

# When a quantifier is not a quantifier: Non-conservative percentage expressions in German<sup>1</sup>

Berit GEHRKE — *Humboldt Universität zu Berlin*

Marcin WAĞIEL — *Masaryk University in Brno*

**Abstract.** In this paper we discuss percentage expressions of the type ‘fifty percent’ in German and two readings they give rise to, a conservative and a non-conservative one. Based on a questionnaire and a corpus study, we show that the non-conservative reading does not just need a bare, non-genitive-marked nominal to arise, but is also conditioned by word order (it has to appear low) and by the types of predicates that allow for it (in essence, predicates that can be used as existential or HAVE-predicates). We propose an account, under which the percentage expression is a type of scalar modifier that has an apparent effect on the predicate due to semantic incorporation ((in)transitives) and to an existential structure (intransitives).

**Keywords:** percentages, quantifier, conservativity, modification, definiteness

## 1. Introduction

The Conservativity Hypothesis (henceforth CH) (Barwise and Cooper, 1981; Keenan and Stavi, 1986) is a semantic universal postulated in generalised quantifier (GQ) theory according to which all natural language determiners denote a conservative function of type  $\langle\langle e, t \rangle, \langle\langle e, t \rangle, t \rangle\rangle$ , see (1), where conservativity is defined as in (2).

- (1) THE CONSERVATIVITY HYPOTHESIS (CH): All extensional determiners in natural language are conservative.
- (2) CONSERVATIVITY: A determiner  $D$  is conservative if and only if for all sets  $R$  and  $S$ ,  $D(R)(S)$  is equivalent to  $D(R)(R \cap S)$

For example, in (3) the determiner denoted by *five* expresses a relation between the set of dogs (the restrictor set  $R$ , the determiner’s first argument, which is the NP complement of the determiner) and the set of barkers (the nuclear scope set  $S$ , the determiner’s second argument, which is the VP in this case). Given conservativity, as defined in (2), this is equivalent to stating the same relation between the set of dogs and the intersection between the set of dogs and the set of barkers. In particular, we are not interested in any barkers that are not dogs.

- (3) Five dogs bark.  $\equiv$  Five dogs are dogs that bark.

Since the first postulation of the CH, empirical challenges have been discussed that call its universality into question. Prominent expressions that seemingly behave like determiners but display (at first sight) non-conservative readings are *only*, as well as *many* under the reverse proportional reading, as illustrated in (4) and (5) (latter examples due to Westerståhl, 1985).

- (4) Only dogs bark.  $\not\equiv$  Only dogs are dogs that bark.

---

<sup>1</sup>Marcin Wağiel gratefully acknowledges that the research was supported by a Czech Science Foundation (GAČR) grant to the Department of Linguistics and Baltic Languages at the Masaryk University in Brno (GA20-16107S).

- (5) a. Many Scandinavians have won the Nobel prize in literature.  
 b. Many Nobel prize winners in literature are Scandinavians.

For example, in determining whether the sentence with *only* in (4) is true or false it is not enough to just consider the set of dogs but we also have to check whether non-dogs bark. Sentences with *many*, in turn, like (5a), can have a reading that is non-conservative, paraphrased in (5b), where *many* appears to first combine with the set provided by the VP (literature Nobel prize winners) and only then with the set of its complement NP (Scandinavians). Common approaches to these challenges while still maintaining the CH are to either deny the expression in question the status of a determiner (e.g., von Stechow 1994 for *only*), or to reduce the meaning of the determiner in question to a conservative core and to delegate the non-conservative effect to additional meaning components. For example, Herburger (2000) argues that the seemingly non-conservative reading of *many* only arises due to focus and in environments that display the definiteness effect (in the sense of Milsark, 1974). Under her account, focus determines the scope of *many*, whereas the non-focused elements constitute the restrictor set.

Recently, Ahn and Sauerland (2015, 2017) observe that percentage quantifier such as *fifty percent* (henceforth %Qs)<sup>2</sup> can give rise to a conservative and a non-conservative reading (6).

- (6) a. The company employs fifty percent of the women. CONSERVATIVE  
 b. The company employs fifty percent women<sub>F</sub>. NON-CONSERVATIVE  
 ~ Fifty percent of the people the company employs are women.

They argue that cross-linguistically, the distinction between the readings can correlate with a difference in definiteness marking (e.g., definite *the women* in the conservative (6a) vs. bare *women* in the non-conservative (6b)), case marking (e.g., genitive/*of* in the conservative (6a) vs. absence thereof in the non-conservative (6b)), as well as in the alleged necessity of focus within the NP following the %Q for the non-conservative reading to arise, which we indicate with a subscripted F, as in (6b). We find the same properties in German, as illustrated in (7).

- (7) a. Die Firma beschäftigt fünfzig Prozent der Frauen.  
 the.NOM company.NOM employs 50%.ACC the.GEN.PL women.GEN  
 ‘The company employs 50% of the women.’ CONSERVATIVE  
 b. Die Firma beschäftigt fünfzig Prozent Frauen<sub>F</sub>.  
 the.NOM company.NOM employs 50%.ACC women.ACC  
 ‘The company employs 50% women.’ NON-CONSERVATIVE

The account the authors ultimately propose is similar in spirit to Herburger’s (2000) approach to non-conservative readings of *many*, in that they assume a marked focus structure and covert movement of the %Q to a position in which it takes the focus set as its first argument, rather than the NP itself (for the most worked-out account see Sauerland and Pasternak, 2022).

While we will not discuss this account here,<sup>3</sup> we will focus on another empirical generalisation that Ahn and Sauerland make, which they acknowledge is not captured by their analysis. They observe that in some languages the non-conservative reading is not possible with subjects, e.g., in English (8a), whereas in languages like German it is (8b) (after Ahn and Sauerland, 2015).

<sup>2</sup>We use the term ‘percentage quantifier’ purely descriptively, without committing to a GQ semantics.

<sup>3</sup>For a more detailed discussion and arguments as to why an account based on a marked focus structure might not be on the right track, see Gehrke and Wągiel (ta).

## When a quantifier is not a quantifier

- (8) a. #Thirty percent students<sub>F</sub> work here.  
b. Dreiig Prozent Studierende<sub>F</sub> arbeiten hier.  
30%.NOM students.NOM work.3PL here  
'30% of the workers here are students.'

All German examples they discuss in this context are intransitive, have the subject in sentence-initial position and appear with a locative expression after the finite verb (e.g., *hier* 'here' in (8b)), although this is not noted or further discussed in their work. In the current paper, we explore the intuition that the most neutral and unmarked word order for non-conservative %Qs in subject position with intransitives is not S-V-PP/ADV, as in (8b), but rather PP/ADV-V-S, as in (9). Moreover, leaving out the locative expression (with intransitives) results in unacceptability, no matter which word order we choose (10). Additionally, we observe that (intransitive) "subjects" become acceptable in English if the syntactic structure is changed to an existential-like structure, and that in this case a locative expression is also obligatory (11).

- (9) Hier / In dieser Firma arbeiten dreiig Prozent Studierende<sub>F</sub>.  
here in this company work.3PL 30%.NOM students.NOM  
'30% of the workers here/at this company are students.'

