

Relative Clauses in Old High German: A Corpus-Based Statistical Investigation of Their Syntactic and Information-Structural Properties

Marco Coniglio

Georg-August-Universität Göttingen

Sonja Linde, Tom Ruetten

Humboldt-Universität zu Berlin

In this paper, we investigate the properties of Old High German relative clauses. A striking fact is that the finite verb in these constructions may either precede or follow its object(s). We survey different possible factors proposed in the literature that could determine the relative order of the verb and its objects (VO/OV order), such as type, time, and place of origin of the text, information-structural properties of the object of the relative clause, presence of a relative particle, definiteness of the antecedent, specificity of the referent, and type of the relative clause (restrictive or appositive). Our investigation is based on a corpus of nontranslated texts. It reveals that the only factors that have statistically significant influence on word order are the type of the relative clause and some information-structural properties of the object of the relative clause.*

1. Introduction.

The literature on German relative clauses is very extensive and a large amount of scientific work has been written on the historical development of these constructions in particular (not only in German but also in other Germanic languages).¹

* We would like to thank Eva Schlachter and Lars Erik Zeige for reading and commenting on the first draft of the paper, and two anonymous reviewers for their valuable criticism and suggestions.

¹ This is just a short list of some of the most important work written on German relative clauses and on their historical development: Tomanetz 1879, Delbrück 1909, Wunder 1965, Fleischmann 1973:114ff., Baldauf 1983, Lehmann 1984, Hock 1991, and more recently Axel-Tober 2012. Even though Fleischer (2005)

In this paper, we want to focus on some of the properties of the relative clauses observed in Old High German (OHG).² Even though we do not discuss all the different types of relative constructions attested during this period, we provide a brief overview of the most important types below.³ Based on Schrodtt 2004:172ff., OHG relative clauses can be classified according to their introducing elements. First, asyndetic relative clauses—a rare type of relative clause—are introduced neither by a particle nor by a relative pronoun:⁴

- (1) enti quad zu dem [Ø dar uuarun]
and said to those there were

et ait his, qui erant ibi

‘and said to those that stood there’

(MF 26.71, cited in Schrodtt 2004:174)⁵

Second, there are relative clauses introduced by a relative particle (*the, de, thi*, etc.):

does not focus on diachronic variation, he gives an interesting overview of synchronic variation in German dialects.

² OHG (750–1050) is the earliest attested variety of High German, followed by Middle High German (MHG, 1050–1350), Early New High German (ENHG, 1350–1650), and New High German (NHG, since 1650).

³ Since they are not traditionally considered on a par with relative clauses, relative-like *sô (h)uuer sô* constructions and their variants (see Schrodtt 2004:170ff.) were not taken into consideration in our investigation.

⁴ Each example in the paper was glossed and translated. If available, the Latin source is indicated after the glosses. This is a list of the abbreviations used in the glosses: ACC = accusative, DAT = dative, DEM = demonstrative pronoun, F = feminine, GEN = genitive, M = masculine, N = neuter, NEG = negation, NOM = nominative, PART = particle, PL = plural, REL = relative, SG = singular, SUBJ = subjunctive.

⁵ In Schrodtt 2004:174, the adverb is spelled *das*. Since Hench’s (1890) edition reports *dar*, we decided to correct the text accordingly. Furthermore, we changed the abbreviation “M” for the Mondseer Fragmente—used in Schrodtt 2004:174—to “MF”, since the first abbreviation is often used for Muspilli.

- (2) *thero manno, [thi ih hera nu bat]*
 DEM-PL.GEN man-PL.GEN PART.REL I here now asked
 ‘[none] of the men that I asked to come now’
 (O 4.6.25, cited in Schrodtt 2004:175)⁶

The particle can also be used as “reinforcement” of a relative pronoun (in the example below, *ther + de/the*):⁷

- (3) **[ther-de** mih gisihit] gisihit then
 DEM-M.SG.NOM-PART.REL me sees sees DEM-M.SG.ACC
[ther-the mih santa]
 DEM-M.SG.NOM-PART.REL me sent

Et qui videt me videt eum qui misit me

‘The one who looks at me is seeing the one who sent me.’
 (T 143.2, cited in Schrodtt 2004:175)

Third, there are relative clauses introduced by a relative pronoun. This is the only type which is still attested in standard Present-Day German (PDG). These relative clauses are introduced by a relative pronoun:

⁶ Kelle (1869:355) does not interpret *thi* as a particle but provides a phonological explanation for it, instead: “Relativ ist *e* bei folgendem Vokal manchmal abgeworfen” [In relative clauses, *e* followed by a vowel is sometimes dropped.] The translation throughout the article is ours. The full form would be *thie*. The question remains why this reduction should only take place in relative clauses.

⁷ In OHG, as in other Germanic languages, the (short) demonstrative is used in relative contexts. Since there is no morphological variation between demonstrative and relative pronoun, we decided to gloss the clause-introducing element in a relative clause as a demonstrative.

- (4) Iudas Scarioth, [ther inan uuas selenti]
 Judas Iscariot DEM-M.SG.NOM him-ACC was betraying

Iudas Scariothis, qui erat traditurus eum

‘Judas Iscariot, who should betray him’

(T 138.2, cited in Schrodtr 2004:176)

As this short typological inventory shows, not all types of relative clauses are attested up to the present day. Notice further that, in canonical subordinate clauses, the finite verb typically occupies the final (or a late) position in the clause, and, in fact, all the examples provided above are cases of verb-final relative clauses.⁸ However, this is not the only pattern one finds in OHG. Particular constructions that are often analyzed as relative clauses are those displaying a noncanonical verb position, namely, V1 and V2 relative clauses. These constructions are characterized by peculiar semantic and syntactic properties (see Axel-Tober 2012 for a detailed discussion):

⁸ Following previous work (such as Delbrück 1878, 1911 and Lehmann 1974), Axel (2007:27ff.) argues that the basic order in OHG (up to PDG) is the verb-final one. In contrast, the typical V2 order observed in OHG (and PDG) main clauses is assumed to be derived from the one of subordinate clauses by means of two types of movement:

1. movement of the finite verb to C;
2. fronting of one constituent (or XP-fronting) to Spec, CP.

This can be illustrated by the following Isidor example:

- (i) Druhtin_j suor_i t_j dauite in uuaarnissu t_i
 Lord swore David-DAT in truth

Iuravit dominus dauid in ueritate

‘The Lord swore to David in truth’

(I 610, cited in Axel 2007:4, our syntactic notations)

(5) a. In dem mere ist einez, [Ø heizzet serra]
 in the sea is one is.named sawfish
 ‘There lives one in the sea which is named sawfish’
 (Aph 104, cited in Axel-Tober 2012:199)⁹

b. sum tuomo uuas In sumero burgi
 certain judge was in certain town
 [ther niforhta got]
 DEM-M.SG.NOM NEG-feared god

Iudex quidam erat In quadam ciuitate | qui deum non timebat

‘There was a certain judge in a certain town who didn’t fear god.’

(T 200, 31, cited in Axel-Tober 2012:208)

A further problematic aspect, which is orthogonal to all types of constructions considered so far, is the position of the verb (V) with respect to the object(s) (O) or to other arguments the verb selects. While in V1 and V2 relative clauses the movement of the verb results in a VO pattern, one would expect non-V1/V2 clauses to systematically display an OV order. However, this is not always the case, since OHG relative clauses also allow for a VO pattern even if the verb has not been fronted to the second position (verb-late order).¹⁰

(6) Daz ist daz hêreste guot, daz der uore
 that is the greatest wealth-N DEM-N.SG.NOM PART.REL before

⁹ Axel-Tober (2012) argues that, in such cases, the verb has moved to C, but no XP occupies Spec, CP. That is why the clause surfaces as a V1 clause.

¹⁰ Syntactically, such examples could be explained either by assuming that objects can be extraposed (Axel 2007:80) or by arguing that the verb may also be base-generated in or moved to a position preceding the object for information-structural reasons (Tomaselli 1995; Schlachter 2004, 2012; Hinterhölzl 2009; Petrova & Hinterhölzl 2010; Weiß, forthcoming), as schematized below:

- (i) a. [_{VP} t_i V] O_i VO as result of the extraposition of the object
- b. [_{VP} V O] VO as base-generated order
- c. V_i [_{VP} O t_i] VO as result of verb movement

gegariwet ist, **gotes trûtfriunden**

afforded is gods intimate.friends-DAT

‘This is the greatest wealth which is provided to God’s intimate friends before.’ (HiH, 36)

In the literature, each of the two possible word orders has been associated with different semantic and syntactic properties of relative clauses: information-structural properties of the object, presence of a relative particle, definiteness of the antecedent, specificity of the referent, and the type of relative clause (restrictive versus nonrestrictive). Since these associations have typically only been demonstrated by isolated examples, we decided to test their strength with a corpus investigation. A number of theoretical investigations explore relative constructions in order to explain their origin and development. However, testing their hypotheses was difficult, since no annotated corpus was available until recently. By now, a number of historical texts have been digitized and annotated morphosyntactically. In particular, a reference corpus for the OHG epoch is now available (see next section). Thus, quantitative analyses can now be conducted to test hypotheses in the literature and/or to formulate new ones. Ultimately, corpus-based investigations should allow one to better understand specific syntactic phenomena.

