCTION

In this chapter, we discuss empirical questions related to the acquisition of the possessive systems in French as L2 (Fr2) and Norwegian as L2 (No2). Based on the theoretical background of Fabricius-Hansen et al. (2017) we will see how the diverging possessive systems of the two languages in question represent challenges for production as well as comprehension. The main objective of this chapter is to present empirical evidence for transfer effects between the learners' L1 and the L2.

In section [2] we recall some of the main points concerning the contrasts between the French and Norwegian system. We develop in section [3] some hypotheses for the language pair Norwegian-French which are tested against data from our empirical investigation. As will be clear, the tests can be elaborated and refined for future research.

[2] NORWEGIAN AND FRENCH POSSESSIVES IN CONTRAST

Norwegian has two sets of possessive determiners marking morphologically the reflexive-irreflexive distinction in the third person:¹

- (1) Han_i fant igjen bilen sin_i/sin_i bil.
he found again car.DEF POSS.REFL/POSS.REFL car
- (2) De_i fant igjen bilen sin_i/sin_i bil.
they found again car.DEF POSS.REFL/POSS.REFL car
- (3) *Han_i fant igjen bilen hans_i/hans_i bil.
he found again car.DEF his.IRREFL/his.IRREFL car
- (4) *De_i fant igjen bilen deres_i/deres_i bil.
they found again car.DEF their.IRREFL/their.IRREFL car

The reflexive possessives in (1) and (2) (through coindexation and principle A of Binding Theory) are bound by the pronominal subjects meaning unambiguously that *he* and *they* necessarily got their own cars back. In contrast, the irreflexive possessives in (3) and (4) exclude binding from the subjects, meaning that the pronominal subjects (*he* and *they*) found someone else's car, not their own. In such cases, reflexive and non-reflexive possessives are in complementary distribution.² When comparing the Norwegian examples in (1)–(2) and (3)–(4) with their French counterparts in (5)–(6), we see that the obligatorily preposed French possessives *son* and *leur* accept binding both clause-internally – from the local subjects (*il* and *ils*) – and clause-externally. The French third person possessives however vary in number with respect to the possessor, yielding third person singular *son* or plural *leur*:

- (5) Il_i a retrouvé sa_{i/j} voiture/*voiture sa.
he found again POSS car
- (6) Ils_i ont retrouvé leur_{i/j} voiture/*voiture leur.
they found again POSS car

Concerning the reflexivity parameter the French possessive determiners in (5) and (6) are thus potentially ambiguous, letting the context decide if they are to be interpreted as reflexives or non-reflexives. Tables 1 and 2 summarize the properties

[1] The Norwegian possessive may occur in postnominal or prenominal position. In the former case the head noun must be doubly specified for definiteness, through a definite suffix (*bil-en*) and the postposed possessive determiner (see Fabricius-Hansen et al. (2017), section 3.3).

[2] It should be mentioned that examples like the starred (4) with plural possessor and reflexive meaning of the non-reflexive form (*deres*) are in fact easily attested for Norwegian. They are still considered ungrammatical for normative reasons (**De_i fant igjen bilen deres_i/deres_i bil*), cf. Fabricius-Hansen et al. (2017), section 3.1.

Inherent properties of antecedent (possessor) DP/referent	Possessive	Reflexivity (Binding condition)
Sg. Masc./Fem.	<i>s*^a</i>	Neutral (\pm local binding)
Plural	<i>leur*</i>	

[a] The starred short forms, *s**, *leur** etc. mean that these are variants of fully inflected forms: *son/sa/ses* – *leur/leurs* etc.

TABLE 1: French third person possessives.

Inherent properties of antecedent (possessor) DP/referent	Possessive	Reflexivity (Binding condition)
No restrictions	<i>si*</i>	Reflexive (local binding)
Sg. masc. human	<i>hans</i>	Irreflexive (non-local binding)
Sg. fem. human	<i>hennes</i>	
Sg. comm. nonhuman	<i>dens</i>	
Sg. neut. (nonhuman)	<i>dets</i>	
Plural	<i>deres</i>	

TABLE 2: Norwegian third person possessives.

of the French possessive system in the third person compared to Norwegian.

French is similar to German in not distinguishing between reflexive and irreflexive possessives (Fabricius-Hansen et al. (2017) and Pitz et al. (2017)). Moreover, neither German nor French makes the human/nonhuman possessor distinction. But contrary to German, French does not mark the gender of the possessor whether in the singular or the plural. In other words, *son N* may apply to a third person singular human possessor – either masculine (*son N à lui*) or feminine (*son N à elle*) – and even to a third person singular nonhuman possessor. Once the (human or nonhuman) *s**-possessor stem is determined, the agreement features on the noun are given by the possessum noun alone: *son/sa/ses N*.

The French learner of No2 has to deal with a morphologically (far) more complex system in the target language than in her mother tongue, and the morphological similarities between the systems, French *s** and Norwegian *si** – turning out to be false friends – even open up for wrong transfer predictions; see Fabricius-Hansen et al. (2017, section 4). What is an explicit marking in Norwegian both for the reflexive-irreflexive and for the \pm human possessor distinction (between *si** and *hans/hennes/dens/dets/deres*) is subsumed under one single form in the third person singular in French. Yet, without making the reflexive and irreflexive distinction, French has separate forms for third person singular and plural possessors.

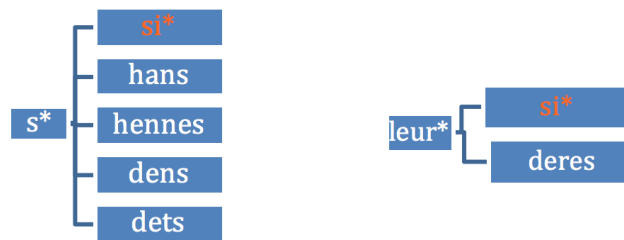


FIGURE 1: French-Norwegian divergence-convergence.

Conversely, Norwegian learners of Fr2 acquire a system on the one hand with less morphological options (no reflexive-irreflexive marking, no gender marking of the possessor, no \pm human marking of the possessor), but on the other hand with additional marking of the number feature (s^* vs. $leur^*$) of the possessor which in Norwegian is marked only in the non-reflexive paradigm.

The differing points between the French and Norwegian systems may be summed up in a simplified fashion as in figure 1.

Our main objective in the following is to determine how such systemic differences influence the processes of acquiring Norwegian or French as L2 by French and Norwegian speaking learners respectively. In the next sections, we formulate some specific hypotheses both relating to the command of No2 possession by French learners and Fr2 possession by Norwegian learners and test them against data.

[3] HYPOTHESES AND EMPIRICAL TESTS

[3.1] Norwegian as L2: testing French learners' command of No2 possessives

We predicted in [Fabricius-Hansen et al. \(2017\)](#) that French No2-learners have problems choosing between possessive si^* and its irreflexive counterparts *hans/hennes/dens/dets/deres*. One could therefore formulate a hypothesis like the following:

H1 French No2+ learners of Norwegian make errors involving si^* versus *hans/hennes/dens/dets/deres*.

Let's see how this hypothesis can be tested. In the first place we will distinguish between grammaticality judgment tests and translation tests focusing both on relevant linguistic knowledge (judgment tests) and on production and comprehension tasks (translation tests).

Judgment test

We find evidence for H1 in a (monolingual) grammaticality judgment task performed on 14 French learners of Norwegian, all aged between 16 and 18 with two to three years of Norwegian training in school (three hours per week). The tests

took place at *Lycée Alain Chartier* in Bayeux during the spring and autumn of 2016 where Norwegian is taught as an optional subject based on the Norwegian upper secondary school system.³ The judgment test contained twelve Norwegian test sentences with determiners including possessives followed by five contextually isolated sentences for translation French-Norwegian and took the following form (see appendix for the full test):⁴

Test 1: No2 grammaticality judgment test

Le possessif en norvégien

Test de jugement grammatical^a

Déterminez si les possessifs soulignés dans les phrases suivantes sont acceptables ou non.

Akseptabel = acceptable/ikke akseptabel = non acceptable/vet ikke = je ne sais pas.

- (i) Kristoffer har tre brødre, men han har ikke sett den yngste av brødrene hans det siste året.

hans = akseptabel/ikke akseptabel/vet ikke

- (ii) Jeanette rydder sjelden rommet sitt.

sitt = akseptabel/ikke akseptabel/vet ikke

- (iii) Christian har en søster. Søsteren sin er lærer.

sin = akseptabel/ikke akseptabel/vet ikke

- (iv) Foreldrene solgte huset sitt da de flyttet til Frankrike.

sitt = akseptabel/ikke akseptabel/vet ikke

[a] 'Grammaticality judgment test. Decide if the underlined possessives in the following sentences are acceptable or not: acceptable/non-acceptable/don't know.'

[3] The upper secondary school in the Norwegian system has three levels: VG1, 2 and 3. In our data set we have nine informants from Bayeux from the spring of 2016 — of which seven are from VG2 and two from VG3. We still only count 14 informants from Bayeux in our samples below. The reason is that seven of the first nine informants took the same test six months later. The total number of informants are therefore 14.

[4] To date, no large scale experiments have been conducted on the acquisition of either Fr2 by Norwegian learners or No2 by French learners (but see Woldsnes (2013) for comparisons between the two systems for inalienables). What we refer to below must therefore be seen as preliminary tests. These tests have been designed by Anne-Kathrine Woldsnes and Hans Petter Helland (both from the University of Oslo) with input from the SPROSS-group, <http://www.hf.uio.no/ilos/english/research/projects/language-as-product-and-process/>, cf. Fabricius-Hansen et al. (2017).

Test 1 includes clear-cut grammatical as well as ungrammatical sentences, for instance (7)-(8):⁵

- (7) Jeanette_i rydder sjeldent rommet √sitt_i.
Lit.: 'Jeanette seldom cleans her._{REFL} room.'
- (8) Kristoffer_i har tre brødre, men han_i har ikke sett den yngste av brødrene
*hans_i (√sine_i) det siste året.
Lit.: 'Kristoffer has three brothers, but he has not seen the youngest of
*his._{IRREFL} (√his._{REFL}) brothers the last year.'

The main focus of the test is on third person possessives, both singular and plural, and mainly based on the reflexive–irreflexive distinction. The judgments of the informants will then give us an indication of how well the reflexive–irreflexive distinction is integrated in the grammar of the French No2 learner

Let's have a look at some examples. Since the possessive in (8) refers back to the subject referent of the same clause, the only grammatically correct form is the reflexive *sin*. The example in (8) is therefore clearly ungrammatical. However, five of fourteen French No2 students found the sentence acceptable, two were uncertain and only 7/14 judged it (correctly as) ungrammatical. The same pattern is repeated for the ungrammatical (9), which demands a reflexive *sin*:

- (9) Bestemor har nettopp kjøpt hus med hage. Hun_i liker å være i hagen
*hennes_i (√sin_i).
Lit.: 'Grandmother has recently bought a house with garden. She likes to be in *her._{IRREFL} (√her._{REFL}) garden.'

Seven informants accepted this sentence, four were uncertain (based on the answer *vet ikke* 'don't know') and only three judged it (correctly) as ungrammatical. Even more strikingly, in non-local binding cases like (10) where Norwegian reflexives are clearly out, a number of the French informants accepted *si**:

- (10) Christian har en søster. Søsteren *sin_i (√hans_i) er lærer.
Lit.: 'Christian has a sister. His._{REFL} (√his._{IRREFL}) sister is teacher.'

Five informants considered (10) as grammatical, two were uncertain, and only seven judged it (correctly) as ungrammatical.

From our data, there thus seems to be a tendency for the French No2 learner of Norwegian to overgeneralize the usage of *si**-forms, corroborating H1 above as a false friend-effect. This pattern can be explained by the systemic differences between the languages since French does not make the reflexive-irreflexive distinction at all. When a Norwegian irreflexive *hans* or *hennes* is used wrongly instead

[5] For clarification for the reader of this paper, co-indexing has been added.

of the reflexive *si** ((7)-(9) above), most of our informants judge it grammatical, which means that, in this case, they base their judgment not on formal similarities between L1 and L2. We cannot rule out, either, a possible influence of English as L2 in the narrow sense. On this account, there is potential evidence for transfer, but this time from L2 to L3. As we have seen in [Fabricius-Hansen et al. \(2017\)](#), transfer may stem from L1 (and even Universal Grammar) or possibly L2 if the language acquired is L3 or L3+. Such questions are empirical in nature, and need further testing. For French speaking learners of Norwegian (in northern France), English may indeed be a L2 source for transfer into Norwegian L3.⁶ These are all instances of negative transfer.

Conversely, we expect that in cases where *s**-forms are used in both languages, there should be positive transfer from L1 to L2. We formulate the hypothesis in H2:

H2 When *si** corresponds to *s**, French No2+ learners make less errors.

We find support for H2 in (11) below. For such cases there is in fact a vast majority of correct judgments (11/14):

- (11) Jeanette_i rydder sjelden rommet **sitt**_i.
Lit.: 'Jeanette seldom cleans her._{REFL} room.'

However, the correct judgment of the reflexive case in (11) does not mean that all the informants have acquired the reflexivity contrast. Rather, the informants tend to interpret, more generally, the Norwegian *si** in accordance with the *s**-possessive in their French L1.

Translation test

Our judgment data are supported by the bilingual translation data of test 2:

Test 2: Translation into No2

Traduisez les phrases suivantes en norvégien :^a

(i) Ils ont acheté leur maison en 2010.

(ii) Il a oublié son sac à la maison.

[6] Transfer from L2 to L3 is labelled lateral transfer in [Jarvis & Pavlenko \(2008\)](#).

(iii) Marie a un oiseau. Son oiseau est apprivoisé.

(iv) Les ouvriers se plaignent à leur patron parce qu'ils veulent améliorer leurs conditions de travail.

(v) Nous avons nos habitudes et vous avez les vôtres.

[a] Translate the following sentences into Norwegian.

In the translation test the (French) No2 learner has to decide whether to use the reflexive (*si**) or the non-reflexive forms (*hans/hennes/dens/dets/deres*). In addition (s)he has to choose between the prenominal or the postnominal position of the possessive, and, in the latter case, associate the position of the possessive with double definiteness (see [Fabricius-Hansen et al. \(2017\)](#); [Julien \(2003, 2005\)](#); [Lødrup \(2011\)](#)). It should be noted that both for the judgment and the translation test the French informants are fully aware of being tested for possessives.

Based on the fact that French lacks the reflexive-irreflexive marking, yet distinguishes between singular and plural third person possessors, we predict that French No2 learners will have problems (H1) acquiring the distinction between the possessor oriented plural interpretation of the reflexive *s** and the irreflexive *hans/hennes/deres* etc. We find errors in the translation test like (12) (non-local binding requires *hennes*) and (13) (the correct form being *sitt*):

- (12) Marie_i a un oiseau. **Son**_i oiseau est apprivoisé.
 Marie har en fugl. Fuglen ***sin** (√**hennes**) er tam.
 Lit.: 'Mary has a bird. *Her.REFL (√her.IRREFL) bird is tame.'

For (12), only seven informants chose the (correct) non-reflexive *hennes*, while the other half of the test group opted for the (incorrect) reflexive (*fuglen *sin*), sometimes with agreement errors: *fuglen *sine* – *fuglen *si* etc.

- (13) Ils_i ont acheté **leur**_i maison en 2010.
 De kjøpte huset ***deres** (√**sitt**) i 2010.
 Lit.: 'They bought their.IRREFL (√their.REFL) house in 2010.'