- (10) a. #Dreiig Prozent Studierende<sub>F</sub> arbeiten.  
30%.NOM students.NOM work.3PL  
b. #Es arbeiten dreiig Prozent Studierende<sub>F</sub>.  
EXPL work.3PL 30%.NOM students.NOM  
Intended: '30% of the workers are students.'

- (11) There are thirty percent students working #(here/at this company).

Given these observations, we propose that word order and predicational structure are crucial for the non-conservative reading to arise, which previous literature overlooked. In §2 we present data from a questionnaire study and a qualitative corpus study in German to support this observation. In §3 we compare the behaviour of non-conservative %Qs with other expressions that show similar restrictions, and we address what these empirical domains have in common. In §4 we propose an account that builds on insights from the literature on semantic incorporation, degree modification within the VP, and existential constructions. Finally §5 concludes.

## 2. German percentage expressions

In order to explore the role that word order plays for the non-conservative reading of %Qs to arise, we designed a questionnaire and conducted a qualitative corpus study.

### 2.1. Questionnaire study

#### 2.1.1. The set-up

We designed a questionnaire that we distributed among native speakers of German. Their task was to compare two test items in a given scenario and to state whether both are fine or just one,

and if both are acceptable whether one is to be preferred; see (12)–(15) for the scenarios and test items.<sup>4</sup> We first tested the non-conservative scenarios and several days later we checked the judgments in the conservative scenarios. Our test items contained %Qs in subject position of an intransitive predicate or in object position of a transitive predicate. The scenarios were construed such that they favoured either the conservative or the non-conservative reading.

- (12) CONSERVATIVE, INTRANSITIVE SCENARIO AND TEST ITEMS  
 The company Kaloma is located not far from a village that is otherwise quite remote. The company employs half of the women from that village.
- a. Es ist interessant, dass **fünfzig Prozent der Frauen** bei der Firma  
 it is interesting that 50%.NOM the.GEN women.GEN at the company  
 Kaloma arbeiten.  
 Kaloma work
- b. Es ist interessant, dass bei der Firma Kaloma **fünfzig Prozent der Frauen** arbeiten.  
 it is interesting that at the company Kaloma 50%.NOM the.GEN  
**Frauen** arbeiten.  
 women.GEN work  
 ‘It is interesting that 50% of the women work at the company Kaloma.’
- (13) CONSERVATIVE, TRANSITIVE SCENARIO AND TEST ITEMS  
 The two companies Pirapo and Ketara are not far from a village that is otherwise quite remote. Therefore, both companies are the main employers for the village inhabitants. While most of the men from the village work at Pirapo, half of the women from the village work at Ketara.
- a. Es ist interessant, dass **fünfzig Prozent der Frauen** die  
 it is interesting that 50%.ACC the.GEN women.GEN the.NOM  
 Firma Ketara beschäftigt.  
 company.NOM Ketara.NOM employs
- b. Es ist interessant, dass die Firma Ketara **fünfzig Prozent der Frauen** beschäftigt.  
 it is interesting that the.NOM company.NOM Ketara.NOM 50%.ACC  
**der Frauen** beschäftigt.  
 the.GEN women.GEN employs  
 ‘It is interesting that the company Ketara employs 50% of the women.’
- (14) NON-CONSERVATIVE, INTRANSITIVE SCENARIO AND TEST ITEMS  
 The company Kaloma is located not far from a village that is otherwise quite remote. A few people from the village work there. Kaloma observes gender equality and half of their employees are women.
- a. Es ist interessant, dass **fünfzig Prozent Frauen** bei der Firma Kaloma  
 it is interesting that 50%.NOM women.NOM at the company Kaloma  
 arbeiten.  
 work

<sup>4</sup>The scenarios were given in German. In (12)–(15) we provide only the English translations, for reasons of space.

## When a quantifier is not a quantifier

- b. Es ist interessant, dass bei der Firma **Kaloma fünfzig Prozent Frauen**  
it is interesting that at the company Kaloma 50%.NOM women.NOM  
arbeiten.  
work  
'It is interesting that 50% of the workers at the company Kaloma are women.'

### (15) NON-CONSERVATIVE, TRANSITIVE SCENARIO AND TEST ITEMS

The two rivaling companies Pirapo and Ketara have about the same amount of employees. While most of the employees at Pirapo are male, half of the employees of Ketara are female.

- a. Es ist interessant, dass **fünfzig Prozent Frauen** die Firma  
it is interesting that 50%.ACC women.ACC the.NOM company.NOM  
Ketara beschäftigt.  
Ketara.NOM employs
- b. Es ist interessant, dass die Firma **Ketara fünfzig Prozent**  
it is interesting that the.NOM company.NOM Ketara.NOM 50%.ACC  
**Frauen** beschäftigt.  
women.ACC employs  
'It is interesting that the company Ketara employs 50% women.'

The test items varied across several factors. First, they varied with respect to DEFINITENESS/CASE ('50% of the women' vs. '50% women'), but we kept this factor constant per scenario: in the conservative scenarios we only used the definite/genitive-marked version, in the non-conservative ones only the bare version. Second, the test items varied with respect to TRANSITIVITY/SUBJECT/OBJECT, as described above, and also here we kept the items constant in the respective scenarios. The actual factor that we wanted to test and varied within each scenario was WORD ORDER: the %Q either appeared sentence-initially (HIGH), resulting in a SPPV order for intransitives and an OSV order for transitives, or it appeared directly before the sentence-final verb (LOW) (intransitive PPSV, transitive SOV order).

In order to ensure a neutral word order, we embedded all test items under 'It is interesting that' so that the sheer fact of what was expressed in the embedded item was reported. This is necessary because word order in German is quite flexible and influenced by information structural and other distinctions (e.g., Müller, 1999; Bader and Häussler, 2010). While the basic word order is SOV (+V2), other orders are available too, as long as the (finite) verb is in its right place. Furthermore, in the transitive scenarios we included an explicit contrast between the two companies, in order to facilitate the use of a sentence-initial object, which deviates from the basic SOV order. In this case the test items might have been information-structurally marked, which could have favoured an OSV order, but the point is that this should have happened in both types of scenarios, all else being equal. Let us move to the results then.

#### 2.1.2. Results of the questionnaire

Table 1 summarises the results of our questionnaire study, where C and NC stand for conservative and non-conservative scenarios, respectively.

	INTRANSITIVE		TRANSITIVE	
	C	NC	C	NC
HIGH	best	very marked	slightly marked	very marked
LOW	slightly marked	best	best	best

Table 1: Questionnaire results for German

In all scenarios either word order was in principle acceptable, but there was a clear preference for one or the other. In the conservative scenarios, the preference for a particular word order resulted only in a minor contrast between the two test items (slightly marked vs. best), but in the non-conservative scenarios, the contrast was bigger (very marked vs. best). In particular, all speakers highly preferred non-conservative %Qs to appear in a low position, just before the sentence-final verb. For transitives this also results in the basic SOV order for German, given that %Qs were in the object position, but in the intransitive case, this resulted in a PPSV order, a potential deviance from the basic word order, which commonly has subjects appear high. In the conservative scenarios, on the other hand, all speakers preferred the basic word order which has sentence-initial subjects (SOV for transitives, SPPV for intransitives).