In this paper, we present the results of a pilot study in which we tested traditional and modern hypotheses regarding OHG relative clauses. Whilst conceding that the results presented below are based on a small set of data and that a larger corpus investigation is called for, we are fully convinced that the findings are valid for the phenomena discussed. Specifically, the following research questions were addressed:

- (i) Since the first written attestations, the typical order of subordinate clauses is OV. Do relative clauses follow this general tendency? How often do they deviate from this pattern (sections 3.1 and 3.2)?
- (ii) Can one observe variation when taking into account the type of text, and its time and place of origin (section 3.3)?
- (iii) Do information-structural properties of the object (such as weight or focus) influence its position with respect to the verb, as maintained in recent syntactic literature on the topic (section 4)?

- (iv) How frequent are relative clauses introduced by a relative particle compared to the clauses introduced by a relative pronoun? More importantly, is there a relationship between VO/OV orders and the presence of a particle (section 5)?
- (v) Do the definiteness of the antecedent and the specificity of the referent have any influence on VO/OV orders (section 6)?
- (vi) Is there a relationship between VO/OV orders and the type of relative clause (restrictive, free, and appositive)? Further, is there a relationship between subject-verb/verb-subject (SV/VS) orders and the type of relative clause (section 7)?

Anticipating the discussion below, our main finding is that the only significant factors determining the VO/OV order are the type of relative clause and the information-structural properties of the object. The other factors—that is, language-external characteristics of the text, presence of a particle, definiteness of the antecedent, and specificity of the referent—have no statistically significant influence on the distribution of the two patterns.

2. Empirical Approach.¹¹

Since our goal was to conduct a pilot study on the properties of relative clauses in OHG, we needed a small corpus of mostly heterogeneous texts, which were representative of the whole epoch and of different dialect regions. This is clearly not an easy task, if not an impossible one, given the fragmentary manuscript tradition. Furthermore, many of the major OHG texts are often unsuitable for syntactic investigation due to various reasons, such as dependency on metrical schemes, the influence of a Latin source, or because they represent only one period or one dialect region. For this reason our decision was made in favor of the collection of so-called “minor OHG texts” (Steinmeyer 1971). These texts are digitized in TITUS and linguistically annotated in the Old German Reference Corpus (OGRC), which provides a digital, parsed,

¹¹ We would like to thank an anonymous reviewer for his or her important observations, criticism, and suggestions on this point.

and searchable database of the entire text corpus of written OHG, as well as Old Saxon.¹²

Our corpus captures a subgroup of more than 80 texts included in Steinmeyer's edition. We selected 49 OHG texts from the beginning of the written tradition in the late 9th century until the period of transition to MHG in the 12th century.¹³ The texts cover all OHG dialect areas, although texts from the southern language area predominate because, in general, there are more extant OHG texts from that region. We excluded some of the texts in Steinmeyer's edition for being clearly one-to-one translated texts and thus strongly dependent on a Latin source.

With our research questions in mind, we created a dataset by searching for clauses annotated as relative clauses.¹⁴ We also considered those relative clauses (namely, free relatives) that function as argument clauses (subject or object clauses) in certain contexts.¹⁵ Finally, some of the clauses annotated as main clauses introduced by a demonstrative were included as well. In all stages of the German language, demonstrative and relative pronouns are homophonous (unless relative pronouns are interpreted as demonstratives, a frequent claim in the literature). Therefore, a distinction between V2 relative clauses and main clauses is often unclear. Consider, for example, the case in 7. The second conjunct may be interpreted either as a main clause or as a relative clause, depending on the reading assigned to the pronoun, namely, a demonstrative or a relative pronoun reading.

(7) Ne-bis-tu liuten kelop mer than Iacob.
 NEG-are-you people-PL.DAT well-known more than Jacob

¹² The corpus is searchable by means of ANNIS (Annotation of Information Structure, Krause & Zeldes 2016).

¹³ A complete list of the selected texts may be found in appendix A. In the collection of the minor OHG texts, there are some texts that strictly speaking do not belong to the OHG period, given that they were written at the end of the 11th or during the 12th century. Nonetheless, these texts can be considered to be based on OHG sources or to belong to the OHG tradition, the manuscript having been issued in the MHG epoch. That is why we speak of a "period of transition".

¹⁴ For more detailed information on annotation and tags used, see appendix B.

¹⁵ See appendix B for further details on this point.

ther gab uns thesan brunnan
 DEM-M.SG.NOM gave us this fountain
 ‘You are not more well-known to the people than Jacob. He gave us
 this fountain’ or ‘(...) who gave us this fountain’ (Ch, 15)

We decided to add these potential cases to our corpus.¹⁶ Our queries produced more than 700 clauses, which, in all likelihood, comprise all the relative clauses present in the selected subset of OGRC. As part of this first step, we then selected the 144 clauses (distributed across 25 texts) that we considered to be relative clauses.

A second step consisted in enriching the remaining 144 relative clauses with additional syntactic, semantic, and information-structural data regarding each relative clause (and its antecedent). The corpus also included metadata for each text regarding its type (that is, prose, alliterative verse, or rhyming verse), dialectal region, and the time of origin. The characteristics annotated in the dataset (and relevant for the current study) are discussed below.

The following sections contain a statistical analysis of the data collected and annotated for the current study, together with a thorough discussion of the different factors that could possibly influence word order.¹⁷ As mentioned above, we discuss the following aspects:

- (i) VO/OV and SV/VS order (sections 3.1 and 3.2);
- (ii) synchronic and diachronic variation across type, time, and place of origin of the texts (section 3.3);

¹⁶ In this particular case, we decided to include this clause in our corpus since the Latin Gospel text is introduced by a relative pronoun (*qui* ‘who’). An anonymous reviewer pointed out that including such examples in our corpus might “be inflating the overall number of VO tokens with clauses that are ambiguous and might not even be relative.” This might be true but, on the one hand, we only included ambiguous cases that could be considered relative clause candidates beyond reasonable doubt, for example, because of an available Latin source. On the other hand, the potentially ambiguous cases included in our calculations are very few with no clear effects on the statistics presented below.

¹⁷ For details on the R code used, see appendix C.

- (iii) information-structural properties of the object of the relative clause (section 4);
- (iv) presence of a relative particle (section 5);
- (v) definiteness and specificity of the antecedent (section 6);
- (vi) type of the relative clause, that is, restrictive versus nonrestrictive (section 7).

Examples are given of the different properties, and the empirical results are discussed in detail.

3. Verb Position: VO/OV Order, SV/VS Order, and Variation.

The first issue we would like to address is the more general problem of the position of the finite verb in relative clauses. According to widely accepted assumptions, the typical order in subordinate clauses is the “basic” OV order. In recent syntactic investigations (for example, Hinterhölzl 2009, Petrova & Hinterhölzl 2010, Schlachter 2004, 2012), it has been argued that the positioning of objects with respect to the verb is information-structurally determined. In particular, the VO order is assumed to be associated with (a particular type of) focus on the object (see section 4 on the influence of information structure on the position of the verb in our corpus). Citing the following example from *Tatian*, Hinterhölzl (2009) analyzes the object as constituting the new information focus in the context:¹⁸

- (8) Inti bráhtun imo / alle ubil habante / (...) /
and brought him all evil having-NOM.PL

Inti thie thár hab&un_v diuual
and those PART.REL had devil

& obtulerunt ei/omnes male habentes/(...) & qui demonia habebant

¹⁸ The term *thár* ‘there’ is originally a locative adverb. However, we decided to annotate it as a relative particle in this context, even if, in traditional literature, the term *relative particle* is restricted to the lemma *the* (see discussion in section 5).

‘and they brought him all the sick ones and those that had the devil’
(T 59, 1, cited in Hinterhölzl 2009:48)

From an information-structural point of view, this seems to be a well-established fact by now. However, we pointed out above that, on the syntactic level, different interpretations for such VO orders in embedded contexts have been proposed. For example, Axel (2007:80ff.) interprets the VO order in subordinate clauses not as the result of verb movement, but rather as the result of “extraposition” of the object. Also, according to Hinterhölzl (2009), no verb movement has taken place in such cases; instead, he assumes that the object is base-generated after the verb (following Kayne’s 1994 Universal Base Hypothesis). In contrast, other authors, such as Schlachter (2004, 2012:55ff.), argue that in subordinate clauses, the verb may move to a higher syntactic position, namely, to a medial I-position, thus yielding a surface VO order.

In this paper, we first analyze the syntactic position of the different elements relative to their linear occurrence on the surface. After that we discuss the implications of various theoretical assumptions made in the literature. In section 4, we provide a statistical analysis of the data pertaining to the information-structural properties of the object. Notice that the OHG verb is typically realized as a unique, finite verb form, with complex predicates being comparatively less frequent. Thus, the question about VO versus OV orders often coincides with the question of the position of the object with respect to the finite verb.