Out of the fourteen informants only four chose the (correct) *si**-form in (13), although sometimes with agreement errors: *huset *sin*. At a higher decision level, the possessum-oriented nature of their French mother tongue system combined with ±reflexive-irreflexive marking makes Norwegian hard to acquire by the French speaking learners.

Other cases

As we have seen in [Fabricius-Hansen et al. \(2017\)](#) there are well known systemic differences between Norwegian and French at the morphological and syntactic level related to position and definiteness (see also [Julien \(2003, 2005\)](#); [Lødrup \(2011\)](#)). There is a tendency in Norwegian to postpose the possessive combined with obligatory double definiteness: *bil-en hans* – **bil hans*. Curiously, the position of the possessive does not seem to represent particular problems for any of the French No2 learners. Even the double definiteness feature is largely acquired, especially in the singular. For instance, the translation of *leur maison* in the translation test (sentence 1) has a hundred percent rate of correct definite *huset* followed by the (often wrong) possessive. The same goes for *son sac*, *son oiseau* and *leur patron*. For the plural *leurs conditions de travail* and *nos habitudes*, however, the results are quite different. Virtually none of the (fourteen) informants have acquired the definite plural. We rather get the erroneous: **arbeidsforhold sine* – **arbeidsforhold deres* instead of (the correct) *arbeidsforhold-ene sine* etc.⁷

[3.2] *French as L2: testing Norwegian learners' command of French possessives*

Not surprisingly, the complex nature of the reflexive-irreflexive distinction in Norwegian also plays a role when Norwegian speakers acquire French as L2. In fact, a challenge for Norwegian Fr2 learners is the problem of acquiring the possessor-related distinction between singular *s** and plural *leur** when used reflexively. Based on the theoretical outlook of [Fabricius-Hansen et al. \(2017\)](#), we may thus make the following hypothesis:

H3 Norwegian Fr2 learners make errors involving *s** and *leur**. More generally, *s** tends to be generalized in plural possessives.

We have designed three different tests in order to verify this hypothesis. The tests are mainly intended for production-comprehension data (translation and cloze tests), but they also indicate aspects of the informants' general level of linguistic knowledge (judgment test). By analyzing learner data from different sources we aim at a better understanding of the mechanisms at stake in the acquisition of French as L2.

[7] For a more general treatment of the syntax of possessives, see [Fabricius-Hansen et al. \(2017\)](#) and references therein: [Alexiadou et al. \(2007\)](#), [Cardinaletti \(1998\)](#). For the syntax of French possessive determiners, see [Peteghem \(2012\)](#) and [Zribi-Hertz \(2003\)](#).

Translation tests

For Norwegian Fr2-learners we have various tests but the purpose of them is never explicitly marked. First, (bilingual) translation tests both into (test 3 below) and from Norwegian (test 4):

Test 3: Translation Fr2→No1

Traduisez le texte suivant en norvégien :^a

Nicolas Sarkozy et Carla Bruni

Il est bien rare que Nicolas Sarkozy manque un concert de **sa** belle Carla Bruni-Sarkozy, qui avait dû mettre entre parenthèses **sa** carrière lors de **son** passage à l'Élysée. Il est sans doute **son** plus grand fan. Et lorsqu'il arrive devant la salle, on est souvent en droit de se demander si les personnes présentes ne viennent pas assister à un meeting de **leur** ancien président.

Depuis le début de sa tournée pleine de poésie en novembre dernier, Carla Bruni a pu compter sur le soutien inconditionnel de **son** époux, qui a assisté à plus d'une vingtaine de **ses** concerts. À Béziers, le 17 janvier dernier, il avait dit : "C'est **mon** dix-septième concert, **mon** dix-septième !" "

Ce qui ne change pas, c'est l'ovation que reçoit Nicolas Sarkozy par le public, et chaque concert est donc l'occasion pour lui de constater que **sa** popularité reste intacte. Dès qu'il le peut, il met Carla en avant, **ses** talents de chanteuse, **son** aisance sur scène. Lorsque dans la coulisse Nicolas Sarkozy se montre un peu trop élogieux, **son** épouse n'hésite pas à le reprendre : "Ne parle pas trop, **mon** amour, ça risquerait de se retrouver dans la presse." Et lui de répondre : "Vous voyez, c'est elle la patronne de **notre** couple !"

Si c'est elle la patronne de **leur** couple, Nicolas Sarkozy reste pour beaucoup le patron de l'UMP et notre candidat le plus crédible à l'élection présidentielle de 2017. Mais si la politique fait encore partie intégrante de **sa** vie, Nicolas Sarkozy n'oublie pas **sa** famille. La preuve avec cet avion privé que loue l'ancien président pour certains concerts en province, afin de permettre à **son** couple de retrouver rapidement **leurs** enfants.

soutien (m)	– støtte	louer	– å leie
inconditionnel	– betingelsesløs	patron (m), patronne (f)	– sjef
ovation (f)	– hyllest	crédible	– troverdig
aisance (f)	– letthet	preuve (f)	– bevis
élogieux	– rosende	en province	– i provinsen

[a] 'Translate the following text into Norwegian.' For clarification again, we have put all the possessives in bold.

Test 4: Translation No1→Fr2

Traduisez le texte suivant en français :^a

Edvard Grieg var en norsk komponist. I Norge er han best kjent for **sin** musikk til diktene av Aasmund Olavsson Vinje, mens det i utlandet var musikken **hans** til Henrik Ibsens tekster som ble lagt mest merke til. Grieg tilbrakte mye tid i utlandet, og var ofte på konsertreiser, hvor han akkompagnerte **sin** kone Nina Hagerup. Hun opptrådte også ofte sammen med mannen **sin**, og **deres** konserter i Europa fikk gode kritikker. Hun var en utmerket pianist, men det var først og fremst stemmen **hennes** og **dens** helt spesielle klang som fascinerte Edvard Grieg. Hagerup fortsatte også å delta på konserter etter **sin** manns død.

Grieg fikk **sin** første musikkutdannelse av moren sin. Han dro allerede som 15-åring til musikkhøyskolen i Leipzig for å studere, men fikk etter hvert et anstrengt forhold til skolen og lærerne der på grunn av **deres** innstilling til musikken **hans**. I 1867 giftet han seg med Nina Hagerup, som faktisk var kusinen **hans**. **Deres** eneste barn døde bare 13 måneder gammel, noe som var spesielt tungt for Nina, som også hadde mistet foreldrene **sine**. Moren **hennes** var teaterinstruktør og hadde hatt stor betydning for henne. I 1884 flyttet Grieg og Hagerup til Trolldhaugen, hvor de bodde resten av livet.

I dag er Trolldhaugen museum, og huset med møblene er godt bevart. Her kan man lære mye interessant om Edvard Grieg, **hans** kone og **deres** liv i utkanten av Bergen. På Trolldhaugen blir det også arrangert konserter med band både fra Norge og fra utlandet, som kommer til Bergen med **sine** tolkninger av Griegs musikk.

[a] Translate the following text into French. Again, for clarification, we have put all the possessives in bold.

The French text (test 3) has a number of possessives to be dealt with, for instance *sa belle Carla Bruni* ‘his beautiful CB’ – *sa carrière* ‘her career’ – *son passage* ‘his accession to...’ – *son plus grand fan* ‘her biggest fan’ – *leur ancien président* ‘their former president’ – *son époux* ‘her husband’ – *ses concerts* ‘her concerts’ – *mon dix-septième concert* ‘my 17th concert’ etc. These include both reflexive (locally bound) and non-reflexive (non-locally bound) uses in French, which must be made explicit in Norwegian; third person singular and plural possessives, first and second person deictic possessives, position of the possessive, and so on.

The Norwegian text (test 4) is the other way around. Explicit reflexive and non-reflexive marking in the third person singular and plural of Norwegian must be rendered in the less morphologically specified French system. In other words, the predominantly possessor-oriented system of Norwegian must find its correspondences in the possessum-oriented system of French. The Norwegian text has forms like *sin musikk* ‘his.REFL music’ – *musikken hans* ‘his.IRREFL music’ – *sin kone* (his.REFL wife) – *mannen sin* ‘her.REFL husband’ – *deres konserter* ‘their.IRREFL concerts’ – *stemmen hennes* ‘her.IRREFL voice’ – *dens helt spesielle klang* ‘its.IRREFL exceptional

sound' – *sin manns død* 'the death of her._{REFL} husband' etc.

The translation tests had participants both from the University of Oslo and the University of Caen, thus marking the distinction between students in an immersion context (Caen) and Norwegian students at home (Oslo). The Caen students were Norwegian students going to France (Caen) for one year studying French as L2 based on the Norwegian university system. The Norwegian students of French L2 at the University of Oslo follow the same program, but this time in a local Oslo University setting.

For the French to Norwegian (Fr2→No1) translation, we had 36 L2 learners of French at the University of Oslo during the autumn of 2015 and 14 L2 learners of French in an immersion context at the University of Caen. For the Norwegian to French translation, we had 21 L2 learners of French at the University of Oslo during the autumn of 2015 and 14 L2 learners of French in an immersion context at the University of Caen. Both groups had studied French grammar at the University level for about two months (requiring that they have two years of training in French from upper secondary school) and had been exposed to explicit teaching and training in determiner syntax and semantics, including possessives. The testing was done in the classroom and took approximately half an hour.

H3 is easily corroborated by our data. In the translation test 4 (No1→Fr2), we find the following examples:

- (14) Hun_i opptrådte ofte sammen med mannen **sin**_i, og ([hun og mannen sin]_j=) **deres**_j konserter i Europa fikk gode kritikker.
Lit.: 'She often acted with her._{REFL} husband and their._{IRREFL} concerts in Europe received good reviews.'
- (15) På Troidhaugen blir det også arrangert konserter med band_i både fra Norge og fra utlandet, som kommer til Bergen med **sine**_i tolkninger av Griegs musikk.
Lit.: 'At Troidhaugen concerts are also staged with bands both from Norway and abroad that come to Bergen with their._{REFL} interpretations of Grieg's music.'

Both in (14) and (15) there are semantically plural possessors: *she and her husband* for the non-reflexive *deres* (14) and *bands from Norway and abroad* for the reflexive *sine* (15). Our immersion-group from Caen, having fourteen participants, had no problems at all rendering *deres konserter* in their French translations. Of the 14 informants, only one missed out by saying **ses* concerts. The rest of the group used the correct stem form *leur*^{*}, even with the correct possessum-agreement in all but one case: *leurs concerts*. This shows that the possessor-related plural possessive *leur*^{*} has indeed been integrated in the students' L2 grammar in its non-reflexive (non-locally bound) use.

Turning now to (15), where the reflexive possessive *sine* is related to the lexical plural possessor *bands from....*, the results in the same Caen group are quite different. In this case, only three out of 14 participants chose **leur***. Six of them opted for a variant of the incorrect stem form **s***, while the rest of the group (five participants) either chose a non-possessive variant or did not answer the question. Since the same group had shown earlier in the test that they had in fact learned the correct plural possessor-related form *leur*, the high percentage of **s***-forms for Norwegian *sine* indicates a strong transfer effect.

In the same vein we occasionally find transfer errors for Fr2 learners' translations from French source texts into Norwegian L1 (test 3) when the Norwegian reflexive *si*-form is clearly ungrammatical (the example is taken from the Caen immersion group):

- (16) Mais si la politique fait encore partie intégrante de **sa**_i vie, Nicolas Sarkozy_i n'oublie pas **sa**_i famille.
 Men hvis politikken tar enda del av ***sitt** (√**hans**) liv, glemmer ikke Nicolas Sarkozy **sin** familie (= *sa famille*).
 Lit.: 'But if politics is still an integrated part of ***his.REFL** (√**his.IRREFL**) life, Nicolas Sarkozy does not forget **his.REFL** family.'

The correct forms should be non-reflexive for the first possessive (**hans liv**), and reflexive for the second (**sin familie**). This seems to be an example of L2 to L1-transfer (or *reverse transfer* in the sense of [Jarvis & Pavlenko \(2008\)](#)).

Even in cases where Norwegian uses postnominal possessives, the *si**-*s**-correspondence is early established, with very few errors. In the translation test No1→Fr2 of (17) containing the postnominal *sin*, all the informants in the Caen group had the translation right, 19/21 in the Oslo group:

- (17) Hun_i opptrådte også ofte med mannen √**sin**_i...
 Lit.: 'She acted also often with her.REFL husband.'

Hence, for (17), all the Caen informants used the correct form **son** followed by *mari* or *homme*. **Son mari** in all but one out of 19 in the Oslo group, the error being feminine *sa* for *son* in the single case. We conclude that *s**-transfer seems to be generalized both for correct (17) cases (*positive transfer*) and for incorrect ones (*negative transfer*) (15). H3 above could then be subsumed under the more general H4:

H4 Norwegian learners of French generalize the transfer of *si** to *s** in their L2 grammar.

Cloze test

In order to test further H2 and H3, we combined the translation tests with a monolingual cloze test (test 5) aimed at testing the production of determiners of all kinds given at the end of the first semester of French studies at the University of Oslo during the autumn of 2014 (55 informants). The cloze test took the following form:

Test 5: Cloze test for Norwegian Fr2-learners

Déterminants

Insérez les déterminants nécessaires dans le texte ci-dessous. Expliquez l'emploi ou le non emploi de déterminant devant les noms *homme politique*, *mains*, *écrivain*, *premier étage*, *fenêtre* (la deuxième occurrence) et *lune*.^a

Jean Acault, _____ homme politique, vient de publier _____ livre sur _____ gouvernement français et _____ décisions actuelles. Quand il l'a eu dans _____ mains pour la première fois, _____ yeux rayonnaient de joie. _____ femme est _____ écrivain, et a aidé _____ mari à rédiger _____ livre. Ils se sont installés dans _____ grande maison à _____ campagne, mais ils n'ont pas encore _____ garage pour _____ voiture. À _____ premier étage, il y a _____ grande fenêtre. Par _____ fenêtre, Jean regarde _____ lune tous les soirs, et souvent il voit _____ nombreuses étoiles à _____ ciel.

[a] Insert determiners if necessary in the following text. Explain the use or the non-use of a determiner in front of the nouns *homme politique*, *mains*, *écrivain*, *premier étage*, *fenêtre* (second occurrence) and *lune*.

There are well known differences between French and Norwegian in such cases. The tendency is to mark the possessive relation more explicitly in French than in Norwegian. For instance, one could easily find cases like (18) from test 5 which would exhibit definite determiners in corresponding No1-cases like (19), but where it's more natural to choose the possessive determiner in French:

- (18) Quand il_i l'a eu dans **ses_i/??**les mains pour la première fois, **ses_i/??**les yeux rayonnaient de joie. **Sa_i/??**la femme est Ø écrivain, et a aidé **son_i/??**le mari à rédiger **son_i/le** livre.

Lit.: 'When he got it in his/(the) hands for the first time, his/(the) eyes shone of joy. His/(the) wife is an author, and helped her/(the) husband to write his/(the) book.'

- (19) Da han fikk den i *hendene* for første gang, skinte *øynene hans* av glede. *Kona hans* er forfatter og hjalp *mannen* med å redigere *boka*.

