DEGREE MODIFICATION, MONOTONICITY, AND MEASURE FUNCTION SELECTION: *EVIDENCE FROM GERMAN*

by

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DEDICATION

Für Klaus und Hermine.
Ich vermisse euch

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ABSTRACT

Excessive degree modification constructions (such as "You run too much.") in German exhibit an interesting dichotomy. In some contexts we find *viel* (often translated as *much*), like in English. In other contexts we find *sehr* (often translated as *very*).

> Ich habe zu {viel/*sehr} Salz.
> I   have too much   salt
> "I have too much salt."

> Ich mag sie zu {*viel/sehr}.
> I   like her too very
> "I like her too much."

I argue that this is due to selectional criteria. The operator *viel* selects measurements that *monotonically* map between the part-whole ordering of the thing that is being measured and the degree that the measurement represents. For example, we can measure salt in terms of weight. As the weight increases, so does the amount of salt. However, when we measure salt in terms of color, this has no effect on the amount of salt present, see Schwarzschild (2006). The operator *sehr*, selects measurements which do not map between a part-whole ordering and degrees.

I contextualize these findings within a current debate in semantics on the status of degree modification and the nature of states. I assume with Wellwood (2015) that measure functions are introduced compositionally by an external operator (*viel* and *sehr* in German). However, I also argue that German supports Baglini (2015)'s claim that states are not ordered in part-whole relationships, but are ordered in equivalence classes instead, which provide different measurements than events. The German distribution can be derived, once we assume that *sehr* selects for the kinds of measurements we find in states and *viel* selects for measurements that monotonically map to a part-whole ordering.

CHAPTER 1

Introduction

The goal of this dissertation is to contribute to the understanding of degree modifications construction and the ontology of measurements at large based on data from German. This dissertation focuses on the status of two items: *sehr* (translated as *very*) and *viel* (translated as *much*). I argue that the distribution of these items supplies evidence that states provide a different class of measurements (intensive/non-monotonic) than pluralities, events, and mass nouns, all of which provide extensive (monotonic) measurements.

In this introductory chapter I will introduce some formal background assumptions. I will then provide an outline for the remainder of the dissertation with a brief summary of each chapter.

1.1   Degrees, Scales, and Degree Modification

It has been a longstanding assumption in the field of formal semantics that gradable adjectives represent a mapping from *entities* to *degrees*, see Bartsch & Vennemann (1972), Cresswell (1976), Heim (1985), and Kennedy & McNally (2005) among others. The question of whether this is a result of composition (Wellwood 2015, Solt 2015) or whether adjectives encode this meaning lexically has been a matter of debate in recent years. I will assume a compositional approach, specifically one based on Wellwood 2015 (see subsection 4.1.3 for an introduction to this framework), however the analysis is not contingent on whether adjectives introduce degrees lexically, or compositionally. Regardless, gradable adjectives and other gradable terms map to degrees, which is why I will briefly introduce what we understand by *degrees*.

$$HEIGHT$$

$$\vdots$$

$$\{d''' = 3ft\}$$

$$|$$

$$\{d'' = 2ft\}$$

$$|$$

$$\{d' = 1ft\}$$

$$|$$

$$\{d = 0ft\}$$
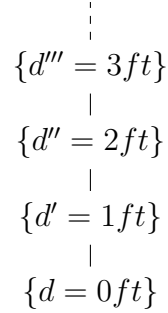
Figure 1.1: Figure representation of $HEIGHT$ on an abstract scale

Degrees are understood to be ordered on *scales*, where an individual degree represents a point on the scale. Refer to Figure 1.1 for a visual representation. A scale is understood to be a triplet, consisting of:

(1)   a. A set of points on the scale (degrees)

   b. A dimension of measurement

   c. An ordering relation (see: Kennedy & McNally 2005: p. 351)

Consider an adjective to relate an individual to a degree on a scale. For a positive adjective, it is standard to assume an operator $[\![POS]\!]$[1] (see: Kennedy & McNally 2005), which ensures that the degree related to the entity exceeds some contextual standard. This is how the denotation of a positive adjective, see (2), is derived.

(2)   John is tall. $\rightarrow$ John is taller than standard.