3.1. VO/OV Order.

Let us start with the question of how often the finite verb comes before or after the object(s) in our corpus.¹⁹ First, we restricted the dataset to

¹⁹ Prepositional objects are also included in the calculations. Even if adjuncts were annotated, their position with respect to the verb is not considered here, since they cannot be considered as objects and their properties make them more flexible syntactic elements (they are also more prone to extraposition and/or being an independent prosodic unit). Furthermore, most of the previous studies concentrated on the reciprocal ordering of the verb and its objects. For reasons of comparability, we then decided to restrict our investigation to cases in which an object could be identified and thus to restrict our survey to VO/OV order rather than to V2/verb-final order. We thank an anonymous reviewer for pointing out this issue.

clauses that can answer this question. These clauses do not contain an object relative pronoun (because, in that case, it would automatically precede the verb for independent syntactic reasons).²⁰ Then, we counted the number of clauses in which the object precedes the verb, as in 9a, or follows it, as in 9b.

- (9) a. Nu vuill-ih bidan den rihchan Crist [...]
now want-I ask the powerful Christ

der **den divvel** gibant_v
DEM-M.SG.NOM the devil enchained

‘Now I want to ask the powerful Christ who enchained the devil.’
(TV, 1)

- b. einer got almahtig, der scuof_v **himil enti erda**
one God almighty DEM-M.SG.NOM created heaven and earth
‘One almighty God, who created heaven and earth’ (BB 3)

Although, strictly speaking, predicatives are not objects, they behave like arguments of a copula. Therefore, recent information-structural research on the ordering of the verb with respect to its objects (or other arguments) often treats predicatives on a par with objects. That is why we, too, decided to treat them as objects for the purposes of our calculations. Examples 10a and 10b below illustrate the predicative-verb and the verb-predicative order, respectively.

- (10) a. anderes manages thes
other-GEN many-GEN DEM-N.SG.GEN

ih uuidar got **sculdic** si_v
I against God guilty am-SUBJ

²⁰ Those cases and clauses without an object at all—total of 66 clauses—were annotated as NA (“not applicable”):

- (i) denne der paldêt, der gipuazzit **habet**
then DEM-M.SG.NOM hopes DEM-M.SG.NOM expiated has
‘Then the one who has expiated takes comfort’ (M, 99)

‘many other things which I am guilty of in front of God’
(MB, 16)

b. nu hebist enin der-n-is_v **din**
now have-SG.2 one DEM-M.SG.NOM-NEG-is yours
‘now, you are with someone who doesn’t belong to you’ (Ch, 27)

Thus, all types of objects (including prepositional ones) as well as predicatives were considered under the more general notion of “objects”. This yielded the results in table 1.

	OV	VO
Frequency distribution	59 (76%)	19 (24%)

Table 1. Frequency distribution of VO/OV order.

The data in table 1 show a clear preference for the OV pattern (76%). Interestingly, this pattern is very similar to the distribution of relative clauses in *Isidor* described in Schlachter 2012:62ff., following Robinson 1997. Her data show that relative clauses belong to the type of subordinate clauses with the lowest rate of VERBFRÜHERSTELLUNGEN (literally, ‘verb-earlier-positions’), that is, cases in which the verb does not occur in the last position (27%). Relative clauses are shown to behave similarly to modal clauses (25%), with only conditional clauses displaying a significantly lower rate of Verbfrüherstellungen (17%).²¹

A possible explanation for the relatively low number of VO cases could lie in the limited information-structural potential of relative clauses, at least of restrictive ones (see, for example, Holler 2005:58ff.). While the OV pattern is always available in subordinate clauses (and thus also in relative clauses), the VO order is possibly restricted just to those cases in which the object is focused (see section 4 on this point). This information-structural strategy—that is, marking focus by the VO order—seems to be only available in contexts with higher illocutionary potential. In fact, we expect for it to be mainly possible in nonrestrictive

²¹ Slightly different data are reported in Petrova 2009:253 for *Tatian*, where non-V-final orders amount to 34.2% of the total cases.

contexts.²² Other types of subordinate clauses (for instance, argument clauses and causal clauses) generally display a higher illocutionary and information-structural potential (see Schlachter 2012:66ff.). As Schlachter (2012:62ff.) and Robinson (1997) show, these pattern differently from relative clauses in allowing a higher number of Verbfrüherstellungen.

3.2. SV/VS Order.

Consider now subjects. At least in main clauses, subjects appear to be possible in postverbal positions too. This order is a well-established Indo-European pattern (see Matras & Sasse 1995). For our corpus, we decided to annotate the syntactic behavior of subjects as well. The largely prevailing pattern is the one in which the subject precedes the finite verb, as in example 10a. Again, we restricted the database to relative clauses in which the subject function is not fulfilled by the relative pronoun (since, in such cases, the subject precedes the finite verb for independent reasons), as in example 10b.

The alternative VS pattern is attested in only three cases, similar to the one in 11. However, to analyze this example in generative terms, one should treat the adverb *umbe* as the nonfinite part of the verb, that is, a verb particle, in modern terms. One should further assume that the finite part of the verb moved to the position preceding the subject.

- (11) tiu sint zimber, mit dien gat_v er umbe
 DEM-N.PL.NOM are buildings in DEM-N.PL.DAT goes he around
 ‘those are buildings within which he wanders around’ (DD, 20)

Such VS patterns can thus be explained not as a result of a true extraposition or base-generation of the subject in the postverbal position

²² Notice that example 10b exemplifies the case of a restrictive relative clause. Nonetheless, it is only apparently an exception. At least two reasons lead us to think so:

- (i) This is probably a case of verb preposing triggered by the specific character of the indefinite antecedent. This is one of the V2-relative clauses investigated in Gärtner 1998, 2001 and Axel-Tober 2012.
- (ii) The relative clause possibly displays a VO order for rhyme reasons (*sin* ‘be’, in the preceding half-line).

(together with the adverbial element), but rather as a result of a movement of the verb to a position preceding the subject, which in turn triggers a V2 pattern in this case.

The examples in our corpus are probably not representative of the phenomenon, but subject extraposition is claimed to be possible in OHG even in subordinate clauses. Some clear cases have been discussed in the literature, such as example 12 cited in Axel 2007:91.

- (12) dhar chiquhedan uuard_v got chisalbot
 where mentioned became God-NOM anointed
cum deus unctus insinuator

‘where the anointed God was mentioned’ (I 3,2)

Even if one considers examples such as 11 as VS cases (with extraposed subjects), the distribution of the subjects in our corpus shows a clear dominance of the SV order (94%), as shown in table 2.²³

	SV	VS
Frequency distribution	45 (94%)	3 (6%)

Table 2. Frequency distribution of SV/VS order.

Compared to the distribution pattern in table 1, the stronger effect in this case may be explained by the syntactic properties of subjects, which is realized in a syntactically higher position than objects (see, for example, Frey & Pittner 1998). Objects—being syntactically lower—may be easily found in postverbal position when focused (via extraposition or movement). In contrast, subjects tend to be realized in preverbal position (maybe a high syntactic position) even when focused. Thus, the syntactic constraints on subjects seem to be rigid enough to guarantee that they are not extraposed even when information-structure—for example, new information focus (see section 4)—would require it.²⁴

²³ Total number of NA cases: 96.

²⁴ That the postverbal position of subjects is much more restricted than that of objects is confirmed by the data in HIPKON, a diachronic corpus for the investigation of the information-structural properties of the so-called NACHFELD

Beyond information-structural and syntactic factors, the distributions in table 1 and table 2 may be related to different influencing factors. In the following sections of this paper, we intend to investigate other potential influencing factors that are sometimes discussed in the literature: the presence of a relative particle, the definiteness of the antecedent, and the specificity of the referent. We show that none of these factors has any influence on the VO/OV pattern. To anticipate the discussion below, we argue that some of the information-structural properties of the object and the type of relative clause (restrictive versus nonrestrictive)—which can ultimately be traced back to information structure as well—influence word order.

3.3. Type, Time, and Place of Origin of the Texts.

Before starting the investigation of the factors mentioned above, a preliminary quantitative assessment was necessary in order to establish whether the type, the time of origin, and the place of origin of the texts had some influence on the other properties of relative clauses. Contrary to expectations, no clear results emerged from this preliminary investigation of the three extra-linguistic factors. Let us briefly summarize this preliminary study. First, word order barely changes across text types, as illustrated in table 3.²⁵

(that is, the part of the sentence that follows the typical position of nonfinite verb forms in main declaratives; see Coniglio & Schlachter 2015a,b). The corpus, which includes sermons from the MHG period to the beginning of NHG, shows that, in main clauses, the postposition of subjects is still possible in MHG texts, but that it decreases more rapidly than the postposition of objects and predicatives in the following epochs.

²⁵ In all our tables, we report the values of the independent variable in the rows, while word order is considered a dependent variable, and its value is reported in the columns. Accordingly, percentages were calculated horizontally (answering questions such as what is the frequency of the OV order in prose texts?), and not vertically (what is the frequency of prose texts with OV order?).