Unlike French, the Norwegian system is much more flexible for the marking of the possessive relation, relying more heavily on contextual input (see [Woldsnes \(2013\)](#)). As long as the possessive relation is clear from context, Norwegian tolerates def-

inite determiners to a large extent where this choice would seem too vague in French. The informants must also distinguish between (non-marked) reflexive and non-reflexive determiners in French and of course make the distinction between third person singular and plural possessors. Recall that Norwegian does not make the distinction between third person singular and plural possessors for reflexive uses:

- (20) mais ils_i n'ont pas encore **de** garage pour $\sqrt{\text{leur}}_i$ voiture.
Lit.: '...but they still don't have a garage for their car.'

The test group chose the correct form *leur* in about half of the cases (26 answers containing *leur*). Because of the tendency in Norwegian to use less specific possessive marking, 18 participants used the (less natural) definite article (*la voiture*). Eight of the informants however chose the incorrect *sa voiture* — again a clear transfer effect — while three of them hesitated between the definite *la* and plural *leur* (both options were indicated in the candidates' answer). We see then that the cloze test gives additional support to hypotheses H3 and H4.

Judgment test

The third kind of test we used for our Fr2-informants was a monolingual grammaticality judgment test (test 6) intended for the two groups of Norwegian students of French in France and Norway. The tests were given in November 2016 during the students' first semester of French studies at the University level, either at the University of Oslo or at the University of Caen in an immersion context. In both cases, the tests were given in the classroom and took between twenty and thirty minutes. We had 40 L2 learners of French at the University of Oslo with Norwegian as L1 (in addition to seven informants with Norwegian not as L1), and 15 L2 learners of French in an immersion context at the University of Caen. The students in these groups differed from those doing the translation or cloze tests presented above, although both groups had been exposed to the same teaching and training of determiner syntax and semantics beforehand. Below are listed some relevant test cases (see appendix for the full test):

Test 6: Grammaticality judgment test for Norwegian Fr2-learners

Les déterminants

Jugez la grammaticalité des déterminants soulignés dans les exemples suivants.^a

- (i) Claire et Paul se sont installés à la campagne avec ses trois enfants.

la = riktig/feil/vet ikke *ses* = riktig/feil/vet ikke

(ii) Les Dupont font ses courses une fois par semaine.

Les = riktig/feil/vet ikke *ses* = riktig/feil/vet ikke

(iii) Il avait oublié son sac à la maison.

son = riktig/feil/vet ikke *la* = riktig/feil/vet ikke

(iv) Les trois sœurs vont toutes à la même école. Son école se situe près de la maison.

la = riktig/feil/vet ikke *son* = riktig/feil/vet ikke

[a] Judge the grammaticality of the underlined determiners in the following examples: acceptable/non-acceptable/don't know.

The test contains 50 sentences with different kinds of determiners: definite, demonstrative, possessive, indefinite, partitive or quantitative determiners, gender issues, correct uses, errors and so on. For our purposes, possessives occur in 24 of the 50 test sentences.⁸ In examples like (2) above (our (21) below), we have blatant errors of possessor agreement (*ses* is ungrammatical, *leurs* is correct):

(21) **Les** Dupont_i font ***ses**_i (√**leurs**_i) courses une fois par semaine.
Lit.: 'The Dupont family do their shopping once a week.'

In other cases, the correct forms occur:

(22) Il_i avait oublié **son**_i sac à **la** maison.
Lit.: 'He had forgotten his bag at home.'

There are both reflexive (like (21)–(22)) and non-reflexive uses (23). In (23), the R(eflexivity)-neutral *son* is (non-locally) bound from outside the clause (obeying to principle B of Binding Theory, (Chomsky 1981)), but the binder is plural, hence the ungrammaticality of *son*. The correct form would be *leur*:

(23) Les trois sœurs_i vont toutes à **la** même école. ***Son**_i (√**leur**_i) école se situe près de la maison.
Lit.: 'The three sisters all attend to the same school. Their school is situated near their home.'

[8] With the numbering from the test, we have the sentences (2), (5), (7), (9), (10), (13), (15), (17), (19), (22), (25), (26), (30), (32), (34), (37), (38), (40), (42), (43), (45), (47), (49) and (50). See appendix for the full test.

The informants judge the cases in the test on the basis of three options: correct, incorrect or uncertain.

Many results from the judgment test strengthen H3 and H4. Example (2) from the test above takes the form of (24):

(24) [Claire et Paul]_i se sont installés à **la** campagne avec ***ses**_i (√leurs_i) trois enfants.

Lit.: 'Claire and Paul moved into the countryside with their three children.'

The *s*-possessive in (24), demanding a singular possessor, is of course incorrect and should be replaced by **leurs** (*trois enfants*). In the Caen immersion group this time (autumn 2016), we had 15 participants. 12 out of them judged the example with the incorrect *ses* as grammatical, one was uncertain and only two had it right. In (24) the possessive is locally bound, but even in cases where we could not have a reflexive in Norwegian, the same kind of *s**-transfer seems to occur.

In (23), the reflexive possessive is strongly ungrammatical in Norwegian (**sin skole*), the correct form being **deres** (*skole*). Still 12 out of 40 informants in the Oslo group and 8/15 in the Caen group judged the incorrect *son* grammatical. The Norwegian Fr2-groups thus still seem to be (unconsciously) influenced by the (partly) false friends *si** and *s** (see [Fabricius-Hansen et al. \(2017, section 4\)](#)) and even overgeneralize the usage of *s** in corresponding cases where the *s**-form is excluded in Norwegian.

The *si**-*s**-transfer from Norwegian to French also means that in cases where the *s**-possessive is (or should be) used in both languages the success rate of correct correspondences tends to rise. This prediction is borne out. In the judgment test for (25) (test 6), 39 out of 40 informants in the Oslo group judged the possessive *son* fully grammatical, 15/15 in the Caen (immersion) group:

(25) Il_i avait oublié √**son**_i sac à **la** maison.

Lit.: 'He had forgotten his bag at home.'

Thus, we find support for H3 and H4 from the judgment test, both from negative (23)-(24) and positive transfer (25), but positive transfer effects don't indicate by themselves that the possessive system of French has been (fully) internalized.

Possessum- vs. possessor-related possessives

Since Norwegian possessives, contrary to French, are generally possessor oriented, we predict errors relating to the directions of the corresponding referent like the following:

(26) ***Son** maison (for *sa maison à lui*)/***Son** voiture (for *sa voiture à lui*)
'His house/his car'

We might therefore formulate a more general hypothesis like:

H5 Norwegian Fr2 learners relate the possessive to the possessor rather than the possessum.

Admittedly, it is much harder to test this hypothesis than H1–H4 above. The problem is actually how to separate common problems of acquiring the gender of the head noun (the possessum) – and hence more directly determiner-noun agreement – from the (anaphoric) orientation of the possessive towards a masculine or feminine possessor. We do however find possible evidence for H5.

In the translation test Norwegian-French (test 4), we have the sentence in (27):

- (27) I 1867 giftet han_i seg med Nina Hagerup, som faktisk var kusinen **hans**_i.
Lit.: ‘In 1867 he married Nina Hagerup who actually was his.IRREFL cousin.’

The correct translation of *kusinen hans* is *sa cousine*, which is neutral with respect to reflexivity (binding conditions) and shows gender and number agreement between possessive and possessum (the following noun). Two participants – one from the Caen group and the other from the Oslo group chose to translate *kusinen hans* by *son cousine* instead of the correct *sa cousine*. These could well be instances of wrong possessor orientation, because in other cases the same informants show that they have indeed acquired the correct feminine forms of the possessive (*sa femme* – *sa mère* etc.). Another possible instance comes from the translation test from French to Norwegian (test 3) with the sentence in (28):

- (28) Dès qu’il le peut, il met Carla_i en avant, **ses**_i talents de chanteuse, **son**_i aisance sur scène.
Lit.: ‘As soon as he can, he puts forward Carla, her talent as a singer, her ease on stage.’

Most of the informants, either in the Caen group or the Oslo group, opt for the correct non-reflexive possessives in their translations: *hennes sangtalent* og *hennes dyktighet på scenen*. The possessum related possessive in French entails different forms of the possessives *ses talents* (masculine plural) and *son aisance* (*son* in front of a singular feminine noun starting with a vowel). Two of the participants in the Oslo group rendered the two possessives in (28) by (29):⁹

- (29) ... √**hennes** talent og ***hans** N...
‘...her.IRREFL talent and his.IRREFL N...’

This might indicate that these informants erroneously take the *ses-son*-distinction in the coordinated structure of French to mark a gender opposition of possessors.

[9] In both cases the translation of *aisance* is wrong, but this is irrelevant for our discussion here, hence the N feature.

A third possible instance of possessor oriented transfer from Norwegian to French (test 4) could be the translation of *musikken hans* in (30):

- (30) ...Mens det i utlandet var musikken **hans** til Henrik Ibsens tekster som ble lagt merke til.
Lit.: ‘...while abroad his.IRREFL music to Henrik Ibsen’s texts were noticed.’

4/14 in the Caen group and 5/21 in the Oslo group translate the non-reflexive Norwegian masculine possessive by *son*: ***son** *musique* (instead of the correct *sa musique*). This might indicate that at least some of these informants relate the possessive ***son** to a masculine possessor. However, for this latter type of examples it cannot be ruled out that it is just an error of assigning the correct gender to the head noun, taking it to be masculine (as in Norwegian) instead of feminine. All in all, for hypotheses of possessor related possessives in Fr2 — as postulated in H5 — we must design more solid tests.

Other cases

The tests we have already constructed could be useful also for further acquisition issues between No1 and Fr2. As noted above, there is a strong tendency of marking the possessive relation more frequently in French than in Norwegian (see also [Fabricius-Hansen et al. \(2017, section 3.2\)](#)). An example from the cloze test gives us a point at hand:

- (31) Quand il l’a eu dans...*mains* pour la première fois, ...*yeux* rayonnaient de joie.
Lit.: ‘When he got it in...hands for the first time, ...eyes shone of joy.’

In this case, it’s more natural in French to use possessives than definites:

- (32) Quand il l’a eu dans **ses**_i *mains* pour la première fois, **ses**_i *yeux* rayonnaient de joie.
Lit.: ‘When he got it in his hands for the first time, his eyes shone of joy.’

The high percentage of definites in the results from the Oslo group shows however that the informants seem to be influenced by their Norwegian L1-system. 35/55 opt for the definite (*les*) in front of *mains*:

- (33) Quand il l’a eu dans **les** *mains* pour la première fois...
Lit.: ‘When he got it in **the** hands for the first time...’

In other cases too we see a tendency of less explicit possessive marking in Norwegian than French. This became very clear from (20) above, repeated in (34), for which 18 of 55 informants in the cloze test chose a definite determiner (35) instead of the more natural possessive in (36):

- (34) ...mais ils n'ont pas encore...garage pour...voiture.
 (35) ...mais ils n'ont pas encore **de** garage pour **la** voiture.
 (36) ...mais ils_i n'ont pas encore **de** garage pour $\sqrt{\text{leur}}_i$ voiture.
 Lit.: '...but they still don't have a garage for the/their car.'

In a similar vein, Norwegian may have the definite determiner in the source text for translation where French clearly would opt for a possessive:

- (37) I 1884 flyttet Grieg og Hagerup til Trolldhaugen hvor de bodde resten av **livet**.
 Lit.: 'In 1884 Grieg and Hagerup moved to Trolldhaugen where they lived for the rest of **the** life.'

In the Caen group, 4/14 informants chose to keep the definite in their French translation (*pour le reste de **la** vie*) instead of the much more natural possessive: *pour le reste de **leur** vie*. Only five out of 14 used the *leur*-form correctly while two made the expected transfer error (*pour le reste de ***sa** vie*) and three informants gave no answer at all.

Finally, all the French L2+ tests above indicate that the position of the possessive — Norwegian admitting both prenominal and postnominal possessives — does not seem to represent a problem at all. In fact, we don't have a single occurrence of Fr2 postnominal possessive in our corpus. Thus, the prediction that the various (prenominal or postnominal) positions of the possessives in the learner's mother tongue (Norwegian as L1) should create problems for her acquisition of the French system is not borne out. This may also well be due to the intervention effect of learning English as L2 before French as L3 in the strict sense ((positive) transfer from L2 to L3). The learner has already acquired a system (English as L2) where possessives are necessarily put in front of the head noun. Regardless of the learner's proficiency in French as L3 (morphological errors, reflexivity parameter, definite or possessive marking etc.), she always puts the possessive determiner in front of the head noun. Hence, even though her L1 grammar allows both preposed and postposed possessives, this option is excluded for her L2 grammar of English and L3 grammar of French.

[4] CONCLUDING REMARKS

We have observed that Norwegian learners of French L2 tend to mix up the inherent possessor-related dependencies of Norwegian with the possessum-related orientation of French (see [Fabricius-Hansen et al. \(2017, section 4\)](#)). Data from different sources (translation, cloze test and judgment tests) show evidence for possessor-related transfer from Norwegian L1 to French L2. Thus, there is a generalized usage of *son/sa/ses* by Norwegian learners of French L2 both for the reflexive

third person singular and third person plural exactly where Norwegian has *si** in both cases. The morpho-phonological *s*-si** similarity may even lead to Norwegian reflexives in translations from French under binding conditions where Norwegian reflexives are clearly ruled out ('shallow' priming according to Pitz et al. (2017); see also Fabricius-Hansen et al. (2017, section 4) and Behrens (2017)).

For French No2 learners, the complexity of the Norwegian system leads to problems first of all for the reflexive-irreflexive distinction in addition to overgeneralization of *si**. The reflexivity contrast is clearly extremely hard to acquire for French speaking learners. This prediction should be tested further both for the *si** versus *hans/hennes/dens/dets*-distinction in the third person singular and the *si**-versus *deres*-distinction in the third person plural. In further works we will follow up these learner language studies and augment the experiments for the assessment of general interlanguage development.

APPENDIX

Test 1: No2 grammaticality judgment test

Le possessif en norvégien

Test de jugement grammatical^a

Déterminez si les possessifs soulignés dans les phrases suivantes sont acceptables ou non.

Akseptabel = acceptable/ikke akseptabel = non acceptable/vet ikke = je ne sais pas.

- (i) Kristoffer har tre brødre, men han har ikke sett den yngste av brødrene hans det siste året.

hans = akseptabel/ikke akseptabel/vet ikke

- (ii) Jeanette rydder sjelden rommet sitt.

sitt = akseptabel/ikke akseptabel/vet ikke

- (iii) Christian har en søster. Søsteren sin er lærer.

sin = akseptabel/ikke akseptabel/vet ikke

- (iv) Foreldrene solgte huset sitt da de flyttet til Frankrike.

sitt = akseptabel/ikke akseptabel/vet ikke

(v) Jeg skal besøke Caroline og familien sin.

sin = akseptabel/ikke akseptabel/vet ikke

(vi) Marie fant ikke boka si.

si = akseptabel/ikke akseptabel/vet ikke

(vii) Nikolai har vondt i armen hans, men vil ikke gå til legen.

hans = akseptabel/ikke akseptabel/vet ikke

(viii) Huset sitt ligger utenfor byen, så hun har lang vei til skolen.

sitt = akseptabel/ikke akseptabel/vet ikke

(ix) Anne er sint på moren sin fordi hun ikke liker den nye mannen hennes.

sin = akseptabel/ikke akseptabel/vet ikke
hennes = akseptabel/ikke akseptabel/vet ikke

(x) Det nye huset vårt ligger ganske nærme leiligheten din.

vårt = akseptabel/ikke akseptabel/vet ikke
din = akseptabel/ikke akseptabel/vet ikke

(xi) Bestemor har nettopp kjøpt hus med hage. Hun liker å være i hagen hennes.

hennes = akseptabel/ikke akseptabel/vet ikke

(xii) Barna våre spiser aldri opp maten sin.

våre = akseptabel/ikke akseptabel/vet ikke
sin = akseptabel/ikke akseptabel/vet ikke

[a] 'Grammaticality judgment test. Decide if the underlined possessives in the following sentences are acceptable or not: acceptable/non-acceptable/don't know.'