The results confirm our intuition outlined in the introduction: non-conservative readings of %Qs require a low position, in this case a position adjacent to the verb. In the transitive test items, this coincides with the basic SOV order, and there was no difference in the position between the conservative and the non-conservative reading; thus, the contrast we built into the scenario did not facilitate the use of a sentence-initial object. Several speakers remarked that sentence-initial objects were possible in transitive scenarios, but that they required explicit contrast, surprise or an element like *only*; this requirement was stronger for the non-conservative construal than for the conservative one. One of the examples that our informants provided to make the marked word order more acceptable is given in (16).<sup>5</sup>

- (16) Fünfzig Prozent Frauen beschäftigt nur [die Firma Pirapo]<sub>F</sub>.  
 50%.ACC women.ACC employs only the.NOM company.NOM Pirapo.NOM  
 ‘It is only the company Pirapo that employs 50% women.’

We conclude then, that indeed there is a strong preference for non-conservative %Qs to appear low, which coincides with a position adjacent to the verbal predicate. In the following section we present the results of a qualitative corpus study that point in the same direction.

## 2.2. Corpus data

We performed a corpus search to get an impression about whether non-conservative %Qs preferably or exclusively occur low, and furthermore whether in the intransitive cases they always co-occur with a locative or similar expression in sentence-initial position. For this purpose, we searched for the string *Prozent Frauen* ‘percent women’ in the German Reference Corpus (Kupietz and Keibel, 2009). In this string *Frauen* appears as a bare nominal so that it

<sup>5</sup>Since ‘only’ lexically associates with focus, we mark the element that bears focus in (16) with a subscripted F.

## When a quantifier is not a quantifier

should give rise to unambiguously non-conservative construals.<sup>6</sup> The search returned 207 hits, out of which quite a few were double or irrelevant, e.g., due to punctuation marks between *Prozent* and *Frauen*. We did not find any sentence-initial/high %Qs. Instead there were ten low subjects of intransitives, which all appeared with sentence-initial PPs, e.g., (17a). We found only two transitive subjects, none of which in sentence-initial position and both with the same verb ‘belong to’ in a nominative-dative constellation, e.g., (17b). The seven transitive objects were all low, e.g., (17c), but given that objects canonically appear low this is less remarkable.

- (17) a. In Bern leben 54 Prozent Frauen.  
in Bern live.3PL 54%.NOM women.NOM  
‘There are 54% women living in Bern.’
- b. 2009 gehörten 36,8 Prozent Frauen dem Landtag an.  
2009 belonged.3PL 36.8%.NOM women.NOM the.DAT Landtag.DAT PRT  
‘In 2009, the Landtag (state parliament) consisted of 36.8% women.’
- c. 15 öffentlich-rechtliche- und zwei Privatsender haben  
15.NOM public-service.NOM and two.NOM private-channels.NOM have.3PL  
22 Prozent Frauen in Führung.  
22%.ACC women.ACC in leadership  
‘15 public and two private channels have 22% women in leadership positions.’

There were three headlines, all with PPs, e.g., (18a). Finally, we found 14 other instances of this string in PPs or adjuncts, e.g., (18b).

- (18) a. 8,3 Prozent Frauen im Aufsichtsrat  
8.3% women in-the.DAT Supervisory Board  
‘8.3% women in the Supervisory Board’
- b. die Forderung nach 30 Prozent Frauen in Führungspositionen  
the demand after 30%.DAT women.DAT in leadership-positions.DAT  
‘the demand for 30% women in leadership positions’

Thus, also this search confirms our intuition that the non-conservative construal correlates with a low position of %Qs, even when they are the syntactic subject (in nominative case). The German data additionally confirm that with intransitives a sentence-initial PP seems to be required.

Interestingly, we found one example with a bare nominal in the corpus for which the interpretation is conservative, rather than non-conservative. A similar example found on Linguee is given in (19) (this time also in sentence-initial position).<sup>7</sup>

- (19) 60 Prozent Frauen in der Kommune können weder lesen noch schreiben.  
60%.NOM women.NOM in the community can.3PL neither read nor write  
‘60 percent of women in the community can neither read nor write.’

In this case, %Qs still first combine with the nominal that follows (‘women’) and only then with the rest of the sentence, just what we expect under the conservative reading. Why it is sometimes possible to get a conservative construal even in the absence of definiteness and genitive case needs to be explored in future research,<sup>8</sup> but we can speculate here that in this

<sup>6</sup>We will see in (19) that this is not always the case, though in the overwhelming majority of examples it is.

<sup>7</sup><https://www.linguee.com/english-german/search?source=german&query=50+Prozent+Frauen>

<sup>8</sup>In English we still have a PP headed by *of* so it could be that the German bare noun still bears genitive case, but

example ‘women’ is understood as a kind term, rather than a specific group of women. What this example further shows is that here it is *only* word order (the sentence-initial position) that correlates with the conservative reading.

### 2.3. General discussion

Let us now return to the question whether in German subject %Qs can be interpreted non-conservatively across the board. As we can see from the questionnaire and the corpus study, this is the case mostly with subjects of intransitives, which appear low in the structure and with a locative in sentence-initial position. We did not find any subjects of transitive or ditransitive predicates in the corpus, other than the two instances with ‘belong’, recall (17b). Also here the %Q in the nominative case did not appear sentence-initially but adjacent to the dative DP, and we assume that such examples involve a small clause structure that is interpreted like an existence-in-a-location or possession relation. We did not test this thoroughly with other native speakers, but according to the native judgment of the first author of this paper it seems that other subjects are not possible, no matter which word order we choose; cf. (20) and (21).<sup>9</sup>

- (20) a. #Vierzig Prozent Institute haben strengere Maßnahmen eingeführt.  
 40%.NOM institutes.NOM have.3PL stricter.ACC measures.ACC introduced  
 b. #Strengere Maßnahmen haben vierzig Prozent Institute eingeführt.  
 stricter.ACC measures.ACC have.3PL 40%.NOM institutes.NOM introduced  
 Intended: ‘40% of those that introduced stricter measures are institutes.’
- (21) a. #Vierzig Prozent Kinder haben Merkel eine Mail geschickt.  
 40%.NOM children.NOM have.3PL Merkel.DAT a.ACC mail.ACC sent  
 b. #Eine Mail haben Merkel vierzig Prozent Kinder geschickt.  
 a.ACC mail.ACC have.3PL Merkel.DAT 40%.NOM children.NOM sent  
 Intended: ‘40% of those that sent an e-mail to Merkel are children.’

The only reading we might get is a conservative one, but then this requires a definite in these two examples (again, we do not fully understand why this is not the case in (19)).

Related to this, the corpus search revealed an interesting fact about the kinds of predicates that occur with non-conservative %Qs. Half of the intransitives were existential verbs (‘be’ and *es gibt* (lit. ‘it gives’ ~ ‘there is/are’), the others were ‘live (in a city)’, ‘teach (at a school)’, ‘work (at a factory)’, i.e. typical ways of BEing (existing) at those locations. Transitive non-conservative subjects, in turn, appeared low with the nominative-dative verb ‘belong to’, which we assume to be semantically similar to ‘have’, only with a reverse argument structure ( $x_{\text{nom}}$  belongs to  $y_{\text{dat}} \sim y_{\text{nom}}$  has  $x_{\text{acc}}$ ). Finally, transitive non-conservative objects involved ‘have’ in more than half of the cases, as well as ‘buy’ (~ purchase to HAVE in one’s possession), ‘invite’ (to HAVE at one’s place), ‘place’ (~ cause to BE at LOC). Similarly, the headlines and the PP examples of the type in (18b) express a meaning of existence at a location or possession.