	OV	VO
Prose	45 (76%)	14 (24%)
Alliterative verse	5 (71%)	2 (29%)
Rhyming verse	9 (75%)	3 (25%)

Table 3. Comparison of VO/OV order in text types.
Fisher Exact $p > 0.05$.

The distribution of the VO/OV order is quite similar in the three text types.

Second, at least with respect to diachronic variation, one could expect a high degree of variation. In fact, looking at the centuries in table 4 below, significant differences may be observed. However, the change does not seem to proceed in a certain direction. For example, one could expect (at least, from the perspective of PDG) that the number of OV cases would increase progressively to the detriment of VO cases. However, our corpus shows no real trend, although this ultimately might have to do with the small amount of data available: Note, for instance, that there are only two examples with a clear word order from the 8th century. Thus, quantitatively speaking, these examples are not very relevant. Only the changes between the 10th and 11th century and between the 11th and 12th century are statistically significant. Notice, however, that we only have a very small amount of data from the 10th and 12th century. Therefore, we prefer not to attribute too much importance to the low p value in this case.

	OV	VO
8th century	1 (50%)	1 (50%)
9th century	26 (79%)	7 (21%)
10th century	3 (43%)	4 (57%)
11th century	23 (92%)	2 (8%)
12th century	4 (44%)	5 (56%)

Table 4. Comparison of VO/OV order throughout centuries.

Finally, we considered the place of origin of the texts (see table 5). Here again, we observed little variation across the dialects. Notice that the Central German dialects in our corpus (Central Franconian and Rhine

Franconian) show no examples of the VO order, but this could be explained by the small amount of data considered.

	OV	VO
Alemannic	8 (73%)	3 (27%)
Bavarian	24 (83%)	5 (17%)
Central Franconian	2 (100%)	0 (0%)
East Franconian	13 (62%)	8 (38%)
Rhine Franconian	5 (100%)	0 (0%)
South Franconian	6 (67%)	3 (33%)

Table 5. Comparison of VO/OV order across dialects.
Fisher Exact $p > 0.05$.

Thus, this preliminary investigation of these three variables (text types, time, and place of origin of a text) does not reveal any interesting quantitative results. Even the two statistically significant changes between the 10th and 11th and between the 11th and 12th centuries are debatable due to their low absolute values. Therefore, we can start considering primarily linguistic variables that could affect word order in relative clauses.

4. Information-Structural Properties of the Object.

Given that theoretical and empirical investigations seem to suggest that the properties of the object could play a crucial role in word order, we also annotated the information-structural properties of the object.²⁶ In recent papers on the topic (see Hinterhölzl 2009, Petrova & Hinterhölzl 2010, Schlachter 2004, 2012), it is argued that the position of the object with respect to the verb is determined by its information-structural properties. For instance, based on Behaghel's (1932) *Gesetz der wachsenden Glieder*, Hinterhölzl (2004, 2009:51) claims that, in OHG, light elements precede heavy elements. Furthermore, he argues that, being prosodically heavy, focused constituents tend to be realized postverbally. We therefore expect the weight of an object to correlate with its position with respect to the verb: Heavier objects should follow

²⁶ We would like to thank an anonymous reviewer for encouraging us to further pursue these fundamental aspects.

the verb much more frequently than lighter objects. Another important observation in Hinterhölzl 2004, 2009 is that this generalization only applies to presentational, or new information focus, since contrastive focus is typically realized in preverbal position in OHG. Moreover, it was shown for Yiddish (see, for example, Diesing 1997) that definiteness plays a crucial role in object movement.

Below we present each of the following potential variables separately:

- (i) weight of the object
- (ii) definiteness of the object
- (iii) new information and contrastive focus

We discuss the influence of each variable on the position of the object with respect to the verb in our corpus.

4.1. *Weight of the Object.*

Let us start our discussion with the factor weight (or length). For the investigation of the impact of weight on the position of the object with respect to the verb, we decided to annotate the number of words for each pre- and postverbal object (as well as each predicative object). For instance, the object in the relative clause in 13 was annotated as having a weight of 2, since it consists of two elements.

(13) *Truhtin suno einboraner Heilanto Christ (...)*

Lord son only savior Christ

Ther nimis_v **sunta uueruldi**

DEM-M.SG.NOM you.take sins world-GEN

‘Lord, God’s only son, Christ the redeemer, who takes away the sins of the world’ (WK, 113)

Table 6 shows the distribution of objects with different weight relative to the verb.

Weight	OV	VO
1 word	35 (90%)	4 (10%)
2 words	15 (65%)	8 (35%)
3+ words	5 (40%)	7 (60%)

Table 6. Weight (or length) and VO/OV order.
t-test p :0.13, Cohen's d :0.33.

We used a *t*-test to check whether the mean value of one group—that is, the mean number of words—is significantly different from the mean value of another group. In this case, the mean weight of the OV group is 1.796, and the mean weight of the VO group is 2.211. The *t*-test reports a *p*-value of 0.13, which is not below the typical alpha level of 0.05, and is thus not significant. Cohen's *d* for this correlation is 0.33, which is typically considered to be only a small association. Despite limited evidence, however, we argue that the data clearly indicate that the weight of the object, operationalized by means of the number of words, has an influence on where the object is positioned. More precisely, the heavier the object, the more likely it is to follow the verb.

4.2. *Definiteness of the Object.*

As mentioned above, in Yiddish, the definiteness of the object has been shown to correlate with a different position with respect to the verb. Hence, we decided to annotate examples according to the (in)definiteness of the object, as shown in 14a and 14b for definiteness and indefiniteness, respectively. However, the definite object in 14a and the indefinite object in 14b both precede the verb.

- (14) a. Nu vuill-ih bidan den rihchan Crist [...]
 now want-I ask the powerful Christ
 der **den divvel** gibant,
 DEM-M.SG.NOM the devil enchained
 'Now I want to ask the powerful Christ who enchained the devil'
 (TV, 1)

- b. dar niist eo so listic man der dar
 there NEG-is ever so clever man DEM-M.SG.NOM PART.REL

iouuiht arliugan megi_v
 anything mock can-SUBJ

‘There is not so clever a man that could mock anything’ (M, 94)

	OV	VO
Definite object	25 (76%)	8 (24%)
Indefinite object	4 (80%)	1 (20%)

Table 7. (In)definiteness of object and VO/OV order.
 Fisher Exact $p:1$, Cramer’s $V:0.03$.

Table 7 shows that there is no correlation between the (in)definiteness of the object and its position relative to the verb. A Fisher Exact p -value of 1 and a meager Cramer’s V of 0.034 indicates no association between the variables. However, since many cases had to be excluded here, these results are inconclusive.

4.3. Focus.

To test current theories on pre- and postverbal positioning of focused objects (see Hinterhölzl 2004, 2009), we distinguished the annotation of new information, or presentational focus on the one hand and contrastive focus on the other. Let us discuss new information focus first. Since focus is a projecting property, it may involve the object alone (narrow focus) or the object as part of a larger focused constituent (broad focus). This is illustrated in 15a and 15b, respectively.

(15) a. Nu vuill-ih bidan den rihchan Crist,
 now want-I ask the powerful Christ

the [Focus **mannelihches chenist**] ist_v [...]
 PART.REL of.every.man salvation is

‘Now I want to ask the powerful Christ who is every man’s
 salvation’ (TV, 1)

b. dar niist eo so listic man der dar
 there NEG-is ever so clever man DEM-M.SG.NOM PART.REL

[_{FOCUS} **iouuiht** arliugan megi_v]
 anything mock can-SUBJ

‘There is not so clever a man that could mock anything’ (M, 94)

In the appositive relative in 15a, only the predicative *mannelihches chenist* is in focus. In contrast, 15b shows the case of broader focus involving at least the predicate with its object (if not the whole relative clause with its antecedent, given the restrictive character of the relative clause). For our annotation, we decided to annotate narrow and broad focus distinctly, since we expected narrowly focused objects to show different syntactic behavior from broadly focused objects.

With respect to contrastive focus, Hinterhölzl (2004, 2009) shows convincingly that it occupies a preverbal position in OHG, unlike new information focus. For that reason we decided to annotate special cases in which a clear contrastive interpretation was available. The following example is an interesting case because here a contrastively focused object fails to appear preverbally:

(16) Ther trinkit_v [_{CONTR} **thiz uuazzer**] [...]

DEM-M.SG.NOM drinks this water

 der afar trinchit_v [_{CONTR} **daz min**] [...]

DEM-M.SG.NOM however drinks the mine]

‘Everyone who drinks this water [...], but whoever drinks mine [...].’ (Ch, 18)

For the statistical part, we considered whether focus type (as a factor) had an influence on the VO/OV order. Then we conducted a post-hoc analysis to see which type of focus contributed most to the observation that the VO order is significantly correlated to object focus. Consider the following contingency matrix:

Focus	OV	VO
Broad	25 (76%)	8 (24%)
Narrow	2 (13%)	13 (87%)
Contrastive	7 (64%)	4 (36%)

Table 8. Object focus and VO/OV order.
Fisher Exact $p < 0.001$, Cramer's $V: 0.53$.