Test 6: Fr2 grammaticality judgment test

Les déterminants

Jugez la grammaticalité des déterminants soulignés dans les exemples suivants.

- (i) Le petit garçon ne mange pas de la glace pendant l'hiver.

de la = riktig/feil/vet ikke
l' = riktig/feil/vet ikke

- (ii) Claire et Paul se sont installés à la campagne avec ses trois enfants.

la = riktig/feil/vet ikke
ses = riktig/feil/vet ikke

- (iii) Ils viennent d'acheter une nouvelle voiture.

une = riktig/feil/vet ikke

- (iv) L'étudiant a emprunté des argents à un ami.

des = riktig/feil/vet ikke
un = riktig/feil/vet ikke

- (v) Les Dupont font ses courses une fois par semaine.

Les = riktig/feil/vet ikke
ses = riktig/feil/vet ikke

- (vi) Marie et son collègue ont des problèmes de communication.

des = riktig/feil/vet ikke

- (vii) Il avait oublié son sac à la maison.

son = riktig/feil/vet ikke
la = riktig/feil/vet ikke

(viii) Il ne boit pas du café le soir.

du = riktig/feil/vet ikke
le = riktig/feil/vet ikke

(ix) Cécile a besoin d'une étagère pour pouvoir ranger ses livres.

une = riktig/feil/vet ikke
ses = riktig/feil/vet ikke

(x) Toutes les familles sont bien rentrées à ses maisons.

les = riktig/feil/vet ikke
ses = riktig/feil/vet ikke

(xi) Cette compagnie a des centaines de salariés.

cette = riktig/feil/vet ikke
des = riktig/feil/vet ikke

(xii) Le professeur a monté ce escalier rapidement.

Le = riktig/feil/vet ikke
ce = riktig/feil/vet ikke

(xiii) Tous les élèves avaient fait ses devoirs.

les = riktig/feil/vet ikke
ses = riktig/feil/vet ikke

(xiv) Cette ville est pleine des musées intéressants.

des = riktig/feil/vet ikke

(xv) Il est très content de ses nouvelles chaussures.

ses = riktig/feil/vet ikke

(xvi) Lisa cherche une maison spacieuse aux alentours d'Oslo.

une = riktig/feil/vet ikke

(xvii) Les enfants sont arrivés, tous avec ses parents.

Les = riktig/feil/vet ikke
ses = riktig/feil/vet ikke

(xviii) Le chalet est entouré du forêt.

du = riktig/feil/vet ikke

(xix) Elle range sa chambre tous les soirs.

sa = riktig/feil/vet ikke
les = riktig/feil/vet ikke

(xx) Christine commande toujours le plat le plus cher.

le = riktig/feil/vet ikke

(xxi) Claude avait planté beaucoup des fleurs dans le jardin.

des = riktig/feil/vet ikke
le = riktig/feil/vet ikke

(xxii) Claire et Paul garent sa nouvelle voiture dans le garage.

sa = riktig/feil/vet ikke
le = riktig/feil/vet ikke

(xxiii) Elle a fait un gâteau sans du sucre.

un = riktig/feil/vet ikke
du = riktig/feil/vet ikke

(xxiv) Julia prend le même bus tous les matins.

les = riktig/feil/vet ikke

(xxv) Paul aime s'occuper de son jardin.

son = riktig/feil/vet ikke

(xxvi) Ils ont deux fils. Ses fils ont tous les deux commencé à étudier à l'Université de Bourgogne.

Ses = riktig/feil/vet ikke
les = riktig/feil/vet ikke

(xxvii) Claire a rencontré un homme dans le supermarché. Elle trouve ce homme étrange.

le = riktig/feil/vet ikke
ce = riktig/feil/vet ikke

(xxviii) Elle a commencé à travailler à Strasbourg l'année dernière.

l' = riktig/feil/vet ikke

(xxix) La mère de Julia connaît toujours la bonne réponse.

la = riktig/feil/vet ikke

(xxx) Jeanne et Gabrielle ont acheté des livres sur la Norvège. Elles trouvent ses nouveaux livres intéressants.

des = riktig/feil/vet ikke
ses = riktig/feil/vet ikke

(xxxi) Les étudiants écoutent le professeur avec d'enthousiasme.

le = riktig/feil/vet ikke
d' = riktig/feil/vet ikke

(xxxii) Il fait ses devoirs le soir, mais il les trouve toujours difficiles.

ses = riktig/feil/vet ikke
le = riktig/feil/vet ikke

(xxxiii) Le Château de Versailles est un des châteaux les plus connus du monde.

les = riktig/feil/vet ikke
du = riktig/feil/vet ikke

(xxxiv) Les trois sœurs vont toutes à la même école. Son école se situe près de la maison.

la = riktig/feil/vet ikke
Son = riktig/feil/vet ikke

(xxxv) Les trois collègues ont pris un grand bateau pour aller au nord de la Norvège. Cet bateau est impressionnant.

un = riktig/feil/vet ikke
Cet = riktig/feil/vet ikke

(xxxvi) Jacques cherche un bon restaurant pour le repas du midi.

le = riktig/feil/vet ikke
du = riktig/feil/vet ikke

(xxxvii) Madame Dupont trouve sa belle-fille adorable.

sa = riktig/feil/vet ikke

(xxxviii) Les Lefébure ont des journaux partout dans le salon, mais ses journaux sont tous vieux.

des = riktig/feil/vet ikke
ses = riktig/feil/vet ikke

(xxxix) Christine aime du chocolat.

du = riktig/feil/vet ikke

(xl) Il s'occupe toujours très bien de ses petits frères.

ses = riktig/feil/vet ikke

(xli) Quelqu'un a volé le sac à main de Marie. Le sac à main était gris.

le = riktig/feil/vet ikke

(xlii) Mes parents ont des voisins bizarres. Ses voisins sont aussi impolis.

des = riktig/feil/vet ikke
Ses = riktig/feil/vet ikke

(xliii) David a acheté sa nouvelle voiture à Berlin.

sa = riktig/feil/vet ikke

(xliv) Mes parents n'ont pas pu trouver suffisamment des verres pour ce soir.

Mes = riktig/feil/vet ikke
des = riktig/feil/vet ikke

(xlv) Les élèves sont contents de son nouveau professeur d'anglais.

Les = riktig/feil/vet ikke
son = riktig/feil/vet ikke

(xlvi) Isabelle lit un livre avant de se coucher.

un = riktig/feil/vet ikke

(xlvii) Paul a menti à son patron.

son = riktig/feil/vet ikke

(xlviii) J'ai accepté cet emploi sans hésiter.

cet = riktig/feil/vet ikke

(xlix) Les deux frères font le ménage pour ses grands-parents le lundi.

ses = riktig/feil/vet ikke
le = riktig/feil/vet ikke

(l) Cette femme a influencé la mode avec son style.

la = riktig/feil/vet ikke
son = riktig/feil/vet ikke

Merci !

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PROCESSING POSSESSIVES IN TRANSLATION BETWEEN UNEQUAL SYSTEMS: AN EXPLORATORY STUDY

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ABSTRACT

The present paper reports on the results of two translation experiments conducted with eye tracking and keylogging. Norwegian and Danish professional and student translators have each translated a small English news text into their L1. The texts include possessives in different syntactic environments which entail a choice between a reflexive and an irreflexive form in the target texts. While native speakers are expected to make uniform choices that conform to regularities on local and non-local binding principles in Danish and Norwegian, disparate solutions have been found among the participants in both groups. The study compares final products with process data, both in terms of edits and in terms of temporal measures indicative of translation effort. Results show a considerable amount of hesitation on choice in all non-finite clause constructions, albeit more so among students than among professionals. Questions of translation effects versus an unstable locality principle are taken up in the final discussion.

[1] INTRODUCTION

This paper¹ deals with grammatical choices made by translators who translate into their mother tongue. The underlying question is whether some of the cognitive mechanisms that are at work in translation into L1 are similar to those that are at work in advanced L2 production. In view of the previous chapters, [Pitz et al. \(2017\)](#) and [Helland \(2017\)](#), which deal with written Norwegian L2 production, the present chapter concentrates on translation into L1.

In an earlier paper ([Behrens 2006](#)), based on contrastive product data, I present some evidence to the effect that advanced L2 production and translation into L1 may reside in similar underlying mechanisms. Online L2 production and translation into L1 consist in verbalizing messages or thoughts conceived as selected from

[1] I would like to express my thanks to MA Alois Heuboeck from the University of Reading for his excellent and extremely valuable help in formulating my hypotheses in accordance with requirements for statistical testing, and for all the statistic tests presented in the results. Without his clever assistance, no statistics but for some simple descriptive measures could have been included.

knowledge in long-term memory or on the basis of interpretation of another text. Very advanced L2 speakers can be expected to know all the ‘rules’ of their L2, but do not always make use of them (Carroll & von Stutterheim 1993). The question is whether translators working into their L1, also do not access all the internalized rules of their mother tongue when intensively engaged in two languages simultaneously. A well-grounded reason for posing the question is linked to observed priming effects, i.e. grammaticized or morpho-phonological features of the source language which carry over into the target. Several studies of bilinguals attest to simultaneous activation of their two languages, even in monolingual settings (Grosjean 1997; de Groot 1992; Kroll & de Groot 1997).

Non-optimal solutions may also result as a consequence of time constraints which affect in-depth interpretation of the text being reproduced in translation, that is, the content is not truly internalized as a thought before it is formulated in the target language.

On the other hand, norms in a language may also be unstable, and allow for some variation (Ydstie 1998; Günthner 2011), or affect translation by overuse of either a source or a target norm. If some grammatical system or norm is unstable, on the move, so to speak, one will expect to find variation among L1 speakers, and on that account a system may be extremely difficult to disentangle even for advanced learners of the language. The results of the experiments reported on in the present paper are an indication that the possessive system in Danish and Norwegian may indeed be unstable.

As presented in Fabricius-Hansen et al. (2017), the Scandinavian languages, as opposed to English and other West-European languages, distinguish between reflexive and non-reflexive possessive determiners. Below (section [2]) I will briefly review the systems and the general syntactic constraints on their use. The goal of the present study is to investigate empirically how professional and non-professional translators handle the systemic difference in practice, and discuss whether potential variation in translation choices may be due to priming, a general translation learner effect or to a possible instability of the system itself.

The paper reports on product and process data showing how native speakers of the target language handle possessive determiners in translation from English. From a cognitive point of view, native speakers are expected to have internalized all the grammatical rules of their mother tongue, so the null hypothesis is that there should be no grammatical mistakes in the target. On the other hand, as already mentioned, priming is known to take place to some extent in translation, also in translation into one’s L1. Observations have been made with respect to false friends (Koessler & Derocquigny 1928) as well as to syntactic priming (Bangalore et al. 2015). It would therefore not be a great surprise if untrained translators are found to be primed by the source text to a greater extent than professionals, who are expected to be more consciously aware of priming. Largely through

Think-Aloud-Protocols, expertise research has shown that experts have strong monitoring skills (Glaser & Chi 1988; Jääskeläinen 2010), which means that they are better trained to keep the systems apart.

The main question to be discussed in this paper is: Are the rules for correct choice clearly represented in the minds of the translators? An answer to this question may be arrived at through an investigation into the following: (i) whether the choices made are unanimous across the population studied, (ii) whether translators find the choice of possessive form hard to make, and (iii) whether any potentially incorrect choice can be testified as priming only.

The paper reports on results from two eye-tracking and keylogging studies of translation from English into Norwegian and Danish, respectively. Each study has collected data from 24 participants divided between professional translators and language students with a high demand of English (see section [4]). Registered measures of reading times, translation duration and pauses will be used in combination with the participants' edits and final products to come closer to an answer to the questions posed above.

The structure of the paper is set out as follows: Section [2] gives a brief overview of the system in Norwegian/Danish as compared with English. Morphophonological similarities are taken up for questions of priming. Section [3] is a presentation of the two experiment texts with a focus on the syntactic environments of the possessives as a variable. Our hypotheses are also presented in this section. Section [4] describes the details of the experiments. Results are presented in section [5], and a general discussion of the results with recommendations for follow-up studies concludes the paper in section [6].

[2] THE ENGLISH AND DANISH/NORWEGIAN POSSESSIVE SYSTEMS

English has a simple possessive system whereby the possessive determiner is the same whether it refers back to a possessor (of the same gender and number) in the same clause (1a), across clauses within the same sentence ((1b) and (1e)) across sentences ((1c) and (1d)) or it refers back to an external, contextually relevant possessor (alternative reading of (1a)).

- (1)
 - a. Craig_i took his_{i/j} dog for a walk.
 - b. John_i was in love with Mary. He_i suspected that his_i feelings were not returned.
 - c. John_i was in love with Mary. His_i thoughts centered around her night and day.
 - d. The blind man_i bumped against the staircase and fell. Martin_j rushed over, picked up his_i cane and assisted him_i to the entrance.
 - e. Peter_i found the bag lying on his_{i/j} desk in the office.

The Scandinavian languages, on the other hand, make a distinction between the reflexive and the non-reflexive possessive, (see below, but also [Fabricius-Hansen et al. \(2017\)](#)). The Danish and the Norwegian systems are the same in all relevant respects but for the third person plural.²

The systemic difference between English and Danish/Norwegian means that the Norwegian or Danish translator of (1a)–(1e) has to decide on the linguistic role of the determiner's antecedent in order to choose the correct possessive in the target language. This may be the result of pragmatic inference based on the co-text (as in (1a) and (1d)), but correct choice is also grammatically constrained. Norwegian translations of (1) appear in (2) below. All the translations have the same syntactic form as the corresponding English source sentences in these examples.

- (2)
- a. Craig_i gikk en tur med hunden sin_i/hans_j.
 - b. John_i var forelsket i Mary. Han_i mistenkte at følelsene hans_i ikke ble gjengjeldt.
 - c. John_i var forelsket i Mary_j. Tankene hans_i sirklet rundt henne_j dag og natt.
 - d. Den blinde mannen_i snublet mot trappen og falt. Martin_j skyndte seg bort dit, plukket opp stokken (hans_i) og hjalp ham_i opp til inngangen.
 - e. Peter_i fant vesken liggende på pulten sin_i /hans_{?i/j} på kontoret.

When reference is found in the subject of the clause in which the possessive occurs, as in (2a), the reflexive *SIN**³ is the only correct choice. The non-reflexive *HANS* in the same example only allows the interpretation of an external referent. If the possessive appears in a finite sub-clause (as for example the Norwegian *at* (English *that*)-clause in (2b)), or in the following sentence (as in (1c) and (1d)), and the antecedent is only available in the matrix clause (2c) or the previous sentence (the pragmatic reading of (2d)), the non-reflexive possessive is the only correct choice. The general rule states that reflexive possessives (and reflexives generally) must be bound within the clause (local binding) (see references in [Fabricius-Hansen et al. \(2017\)](#)). Note in (2) that in the default, unmarked case in Norwegian, the possessive appears after the possessum. Pre-placement of the possessive also occurs in Norwegian but is constrained to a more formal register. If the possessive is pre-posed, the possessum appears without the definiteness marker (for example, the *-en* ending on the masculine noun). When it occurs after the possessum, definite marking on the noun is required. In Danish, pre-position is the default. Since pre- and post-position are both grammatically correct in Norwegian, although the latter is considered the more idiomatic choice, position will not be included as a variable in this study, although some mention of it will be

[2] The difference has no relevance for the present study.