In §4, we will argue that all intransitives with non-conservative %Qs have a structure that is like that of an existential construction, in which the location is the logical subject and the rest

---

due to case syncretism this is not obvious.

<sup>9</sup>With ditransitives, in principle, even more word orders are possible; here we chose to illustrate with two of them, but the judgments are the same for other possible orders.



of the sentence the predicate, rather than a regular subject-predicate construction, and that such a constellation is needed for the non-conservative reading to arise. For both transitives and intransitives, we will capitalise on two empirical observations: the obligatory bareness of the noun, as well as the restriction to HAVE-predicates and objects in the case of transitive predicates. We propose that non-conservative %Qs are interpreted in a way similar to semantically incorporated objects, which also share these properties, as semantic incorporation involve bare nominals, and in a number of languages it is restricted to objects of HAVE-predicates (cf. Espinal and McNally, 2011; LeBruyn et al., 2016). We now turn to two further empirical domains that share many of the properties of %Qs.

### 3. Similar empirical domains

In this section, we discuss two empirical domains that at first sight look quite different from non-conservative %Qs, but which turn out to share some important properties with these. We first address adverbial readings of temporal frequency adjectives in English and then turn to a German adnominal expression that historically derives from an adjective but gives rise to meanings that are similar to the non-conservative readings of *only* and *many*. Both these empirical domains share with non-conservative %Qs the effect of seemingly operating on the VP rather than having their semantic effect within the NP they appear with.

#### 3.1. Adverbial readings of adjectives: Frequency adjectives

Recall that intuitively %Qs under the non-conservative reading have their effect on the VP rather than on the NP, and in this way they are similar to adverbs, without actually being adverbs.<sup>10</sup> It could be instructive, therefore, to look beyond proportional expressions to other empirical domains for which an element that does not directly operate on the VP on the surface nevertheless seems to have its semantic effect on the VP. For example, there are seemingly adnominal (DP-internal) adjectives that can get an ‘adverbial’ reading, in the sense that they can be paraphrased as sentential or event-related adverbs. One famous such case is that of frequency adjectives (FAs) like *occasional*, see (22) (first observed in Bolinger, 1967).

(22) The occasional sailor strolled by. ~ Occasionally, a sailor strolled by.

Gehrke and McNally (2014, 2015) argue that there are different paths to adverbial paraphrases and to not fall into the trap of providing an analysis similar to a quantificational adverb, based on the availability of an adverbial paraphrase. For example, while *occasional* can give rise to an adverbial reading in combination with sortal nouns and with both definite and indefinite determiners, other FAs, e.g., *frequent* and *sporadic*, need to combine with an event noun and an indefinite determiner or bare plural to give rise to an adverbial reading, cf. (23).

(23) a. The/a frequent sailor strolled by.  $\not\sim$  Frequently, a sailor strolled by.  
 b. The storm was punctuated by a sporadic crash of thunder. ~ Sporadically, ...

<sup>10</sup>Sauerland and Pasternak (2022) have a detailed discussion in which they convincingly show that non-conservative %Qs are different from adverbial percentage expressions.

The authors conclude that there must be at least two different paths to adverbial paraphrasability with FAs, and in Gehrke and McNally (2015) these are spelled out in detail. A third path is noted to exist for FAs like *frequent* even in combination with non-event nouns, cf. (24).

(24) She wrote me frequent letters. ~ She frequently wrote me letters.

Gehrke and McNally (2014) show that the adverbial reading in these cases is only possible with bare plurals in object position and with temporal distribution of atomic units involved in some stereotypical activity (e.g., of writing letters, baking cakes etc.). They argue that the intuitive effect on the VP comes about due to atomic event-entity mapping (this is needed for the general pluractional character of these FAs), implemented by a generalised version of Chung and Ladusaw’s (2004) RESTRICT rule. Under Chung and Ladusaw’s semantic account of incorporation, illustrated in (25), the internal argument is not a referential (or quantificational) DP, rather it is a property-denoting predicate ( $P$  in (25a)) that does not saturate the predicate  $P$ ’s argument slot but merely modifies (RESTRICTS) it. The internal argument variable is existentially closed (EC) in the subsequent derivation (25b).

(25) a.  $\text{RESTRICT}(\lambda x_e \lambda y_e [R(x)(y)], \lambda z_e [P(z)]) = \lambda x_e \lambda y_e [R(x)(y) \wedge P(x)]$   
 b.  $\text{EC}(\lambda x_e \lambda y_e [R(x)(y)]) = \lambda y_e \exists x_e [R(x)(y)]$

In §4, we will also employ RESTRICT in our analysis of non-conservative %Qs in object position. These share with the English FA data discussed here the restriction to the object position, the obligatoriness of a bare plural, as well as the paraphrasability as an adverb. More generally, they share with incorporation constructions in other languages that they occur with HAVE-predicates, as shown in the previous section. On the other hand, we cannot directly apply Gehrke and McNally’s (2014) account of FAs to non-conservative %Qs because there are important differences. While temporal FAs are adjectives, which are furthermore restricted to operate on events and to express distribution of atomic units in time (e.g., atomic cake-bakings), %Qs are not adjectives, they are not restricted to events, and they do not involve distribution of atoms but rather a partition of a group that is homogeneous in some relevant sense (e.g., a group of (female) workers). When a bare singular can be interpreted as a group, it is also allowed, as shown in (26), but this would not be possible with FAs, which require a bare plural.

(26) Diese Firma beschäftigt neunzig Prozent Abschaum.  
 this.NOM company.NOM employs 90%.ACC scum.ACC  
 ‘This company employs 90% scum.’

Nevertheless, our analysis in §4 shares the idea that the empirical phenomenon can overall be situated within the general family of incorporation structures. Let us then move on to yet another empirical domain with similarities to %Qs, this time returning to German.

### 3.2. Non-conservativity by modification: German *lauter*

Another empirical domain in which bare plurals are necessary for an adnominal element to appear to have a semantic effect on the VP is German *lauter*, discussed in Eckardt (2006) and Anderssen (2011). As Eckardt shows, *lauter* was originally an uninflected adjective with the meaning ‘pure’, which developed uses that in some cases are similar to *only*, see (27a) (the ‘only’ use), and in others similar to *many*, see (27b) (the ‘many’ use) (examples after Eckardt, 2006: 203). Even under the ‘only’ use, *lauter* requires there to be a bigger number of entities.

### When a quantifier is not a quantifier

- (27) a. Die Maiers haben lauter Töchter.  
 the.NOM Maier-family.NOM have LAUTER daughters.ACC  
 ‘The Maier family have only daughters (and quite a few at that).’
- b. Unter dem Baum wachsen lauter Hallimasche.  
 under the tree grow.3PL LAUTER honey-fungi.NOM  
 ‘There are a lot of honey fungi growing under the tree.’