The results of a Fisher Exact test in table 8 show strong significance, with a p -value well below 0.001 ($=0.0001624$). These results indicate that the focus type most definitely influences the position of the object relative to the verb. As expected, the effect size, as measured by Cramer's V , is at 0.531, which is considered a strong association between the variables. A post-hoc analysis of the percentage values immediately shows that the narrow focus deviates from the distribution that can be observed for broad and contrastive focus: Narrow focus prefers a VO order, whereas broad and contrastive focus tend to result in an OV order, as predicted by the theoretical work on this topic (see Hinterhölzl 2004, 2009, for example).

5. Relative Particles.

Another factor that might influence the VO/OV pattern is the presence of a relative particle. As shown in examples 2 and 3 above, relative particles (such as *the*, *de*, *thi*, etc.) are sometimes used to introduce relative clauses, either alone or along with relative pronouns. The traditional assumption is the one espoused in Schrodtt 2004:174 (see also Tomanetz 1879:84ff., among others):

Während von einem Relativpronomen eingeleitete Relativsätze Späterstellung des finiten Verbs haben, weisen die von einer Relativpartikel eingeleiteten Sätze Verbzweitstellung auf (...). Die Relativpartikel war somit nicht subordinierend.

While relative clauses that are introduced by a relative pronoun have late placement of the finite verb, relative clauses that are introduced by a relative particle display V2 order. [...] Thus, the particle was not subordinating.

According to this view, the relative particle is just an element introducing the relative clause, not a syntactic subordinator. A different approach is the one proposed by Axel-Tober (2012:195ff.). She interprets the particle as a subordinating element that blocks the movement of the verb, which thus remains *in situ*. The expected word order is thus the OV order. She explains the deviating VO pattern by assuming that the object has been extraposed in such cases (Axel-Tober 2012:213).

The diverging opinions in the literature led us to test this factor as well. For our calculation, we not only counted those relative clauses that display what is considered to be a relative particle in traditional terms (such as *the, de, thi*, etc.), but we also considered adverbial elements that behave like particles, such as *dir, der, ther, dâ, dâr*.²⁷ Hence, we do not distinguish between relative particles and relative adverbs, and refer to both categories as *relative particles* for short (see Diels 1906:180ff.). Notice further that, for the sake of comparability across factors, we discuss the test results for the VO/OV order, whereas the results for the V2 versus non-V2 order are provided in note 29.

There was also a methodological reason for doing so: The notion of V2 is theory-dependent, and the V2 versus non-V2 order cannot be easily tested without assuming a particular syntactic theory, which we intended to avoid when collecting and annotating the data. For example, the order in 17a does not allow one to conclude that one is dealing with a V2 pattern, since this order could be interpreted as a case of extraposition, as in 17b (as proposed in Axel-Tober 2012:213).

- (17) a. demonstrative + particle V O
 b. demonstrative + particle t_i V O_i

More generally, the OV order in subordinate clauses is a non-V2 order, but the VO order is not automatically a V2 order. Nonetheless, if the data show robustly that the VO order mostly occurs under certain conditions,

²⁷ In historical terms, all these elements trace back to an Indo-European pronominal stem ⁺*to-*. Braune (2004:249) points out that in relative contexts, only phonologically weakened forms of the locative adverb appear (adverb *dâr* ‘there’ > particle in relative contexts *dar/da/de*). This circumstance leads to the fact that the locative adverb often resembles the relative particle *de*.

then one can conclude that these conditions either correlate with V2 or with the extraposition of the object.

According to our annotation schemes, four combinations were possible: relative particle with OV order, as in 18a; relative particle with VO order, as in 18b; no relative particle with OV order, as in 18c; no relative particle with VO order, as in 18d.

- (18) a. dar niist eo so listic man der dar
 there NEG-is ever so clever man DEM-M.SG.NOM PART.REL

iouuiht arliugan megi_v
 anything mock can-SUBJ
 ‘There is not so clever a man that could mock anything’ (M, 94)

- b. alle gotes trûtfriunt, die der hant_v
 all God’s intimate.friends DEM-M.PL.NOM PART.REL have

eruullet **diu uier euangelia**
 fulfilled the four gospels
 ‘all God’s intimate friends, who fulfilled the four gospels’
 (HiH, 10)

- c. Hluduig ther gerno **gode** thionot_v
 Ludwig DEM-M.SG.NOM willingly God serves
 ‘Ludwig, who serves God willingly’ (L, 1)

- d. Truhtin suno einboraner Heilanto Christ (...)
 Lord son only savior Christ
 Ther nimis_v **sunta uueruldi**
 DEM-M.SG.NOM you.take sins world-GEN
 ‘Lord, God’s only son, Christ the redeemer, who takes away the
 sins of the world’ (WK, 113)

In some cases, these relative elements are homophonous with the locative adverb meaning ‘there’ (see note 27). For that reason it was not

always possible to determine whether we were dealing with a particle or with the adverb meaning ‘there’.²⁸

To investigate the relationship between the VO/OV order and the presence of a relative particle, we calculated a contingency table with absolute frequencies and percentages of the VO/OV order. We only considered those cases where we were certain about the status of the particle. The results are presented in table 9.²⁹

	OV	VO
Particle	9 (75%)	3 (25%)
No particle	50 (76%)	16 (24%)

Table 9. VO/OV order and presence of relative particle.
Fisher Exact $p:1$, Cramer’s $V:0.01$.

The Fisher Exact test yields a p -value of exactly 1. These results show that there is no reason to doubt the null hypothesis, that is, that there is no relationship between the VO/OV order and the presence of the

²⁸ We have a total of 66 NA cases. The following is an example of a relative clause for which we could not decide whether it contains a relative particle or not:

(i) Denne verit er ze deru mahalsteti,
 then goes he to the court place
 deru dar kimarchot ist,
 DEM-F.SG.DAT there/PART.REL marked is
 ‘Then, he goes to the court place that is designated for this / which is delimited here.’ (M, 77)

Notice that in this example, so-called case attraction has taken place, that is, the relative/demonstrative pronoun *deru* does not fulfill the case requirements of the relative clause (nominative), but agrees with the case of the antecedent (dative).

²⁹ Even if we consider the distribution of relative clauses with or without particles in V2 versus non-V2 orders, we do not get any statistically significant results (Fisher Exact $p:0.74$). Relative clauses with particles display V-late or V-final orders in 21 cases, the V2 order in just two cases. In the absence of the particle, we find 101 V-late or V-final orders, and 15 V2 cases. Number of NA cases: 5.

particle. This is not surprising, since the observed percentages are almost identical. In addition, Cramer's V for this contingency table is 0.01, which indicates a weak to nonexistent relationship between the VO/OV order and particle occurrence in relative clauses.

With respect to relative particles as possible factors influencing the position of the verb in relative clauses, we can conclude from table 9 that the presence of a particle does not affect the VO/OV order. It is true that the data are quite limited, and one should be careful in interpreting them. Yet the tendency in our corpus does not support Schrod't's (2004:174) conclusion that relative clauses introduced by a particle prefer V2 word order.³⁰ We cannot observe any significant difference between the two types of relative clauses, namely, those with a particle and those without a particle. Recall also that for our calculation, we considered all VO cases, not only V2 cases (see note 29). That means that, according to Schrod't's hypothesis, we would have expected an even higher number of VO examples.

6. Definiteness of Antecedents and Specificity of Referents.

As sometimes hypothesized in the literature, the VO/OV order may also be influenced by the definiteness of the antecedent and the specificity of the referent. Below, we first consider each factor separately, and then the interaction between them.

6.1. Definiteness of the Antecedent.

Axel-Tober (2012:213) hints at a possible correlation between the definiteness of the antecedent and verb position in MHG prose texts. In particular, she argues that, on the one hand, the definiteness of the

³⁰ Schrod't's (2004:174) second conclusion (that the particle was not subordinating) should probably also be rejected. Although we do not want to pursue this point further, we can conclude that the particle had a subordinating function, given that 9 relative clauses with an OV pattern are introduced by a particle. In this scenario, however, we should explain the remaining cases, that is, the three VO cases with particles. A possible interpretation would be that the verb has remained *in situ*, and the deviating order is not derived by verb movement. Instead, it is derived either by object extraposition (Axel-Tober 2012:213) or by means of base generation of the object in a position following the verb (Hinterhölzl 2009:48), maybe as a consequence of information-structural requirements.

antecedent correlates with a verb-final pattern (and the presence of a relative particle). On the other hand, indefiniteness is associated with a V2 order (and with the absence of the particle). She links (in)definiteness to verb position and to the absence/presence of the particle. It would be difficult for us to test both factors simultaneously, given the small amount of data that would fit the calculation. However, if we ignore the particle factor (which was shown to play no important role), the factor definiteness *per se* could have some influence on the VO/OV patterns in our OHG corpus as well.

We identified all types of antecedents in our corpus, and we annotated them as definite or indefinite, as in 19a and 19b, respectively.³¹

(19) a. **daz uuip**, thaz ther thara quam_v
 the woman DEM-N.SG.NOM PART.REL there came
 ‘the woman who came there’ (Ch, 5)

b. nu hebist **enin** der-n-is_v din
 now have-SG.2 one DEM-M.SG.NOM-NEG-is yours
 ‘now, you are with someone who doesn’t belong to you’ (Ch, 27)

The results of this search are summarized in table 10.