[3] The reflexive is inflected for the gender of the possessum in Norwegian and Danish. *SIN** or just *SIN* is used in the present paper as an abstraction from the individual genders of the possessum.

made in the presentation of the results.

(1e) is an example of the possessive occurring in a non-finite participial clause. The same syntactic structure is available also in Norwegian in this example, although present participial clauses generally are much more constrained in Norwegian than in English (Faarlund et al. 1997; Kinn 2014).

In the translation, (2e), the reflexive possessive is normal, in spite of being bound by a referent outside the participial clause. A central question in this paper is how general this long distance binding is across different types of non-finite clauses. Norwegian has a highly restricted set of verbs that take present participial clauses (equivalent to English *find someone V-ing; have someone V-ing; come V-ing + Compl*). Also, the verbs taking the present participial morpheme in these contexts are generally intransitive and unbounded: for example, *have someone staying* → *ha noen boende* vs *find someone taking a book from the shelf* → **finne noen taende en bok fra hyllen*. Norwegian differs in this respect quite radically from English *-ing* complements and adjuncts.⁴ Whether this means that the general rule of local binding is too strict, is somewhat unclear and will be considered in the discussion section towards the end of the paper. It should be noted that the adjunct phrase in (2e) (*in his office*) is free to attach to the main clause predicate (cf. *found it in his office, lying on the desk*) and not only to the subordinate clause. On such an analysis, the possessive is controlled locally, i.e. by the main clause subject, and the choice of a reflexive can be explained. On the other hand, if the prepositional phrase is attached to the subordinate participial clause, then, according to the general rule, the possessive should be *HANS* in order to be bound by the subject of the higher clause.

A more frequent non-finite clause type in Norwegian and Danish is the infinitive. The Norwegian reference grammar (Faarlund et al. 1997) establishes the general rule that the underlying PRO subject of the infinitive controls the reflexive possessive (Faarlund et al. 1997, 1162), but that occurrences of a reflexive possessive bound by the subject of the main clause are also attested. If the antecedent for the reflexive and the controller of the underlying PRO subject of the infinitive are different, but both in the third person singular, ambiguity may result. No study to my knowledge has made a systematic investigation into the binding restrictions on Norwegian possessives in non-finite clauses.⁵ An empirical study is underway Behrens & Dirdal (To appear), as a follow-up of the present study. In the present study, the constraints have been set by agreement among a small group of colleagues, and will be referred to only in relation to the example types reported on

[4] Past-participle clauses also occur in Norwegian as predicative clauses. They are also interesting from the perspective of binding conditions for possessives, eg. *henvist til rommet sitt_{i/2j}/hans_j, satte hunden_i i å bjeffe på Petter_j*. Such structures are outside the scope of this paper.

[5] An exception is Lundquist (2014), who reports on a small study of what he calls 'mid-structures'. These are relevant for the present study, and are considered in the discussion section.

	English	Danish/Norwegian	
		Poss. refl.	Poss. non-refl
First person sg./pl.	my/our	min*/vår*	min*/vår*
Second person sg./pl.	your	din*/deres	din*/deres
Third person sg. masc.	his	} sin*	hans
Third person sg. fem.	her		hennes
Third person sg. neut.	its		dens*
	their	deres/sin*	deres

TABLE 1: The English and Danish/Norwegian possessive systems.

in the present paper.

To complete the picture, it is worth mentioning that generally, possessives are dropped with inalienables in Norwegian, as mentioned in [Fabricius-Hansen et al. \(2017\)](#). ‘Inalienables’ is a term used to refer to nouns denoting parts of one’s body, clothes, and the notion has often been extended to include other objects usually thought to be permanently owned – such as *one’s apartment*, *one’s dog* etc. English generally requires the possessive determiner in these contexts. Idiomatic translation from English into Norwegian (and Danish) would drop the possessive, viz. (3) below.

- (3)
- a. He couldn’t move his arm → Han kunne ikke røre armen. (‘...the arm’)
 - b. He put on his jacket/shoes → Han tok på seg jakken/skoene. (‘...the jacket/shoes’)
 - c. He had locked the door to his apartment. → Han hadde låst døren til leiligheten. (‘...to the apartment’)

Dropping the possessive altogether is also very common with the mention of objects whose ownership is given in the immediate context or otherwise pragmatically inferred to belong to a contextually salient referent. This is relevant for some of the examples discussed, e.g. (2d), and will be taken up below.

[2.1] Morpho-phonological similarity across the languages

What adds to the difficulty of acquiring the system(s) for an English learner of Norwegian or Danish is the morpho-phonological similarity between the Norwegian/Danish non-reflexive forms and the English possessives (first and third person masculine in particular), viz. table 1 below, which sums up the forms in the two systems. Morpho-phonological similarity is a well-known cause for priming. For first and second person singular there is furthermore, like English and German, no morphological distinction between the reflexive and the non-reflexive possessive.

The morpho-phonological similarity between the English possessive determiners and the non-reflexive forms in Danish/Norwegian suggests that priming should yield a higher frequency of the non-reflexive forms in translation from English, even in syntactic environments that do not license them. There is a similar morpho-phonological similarity between German and Norwegian, but for this language pair, the similarity is with the Norwegian/Danish reflexive possessives: cf. German *sein*, which does not distinguish between a reflexive and a non-reflexive use, and the Norwegian reflexive *sin*, (see [Fabricius-Hansen et al. \(2017\)](#) and [Pitz et al. \(2017\)](#)). Germans who have not fully acquired the Norwegian system, would thus be expected to overuse the reflexive form (see evidence in [Pitz et al. \(2017\)](#)), while the English learners could be phonologically primed to overuse the non-reflexive form in the Scandinavian languages.

Translation requires a constant change of linguistic mode from one language to the other. While even true bilinguals are claimed always to have both languages active simultaneously when listening/reading or speaking/writing, as mentioned in the introduction, the degree to which they are both active is understood to be influenced by situational factors, such as the degree of involvement in the two languages in the situation. If the conversational context is monolingual, the non-used language is less active than for example in translation, where the bilingual continuously switches between the two modes of language use. Translation, therefore, is predicted to have higher priming effects than other modes of communication among bilinguals. Priming is here thought of in two ways: on the one hand, the morpho-phonological similarity between forms in the two languages (cognates) may influence the translator to choose the target form that is phonologically most similar to that of the source. On the other hand, the structure of the source clause may be copied into the target, even if it is not the most idiomatic structure in the target. The latter type of priming is considered a learner effect, as novice translators are known to have the urge not to leave implicit anything that is explicitly expressed in the source text.

[3] POSSESSIVES IN COHERENT TEXT. VARIATION IN THEIR SYNTACTIC ENVIRONMENTS

The texts used in the experiments (see appendix) are both naturally occurring English texts of approximately the same length taken from two English newspapers. DA — used in the Danish experiment — is a text about a male nurse sentenced for having killed four of his patients. The possessives occur in sentences 2 and 10, in different syntactic configurations. NO is the text used in the Norwegian experiment, about a driver who beats a dog and the dog later returns the attack by ruining the driver's car. The possessives occur in the second and the third sentences of the text, in different syntactic configurations, the translation of which affect the choice of possessive.

The relevant sentences from texts DA and NO appear in (4)–(7):

- (4) Norris disliked working with old people. All of his victims were old, weak women with heart problems. (DA, sentence 10)
- (5) Hospital nurse Colin Norris was imprisoned for life today for the killing of four of his patients. (DA, sentence 2)
- (6) Exiting the vehicle, the driver reportedly kicked the prostrate animal before returning to his car, an onlooker claimed. (NO, sentence 3)
- (7) The unnamed driver had found the dog sleeping in his favorite parking spot outside his home in Chongqing. (NO, sentence 2)

The possessive in (4) finds its antecedent in the subject of the previous sentence. In (5) it occurs in a nominalization with an event nominal (the killing) determined by a regular definite article, and a noun phrase referring to the objects affected by the event (his patients). In (6), the possessive occurs in a gerund-participial clause headed by a conjunction and finds its antecedent in the subject of the higher clause (the driver). The antecedent for the possessives in the two prepositional phrases in (7) is pragmatically inferred to be the subject of the higher clause (the driver).

Each example will be discussed in view of translation, and hypotheses to be tested with respect to each will be formulated in the next section.

[3.1] *Hypotheses relating to the Danish material*

The possessive in (4) finds its antecedent in the subject of the previous sentence. It thus parallels (1c) in section [2], where binding (in a loose sense) crosses a sentence boundary. Providing the same syntactic structure in the Danish translation, the non-reflexive possessive is the only correct choice, cf. (8):

- (8) Norris_i brød sig ikke om at arbejde med ældre. Alle hans_i/*sine ofre var gamle, svage kvinder med hjerteproblemer.

The non-reflexive possessive in (8), the Danish translation of (4), is also the phonologically closest to the parallel English possessive. HYPOTHESIS 1 to be tested is therefore that the same choice, the non-reflexive *hans* will be made by professionals and students alike without much hesitation. Hesitation, or uncertainty, will be measured in terms of edits and pauses in the key-logging data.

The possessive in (5) appears within a nominalization forming the complement of a preposition. The nominalized verb is not itself determined by a possessive, and there is thus no linguistic marker to tell what the underlying subject would be, although pragmatic inference would make the subject of the sentence (*Norris*) the likely subject. From a structural point of view, two translation alternatives are relevant: (i) a translation with the same nominal structure as the source, or (ii) an

infinitive clause. Structural choice has consequences for choice of possessive.

HYPOTHESIS 2A: With a nominalization in the target, there will be indecision with respect to choice of possessive across participants.

The background for this hypothesis is that the source allows two vaguely different readings: (i) a reading in which the subject of the embedding clause is read as the underlying subject of the nominalization. On this reading the possessive will have a local binder (identical to the subject of the matrix), and the possessive is reflexive. (ii) A second reading is available since the head noun of the nominalization does not have a specified underlying subject. On such a reading, the writer does not commit him/herself to who actually killed the patients. The determiner *his* points back to the higher subject, and the non-reflexive possessive should be chosen.

HYPOTHESIS 2B: The choice of non-reflexive *hans* in a nominalized target structure is expected to occur more often with the professionals than with the students.

Our motivation for this hypothesis is that the reading that takes the non-reflexive requires more reflection on the interpretation.

For a verbal structure in the target (alternative (ii)), the possessive has a local binder in the underlying subject of the verb *dræbe* 'kill', which is identical with the subject of the matrix clause. The reflexive possessive is therefore the only correct choice, according to the general rule.

HYPOTHESIS 2C: All participants choosing a verbal structure in the target will use the reflexive possessive.

Verbalization of a nominalized structure is very common in translation from English to Danish/Norwegian. An equivalent alternative in English would be a participial clause *for having killed four of his patients*. Given the availability of both a nominal and a verbal form of a base with the same denotation in the source and the target language, I do not expect translation into a verbal form to take significantly more time than translation into a nominal form (HYPOTHESIS 2D).

Based on the different complexities of the two examples, HYPOTHESIS 2E is that translation of (5) will require more effort than translation of (4). Effort will be measured according to the following variables: total reading time of the source unit (TrtS), Pause, DUR (the time needed to type the translation, see section [4] below) and Total reading time of the target unit (TrtT). When particularly relevant, regression path duration (RPDur) is also considered, i.e. the duration of the first fixations on the source unit, including the time a participant spends looking back into contextual information before going on to the next element (see section [4] below).

[3.2] *Hypotheses relating to the Norwegian material*

A similar comparison as done for the Danish material will be made for the Norwegian experiment data, although the syntactic structures in which the possessives

occur are not identical. The similarity of the two sets lies in the observation that (4) as well as (6) have only one translation choice, while the second sentence in each set allow more syntactic variety which is expected to affect the translation of the possessive. The possessive in (6) appears in a conjunction-headed non-finite participial clause.⁶ From a contextual and pragmatic perspective, the car belongs to the driver, and the driver is therefore understood as the underlying subject of the participle. The anaphoric link to the vehicle exited by the driver at the beginning of the sentence makes this the only relevant reading.⁷ For Norwegian translation, the strong link between the (assumed) owner (the driver) and the car makes omission of the possessive not only possible, but also very likely. Moreover, Norwegian has no non-finite structure that can complement a conjunction. A finite structure is the only choice, meaning that a subject must be expressed in the clause. A pronominal subject *he* pointing back to the driver will bind the possessive locally, i.e. the reflexive possessive is the only correct choice. HYPOTHESIS 3A: The reflexive possessive *sin* will be chosen across participants unless it is dropped altogether. It is also expected that choice of possessive will not require much effort (HYPOTHESIS 3B). Since there is no phrase we can use as a baseline against which effort in terms of temporal processing times can be measured with reasonable certainty, this hypothesis can only be tested against measures of edits performed by the participants. Our HYPOTHESIS 3B will thus be confirmed if the participants do not make any edits on the possessive.

The likelihood of dropping the possessive altogether is expected to be higher among the professional translators than the students (HYPOTHESIS 3C). A student's lack of practice has often demonstrated more literal translations in the sense that no information made explicit in the source can be dropped, (personal experience). This observation suggests that the students have less access to the pragmatic rules of the target in the process of translating.

Since the phrase in (6) is unambiguous and has only one very regular target solution beyond the choice of dropping the reflexive altogether, the translation process is considered 'basic' enough for the process data to be used for comparison with the next example in the Norwegian text.

From a formal point of view, (7) is syntactically and semantically ambiguous. In classical generative terms, it exemplifies a case of raising. The object of the matrix clause (*the dog*) has been raised from the subject position of the subordinate

[6] According to grammars of English, the category membership of *before* and *after* is unclear. According to Huddleston & Pullum (2002), they are prepositions only. This classification is problematic in that prepositions do not take finite clauses in English. *Before* and *after* do admit finite clauses, for example *before/after he left, I called a friend*. In Norwegian, the parallel to *before*, *før*, operates as a preposition and as a subordinating conjunction (Faarlund et al. 1997, 340). As a conjunction it takes a finite clause. Prepositions never take finite clauses in Norwegian. I therefore classify *before* as a conjunction.

[7] From a purely syntactic point of view, there is no given rule that prevents the object of the main clause to be available as the underlying subject of the participial clause. However, such an interpretation is hard to get and pragmatically impossible.

clause, which is the participial clause in which the possessives occur. Formally, therefore, the possessives could be locally bound by this subject. From a pragmatic perspective, however, the possessives find reference in the subject of the main clause, *the driver*. It is very likely that the driver has a home and a parking spot outside it. It is highly unlikely, even contradictory, that a stray dog has a home and a parking spot. With the contextual information added, it is reasonable to expect that the reading of this sentence for comprehension should take no longer than the reading of (6), normalized by length.⁸ However, in view of the introductory remarks on possessives in non-finite clauses in section II, the general observations on reflexives in subordinate clauses make it hard to determine what translation choice can be expected. Furthermore, as was suggested for the participial clause in (2e) in section [2], the prepositional phrases with the possessives (as one unit) have two possible attachments: to the verb in the subordinate clause (*sleeping*), or to the verb in the main clause (*found*). On the latter account, the possessives are locally bound by the subject of the main clause, and providing the same structure in the target language, the correct choice is that of a reflexive possessive (*SIN*) to refer to the driver. On the account that it attaches to the lower clause, on the other hand, the pragmatically likely reading would require the non-reflexive possessive (*HANS*), to ensure co-reference with the subject of the higher clause. Choice of the reflexive on this analysis would indicate local binding (the unlikely reading).