Eckardt shows that *lauter* in many respects behaves like a quantificational determiner. For example, it cannot combine with a (preceding or following) determiner, and it also does not pattern with focus particles since it cannot appear in adverbial position, see (28) (Eckardt, 2006).

- (28) a. {\*die / \*einige} lauter Pfifferlinge  
 the some LAUTER chanterelles
- b. lauter {\*die / \*zwei} Morchel  
 LAUTER the two morels
- c. Hans hat {nur / bloß / \*lauter} geschlafen.  
 Hans has only barely LAUTER slept  
 ‘Hans only slept.’

Non-conservative %Qs display the same behaviour: They cannot combine with (preceding or following) determiners and cannot appear in adverbial position, but instead the adverbial counterpart with *zu* ‘to’ has to be used, as illustrated in (29).

- (29) a. Bei Kaloma arbeiten (\*die) fünfzig Prozent Frauen.  
 at Kaloma work the 50%.NOM women.NOM
- b. \*fünfzig Prozent die Frauen  
 50%.NOM/ACC the.NOM/ACC women.NOM/ACC
- c. Marta hat \*(zu) fünfzig Prozent geschlafen.  
 Marta has to 50% slept  
 ‘Marta half slept.’

Eckardt notes that if *lauter* were to be analysed as a quantificational determiner, it would be similar to reverse proportional readings of *many* and would therefore, at least at first sight, violate conservativity. Rather than pursuing such an analysis, solely based on superficial similarity to *only* or *many*, Eckardt argues, based on diachronic evidence, that *lauter* should receive a property treatment, similar to the adjective that it developed from. In particular, while the adjective *lauter* ‘pure’ was originally used to describe purity of matter, it developed a second use to describe purity of objects, which then led to its modern-day use.

In the same spirit as Eckardt, Anderssen (2011) argues that *lauter*-DPs are not quantificational. More generally, he assumes, as do many others, that DP can in principle be of three different types: referential (type *e*), quantificational (type  $\langle\langle e, t \rangle, \langle\langle e, t \rangle, t \rangle\rangle$ ), and predicational (type  $\langle e, t \rangle$ ). He argues that *lauter*-DPs are always predicational, based on the following observations. First, *lauter*-DPs are restricted to environments that require a weak interpretation of the DP (in the sense of Milsark, 1974) and such DPs can never be interpreted as topics. For example it has been shown that subjects of stage-level predicates (e.g., *be sick*), but not those of individual level predicates (e.g., *be intelligent*), can be weak; *lauter*-DPs can be subjects of the former, but not of the latter, see (30) (after Anderssen, 2011: 141).

- (30) Bei uns am Institut sind lauter Professoren {krank / #intelligent}.  
 at us at-the department are LAUTER professors.NOM sick intelligent  
 ‘In our department, there are many {sick / #intelligent} professors.’

Furthermore, in German the position in the middle field relative to adverbs and other expressions can result in a distinction between a weak and a strong reading of a given DP, in the sense that a higher position correlates with a strong interpretation, while a lower position correlates with a weak interpretation. Anderssen shows that *lauter*-DPs have to appear lower than an adverb like *leider* ‘unfortunately’, see (31) (Anderssen, 2011: 144).

- (31) ... weil ihm {leider} lauter Hindernisse {\*leider} im Weg  
 because him.DAT unfortunately LAUTER obstacles.NOM unfortunately in-the way  
 standen.  
 stood.3PL  
 ‘... because many obstacles unfortunately were in his path.’

Based on a corpus study, for which he extracted all *lauter*-DPs, he concluded that a subject *lauter*-DP always appears lower in the clause with respect to a co-occurring adverb, even if with other DPs the adverb in question could in principle also appear lower.

We observe the same behaviour of non-conservative %Qs, as they also obligatorily occupy a position below an adverb like *leider* ‘unfortunately’ in the middle field, cf. (32).

- (32) ... weil die Firma {leider} neunzig Prozent Vollidioten  
 because the.NOM company.NOM unfortunately 90%.ACC full-idiots.ACC  
 {\*leider} beschäftigt.  
 unfortunately employs  
 ‘... because the company unfortunately employs 90% complete idiots.’

Similarly to our finding that %Qs preferably appear low in the structure, Anderssen observes that *lauter*-DPs also prefer a low position and that in particular the prefield position in German, which has a high preference for the interpretation as a topic, is often not a good position for *lauter*-DPs. In his corpus study he found that generally, German subject DPs in unembedded sentences appear in sentence-initial position in over half of the cases, but that *lauter*-DPs in subject position only do so in less than 7% of the cases. When they do, in turn, he observes that the interpretation is information-structurally marked, which is similar to our example in (16).

Finally, Anderssen found a number of cases in which the sentence-initial position in sentences with *lauter* DPs in subject position is occupied by the expletive *es* ‘it’, a placeholder to fill the position before the finite verb in V2 contexts. In particular, he found 13 existential sentences with expletive *es* in sentence-initial position, as well as other examples with this expletive in sentence-initial position, e.g., (33) (both from Anderssen, 2011: 160).

- (33) Es sitzen lauter Zensoren in diesem Verein.  
 it sit.3PL LAUTER censors.NOM in this club  
 ‘There are a whole lot of censors in this club.’

While Anderssen (2011) does not spell out a full semantic account of *lauter* he argues that the semantics of *lauter*-DPs should be that of a predicate, i.e., to denote a property. This property, in turn, is suggested to modify the main predicate, in terms of Chung and Ladusaw’s (2004) RESTRICT, very much like what we saw for frequency adjectives discussed in §3.1.

In sum, the word order effects and other empirical observations that Anderssen reports for *lauter*-DPs match those we found for non-conservative %Qs, and even the theoretical account he hints at fits the one we will ultimately employ for non-conservative %Qs in the following section. Also when we go back to Eckardt's (2006) examples, we observe that all of her instances of *lauter* in its 'many' use involve lower subjects of intransitives, with sentence-initial PPs, e.g. (27b), and the best paraphrase into English is an existential construction. Even most of her examples for the 'only' use of *lauter* are like this, or they involve transitive predicates that arguably express some kind of possession, such as 'have', recall (27a), 'have fished', 'own'. Also here there seems to be a parallel to non-conservative %Qs, recall §2.2.

Again, there are important differences between *lauter* and non-conservative %Qs, the most important one being that %Qs are not (and never have been) adjectives. Nevertheless, this could be a diachronic difference, and the synchronic picture could be the same or at least similar enough. The diachronic path to the similarities between *lauter* and %Qs certainly must be a different one that could be explored in future research. We will leave it at that and keep in mind for further exploration the parallels to *lauter* and whether the account we propose for non-conservative %Qs can be extended to *lauter*. Let us move to this account then.

#### 4. The account

In the previous sections we saw that the non-conservative reading with %Qs arises in combination with bare plural nominals and when %Qs appear low. With intransitives, there is a sentence-initial locative expression and a verbal predicate that either is an existential predicate or could be analysed as being used as such. With transitives, %Qs are regularly low objects that furthermore seem to appear with a more restricted set of predicates, which can be analysed in terms of HAVE-predicates (in the sense of, e.g., LeBruyn et al., 2016). Finally, %Qs also appear in headlines or in small clauses with PPs, which similarly receive the interpretation of possession or existence at a location.