I take *degree modification constructions* to be constructions that involve the modification of degree denoting constructions. This includes comparatives, equatives (*as tall as*), excessives (*too tall to*), and instances where *sehr* and *viel* modify a predicate directly.

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[1]POS here stands for *positive*, as in positive adjective.

1.2 Mereological Orderings and Monotonicity

The notion of a part-whole relationship will be a crucial component going forward in this dissertation, so will the notion of *monotonicity*. I will refer these ideas frequently in chapter 3 and chapter 4. *Mereology* can be defined as the study of part-whole relationships. In the study of language, mereology has been used to explain distinctions between mass and count nouns, see Link (1983) for an extensive discussion. While there are varieties of mereological theories, I will consider a mereology a part-whole relationships given by a partial order, which is *reflexive*, *transitive*, and *antisymmetric*. Going forward, the term *mereology* will be used to refer to such partial orders. We will represent the part-whole relationship as $\leq$, where $x \leq y$ is understood to mean "x is a part of y". This part-whole relationship is a primitive relationship of the mereology. All other axioms are derived on the basis of the part-whole relationship.

(3)   Reflexivity: $\forall x[x \leq x]^2$

(4)   Antisymmetry: $\forall x \forall y[x \leq y \wedge y \leq x \rightarrow x = y]^3$

(5)   Transitivity: $\forall x \forall y \forall z[x \leq y \wedge y \leq z \rightarrow x \leq z]^4$

I will also assume Baglini (2015: 48, ex. (43-44))'s definition of a sum and overlap:

(6)   Sum:
  $sum(x, P =_{def} \forall y[P(y) \rightarrow y \leq x] \wedge \forall z[z \leq x \rightarrow \exists z'[P(z') \wedge z \otimes z']]^5$

(7)   Overlap:
  $x \otimes y =_{def} \exists z[z \leq x \wedge z \leq y]^6$

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[2] For all x, x is a part of x.

[3] If x is a part of y and y is a part of x, then x is y.

[4] If x is a part of y and y is a part of z, then x is a part of z.

[5] A sum x of a set P is a thing that consists of everything in P and whose parts each overlap with something in P (Baglini 2015: 48, ex. (43)).

[6] Overlap between x and y is defined as such: There exists a z that is a part of x and a part of y.

$$\{a, b, c\}$$

$$\{a, c\} \quad \{a, b\} \quad \{b, c\}$$

$$\{a\} \quad \{c\} \quad \{b\}$$
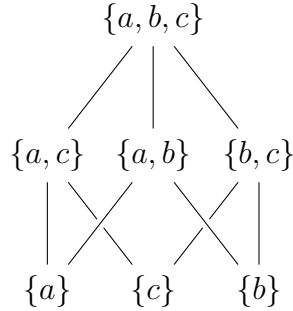
Figure 1.2: Join semi-Lattice presented as a Hasse Diagram

I will use the term *mereology* to describe a set of elements which is closed under *sum* and ordered under a part-whole relationship ($\leq$) that observes (3)-(5). We can visualize such a relationship as a join semi-lattice in Figure 1.2, according to Link (1983).

The term *monotonic* comes from the study of mathematical functions, in particular, it concerns relationships between the domain and range of a function. Within the scope of this dissertation, we will only discuss increasing monotonicity, which can be defined as seen in (8):

(8)   A function f is monotonic increasing iff:

$\forall x, y [x \leq y \wedge f(x) \leq f(y)]$[7]

A relation is monotonic for our purposes if it preserves the ordering of its possible inputs to its possible outputs. For example, a fixed exchange rate between two currencies is a monotonic relationship. For every extra US Dollar that gets exchanged, we get a relative increase in the amount of Czech Crowns that is being returned. I will return to this type of relationship in chapter 3.

1.3   Outline

In chapter 2, I will introduce the distribution of *viel* and *sehr* in German. I will pay particular attention to patterns that deviate from the English patterns for *much* and

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[7]For all x and y, x is less or equal to y and f(x) is less or equal to f(y).

very. I will show that the distribution of these items cannot be clearly delineated along the lines of lexical category.