With the ambiguity in mind, and in view of findings in the literature to the effect that reading for translation involves at least some activation of translation alternatives, the reading of this example is expected to take longer than the reading of (6) (HYPOTHESIS 4A). Furthermore, more variety in choice of possessives both in the final products and in the number of edits in this example is expected as compared with (6) (HYPOTHESIS 4B). Consequently, choice of possessive is expected to take longer than in (6) for both groups (HYPOTHESIS 4C). Again, on the basis that students lack experience, and that they on that account may have less access to the pragmatic rules of the target in the translation situation, students are expected to follow the structure of the source with higher frequency than the professional translators will. In particular, since the possessives occur in two prepositional phrases and find their antecedent in the same referent (pragmatically inferred), mention of possession in both phrases is superfluous in Norwegian. HYPOTHESIS 4D is that double possessives will occur more often in the non-professionals' targets.

[4] THE EXPERIMENTS

The data extracted for this study consists of process and product data from two online translation experiments run with eye tracking and key logging. The English-Norwegian study conducted at the University of Oslo in 2015 comprises data col-

[8] This cannot be tested, since no participants were asked to read the text for comprehension only.

lected from 25 participants, all with Norwegian as their mother tongue. The experiment was conducted with an SMI 500 eye tracker with a plug-in for Translog II.⁹ Translog II is a software logging among other things the times at which the informant's eyes are focused on a particular item in the source text or in the target text produced, the time it takes to read a word or a sequence of words, and the number of times an item is looked at. Regressions are also measured, that is, the amount of time it takes from the first fixation on an item until the eyes move on to the next word in the text. Importantly, it includes temporal measures for all eye movements back (regressions) to the left of the fixated word. Furthermore, all keyboard activities are logged, including measures of inactivity (calculation of pauses). This means all the revisions made before the final translation is typed in can be extracted from the tables, as well as the time lapse (pauses) between the translations of two items or two or more versions of an item. Duration (Dur) is a measure of the total time needed to type the final translation, in other words including all the typing activities related to the translation of that word or string. (For an overview of the variables measured in the output of the Translog II data, see [Carl et al. \(2015\)](#)).

The Danish data comes from the CRITT database.¹⁰ The Danish experiment was conducted by Hvelplund and was used as basis for his cognitive linguistic PhD study of translator behavior ([Hvelplund 2011](#)). Eye tracking and keylogging were registered by use of a Tobii60 eye tracker with Translog software. Both data sets of the present study have been collected according to the same experimental set up, with 24 and 25 informants, and with texts of about the same length (141 vs. 148 words). In each experiment, half of the group is advanced students of English with little or no translation experience, the other half are professional translators.

The logging data makes it possible to look into the ways in which the informants handle their translation tasks. Previous studies on translation behavior (see for example [Jakobsen & Jensen \(2008\)](#)) show that reading for translation, as compared to reading only for comprehension, is slower. The saccades are shorter and the fixations are longer. This indicates very clearly that the purpose of the reading task has an important impact on the processing. A generally held interpretation of this behavioral difference is that the translator co-activates both source and target language during reading, and that some (pre-)translation is going on already in the first reading of a phrase or segment ([Bangalore et al. 2015](#)). With eye tracking technology, cognitive load (effort) in translation can consequently be measured based on reading times on relevant items or segments during a translation task. Along with the edits logged in the data, temporal measures of gaze on particular words or the reading of larger strings in the source or in the target are used as behavioral indicators of translation difficulties. An additional measure is the

[9] <https://sites.google.com/site/centretranslationinnovation/tpr-db>

[10] <https://sites.google.com/site/centretranslationinnovation/tpr-db>

duration of pauses between unit productions. The analysis includes absolute frequencies on products and edits as well as temporal measures of Duration, Pauses and Total reading times of the source units and the target units.

The temporal measures are transformed for statistical tests¹¹ as follows:

- (i) Normalization: to account for the fact that the units analyzed are unequal in length, the measure is divided by the number of characters in the English source unit.
- (ii) Aggregation: the mean value of all normalized numbers is computed for each participant over the whole phrase under consideration, excluding null values.
- (iii) The data were log-transformed to account for skewness where relevant.

The results are mean normalized variables, on which the t-tests have been performed. Paired t-tests have been used for inference on the difference between corresponding measures of the same participant in different examples. Non-paired t-tests have been used for inference on the difference between corresponding measures of groups of participants (mainly students versus professional translators). Equal variance has not been assumed in the tests, and the significance level chosen throughout is 0.05.

Proportions of categorical variables (types of translation choices) are estimated as a 95% confidence interval. Due to small sample sizes, this has been done using bootstrapping. Sample sizes are provided for each data set considered in the results.

[5] RESULTS

[5.1] *The Danish study: Absolute and statistical values*

Example 4: 'All of his victims...'

Table 2 gives the absolute frequencies of the choices made by the professionals and students for the unit 'all of his victims'. The results are identical for the two groups. Although one participant in each group chose to drop the possessive altogether, leaving possession to inference, the rest all chose the non-reflexive possessive in their translation. The fact that no participants chose the non-reflexive possessive is strong support for HYPOTHESIS 1.

There were no edits in the choice of possessive across students and professionals. Furthermore, the choices were uniform across participants but for one in each group. These facts are stipulated to indicate that the participants did not hesitate on their choice. Temporal measures for this example have been computed only for comparison with (5) (see below).

[11] R version 3.3.0 was used for the statistics.

Group	Non-reflexive	Possessive dropped
Professionals	11	1
Students	11	1

TABLE 2: Product results for (4).

	[Norris]...blev fængslet	Students	Professionals
a) Verbalization + SIN	<i>...for at have dræbt fire af sine patienter</i>	6	7
b) Verbalization + HANS	<i>...for at have dræbt fire af hans patienter</i>	3	0
c) Nominalization + SIN	<i>for drabet på fire af sine patienter</i>	1	2
d) Nominalization + HANS	<i>for drabet på fire af hans patienter</i>	2	2
e) No possessive	<i>for drab på fire patienter</i>	0	1

TABLE 3: The different types of translation of (5) in Danish.

Example 5: ‘...for the killing of four of his patients’

Tables 3 and 4 show the results for the relevant phrase of (5), repeated here:

- (5) Hospital nurse Colin Norris was imprisoned for life today for the killing of four of his patients. (DA, sentence 2)

Variation was predicted between a nominalized and a verbalized structure in the target. This is confirmed by the resulting products. Examples of the different structures, taken from the participant data, are listed in table 3.

Interestingly, the verbalized structure was chosen twice as often as the nominalized structure. There is no vacillation (in terms of edits) with respect to choice of a verbal or a nominal structure. Both are also equally acceptable translation choices. In view of the possible pragmatic readings of the source sentence (whether Norris actually is taken to be the agent of the killings, not just imprisoned for them), HYPOTHESIS 2A stated that the participants would vary in choice of possessive if a nominal structure was chosen. This hypothesis is confirmed by the absolute frequencies. HYPOTHESIS 2B, however, is disconfirmed: the choice of a non-reflexive distributes with equal numbers (2–2) in both groups table 4.

The choice of a verbal structure in the target, on the other hand, has led to interesting differences between the two groups. All the professionals (seven participants) make the same reflexive target choice. As for the students, one third

	Nominalization		Verbalization (infinitive)	
	Professional	Student	Professional	Student
Reflexive	2	1	7	6
Non-reflexive	2	2	0	3
No possessive	1	0	0	0
Sum 1	5	3	7	9
Sum 2	8		16	

TABLE 4: Product results among professionals and students for (5).

(three out of nine) choose the non-reflexive possessive. Our HYPOTHESIS 2C, that the reflexive would be chosen across participants, is disconfirmed by the data. One might speculate that the students choosing the ‘erratic’ non-reflexive possessive are primed by the source, but the study gives no clear evidence of this.

A look at edits in the data for this example might indicate whether the participants hesitate in choosing between a reflexive and a non-reflexive form, thus demonstrating some conscious reflection and indecision on the choice, or not. The three participants choosing the non-reflexive form in the verbalized translation have no edits. However, hesitation is demonstrated in the overall data for this example, as two other students had the non-reflexive as her/his first choice in the verbal structure, but revised it to the reflexive during the production, and one professional translator edited her/his initial non-reflexive choice to the reflexive during a second reading of the target.

Temporal measures may indicate whether the ‘marked’ choices are a matter of priming, or based on a more conscious decision. To test for this, the following four claims were postulated:

- (i) The translation of the ‘error’ examples take less time (DUR average measured over the unit) than the rest of the student translations (irrespective of syntactic choice of the phrase).
- (ii) TrtS and TrtT are significantly lower for the ‘error’ participants than for the rest of the students (or for the rest of the participants).
- (iii) The regression path duration for the ‘error’ responses is no higher than the first fixation duration for the same responses (i.e. they do not look back into the context)
- (iv) There is no pause duration for this choice.

The claims were tested by two-sided paired t-tests, with no equal variance assumed. The measures are based on normalization by length of the target phrases.

Min.	Max.	Median	Mean
46.19	110.6	47.73	68.17

TABLE 5: Summary of the difference between normalized RPDur and FFDur.

The claims are not substantiated by the data. In fact, the mean of mean normalized duration is higher in the ‘error’ group than in the rest of the student group. Normalized TrtS and TrtT are higher in the ‘error’ group as compared with the rest of the student group as well as with the whole ‘non-error’ group together. As for (iii), t-tests indicate that regression path duration in the ‘error’ group in fact is higher than the first fixation duration, i.e. they do look back in context while reading. Differences between normalized RPDur (regression path duration) and FFDur (First Fixation duration) lie between 46.19 and 110.6. A summary of the difference is given in table 5.

The claim that RPDur is no higher than FFDur is tested in two t-tests: the first, on the full data (comparing the two variables for each token and participant); and a second one on the aggregated data, comparing mean normalized RPDur and FFDur for each participant. Test 1 yielded a p-value of 0.002, the second one a p-value of 0.042, hence the data rejects the claim in (iii) and supports the alternative hypothesis that RPDur in the ‘error’ group is greater than FFDur.

Finally, the ‘error’ group has some values in the Pause variable, meaning that the claim in (iv) is contradicted. It should be noted that the ‘error’ group is very small, only 3 participants. Therefore, any generalizations to whole populations of student and professional translators should be taken with caution. However, the results may be indicative of a particular learner profile, as will be discussed further in section [6] below.

It was hypothesized that the verbal choice would not take significantly longer than the choice of a nominalized form. For this, the temporal measures for the V(erb)al target and the N(ominal) target of whole phrase ‘the killing of four of his patients’ were compared. The verbal form was found to take longer than the nominal form, although not at a significant level for any of the measures:

A t-test for Duration yielded a p-value of 0.163 and for Total reading time of the Source a p-value of 0.6, both indicating higher values for the verbal target, although the results are not significant. The Pause measure was almost identical between the two, and the total reading time of the target yielded no obvious structure, so measures were not calculated.

FOR HYPOTHESIS 2C the phrases were restricted to *four of his patients* vs. *all of his victims*. Based on an expected difference in choice of possessive due to the different syntactic choices, the hypothesis was that the phrase in (5) would be more effortful to translate than the phrase in (4). The same analysis was performed on each of

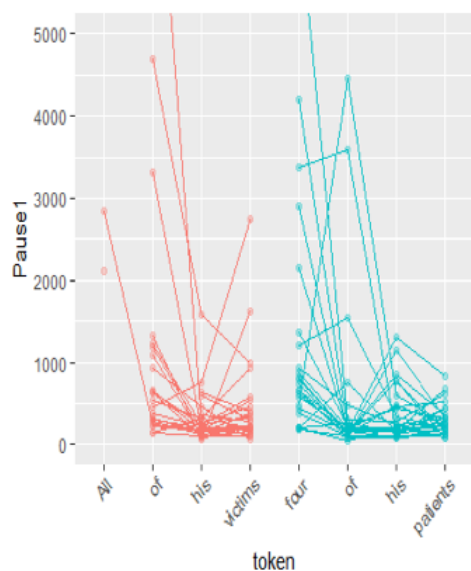


FIGURE 1: Pause1 per token and participant.

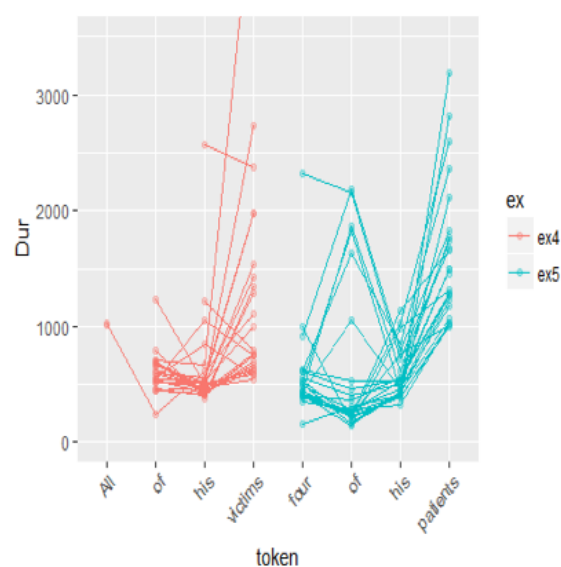


FIGURE 2: Dur per token and participant.

the variables Duration, Pause, TrtS and TrtT. For Dur and Pause, and the patterns found are uniform. For Pause, the time decreases towards the end of the phrase, for Dur it increases towards the end of the phrase, and the increase is stronger for (5) than for (4).

A t-test on the data after log-transformation yielded a p-value of 0.269 for Dur and 0.324 for Pause, thus $p > 0.05$ for both, i.e. the results are not statistically significant.

The patterns for reading times are shown in figures 3 and 4.

The reading times of the source yield two different patterns, an increasing trend from the beginning to the end of the phrase in (4), and a more U-shaped pattern in (5); the range of values seem roughly comparable in the two examples. The readings of the target look more different: although both patterns for TrtT look uniform throughout the phrase, with a slight increase towards the end, there is a lot of variation, especially in (5). The values for TrtT seem somewhat higher for (5) than for (4).

Comparing the boxplots for TrtS for the two phrases in figure 5, the median value for (5) is found to be clearly higher than for (4).

The variation in (4) noted above is reflected in the inter-quartile range of (4) stretching far beyond the boundaries of the IQR of (5) on both sides.

Since the data is right-skewed, a log-transformed t-test was performed; yielding a p-value of 0.123, hence the data provides no evidence to reject the null hypothesis that the mean of normalized TrtS is the same for (4) and (5).

The boxplots for TrtT in figure 6 show that the medians of mean normalized

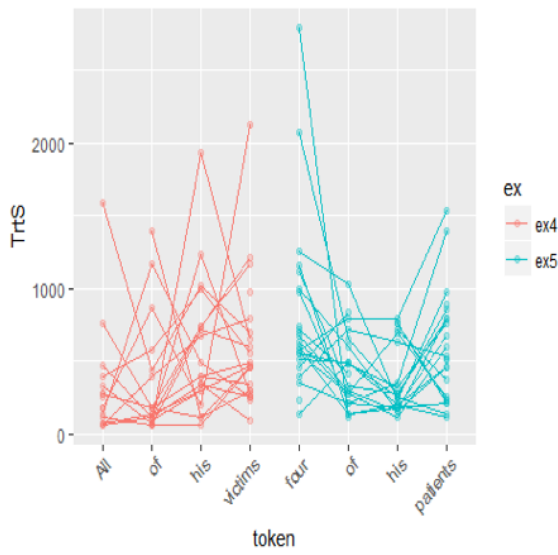


FIGURE 3: TrtS per token and participant.