In this section, we propose an account that capitalises on the empirical commonalities between the transitive examples and incorporation structures (bare nominals, objects, HAVE-predicates) (§4.1), and those between the intransitive examples and existential constructions (definiteness effect, obligatory locative, word order) (§4.2). In particular, we argue that %Qs are always interpreted low, as part of the predicate. We argue that the effect of %Qs on the predicate (a kind of adverbial reading) comes about due to semantic incorporation, modeled in terms of Chung and Ladusaw's (2004) RESTRICT. In the case of intransitives, the structure we argue for is essentially a kind of existential construction (on which see McNally 2016 and literature cited therein). Existential constructions can be contrasted with locative predications (of the type DP is PP), as illustrated in (34).

- |      |    |                            |             |
|------|----|----------------------------|-------------|
| (34) | a. | There is a doctor in town. | EXISTENTIAL |
|      | b. | A/The doctor is in town.   | LOCATIVE    |

An existential construction describes the existence of an entity at a location or time, and the nominal that expresses this entity is necessarily a weak nominal (this has been labeled the definiteness effect). This nominal, which is called the pivot in existential constructions, e.g., *a doc-*

*tor* in (34a), is in a different position than it is in the locative counterpart. Cross-linguistically, existentials involve verbs like ‘to be’, ‘to have’, or dedicated existential predicates, such as Spanish *hay* (which diachronically derives from ‘there has’), and they can differ in their structure while still expressing an existential meaning. For example, a common assumption for English existentials holds that *there* is the logical subject and the pivot denotes a property (of type  $\langle e, t \rangle$ ); the material following the pivot, e.g., *in town* in (34a), is the coda, which has been analysed as an adjunct. In 4.2, we will see that German existentials have a different structure.

In our analysis, %Qs themselves will not be treated as determiners in a generalised quantifier sense (of type  $\langle \langle e, t \rangle, \langle \langle e, t \rangle, t \rangle \rangle$ ). Rather, we argue that they are of type  $\langle \langle d, \langle e, t \rangle \rangle, \langle e, t \rangle \rangle$ , as they take a gradable predicate encoding a quantity-based scale grounded on the part-whole structure of the individual argument, to return a predicate. The %Q is modeled in the spirit of Bochnak’s (2010) treatment of cross-categorial *half*, and we argue that %Qs involve a measure function that has a built-in proportional ‘quantificational’ semantics. In this way, they essentially work like a scalar modifier that operates on a scale provided by the modified expression.

#### 4.1. Transitives

Based on the morphosyntactic evidence discussed in previous sections, we propose that non-conservative transitive construals involve semantic incorporation of the bare plural noun in object position into the verbal predicate and that the resulting complex predicate is subsequently shifted to a scalar expression on which the %Q operates. The idea is that the sentence in (35) has a meaning that could (roughly) be paraphrased as ‘The company women-employs to the extent of 50%’.

- (35) Die Firma beschäftigt fünfzig Prozent Frauen.  
 the.NOM company.NOM employs 50%.ACC women.ACC  
 ‘The company employs 50% women.’

In this constellation, the grammatical subject is the logical subject of the sentence. We assume that in (35) the noun ‘company’ is interpreted as a group noun of sorts, and thus it denotes a set of singular company members as well as pluralities thereof. Hence, the DP ‘the company’ provides the argument for the main predicate, the maximal plural individual in the denotation of ‘company’, which we will call *tc*.

On the other hand, we assume that the bare plural is semantically incorporated and combines with the transitive verb via Chung and Ladusaw’s (2004) RESTRICT mode of composition, recall (25a) in §3.1. For convenience, we will represent the incorporation expression as ‘women-employ’, see (36). Notice that we do not apply the existential closure at this stage.

- (36)  $\llbracket \text{women-employ} \rrbracket = \text{RESTRICT}(\lambda x_e \lambda y_e [\text{EMPLOY}(x)(y)], \lambda z_e [\text{WOMEN}(z)]) =$   
 $\lambda x_e \lambda y_e [\text{EMPLOY}(x)(y) \wedge \text{WOMEN}(x)]$

Subsequently, (36) will be shifted to a gradable property associated with a fully closed cardinality-based scale and the %Q will operate on that scale. Building on Bochnak’s (2010) treatment of cross-categorial uses of *half*, we analyse %Qs as scalar modifiers that target an ordered set of degrees provided by the modified expression. Such an approach is supported by the fact that %Qs can be used to modify gradable adjectives encoding fully closed scales, as shown in (37).

## When a quantifier is not a quantifier

(37) The glass is {half / fifty percent} full.

Since unlike *half*, %Qs are complex expressions, we decompose them into two components. The numeral simply refers to a natural number (type  $d$ ), as in (38). On the other hand, the ‘percent’ word denotes a function that takes a degree and yields a scalar modifier of type  $\langle\langle d, \langle e, t \rangle \rangle, \langle e, t \rangle\rangle$ , see (39), where  $G$  is a gradable predicate (an expression of type  $\langle d, \langle e, t \rangle \rangle$ ),  $S_G$  is a fully closed scale encoded by that predicate,  $\text{MAX}$  returns the maximal degree on that scale, and  $d$  is the value provided by the numeral. For instance, (40) specifies that the extent to which a gradable property applies to an individual is 50%.

(38)  $\llbracket \text{fifty} \rrbracket = 50$

(39)  $\llbracket \text{percent} \rrbracket = \lambda d_d \lambda G_{\langle d, \langle e, t \rangle \rangle} \lambda x_e [G(x) (\frac{d}{100} \times \text{MAX}(S_G))]$

(40)  $\llbracket \text{fifty percent} \rrbracket = \lambda G_{\langle d, \langle e, t \rangle \rangle} \lambda x_e [G(x) (50\%(S_G))]$ , where  $50\%(S_G)$  is an abbreviation for  $\frac{50}{100} \times \text{MAX}(S_G)$

Given the semantics above, the %Q cannot combine with the incorporation expression in (36) directly, as it combines with the gradable adjective in (37). However, following Bochnak’s analysis of the degree/quantity ambiguity in sentences such as (41), we assume that in (35) the %Q targets a cardinality-based scale in order to provide a proportion of a plurality.

(41) The meat is half cooked.

For this purpose, we adapt Bochnak’s  $\mu$  operation, which on our account relates the part-whole structure of a plurality denoted by the subject with a cardinality scale, i.e., an ordered set of degrees that can be accessed by the %Q. As defined in (42),  $\mu_R$  shifts a relation between individuals into a scalar expression of type  $\langle d, \langle e, t \rangle \rangle$  by existentially binding the direct object variable and introducing an open degree argument associated with the cardinality of the relevant (plural) individual via the # measure function. After  $\mu_R$  combines with the incorporation construction, we obtain the gradable predicate in (43).