	OV	VO
Definite	26 (72%)	10 (28%)
Indefinite	14 (70%)	6 (30%)

Table 10. VO/OV order and (in)definiteness of antecedent.
 Fisher Exact $p:1$, Cramer’s $V:0.02$.

³¹ As in the other cases, some clauses could not be ascribed to either type. Free relatives are typical examples, given that they do not have an explicit antecedent:

(i) Ther trinkit_v thiz uuazzer be demo thurstit inan mer
 DEM-M.SG.NOM drinks this water by DEM-N.SG.DAT thirsts him more
 ‘Whoever drinks of this water shall thirst again’ (Ch, 18)

For this calculation, we had a total of 88 NA clauses.

The contingency table above clearly shows no substantial difference between relative clauses with a definite antecedent and those with an indefinite one. In fact, the Fisher Exact and Cramer's V confirm this result. In our corpus, there is probably no correlation between (in)definiteness of the antecedent and verb position.

6.2. Specificity of the Referent.

When we talk about specificity, we refer to whether or not a referent can be identified in a certain context. The following example can illustrate the point:

(20) I am looking for a woman.

In this simple sentence, *a woman* is ambiguous between two possible readings. The first reading is the specific one: The speaker is looking for a certain woman—for example, Mary—whom they met before. The second reading is the nonspecific one: For example, the speaker is telling a friend that they would like to have a girlfriend or a wife.

When considering an expression modified by a relative clause, its specificity is determined not only by the antecedent, but also by the content of the relative clause. This is shown in the following examples, where the relative clause disambiguates between the specific and the nonspecific reading:

- (21) a. I am looking for a woman that I met yesterday.
b. I am looking for a woman that would like to marry me.

Thus, the specificity of the referent cannot be only determined based on the semantics of the antecedent. It also depends on the content of the relative clause.

Specificity, in combination with definiteness, seems to play an important role in certain relative clauses in German, namely, in those displaying a V2 order. For PDG, Gärtner (1998, 2001) shows that V2 relative clauses can only modify an indefinite antecedent with a specific reading, as illustrated by the following examples taken from Gärtner 2001:119:

- (22) a. Hans möchte einen Fisch fangen (/),
 Hans wants a fish catch
 [den er essen kann_v].³²
 DEM-M.SG.ACC he eat can
 ‘Hans wants to catch a fish that he can eat.’
- b. *Hans möchte einen Fisch fangen (/), [den kann_v er essen].
- c. Hans möchte einen Fisch fangen (/),
 Hans wants a fish catch
 [der taucht_v gerade].
 DEM-M.SG.NOM is.diving at the moment
 ‘Hans wants to catch a fish, which is now disappearing under water.’

Example 22a contains an indefinite antecedent, which has a nonspecific reading due to the semantics of the following relative clause. The modifying relative clause displays a verb-final pattern. The example in 22b shows the ungrammaticality of 22a if the verb is placed in the second position of the relative clause. However, if the indefinite antecedent is modified by a relative clause that renders the referent specific, then a relative clause with a V2 pattern is acceptable, as in 22c.

Similar observations on earlier stages of the language were made by Axel-Tober (2012:207ff). Among others, she illustrates this phenomenon by means of example 5b, repeated here as 23.

- (23) sum tuomo uuas In sumero burgi
 certain judge was in certain town
 [ther niforhta got]
 DEM-M.SG.NOM NEG-feared god

³² The symbol (/) means that a high boundary tone precedes the relative clause. This is particularly important in those cases that are ambiguous between a relative clause and a main clause interpretation. Apart from syntax, prosody too has a disambiguating effect.

Iudex quidam erat In quadam ciuitate | qui deum non timebat

‘There was a certain judge in a certain town who didn’t fear god.’
(T 200, 31, cited in Axel-Tober 2012:208)

Nonetheless, we should point out that for earlier stages of the language, the position of the verb with respect to the object was influenced by other factors, as already noted. For instance, in a generative framework, one cannot exclude the possibility that in 23, it is the object—and not the verb—that moved. All these considerations led us to annotate specificity, too, and to assess its role in determining the position of the verb. Below, we show how specificity affects word order. In the next section, we discuss the effect of the interaction of definiteness and specificity.

With respect to specificity, in our corpus we have examples both of specific and nonspecific referents, as shown in 24a and 24b, respectively.³³

- (24) a. *einer got almahtig der scuof_v himil enti erda*
 a God almighty DEM-M.SG.NOM created heaven and earth
 ‘an almighty God who created heaven and earth’ (BB, 2)
- b. *neouuihtes, des e tages gitan si_v³⁴*
 nothing-GEN DEM-N.SG.GEN before day-GEN done is-SUBJ

³³ A typical example of ambiguity between specific and nonspecific reading is that of the formulaic language used for confessions, as in the following case, where the penitent confesses to both specific and nonspecific (only potential) sins:

- (i) *alles (...) des ih uuizzanto kiteta_v eddo unuizzanto,*
 all-GEN DEM-N.SG.GEN I aware did or unaware
notak eddo unnotak, slaffanti eddo uuachenti:
 coerced or uncoerced sleeping or waking
 ‘everything I did, aware or unaware, coerced or uncoerced, sleeping or waking:’ (AB, 4)

More generally, we had 86 NA cases.

³⁴ This could be a case of attraction (see note 28) or a partitive reading of the genitive case.

‘nothing that is made before daybreak’ (BR1, 13)

The following contingency table illustrates the distribution of VO/OV order in relation to the (non)specificity of the referent:

	OV	VO
Nonspecific	13 (87%)	2 (13%)
Specific	29 (67%)	14 (33%)

Table 11. VO/OV order and (non)specificity.
Fisher Exact p :0.19, Cramer’s V :0.19.

Even though the data show a preference for the OV pattern in both cases, the VO order is much more frequent in specific cases than in nonspecific ones. Notice, however, that the Fisher Exact test yields a p -value that is statistically not significant (given the typical α -level of 0.05). Thus, we cannot conclude that specificity alone is to be considered as a factor triggering the VO order.

6.3. Interaction of Definiteness and Specificity.

We have shown that at least in PDG, the interaction of definiteness and specificity appears to influence the position of the verb in a relative clause. The following table shows the frequency distribution of the relative clauses across the three variables simultaneously.³⁵

		OV	VO
Nonspecific	Definite	5 (71%)	2 (29%)
	Indefinite	5 (100%)	0 (0%)
Specific	Definite	21 (72%)	8 (28%)
	Indefinite	8 (57%)	6 (43%)

Table 12. VO/OV order and definiteness and specificity.
Fisher Exact p :0.39, Cramer’s V :0.25.

³⁵ Notice that we also had a total of 89 NA cases.

We should point out that the small amount of data in each cell calls for caution in their statistical interpretation. Even though the Fisher Exact test shows no statistical significance, Cramer’s V indicates a moderately strong association between the variables. A tendency is clear if one compares table 11 with table 12. While definiteness seems to remain untouched by the specificity versus nonspecificity of the referent, the same cannot be said for indefiniteness, which shows an absolute preference for the OV order in the case of nonspecific referents. While in our corpus, no case for nonspecific indefinites with VO order is provided, nearly half of the cases of specific indefinites display that order. This fact seems to be in line with the observations in Gärtner 1998, 2001 and Axel-Tober 2012:207ff. on V2 relative clauses in PDG and in earlier stages of the language.

The relationship between these parameters can be visualized in a mosaic plot:

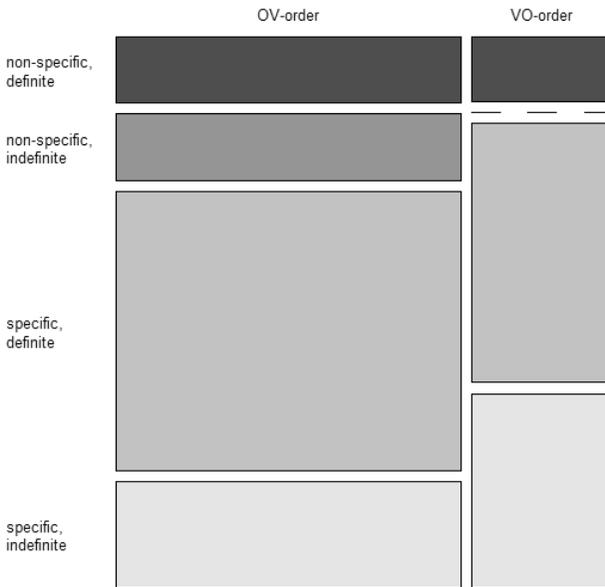


Figure 1. VO/OV order and (in)definiteness and (non)specificity.