In chapter 3, I will introduce the notion of *Monotonicity* in the sense of Schwarzschild (2006). I will argue that the distribution of *viel* and *sehr* can be explained once we consider that *viel* picks out monotonic measurements. I will argue that each in instance in which we found *viel* in chapter 2, we also find monotonic measurements.

In chapter 4, I will discuss previous approaches to *much* and contextualize them with the findings in chapter 2 and chapter 3. I argue that the findings in chapter 3 are supportive evidence for Baglini (2015)'s claim that states only provide *intensive* measurements. I provide a formal semantics for *viel* and *sehr*, based on proposals by Wellwood (2015). I then close with a discussion of this dissertation's findings in chapter 5.

CHAPTER 2

German Degree Modification: The Paradigm of *Viel* and *Sehr*

In this chapter, I will discuss the distribution of the degree modifiers *sehr* (usually translated as *very*) and *viel* (usually translated as *much*). I will show that the distributions of these items varies significantly between German and English in section 2.1. I will show that the German distribution cannot be explained in terms of grammatical categories or sub-types of grammatical categories. I will then introduce the concept of *Monotonicity* (Schwarzschild 2006) in chapter 3, and show that the German distribution can be explained by leveraging a strict version of monotonicity as a selectional requirement.

2.1 Relevant Generalizations

Most of the literature surrounding *much*-like operators deals with English. However, it is standard practice to draw on other languages for evidence when discussing the semantic and syntactic nature of *much* (see: Dunbar & Wellwood 2016, Neeleman et al. 2004, Corver 1997a,b, Rett 2008, Wellwood 2018a). The implication is that the *much*-like operator behaves the same in other languages and that there is some kind of universality, at the least in related languages, to the distribution and role of the *much* operator.

One could reasonably expect then, that German, being closely related to English,[8] patterns similarly to English when it comes to degree modification with *much/viel* and *very/sehr*. However, a brief look at the data in Table 2.1 shows that this is not the case. The distribution of *much* in English seems to map onto both

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[8]Both German and English are Germanic languages.

sehr and *viel*, which are characterized as the German equivalents of *very* and *much*. We can see a pronounced split when it comes to the *too-ellipsis* of adjectives, the *too-modification* of count-nouns, and the modification of states. Finally, we find some curious patterns in adjectives that are stage level-predicates.

Usage	English	German
too-modification of mass-nouns[9]	much	viel
too-modification of singular count-nouns[10]	much	**sehr**
too-modification of plural count-nouns[11]	many	viel-e
too-ellipsis of adjectives[12]	much	**sehr**
modification of states	(very) much	**sehr/viel**
modification of dynamic events	much/a lot[13]	viel
quantify mass nouns	much/a lot	viel
quantify count nouns	many/a lot	viel-e
modify positive adjectives	very	**sehr/*viel**[14]
modify comparatives	much	viel
modify participial adjectives	very/much	sehr/viel[15]

Table 2.1: The distribution of *viel/much* and *sehr/very* respectively.

The following sections will provide examples for all the environments in which German departs from the English pattern of degree modification with *much* and *very* in order to form a better understanding of this pattern. One of the aims will be to show that the distribution cannot be explained purely along categorical lines.

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[9] "We have too much rice."

[10] "You're too much of a linguist."

[11] "We have too many dogs."

[12] "This house is old, in fact it is too **much** so."

[13] We should note that in cases where we find *a lot* in this table, we are really looking at positions that are available to *much*. This is due to the fact that *much* in nominal and verbal contexts acts as an NPI in English: "? I go out much." vs "I don't go out much."

[14] This is only licensed in stage-level predicates.

[15] Licensing of *viel* and *sehr* varies by type of participial and varies between different items, see section 2.5.

2.2   Too-modification, Ellipsis, and Quantification in Nominals

German allows excessive (i.e. *too-modification*) constructions of nominals, just like English. However, German seemingly requires nominal excessives of singular count nouns to be constructed with *sehr*.