(42)  $\llbracket \mu_R \rrbracket = \lambda R_{\langle e, \langle e, t \rangle \rangle} \lambda d_d \lambda y_e \exists x_e [R(x)(y) \wedge \#(x) = d]$

(43)  $\llbracket \mu_R \rrbracket (\llbracket \text{women-employ} \rrbracket) = \lambda d_d \lambda y_e \exists x_e [\text{EMPLOY}(x)(y) \wedge \text{WOMEN}(x) \wedge \#(x) = d]$

(43) encodes a cardinality scale, which is based on the part-whole structure of the  $\lambda$ -bound nominal argument, which will be saturated by the subject. Since that argument represents a bounded individual, the corresponding scale is also bounded, and thus fully closed, which makes it compatible with (40). Consequently, (43) serves as the input for the %Q and the output is the predicate in (44), where  $S_{\text{women-employ}}$  is a cardinality-based fully closed scale.

(44)  $\llbracket \text{fifty percent} \rrbracket (\llbracket \mu_R \text{ women-employ} \rrbracket) =$   
 $\lambda G_{\langle d, \langle e, t \rangle \rangle} \lambda x_e [G(x) (50\%(S_G)) (\lambda d_d \lambda z_e \exists y_e [\text{EMPLOY}(y)(z) \wedge \text{WOMEN}(y) \wedge \#(y) = d])] =$   
 $\lambda x_e [(\lambda d_d \lambda z_e \exists y_e [\text{EMPLOY}(y)(z) \wedge \text{WOMEN}(y) \wedge \#(y) = d] (x) (50\%(S_{\text{women-employ}}))] =$   
 $\lambda x_e \exists y_e [\text{EMPLOY}(y)(x) \wedge \text{WOMEN}(y) \wedge \#(y) = 50\%(S_{\text{women-employ}})]$

Finally, the predicate in (44) combines with the subject DP, and thus gets saturated by the entity *tc*. As a result, the formula in (45) states that the extent to which the company employs women is 50% of the maximal value on a cardinality scale based on the part-whole structure of *tc*. These are the desired truth conditions capturing the non-conservative meaning of (35).

$$(45) \quad \llbracket \text{fifty percent } \mu_R \text{ women-employ} \rrbracket (\llbracket \text{the company} \rrbracket) = \\ \exists y_e [\text{EMPLOY}(y)(tc) \wedge \text{WOMEN}(y) \wedge \#(y) = 50\%(\mathcal{S}_{\text{women-employ}})]$$

Let us now see how this approach allows us to capture non-conservative intransitive construals.

#### 4.2. Intransitives

The general idea is that non-conservative intransitive construals underlyingly resemble existential constructions. This view is supported by the fact that German sentences such as (46a) can be expressed in English by existentials, see (46b), despite the fact that in English regular declarative non-conservative intransitives are infelicitous, recall (8a). In German, however, the existential has the structure in (46c), which looks like our intransitive non-conservative %Q examples, except that the verb is ‘to be’.

- (46) a. In dieser Firma arbeiten fünfzig Prozent Frauen.  
in this company work.3PL 50%.NOM women.NOM  
‘50% of the workers at this company are women.’  
b. There are fifty percent women working at this company.  
c. Im Garten sind Blumen.  
in-the garden are.3PL flowers  
‘There are flowers in the garden.’

We assume for German that it is the location (or more precisely: a plural individual at that location) that is the subject (see Bassaganyas-Bars 2015 for one such account of existentials). In (46a) we take the PP ‘at this company’ to denote a set that is pragmatically restricted to include only individuals that work at the company. We take its extension to involve both atomic individuals and pluralities of individuals. Consequently, the PP predicate is shifted by the standard IOTA-shift to the maximal plurality in its extension, i.e., the plurality that contains all the atomic individuals that work at this company, see (47). Let us call this plural individual *atc*.

$$(47) \quad \text{IOTA}(\llbracket \text{at this company} \rrbracket) = \sigma_{x_e} [\text{AT-THIS-COMPANY}(x)] = atc$$

As for the VP, we follow Bassaganyas-Bars (2015) in assuming that in existentials the verb is interpreted as introducing a general pragmatically determined relation  $\pi$  (Barker, 1995). Specifically, we propose that ‘work’ in (46a) denotes  $\pi_{\text{work}}$ , which is resolved as a working relation between two individuals. Furthermore, we assume that the bare plural ‘women’ in the pivot is incorporated into the verbal predicate via RESTRICT and then the result in (48) feeds  $\mu_R$  in order to yield the gradable property in (49), associated with a fully closed scale.

$$(48) \quad \llbracket \text{women-work} \rrbracket = \text{RESTRICT}(\lambda x_e \lambda y_e [\pi_{\text{work}}(x)(y)], \lambda z_e [\text{WOMEN}(z)]) = \\ \lambda x_e \lambda y_e [\pi_{\text{work}}(x)(y) \wedge \text{WOMEN}(x)]$$

$$(49) \quad \llbracket \mu_R \rrbracket (\llbracket \text{women-work} \rrbracket) = \lambda d_d \lambda y_e \exists x_e [\pi_{\text{work}}(x)(y) \wedge \text{WOMEN}(x) \wedge \#(x) = d]$$

The scalar expression in (49) combines with the %Q, which targets the cardinality scale  $\mathcal{S}_{\text{women-work}}$ , see (50). That scale is again based on the part-whole structure of the  $\lambda$ -bound variable.



## When a quantifier is not a quantifier

$$\begin{aligned}
 (50) \quad & \llbracket \text{fifty percent} \rrbracket (\llbracket \mu_R \text{ women-work} \rrbracket) = \\
 & \lambda G_{\langle d, \langle e, t \rangle \rangle} \lambda x_e [G(x)(50\%(S_G))] (\lambda d_d \lambda z_e \exists y_e [\pi_{\text{work}}(y)(z) \wedge \text{WOMEN}(y) \wedge \#(y) = d]) = \\
 & \lambda x_e [(\lambda d_d \lambda z_e \exists y_e [\pi_{\text{work}}(y)(z) \wedge \text{WOMEN}(y) \wedge \#(y) = d](x)(50\%(S_{\text{women-work}}))] = \\
 & \lambda x_e \exists y_e [\pi_{\text{work}}(y)(x) \wedge \text{WOMEN}(y) \wedge \#(y) = 50\%(S_{\text{women-work}})]
 \end{aligned}$$

The resulting expression in (50) gets saturated by the maximal plurality of individuals working at the company, i.e., *atc* from (47), and we arrive at the truth conditions in (51), which state that (46a) is true if the extent to which there is a working relationship between women and the individuals working at this company is 50% of the maximal degree on the relevant cardinality scale or, in simpler words, if 50% of the individuals working at this company are women. These are the desired truth conditions for (46) since the proportion of the women is calculated with respect to the individuals working at the company.

$$\begin{aligned}
 (51) \quad & \llbracket \text{fifty percent } \mu_R \text{ women-work} \rrbracket (\llbracket \text{at the company} \rrbracket) = \\
 & \exists y_e [\pi_{\text{work}}(y)(atc) \wedge \text{WOMEN}(y) \wedge \#(y) = 50\%(S_{\text{women-work}})]
 \end{aligned}$$

To conclude, our analysis captures the empirical facts discussed in the previous sections. First of all, it explains the use of bare plurals in non-conservative construals with %Qs as well as the fact that %Qs in such constructions appear low. The reason is an incorporation structure in transitive constructions and an underlying existential-like structure coupled with incorporation in intransitive configurations. This in turn accounts for the apparent effect of the %Q on the VP. Specifically, the %Q always operates on a gradable expression derived from the main predicate. Finally, our approach provides a compositional treatment of %Qs.