Despite the small set of data, figure 1 shows a very interesting pattern with respect to the influence of the definiteness of the antecedent and the

specificity of the referent on word order. In particular, the following observations can be made:

- (i) The VO/OV order is by no means affected by definiteness. The VO to OV ratio is the same regardless of whether the antecedent is definite or indefinite.
- (ii) Specificity seems to play a fundamental role in OV order, but it has an even stronger influence on VO order. In VO cases, nonspecific indefinite referents are absent in our corpus. VO cases correlate more strongly with specificity of the referent than OV cases. Not only definite specific referents trigger VO order, but also indefinite specific ones.

Still investigating the semantic properties of antecedent and relative clauses in combination, the next section focuses on the restrictiveness of the relative clause.

7. Restrictiveness.

Several studies indicate that the types of relative clauses influence their phono-syntax, semantics, illocution, and information structure (compare Holler 2005:25ff.). For the purposes of our investigation, we distinguish between appositive and restrictive relative clauses, as in 25a and 25b, respectively. However, we also annotated a third type—free relative clauses, as in 25c—separately.³⁶

³⁶ There are also some unclear clauses annotated as NA. Given the ambiguity of *dar*, the relative clause in note 28—repeated below—could receive a restrictive or an appositive interpretation:

- (i) Denne verit er ze deru mahalsteti,
then goes he to the court place

deru dar kimarchot ist,
DEM-F.SG.DAT there/PART.REL marked is

‘Then, he goes to the court place that is designated for this / which is delimited there.’ (M, 77)

In this case, we had 69 NA clauses.

(25) a. usere liuti alte anti frote dea érhina warun_v
 our people old and wise DEM-M.PL.NOM before were
 ‘our old and wise people who were here before’ (H, 15)

b. ni-inpiize des eies des
 NEG-eat-SUBJ the-GEN egg-GEN DEM-N.SG.GEN
 in demo tage gilegit si_v³⁷
 at the day laid were
 ‘He should not eat an egg which is laid on the same day’ (BR1, 15)

c. Ther trinkit_v thiz uuazzer be demo
 DEM-M.SG.NOM drinks this water by DEM-N.SG.DAT
 thurstit inan mer
 thirsts him more
 ‘Whoever drinks of this water shall thirst again’ (Ch, 18)

With respect to information structure, Holler (2005:68) among others points out that in contrast to restrictive relative clauses, appositive relative clauses are not integrated in the focus-background-structure of the hosting clause, and that they thus form an information unit of their own (see section 4).

If this also holds for OHG, one would expect restrictive clauses to display a much more limited information-structural potential compared to appositive clauses. Our predictions are twofold:

- (i) If the VO order is often associated with (narrow) new information focus on the object (section 4), then appositive relative clauses should allow this order more liberally than restrictive clauses.
- (ii) If a higher illocutionary and information-structural potential typically finds realization in V2 structures, then one would expect for appositive relative clauses to display VO order more frequently than restrictive ones.

³⁷ This is another case of attraction or partitive genitive (see note 34).

Both points lead us to hypothesize that appositive relative clauses would show a higher frequency of VO. This hypothesis is borne out in our data. The underlying question was: Is there a specific word order for each type of relative clause, or is the variation in the VO/OV order not influenced by the type? In order to test this, we compared the types of relative clauses with the VO/OV order (by excluding uncertain cases) and obtained the following contingency table:

	OV	VO
Appositive	7 (47%)	11 (53%)
Restrictive	32 (86%)	5 (14%)
Free	17 (85%)	3 (15%)

Table 13. VO/OV order and type of restrictive clause.
Fisher Exact $p < 0.001$, Cramer's $V: 0.46$.

The Fisher Exact test finds a p -value of 0.0006, which is much smaller than the usual α -level of 0.05.³⁸ This strongly significant ($p < 0.001$) correlation indicates that VO/OV order is very unlikely to be randomly related to the type of relative clause. Cramer's V is 0.46, which is generally considered to be indicative of a very strong association between VO/OV order and the type of relative clause.³⁹

As to whether or not the VO/OV pattern is influenced by the type of the relative clause, table 13 clearly shows that the answer is positive. The postverbal position of the object is clearly much more frequent in appositive clauses, which in fact seems to correlate with their peculiar illocutionary force and information structure. As discussed above (see

³⁸ As a reminder, this indicates that the chance of finding the given distribution of VO/OV order over the relative clause types when assuming no relationship between these two factors would be less than a tenth of a percentage. In other words, it is very unlikely to find the current distribution if the two factors were unrelated.

³⁹ If one considers the distribution of type of relative clauses in V2 versus non-V2 orders, one receives a result below the 0.05 threshold, which indicates statistical significance (Fisher Exact $p < 0.05$). Appositive relative clauses display V-late or V-final orders in 22 cases, the V2 order in 12. In restrictive clauses, the ratio is 70:3, while in free relatives it is 28:2. Number of NA cases: 7.

also Holler 2005:58ff.), appositive relative clauses are characterized by an independent illocutionary force and information structure. They differ from restrictive relative clauses, which typically depend on the matrix clauses both for their illocutionary force and information structure. This explains the different realization of (narrowly) focused postverbal objects in the two types, namely, appositives and restrictives.

Notice that free relative clauses show a distribution that is almost identical to that of restrictive relative clauses. This is not surprising if one assumes that free relative clauses are just a special type of restrictive relative clauses that lack an overt antecedent in the matrix clause. In addition, we considered the position of the subject with respect to the verb in relation to the type of relative clause, which is represented in table 14.⁴⁰

	SV	VS
Appositive	7 (78%)	2 (22%)
Restrictive	31 (97%)	1 (3%)
Free	6 (100%)	0 (0%)

Table 14. SV/VS order and type of relative clause.

Fisher Exact p :0.13, Cramer's V :0.32.

The absolute values in this contingency table are very low, yielding unreliable percentages, and absolute caution should be applied when interpreting them. Nonetheless, it is, first of all, obvious that the VS order is rare, which was already apparent from table 2 (and related discussion). The Fisher Exact test returns a p -value of 0.13 indicating a 13% chance that this frequency distribution would have been observed if the type of relative clause were unrelated to the order of subject and verb. The related Cramer's V of 0.32 indicates a relatively strong association between the type of relative clause and the SV/VS order.

Table 14 shows that postverbal subjects are in general disfavored if compared to postverbal objects in table 13. This probably has to do with grammatical factors colliding with information-structural ones. Although it is still possible to extrapose subjects in OHG main clauses, they tend to

⁴⁰ Number of NA cases: 97.

be excluded from this position not for information-structural reasons, but rather for syntactic ones.⁴¹

8. Conclusion.

In this study, we analyzed the properties of OHG relative clauses, based on a corpus of minor texts. We discussed a number of aspects often described in the literature on OHG relative structures. In order to do this, we carried out statistical research based on a modern corpus investigation, which is a desideratum in the field of historical linguistics. Our aim was to examine the position of the finite verb with respect to its arguments, in particular to the object. Since the first written attestations, the typical order of subordinate clauses has been OV. Thus, our first question was: Do relative clauses follow this general tendency? How often do they deviate from this pattern? Then, we tested the factors that are reported or could be assumed to determine VO versus OV patterns. Let us summarize the major findings of this investigation:

- (i) Our corpus revealed that the type of texts (prose, alliterative verse, or rhyming verse) cannot be considered to be a factor determining the reciprocal position of verbs and objects in relative clauses. Contrary to expectations, time and place of origin of the texts did not show quantitative influence either.
- (ii) Some of the information-structural properties of the object were shown to play a fundamental role, in particular:
 - a. With respect to the factor weight (or length), it was shown that heavier constituents tend to be realized more often in postverbal position than lighter constituents, but our calculations did not reveal any statistically significant results.

⁴¹ See also Coniglio & Schlachter 2015a,b, in which it is shown that subjects of main clauses can still be extraposed in MHG, but that they decrease in the following centuries. The present research shows that this grammatical restriction may have operated earlier in subordinate clauses instead.

- b. The definiteness of the object did not show any statistically significant association with the position of the verb either, in contrast to what was pointed out for Yiddish, for instance.
 - c. In contrast, focus reveals a strong correlation with the position of the object with respect to the verb. In particular, narrow focus on the object is responsible for its postverbal position, whilst contrastive focus is associated with a preverbal position (as in the case of broad focus). This is in line with what has been proposed in the literature on the topic (mainly based on major OHG texts).
- (iii) The presence of particles, which were not particularly frequent in our corpus, was shown not to correlate with the distribution of VO/OV patterns.
- (iv) No statistically significant results—albeit with an indication of association—ensued from the investigation of the interaction of word order either with the definiteness of the antecedent or with the specificity of the referent (or with both properties simultaneously).
- (v) Our research showed that the type of relative clause (restrictive versus nonrestrictive) plays a role in determining word order: Our analysis yielded statistically significant results. This was ultimately explained in terms of information structure.

To sum up, our corpus-based investigation revealed that the postverbal position of the object within a relative clause is strongly associated with the information-structural properties of the object and, more generally, with the information-structural properties of the relative clause. The preverbal position of the object is the unmarked position, which is typical for subordinate clauses. This pattern is thus also observed in the case of broad focus or contrastive focus on the object. Conversely, the postverbal position seems to be restricted to the cases in which the object is narrowly focused or, more generally, in which the relative clause exhibits a higher illocutionary potential (for example, in appositive contexts).