(9)   Excessive Modification in German Nominals:

   a.   Wir haben zu **viel**/*sehr Reis.
       We have   too **much**   rice
       "We have too much rice".

   b.   Du bist zu **sehr**/*viel Amerikaner, um   das zu verstehen.
       You are too **very**   American   (in order) to that to understand
       "You're too much of an American to understand this."[16]

   c.   Remo ist zu **sehr**/*viel Semantiker, um   das zu verstehen.
       Remo is   too **very**   semanticist (in order) to that to understand
       "Remo is too much of a semanticist to understand this."[17]

   d.   Wir haben zu **viel-e**/*sehr Strassenhunde in Indien.
       We have   too much-pl   street dogs   in India
       "We have too **many** street dogs in India."

We can observe that for mass nouns, German and English pattern together in (9a). However, when constructing an excessive over a singular count noun, German requires *sehr* and disallows *viel* as seen in (9b). There is a distinct difference between (9a)/(9d) and (9b)/(9c): examples such as (9b)/(9c) are predicate nominals. Predicate nominals are a syntactically distinct class, see Kuno (1970) and Yusa (1992) for an in-depth discussion. It is in fact the case that all predicate nominals formed from count nouns require *sehr* in too-modification, regardless of their plurality:

(10)   Die Ärzte   in meinem Krankenhaus sind zu **sehr**/*viel Profis
       The doctors in my   hospital   are too very   professionals
       um   so   einen Fehler   zu machen.
       (in order) to such a   mistake to make

---

[16]Note that "Amerikaner" here is a noun. Speakers will usually prefer an adjectival version of this utterance: "zu amerikanisch". Consider (9c), where an adjectival construction is not available.

[17]This meaning cannot be expressed in an adjectival construction, contrary to (9b).

"The doctors in my hospital are too professional to make this kind of mistake."[18]

Hence it is not only a matter of singular vs plural count-nouns that decides the availability of *viel* vs *sehr* in too-modification, but also predicative count nominals vs other usages of count nominals. It appears to be the case that bare too-modification is only available within a predicative context for singular count-nouns:

(11)   * Wir haben zu sehr Strassenhund(-e).
         We have   too very street dog(s)

Predicative nominals with mass nouns are possible in German and take *viel*, but they require some context and are fairly rare in natural language use:

(12)   Context: Speakers are discussing the grain export statistics from different
        agricultural regions.

        a. Das Getreide aus   Österreich ist zu **viel**/*sehr   Roggen und nicht
           The grain   from Austria   is too much/*very rye   and not
           genug   Weizen.
           enough wheat
           "The Autrian grain is too much rye and not enough wheat."

Similarly to English (when controlling for the NPI properties of English *much*), German *viel* may also modify bare plural count nouns and bare mass nouns:

(13)   Meine Oma   hat viel-e   Hunde.
       My   grandma has much-PL dogs
       "My grandma has many dogs"

(14)   Meine Oma   hat viel Reis zuhause.
       My   grandma has much rice at.home
       "My grandma has a lot of rice at home"

To summarize thus far, the following generalizations can be made for the nominal domain:

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[18]The more literal translation here would be: "They are too much of professionals to..."

(15) *sehr*: licensed only in predicative nominals of count nouns and only under a too-modification

(16) *viel*: licensed with bare mass nouns, bare plural count nouns, too-modified plural count nouns, too-modified mass nouns

The attentive reader may wonder whether the use of *viel-e* in (9d) and (13) might not be a different operator altogether. This is a valid concern, as English uses *many* in these constructions. German allows the use of *viel* in positions where English uses *much*, *many*, and *a lot*, see (17). We can demonstrate that *viel-e* is actually *viel* with plural inflection *-e*. In nominal constructions of count nouns, *viel* inflects like a normal adjective. It inflects for number, and definiteness as we can see in (18).[19] *Viel* can inflect similarly for mass nouns, for example by using a definite determiner, see (19). Finally, the plural inflection *-e* carries over into excessive constructions, which strongly suggests that *viele* is simply *viel+pl* (17c). This is simple syntactic inflection and bar contrary evidence we can assume that it does not have any impact on the semantics of *viel*.