## 5. Conclusion

In this paper, we discussed conservative and non-conservative readings of constructions with percentage quantifiers (%Qs) such as *fünfzig Prozent* ‘fifty percent’ in German. Previous literature has shown that the conservative reading arises in German when %Qs combine with definite DPs in the genitive, whereas the non-conservative reading arises with bare plurals and the absence of genitive case. Based on the results of a questionnaire and a corpus study, we added new empirical generalisations and showed that the non-conservative reading is conditioned by word order (non-conservative %Qs have to appear low) and that there are important restrictions on the kinds of predicates that %Qs are arguments of (these have to express existence at a location or possession). To capture these empirical observations, we proposed an account, on which the %Q is decomposed into a natural number and a function that takes a degree and yields a scalar modifier. It applies to a property of individuals that has been shifted into a gradable predicate. The apparent effect on the predicate comes about by assuming that the nominal with %Qs incorporates into the verbal predicate, and that in the case of intransitives we additionally have an existential structure, in which %Qs are part of the predicate.

Let us then return to the bigger question that we addressed in the beginning of the paper, namely whether non-conservative readings of %Qs challenge the Conservativity Hypothesis, according to which all natural language determiners are conservative. Our answer to this is negative, since under our account %Qs are, in fact, not quantificational determiners but rather a type of scalar modifiers. In this way, our solution to the problem is more along the lines of works

that deny a quantificational determiner status for adnominal elements with seemingly non-conservative readings, such as *only* (e.g., von Stechow, 1994), but also lesser discussed cases like adverbially interpreted frequency adjectives (Gehrke and McNally, 2014, 2015) and German *lauter* (Eckardt, 2006; Anderssen, 2011). In fact, we showed that non-conservative %Qs share a number of properties with the latter two empirical domains.

Future research needs to address what happens when we add additional modifiers to the nominal. Ahn and Sauerland (2017) and Sauerland and Pasternak (2022) show that narrow focus on the modifier alone gives rise to a truth-conditional difference with respect to the wider focus on the entire modified nominal, as illustrated in (52).

- (52) a. Hier arbeiten dreißig Prozent [polnische Frauen]<sub>F</sub>.  
 here work 30%.NOM Polish.NOM women.NOM  
 ‘30% of the workers here are Polish women.’  
 b. Hier arbeiten dreißig Prozent [polnische]<sub>F</sub> Frauen.  
 here work 30%.NOM Polish.NOM women.NOM  
 ‘30% of the female workers here are Polish.’

Finally, we might explore whether the account we proposed for non-conservative %Qs could be extended to German *lauter*, given the empirical commonalities, and possibly even to non-conservative readings of *many*, briefly mentioned in the introduction.

## References

- Ahn, D. and U. Sauerland (2015). Non-conservative quantification with proportional quantifiers: Crosslinguistic data. In T. Buy and O. Deniz (Eds.), *NELS 45: Proceedings of the Forty-Fifth Annual Meeting of the North East Linguistic Society*, pp. 1–10. Amherst: GLSA.
- Ahn, D. and U. Sauerland (2017). Measure constructions with relative measures: Towards a syntax of non-conservative construals. *The Linguistic Review* 34(2), 215–248.
- Anderssen, J. (2011). *Quantification, misc.* Ph. D. thesis, UMass, Amherst, MA.
- Bader, M. and J. Häussler (2010). Word order in German: A corpus study. *Lingua* 120(3), 717–762.
- Barker, C. (1995). *Possessive descriptions*. Stanford, CA: CSLI.
- Barwise, J. and R. Cooper (1981). Generalized quantifiers and natural language. *Linguistics and Philosophy* 4(2), 159–219.
- Bassaganyas-Bars, T. (2015). The rise of *haver* as the existential predicate and the perfect auxiliary: The case of Old Catalan. In E. Csipak and H. Zeijlstra (Eds.), *Proceedings of Sinn und Bedeutung* 19, pp. 107–124.
- Bochnak, M. R. (2010). Quantity and gradability across categories. In N. Li and D. Lutz (Eds.), *Semantics and Linguistic Theory (SALT) 20*, pp. 251–268. Ithaca, NY: CLC Publications.
- Bolinger, D. (1967). Adjectives in English: Attribution and predication. *Lingua* 18, 1–34.
- Chung, S. and W. Ladusaw (2004). *Restriction and Saturation*. Cambridge, MA: MIT Press.
- Eckardt, R. (2006). *Meaning Change in Grammaticalization: An inquiry into semantic reanalysis*. Oxford: Oxford University Press.
- Espinal, M. and L. McNally (2011). Bare singular nominals and incorporating verbs in Spanish and Catalan. *Journal of Linguistics* 47, 87–128.

## When a quantifier is not a quantifier

- Gehrke, B. and L. McNally (2014). Event individuation by objects: Evidence from frequency adjectives. In U. Etxeberria, A. Falas, A. Irurtzun, and B. Leferman (Eds.), *Proceedings of Sinn und Bedeutung 18*, pp. 146–163. semanticsarchive.
- Gehrke, B. and L. McNally (2015). Distributional modification: The case of frequency adjectives. *Language* 91.4, 837–870.
- Gehrke, B. and M. Wągiel (t.a.). There is fifty percent truth to their story: Non-conservative readings of percentages in Slavic and German. *Glossa: a journal of general linguistics*.
- Herburger, E. (2000). *What Counts: Focus and Quantification*. Cambridge, MA: MIT Press.
- Keenan, E. L. and J. Stavi (1986). A semantic characterization of natural language determiners. *Linguistics and Philosophy* 9(3), 253–326.
- Kupietz, M. and H. Keibel (2009). The Mannheim German Reference Corpus (DeReKo) as a basis for empirical linguistic research. In M. Minegishi and Y. Kawaguchi (Eds.), *Working Papers in Corpus-based Linguistics and Language Education 3*, pp. 53–59. Tokyo: Tokyo University of Foreign Studies.
- LeBruyn, B., H. de Swart, and J. Zwarts (2016). From *HAVE* to *HAVE*-verbs: Relations and incorporation. *Glossa* 182, 49–68.
- McNally, L. (2016). Existential sentences crosslinguistically: Variations in form and meaning. *Annual Review of Linguistics* 2, 211–231.
- Milsark, G. (1974). *Existential Sentences in English*. Ph. D. thesis, MIT.
- Müller, G. (1999). Optimality, markedness, and word order in German. *Linguistics* 37, 777–818.
- Sauerland, U. and R. Pasternak (2022). German measurement structures: Case-marking and non-conservativity. *The Journal of Comparative Germanic Linguistics* 25, 221–272.
- von Fintel, K. (1994). *Restrictions on Quantifier Domains*. Ph. D. thesis, University of Massachusetts, Amherst.
- Westerståhl, D. (1985). Logical constants in quantifier languages. *Linguistics and Philosophy* 8(4), 387–413.