APPENDIX A
Primary Texts

- AB Altbairische Beichte. *Elias von Steinmeyer* (1916:309)
 BB Bruchstück einer Beichte. *Elias von Steinmeyer* (1916:326–327)
 BR1 Basler Rezepte 1. *Elias von Steinmeyer* (1916:39–42)
 Ch Christus und die Samariterin. *Elias von Steinmeyer* (1916:89–91)
 DD De definitione. *Elias von Steinmeyer* (1916:118–120)
 H Hildebrandslied. *Elias von Steinmeyer* (1916:1–15)
 HiH Himmel und Hölle. *Elias von Steinmeyer* (1916:153–155)
 L Ludwigslied. *Elias von Steinmeyer* (1916:85–88)
 M Muspilli. *Elias von Steinmeyer* (1916:66–81)
 MF Monseer Fragmente. Hench, George A. (ed.) 1890. *The Monsee Fragments. Newly collated text with introduction, notes, grammatical treatise and exhaustive glossary and a photo-lithographic fac-simile.* Straßburg.
 MB Mainzer Beichte. *Elias von Steinmeyer* (1916:329–331)
 T Tatian. Masser, Achim (ed.) 1994. *Die lateinisch-althochdeutsche Tatianbilingue Stiftsbibliothek St. Gallen Cod. 56.* Göttingen.
 TV Trierer Verse. *Elias von Steinmeyer* (1916:399–400)
 WK Weissenburger Katechismus. *Elias von Steinmeyer* (1916:29–18)

Links

- ANNIS corpus-tools.org/annis/
 OGRIC <http://www.deutschdiachrondigital.de/home/>
 TITUS <http://titus.uni-frankfurt.de/indexd.htm>

Selected texts

Alemannischer Glauben und Beichte; Altbairische Beichte; (Münchner) Augensegen; Bamberger Blutsegen; Basler Rezepte 1; Basler Rezepte 2; Benediktbeurer Glaube und Beichte III; Binger Inschrift (Rheinfränkische Grabinschrift); Bruchstück einer Beichte (Vorauer Beichte); (Deutsche) Buchunterschrift (Weingartner Buchunterschrift); Christus und die Samariterin; Contra Malum Malannum; De Definitione (Bruchstück einer Logik); De Heinrico; (Fuldaer) Federprobe; Gebetbruchstück; Geistliche Ratschläge; Georgslied; Hammelburger; Markbeschreibung; (Zürcher) Hausbesegnung (Sangaller Haussegen); Hildebrandslied; Himmel und Hölle; Hirsch und Hinde; Jüngere Bairische Beichte; (Althochdeutsche) Lex Salica; Lorscher Bienensegen; Ludwigslied; Mainzer Beichte; Memento Mori; Merseburger Zaubersprüche; Muspilli; Pariser Blutsegen; Petruslied; Pfälzer Beichte; Priester

Eid; Reimspruch; Sigiharts Gebet; St. Galler Glaube und Beichte I; St. Galler Glauben und Beichte III; St. Galler Schreibervers; St. Galler Spottvers 1; St. Galler Spottvers 2; St. Galler Sprichwörter; Strassburger Blutsegen; Straßburger Eide; Trierer Verse (Wider den Teufel); Weissenburger Katechismus; Wessobrunner Gebet; Wiener Hundesege

APPENDIX B

Information on Annotation and Tags

This study benefited from the data set provided by the project *Old German Reference Corpus*. OGRC includes annotated versions of all OHG and Old Low German texts. The annotation encompasses, amongst others, lemmatization, word classes, and morphological annotation. There are no syntactic comments using treebank annotation. Nevertheless, some specific syntactic information is recorded using a simple linear schema, which allows searches for certain clause types, such as relative clauses.

Since treebanks are excluded from annotation, no syntactic dependencies can be shown except using tags for object clause, subject clause, adverbial clause, etc. For some special cases, different annotation tiers were combined in order to give an easy and pragmatic way to find these constructions in the database. Thus, free relatives that function as object or subject arguments in the main clause are tagged as subject clauses and object clauses, respectively, and the clause introducing element is marked as a relative pronoun, as expected. On the one hand, this leads to the strange fact that these relatives are annotated as argument clauses introduced by a relative pronoun. On the other hand, however, the advantage is that one is able to find these—and only these—free relatives in a very simple way.

Our study is based on a dataset created on the basis of the following queries in the OGRC database:

- a. Relative clauses
`clause=/CF.*_[IU]_Rel/`
- b. Free relatives that function as arguments
`clause=/CF_I_(OIS)/ & pos=/DDSREL/ & #1_1_#2`
- c. Main clauses introduced by a substituting demonstrative
`clause=/CF_U_M / & pos=/DDS/ & #2_1_#1`

See <http://korpling.german.hu-berlin.de/annis3/ddd/> for details on Annis Query Language (AQL). Annotation tags used in the queries: CF = clause finite; DDS = determiner, demonstrative, substituting; DDSREL = determiner, demonstrative, substituting, relative; I = introduced; M = main; O = object; Rel = relative; S = subject; U = unIntroduced

APPENDIX C
R Code Used

The following R code was used in this paper for the quantitative analysis, the inferential statistics, and the visualization.

```

library(vcd)
ds = read.delim('dataset.txt', header=T, sep='\t', row.names=NULL)

# table 1: distribution of object in front of verb versus object after the verb
table(ds$object.vor.verb)

# table 2: distribution of subject in front of verb versus subject after the verb
table(ds$subj.vor.verb)

# table 3: verb/object order and text type
table(ds$textart, ds$object.vor.verb)

# table 4: verb/object and century
table(ds$century, ds$object.vor.verb)

# table 5: verb/object and location
table(ds$location, ds$object.vor.verb)

# table 6: weight and verb/object
table(ds$Obj.Weight, ds$object.vor.verb)
ov = ds[ds$object.vor.verb %in% c("ov", "pv"), "Obj.Weight"]
vo = ds[ds$object.vor.verb %in% c("vo", "vp"), "Obj.Weight"]
t.test(as.numeric(ov)-1, as.numeric(vo)-1)

# table 7: verb/object and definiteness
table(ds$Definiteness, ds$object.vor.verb)
fisher.test(cbind(c(4,25),c(1,8)))
assocstats(cbind(c(4,25),c(1,8)))$cramer

# table 8: verb/object and focus
narrow = table(ds$object.vor.verb, ds$Obj.narrow.information.focus)[,"t"]
broad = table(ds$object.vor.verb, ds$Obj.broad.information.focus)[,"t"]
contrast = table(ds$object.vor.verb, ds$Obj.Contrast)[,"t"]
fisher.test(cbind(c(2,27,7), c(13,5,4)))

# table 9: verb/object order and presence of relative particle

```

```

table(ds$particle, ds$object.vor.verb)
fisher.test(cbind(c(9,50), c(3,16)))
assocstats(cbind(c(9,50), c(3,16)))$cramer

# table 10: verb/object order and definiteness of antecedent
table(ds$ac_definite, ds$object.vor.verb)
fisher.test(cbind(c(26,14),c(10,6)))
assocstats(cbind(c(26,14),c(10,6)))$cramer

# table 11: verb/object order and specificity
table(ds$ac_relclause_specific, ds$object.vor.verb)
fisher.test(cbind(c(13,29),c(2,14)))
assocstats(cbind(c(13,29),c(2,14)))$cramer

# table 12 + figure 1: verb/object order and definiteness + specificity
ftable(ds$object.vor.verb ~ ds$ac_relclause_specific + ds$ac_definite)
ov.vo = cbind(c(5,5,21,8), c(2,0,8,6))
colnames(ov.vo) = c('OV-order', 'VO-order')
rownames(ov.vo) = c('non-specific,\nndefinite',
                    'non-specific,\nindefinite',
                    'specific,\nndefinite',
                    'specific,\nindefinite')
mosaicplot(t(ov.vo), las=1, color=TRUE, main="", cex.axis=0.8)
fisher.test(cbind(ov,vo))
assocstats(cbind(ov,vo))

# table 13: verb/object order and type of relative clause
table(ds$type, ds$object.vor.verb)
fisher.test(cbind(c(7,32,17),c(11,5,3)))
assocstats(cbind(c(7,32,17),c(11,5,3)))$cramer

# table 14: verb/subject order and type of relative clause
table(ds$type, ds$subj.verb)
fisher.test(cbind(c(7,31,6),c(2,1,0)))
assocstats(cbind(c(7,31,6),c(2,1,0)))$cramer

```

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Marco Coniglio
Georg-August-Universität Göttingen
Seminar für Deutsche Philologie
Käte-Hamburger-Weg 3
37073 Göttingen
Germany
[marco.coniglio@phil.uni-goettingen.de]

Sonja Linde
[sonja.linde@gmx.de]

Tom Ruetten
Faculty of Arts/Research Unit Linguistics
Blijde Inkomststraat 21
P.O. Box 3308
3000 Leuven
Belgium
[tom.ruetten@gmail.com]