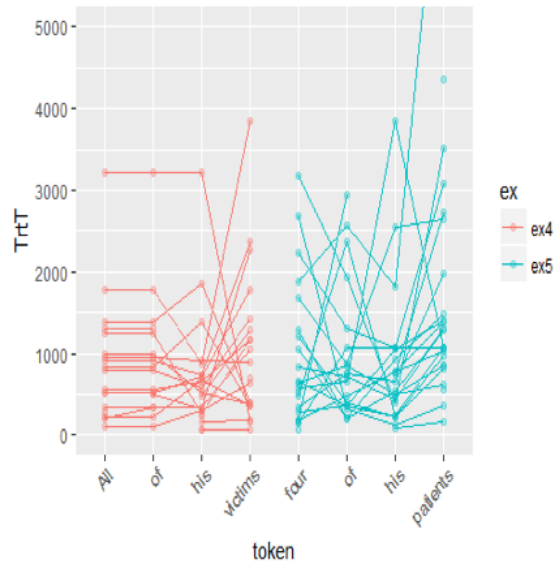


FIGURE 4: TrtT per token and participant.

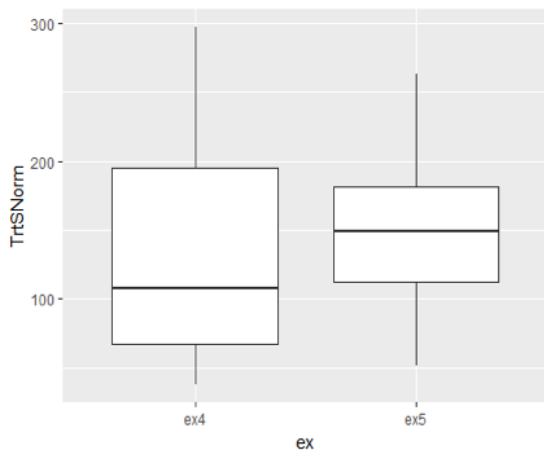


FIGURE 5: Normalized mean TrtS: (4) vs. (5).

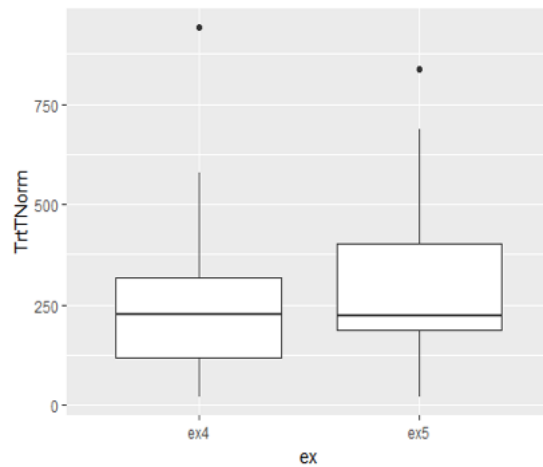


FIGURE 6: Normalized mean TrtT: (4) vs. (5).

TrtT are very similar for both examples. A t-test yielded a p-value of 0.504; hence the difference is not significant.

[5.2] *The Norwegian study: Absolute and statistical values*

Example 6: 'before returning to his car'

To start, absolute frequencies on choice of possessive for the individual examples are presented. For ease of reading, the example is repeated here:

- (6) Exiting the vehicle, the driver reportedly kicked the prostrate animal before returning to his car, an onlooker claimed. (NO, sentence 3).

Table 6 shows the results on final choice of possessives in the Norwegian target.

	Professionals	Students
No possessive	10	8
Possessive (reflexive)	2	5
Possessive non-reflexive	0	0

TABLE 6: Results on translation of the possessive in (6).

There was hardly any hesitation in terms of edits among the participants. Only one (professional) edited his/her first choice with a reflexive possessive, deleted it, and then re-wrote it, changing from pre- to post-position.¹² HYPOTHESIS 3A and HYPOTHESIS 3B are largely confirmed: Professionals and students alike tend to drop the possessive. Although different in the two groups, with a higher score for professionals, there is only a weak trend in the direction of the hypothesis.

Example 7: 'in his favorite parking spot outside his home...'

Table 7 shows the product results for (7), repeated below:

- (7) The unnamed driver had found the dog sleeping in his favorite parking spot outside his home in Chongqing. (NO, sentence 2)

The table demonstrates quite a variety of solutions, which confirms the first part of HYPOTHESIS 4B. On the one hand, there is a distinction between syntactic structures in the targets, some of which affect choice of possessive. On the other hand, whether the target choice retains the same structure as the source or not, there is considerable difference overall between the students and the professional translators. Most notable is the repetition of a possessive in the two noun phrases in target choices that have the same non-finite syntactic form as the source. This

[12] The pre- and post-positions of the reflexive in Norwegian were mentioned in section [2] as an option. This option has not been included in the present study.

Norwegian target		Professionals	Students
One possessive (same structure as in English)	<i>SIN</i> (refl.)	4	0
	<i>HANS</i> (non-refl.)	0	1
Two possessives (same structure as in English)	<i>SIN-SIN</i>	0	3
	<i>HANS-HANS</i>	0	5
	<i>SIN-HANS</i>	0	1
	<i>HANS-SIN</i>	1	2
No possessive (same structure as in English)		1	0
Restructuring into different finite forms		6	1
Total		12	13

TABLE 7: Final solutions by professionals and students for (7).

occurs in 11/13 student translations, and only once among the professional translators. HYPOTHESIS 4D — i.e. double possessives are expected to occur more often in the non-professionals' target text — was tested for significance using two 95% bootstrap intervals:

- (i) Professionals: 95% bootstrap confidence interval for percentage of 'double possessive' = (0; 25)
- (ii) Students: 95% bootstrap confidence interval for percentage of 'double possessive' = (58.3; 100)

As the intervals do not overlap, the data provides convincing evidence that for the translation of this example, it is not mere chance that students use double possessive solutions more frequently than professionals. Based on these confidence intervals, the difference is at least a factor of 2.3.

The second part of HYPOTHESIS 4B states that there will be more edits, reflecting more uncertainty, in the processing of the target in this example as compared to edits for (6) above. While only one edit was found for (6), table 8 shows that seven participants (three professionals and four students) edited their choice of possessives.

The variety in choice as well as the hesitations demonstrated by the edits for this example invited an analysis of the temporal measures for this example against measures of the same variables for (6), considering measures for the latter to form a reasonable base line. The comparative measures are intended to indicate to what extent the varieties in the counts in table 7 and 8 are reflected in our temporal

Solutions in target	Norwegian	No revision of POSS	Revision POSS
ONE POSS	Professionals	4	1
	Students	1	0
TWO POSS	Professionals	0	1
	Students	7	4
NO POSS	Professionals	0	1
REFORMULATION	Professionals	5	0
	Students	1	0
Total		18	7

TABLE 8: Edits by professionals and students for (7).

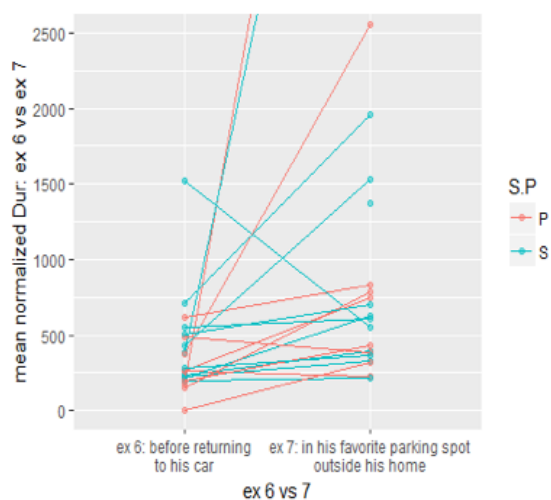


FIGURE 7: Normalized mean Dur of possessive phrase.

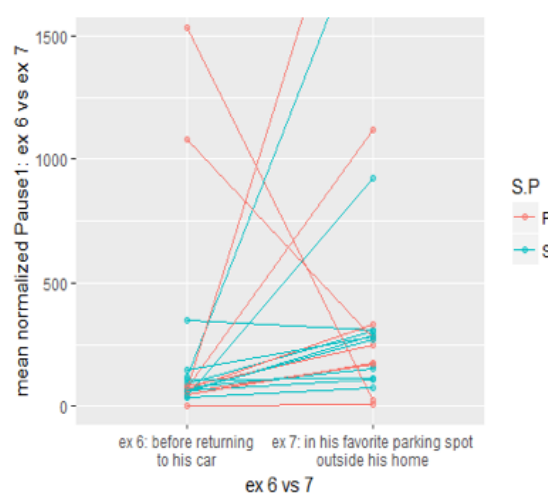


FIGURE 8: Normalized mean Pause1 of possessive phrase.

measures of translation effort. A one-sided paired t-test was made on the following specified hypotheses:

Null hypothesis For each of the variables Dur, Pause, TrtS, TrT, RPDur, and for each of the groups S(tudents) and P(rofessionals), the mean of the normalized measure taken over the phrase is the same for (7) and (6).

Alternative hypothesis The mean of the normalized temporal measure taken over the phrase is greater for (7) than for (6).

The normalized mean production duration and of the possessive phrase translation and the pause duration are plotted in figures 7 and 8.

The general trend is for both measures to be higher for (7) than for (6). The box plots below show that the median of the mean of the difference between (6)

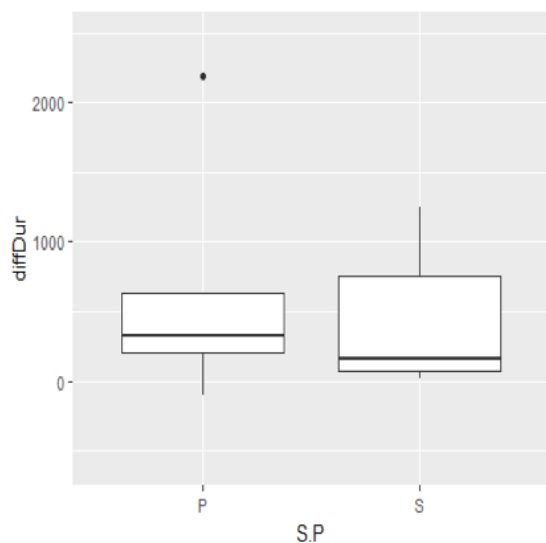


FIGURE 9: Difference in mean normalized Dur between (6) and (7).

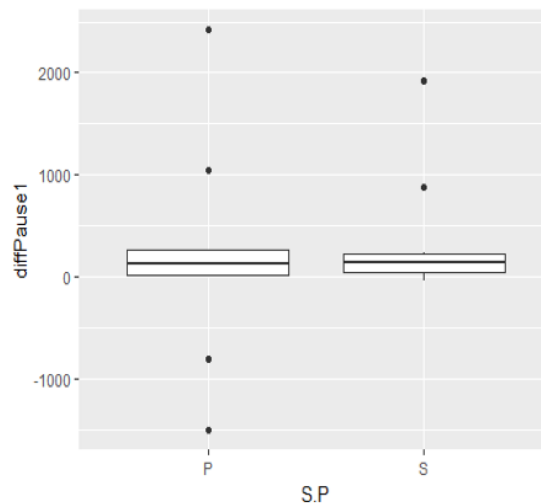


FIGURE 10: Difference in mean normalized Pause1 between (6) and (7).

and (7) are greater than zero. It is higher for (7), as predicted by the hypothesis. Note that the difference is more marked in the group of professionals than in the student group. Box plots are provided in figures 9 and 10.

T-tests on differences between (6) and (7) in the group of professionals yield: 0.073 for Dur and 0.296 for Pause. For the student group, p-value for t-tests on differences between (6) and (7) yield 0.097 for Dur and 0.042 for Pause. In sum, then, the Dur measures are not significant for either group, while the Pause measures are significant at $p < 0.05$ for the student group, but not for the professionals.

Plots for the variables reading time of the source and the target are shown in figures 11 and 12.

Again, the general trend is for both measures to be higher for (7) than for (6), although there are some countrexamples. The most extreme is one professional in the TrtS, but there are also (slightly) negative values among students as well as professionals in TrtT. For TrtT there seem to be three types of differences, which also seem about equally likely in the two groups:

- (i) TrtT is much larger for (7) than for (6), supporting the hypothesis
- (ii) TrtT is slightly larger for (7) than for (6), also supporting the hypothesis
- (iii) TrtT is slightly smaller for (7) than for (6), contradicting the hypothesis

The box plots for the participant results in figures 13 and 14 show that the median of the mean of the difference between (6) and (7) are greater than zero for both variables.

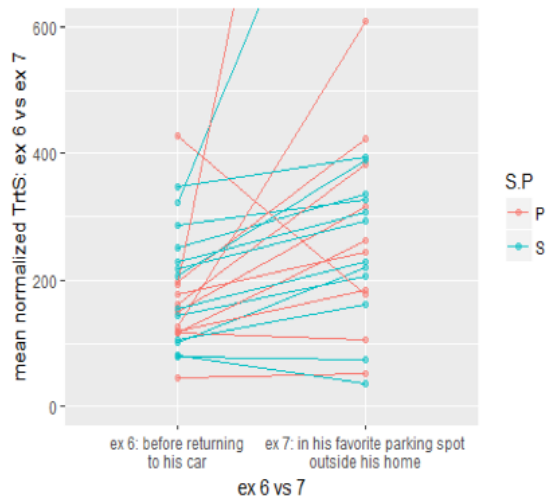


FIGURE 11: Normalized mean TrtS of possessive phrase.

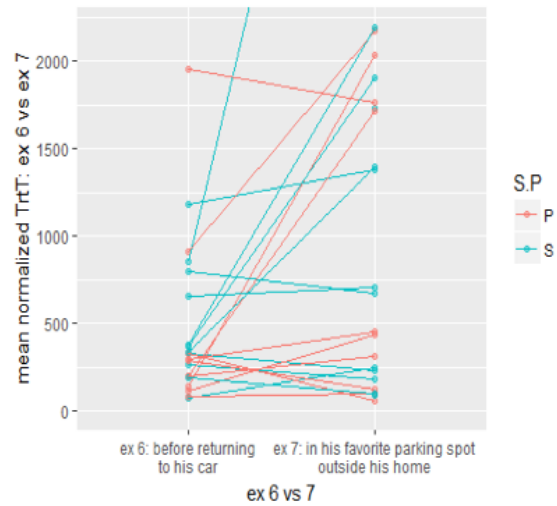


FIGURE 12: Normalized mean TrtT of possessive phrase.

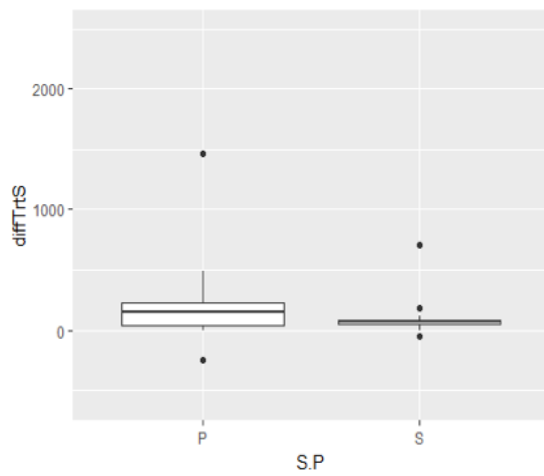


FIGURE 13: Difference in mean normalized TrtS between (6) and (7).

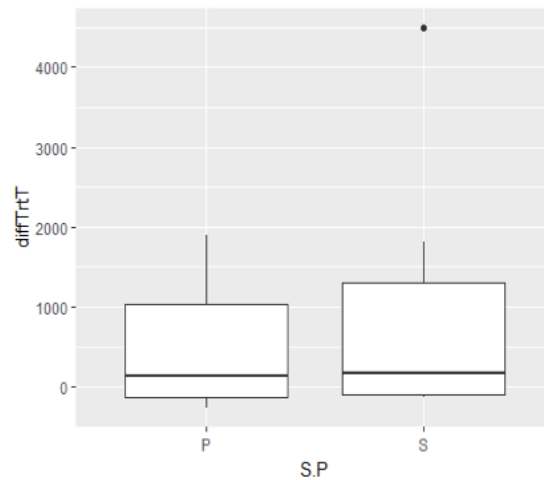


FIGURE 14: Difference in mean normalized TrtT between (6) and (7).

It should be noted that there is very little variance in the student group for the reading of the source (TrtS), which differs from that of the professionals. For the reading of the target (TrtT, figure 14), the boxplot summaries look similar for P and S as the median difference is greater than zero, although only slightly and with the inter-quartile range ranging into negative values in both groups.

A t-test on TrtS for differences between (6) and (7) yields a p-value in the professional group at 0.056; hence $p > 0.05$ and the difference is not significant. For the student group the t-test for the same difference yields $p = 0.024$, hence the difference is highly significant in the direction of the hypothesis that the translation of (7) is more difficult than the translation of (6). For reading of the target (TrtT) the t-test gave a p-value of 0.047 for the professional group and 0.042 for the student group. Both p-values are < 0.05 in favor of the hypothesis that that translation of (7) takes longer than the translation of (6).

It should be noted that many of the p-values are relatively close to the significance level of 0.05 (> 0.04), but still significant. We are also cautious about the fact that all of the distributions in question are strongly right-skewed, which makes the t-test on small samples somewhat less reliable. Finally, outliers both in the positive and the negative direction are frequent; in view of the small sample of data, they can have a decisive influence.

[5.3] *Summing up the results*

For the Danish study, a subject phrase referring back to an antecedent in the previous sentence in (4) was solved in the same way by the two groups. Their choice is in accordance with the general rules stated in section [2] above. For (5), where the possessive occurred in a nominalization, there was considerable variation in the solutions, although the phrase as a whole distinguished two target structures: (i) a nominal structure equal to the source and (ii) a verbal, infinitive structure. The reflexive as well as the non-reflexive possessive was found in both structures. For the verbal alternative, there was a clear preference for the reflexive form, (*SIN*), (13/16 across participants). The non-reflexive (*HANS*) in this structure was found only in the student group. However, revision from a non-reflexive first choice to the reflexive was found in three participants overall. In the nominal version, choice between the reflexive and the non-reflexive was equally distributed between the two groups, and no edits were performed in the process. Any expected difference in the temporal measures between the two groups was disconfirmed by statistics. Also, no significant difference was found in the temporal measures between the processing of the apparently ‘simpler’ (4) and the more complex (5) for any of the groups.

The Norwegian examples were also compared on the assumption that there would be no hesitation on choice of possessive in the only, finite target solution to (6), but a variety of solutions and an expected uncertainty related to the formally

(but not pragmatically) ambiguous (7). The simpler phrase in 6 was found to yield a difference between an expressed reflexive and no possessive, with a somewhat higher result on expressed reflexive in the student group. There was no choice of a non-reflexive form. On the other hand, a variety of solutions was found for the more complex structure in (7). Notably, 50% of the professional translators opted for a partial or total reformulation to ensure a syntactically unambiguous reading. Moreover, the choice of a double possessive in the structure was chosen only by one of the professional translators. The students opted for double possessives in 11/13 cases. There was also a considerable amount of edits for (7), rather equally distributed between the two groups. It should be noted that many of the significant p-values are relatively close to the significance level of 0.05 (> 0.04). The fact that all of the distributions in question are strongly right-skewed admittedly makes the t-test on small samples somewhat less reliable. Finally, outliers — in the positive as well as the negative direction — are frequent; in view of the small sample of data, they can have a decisive influence. Their status is unclear: they may be the result of chance, or a sign of high inherent variability in all these measures.

Temporal measures were analyzed for questions of significant differences among the students and the professional translators for (7). All t-tests for differences in temporal measures yield p-values > 0.05 , thus there is no indication that the students struggled more than the professional translators. However, considering a comparison of the temporal measures for the two examples, the tests of Pause and total reading time of the source (TrtS) were significantly higher for the student group, and reading time of the target of (7) as compared with (6) (normalized for length) yielded a p-value < 0.05 across participants, thus providing convincing evidence in favor of the hypothesis that (7) would take longer to process than (6) for both groups.

[6] DISCUSSION AND RECOMMENDATIONS FOR FOLLOW-UP STUDIES

[6.1] *Interpretation of the results*

The findings of the two studies are quite interesting in view of the general claim about the use of reflexive and non-reflexive possessives in Danish and Norwegian as well as in view of translation. The study indicates that there is a clear preference for the non-reflexive possessive in a structure where the possessive finds its antecedent in the previous sentence, such as in the Danish (4). The choice is uniform across participants, and follows the system as described in section [2]. Uniformity was also found for the finite structure in the Norwegian target of (6), as no participant chose the non-reflexive form in this example of a finite form with a local binder in the subject. However, there is variety in the choice of a reflexive or no mention of possession. The choice of dropping the reflexive possessive altogether was found to be the preferred one here. This is taken to mean that when possession is highly accessible in the immediate context, it is better left to

inference than made explicit. This is also the case for (7), where a single possessive is adequate, as shown by the preference for one possessive among the professional translators. Double possessives were hypothesized to appear among the student solutions due to a lack of access to the pragmatic rules of Norwegian during the translation process. This hypothesis was confirmed.

However, the idea that students have been primed by the source is less clear. The choice of a non-reflexive possessive in the Danish verbal form in (5) may be an indication of priming among the students. No professional translators made this choice, there was no hesitation among these three students in terms of edits, and no significant difference in the temporal measures was found to suggest a translation problem with this choice. On the other hand, the judgement on errors is uncertain. Three other participants had the non-reflexive form as their first choice. This may mean that there is some uncertainty in the population with respect to binding conditions in non-finite structures. We will have to leave it open to further research to test choice of possessive in infinitive clauses in a systematic monolingual experiment to come closer to the question of priming in a translational setting.

The Norwegian translations of (7), apart from the reformulations already mentioned, are also cases of possessives in a non-finite structure. Here this study shows a variety of solutions among the students. The double possessive is particularly interesting: There does not seem to be a regular pattern of choice between the reflexive and the non-reflexive form. Also the temporal measures on reading the source, pausing and reading the target are strong indications that the students have reflected on the choice rather than just choosing the form most similar to the English one from a phonological perspective. It seems reasonable to interpret the results here as reflecting an uncertainty with respect to binding conditions when the possessive occurs in a non-finite clause structure. One particularly interesting example is (9) below. The student translator has the same syntactic form as the source in his/her translation, and ends up with a non-reflexive possessive in the first case and a reflexive in the second:

- (9) P23 (stud): Den ikke navngitte sjåføren hadde funnet hunden sovende i favoritt-parkeringsplassen hans utenfor hjemmet sitt i Choongqin.
 Lit.: 'The not named driver had found the dog sleeping in the favorite parking spot HANS outside the home SIN in Chongqing.'

The student's uncertainty is very clear. After spelling out the first translation with the non-reflexive in both phrases, s/he re-reads the target phrase, looks back to the source phrase four times without changing the target before s/he goes on to the next phrase unit. This process takes 28.5 seconds. In the revision phase after the first draft of the whole translation, s/he stops again at the relevant phrases, reads and re-reads the target several times, revises the first possessive

twice and the second once. The process takes 58.8 seconds, almost one minute. Before stopping at the end of the revision of the whole translation, the participant takes a final brief look at this particular phrase, with no change, viz. (10):

- (10) i hans [snah] sin[nis]hans[snah] favorittparkeringplass ute
[etuo]en hans[snah] sin¹³

It is interesting to see that this informant has a clearly wrong choice of preposition in the first phrase: the preposition chosen is the one phonologically most similar to the English source (*i* for *in*), and not the correct *på*. This may be indicative of hard concentration around the possessive.

The comparison of the student group and the group of professionals is interesting in view of the double possessive choice among the students. The fact that duration as well as pause measures for the phrase were significantly higher for the student group as compared with the same measure for (6) is no evidence that the processing of the phrase is an effect of priming. On the contrary, hesitation as measured through pauses and edits may well be interpreted as a general learner effect, as discussed in section [2].

Temporal measures in TrtT among the professionals were also found to be significantly higher for (7) than for (6). The fact that temporal measures indicate no processing difficulties in the reading of the source (relative to (6)) suggests a formulation problem rather than a comprehension problem. The high number of restructured solutions supports this view. Examples of restructured targets are partial or total changes of the syntax, typically choices with finite structures (i.e. with subjects) which make only one reading available (cf. (11) and (12), or the non-mention of possession, leaving the interpretation of ownership to pragmatic inference (cf. (13):

- (11) P07, PROFESSIONAL
Den ikke navngitte sjåføren hadde kommet over hunden, der den lå og sov på parkeringsplassen han brukte foran sin hjem i Chongqing.
Lit.: ‘The unnamed driver had come across the dog, where it lay and slept in the parking spot *he*¹⁴ used in front of SIN home in Chongqing.’
- (12) P13, PROFESSIONAL
Den ukjente bilisten hadde oppdaget hunden, som lå og sov på bilens vante parkeringsplass, utenfor huset hans i Chongqing.
Lit.: ‘The unknown driver had discovered the dog, who lay and slept on the car’s usual parking spot outside the house HANS in Chongqing.’

[13] The reverse form of the possessives in the square brackets is a representation of the deletions (from end to beginning).

[14] Italics have been used to show the subject within the finite clause. I note that the choice of reflexive appears with the incorrect gender relative to its possessum, but this is irrelevant for the point made here.

- (13) P04, PROFESSIONAL
 Sjøføren, som kan forbli navnløs, hadde funnet hunden sovende på parkeringsplassen utenfor hjemmet i Chongqing.
 Lit.: 'The driver, who will remain nameless, had found the dog sleeping in the parking spot outside the home in Chongqing.'

In conclusion, the present study gives strong support to the general rule that the reflexive possessive is the only correct choice when it is controlled by the (expressed) subject of its clause (cf. (6)). It also supports the general rule that the non-possessive is the only correct choice when it finds its antecedent across sentence boundaries ((4)), or it appears in a finite subordinate clause with its antecedent in the matrix (the translation solution in (11)). When it comes to non-finite clauses such as the infinitive clause translations of (5), and the participial clause translations of (7), as well as the nominalization translations of (6), the rule is far from clear, according to the native target language translators. On this account, it would not be surprising that learners of Danish or Norwegian whose first language does not make the contrast between reflexive and non-reflexive possessives should find it hard to acquire the possessive system in these languages, as demonstrated in Hellan as well as [Pitz et al. \(2017\)](#). Follow-up studies may inform us on the preferences among native Norwegian speakers. Only then can we decide whether the indecisions and processing difficulties demonstrated in the present study are due to translation blocking access to the target system or to the target system itself.

[6.2] *Limitations of the study*

While the behavioral measures in terms of processing times have been very helpful in understanding some of the linguistic problems translators meet, the analyses admittedly have clear limitations. One problem, quite general in translation process research, is the small size of the population studied. When furthermore individual variation is considerable, as in the present study, it is hard to draw very definite conclusions. Edits, on the other hand, in comparison with the final products, are better indicators of the problem, although again, the small sample problem has not been solved.

The reader may have wondered why the present study has computed temporal measures based on whole phrases as a unit rather than on the possessive alone. A weakness of such an approach is that the lexical items in the various examples differ, and some of the measures may therefore be due to problems with lexical choice rather than problems with the choice of possessive. Admittedly, this is a problem. However, there are three arguments for choosing the phrase measure over the word measure. First, even though the background for starting eye tracking as a method of studying reading and translation is based on the long-held eye-mind

hypothesis of [Just & Carpenter \(1980\)](#) – that what you look at is what you think about, no eye tracking system to date is precise enough to avoid some skewing. The result is that some manual revision has to be made to the best of our understanding, in the hope that the measures come closer to what is actually being read when skewing is obvious. The second argument is that processing for interpretation often takes place after the word has been read: the reader needs a context to restrict the meaning or find the reference of a word. Finally, the fact that function words are often not fixated, but content words are, as well as the fact that the eye observes some letters to the left and to the right of what they focus on can only be interpreted to mean that the participant interprets and makes a translation hypothesis about the possessive to the left of the content word s/he looks at.

Finally, the study's analyses rely to some extent on descriptive statistics. While this makes good sense in many places, it makes generalizability somewhat problematic. A follow-up study might benefit from inferential statistical testing of the results (cf. [Hvelplund \(2016\)](#)).

[6.3] *Follow-up studies*

While the present study has made a thorough investigation into Scandinavian native speakers' translation of possessives from English, there is clearly a need to make a systematic study of native Scandinavian preferences of reflexive and non-reflexive possessives in non-finite and other clause structures in a monolingual setting. One such work is on its way ([Behrens & Dirdal To appear](#)), in which sentences with the same lexical units are varied for non-finite, nominalized and finite structures and tested for interpretation and acceptability in a Norwegian-only experiment. A parallel translation test has been worked out. A comparison of the two can give more precise results on preferences in a monolingual setting and give us more precise information on a possible distinction between native speaker judgments in a monolingual setting and in translation.

APPENDIX: THE SOURCE TEXTS USED IN THE TWO TRANSLATION EXPERIMENTS

DA

Killer nurse receives four life sentences.

Hospital nurse Colin Norris was imprisoned for life today for the killing of four of his patients. 32 year old Norris from Glasgow killed the four women in 2002 by giving them large amounts of sleeping medicine. Yesterday, he was found guilty of four counts of murder following a long trial. He was given four life sentences, one for each of the killings. He will have to serve at least 30 years.

Police officer Chris Gregg said that Norris had been acting strangely around the hospital. Only the awareness of other hospital staff put a stop to him and to the

killings. The police have learned that the motive for the killings was that Norris disliked working with old people. All of his victims were old, weak women with heart problems. All of them could be considered a burden to hospital staff.

NO

A stray dog in China proved that revenge is a dish best served cold after damaging the car of the driver who kicked it. The unnamed driver had found the dog sleeping in his favorite parking spot outside his home in Chongqing. Exiting the vehicle, the driver reportedly kicked the prostrate animal before returning to his car, an onlooker claimed. But that was not the end. The animal later returned — with reinforcements — and proceeded to attempt to rip apart the car's bodywork, tearing off the wind-screen wipers, and scratching the paint. The attack of the hounds was captured on camera by an astonished neighbor.

China is home to about 130 million dogs, many of them pampered pets. As the middle class expands, rising numbers of pet owners have resulted in increased opposition to animal cruelty. Unfortunately, there is still scant legislation protecting animals' rights.

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