(17) a. Wir haben viel   Reis.
        We   have   much rice
        "We have a lot of rice"

      b. Es gibt   viel-e   Länder   auf der Erde.
        It exists much-pl countries on the earth
        "There are many countries in the world."

      c. Es gibt   zu viel-e   Länder   auf der Erde.
        It exists too much-pl countries on the earth
        "There are too many countries in the world."

(18) a. Die viel-en   schön-en   Häuser in Tucson gefallen mir gut.
        The much-pl.def beautiful-pl.def houses in Tucson enjoy   me good
        "I like the many pretty houses in Tucson."

      b. In Tucson gibt   es viel-e   schön-e   Häuser.
        In Tucson exists it much-pl beautiful-pl houses
        "There are many pretty houses in Tucson."

---

[19]German adjectives inflect for number, definiteness, and **case**. However, with count nouns *viel* is only used in a plural form. The plural inflection is the same for all cases in German adjectives.

(19) Der viel-e   Reis gestern   war mir zu schwer.
      The much-def rice yesterday was me too heavy
      "The large amount of rice (I ate) yesterday was too heavy (on my stomach)"

We can summarize the distribution as following: *viel* is licensed in mass nouns and plural count nouns. *Sehr* is only licensed in predicate nominals of count nouns.

2.3 Adjectives

On first glance, German adjectives behave similarly to English adjectives with regards to degree modification by the two operators in question. Positive adjectives can be modified with *sehr* (20) and comparatives (and excessives) can be modified by *viel* (21).

(20) Das Haus ist **sehr**/*viel grün.
      The house is very   green
      "The house is very green."

(21) Mein Haus ist **viel**/*sehr grüner als   dein Haus.
      My   house is much   greener than your house
      "My house is much greener than your house."

However, there is a subclass of adjectives in German that allows modification by *viel* in the positive form. These are adjectives that constitute *stage-level predicates* (Carlson 1977). Individual level predicates are predicates that are true of an individual without any clear temporal limit (i.e. they exhibit lifetime effects). If a house is green, that is not a temporary state (even if we can repaint the house). On the other hand, stage-level predicates allow for a temporary interpretation. If Remo is scared, we assume that this is a temporary state (even if it can be a permanent descriptor).

Nitschke (2022: pp. 249–251) shows that German allows stage-level predicate adjectives to be modified by *viel*, which yields a frequency interpretation where the predicate is "often true" of the individual:

(22) Ich bin viel ängstlich.
I   am much fearful
"I am often fearful/afraid" (Nitschke 2022: 249, ex. (63))

(23) Sie ist viel neidisch.
She is much jealous
"She is often jealous" (Nitschke 2022: 249, ex. (65))

(24) * Das Kind ist viel klein.
The child is much small
(Nitschke 2022: 249, ex. (67))

In order to show that these are stage-level predicates, Nitschke (see: 2022: p. 250) applies the following test taken from Kratzer (1995), who shows that German stage-level predicates will allow for two readings in a specific type of construction, whereas individual level predicates will only allow one reading:

(25) stage level predicate:

... weil fast   alle Flüchtlinge in der Stadt umgekommen sind.
since almost all refugees   in the city   perished   are.

"Since almost all of the refugees in the city perished" [reading 1]

"Since almost all the refugees perished in this city" [reading 2]

(26) individual level predicate:

... weil fast   alle Schwäne in Australien schwarz sind.
since almost all swans   in Australia black   are

"Since almost all swans in Australia are black." [only 1 reading]

(Kratzer 1995: 127, exx. 4&8)

In (25), there are two licensed interpretations. In one reading, most of the refugees in the city perished, meaning there was a certain number of refugees in the city, and most of them perished. In the other interpretation almost all of the refugees of a contextually relevant set of refugees perished in the city. In the second reading, if we are talking about refugees in general, this would mean that almost all refugees globally perished in this one city. An individual level predicate like *black*,

will only ever license one interpretation in these types of constructions, as we can see in (26).[20] Nitschke (2022: p. 250) uses this test to show that the adjectives in (22-23) are indeed stage level:

(27) ängstlich:

    ... weil   fast   alle Polizisten in Australien ängstlich sind.
       because almost all policemen in Australia afraid   are

    [reading 1: it is the case that most Australian policemen are scared]
    [reading 2: irregardless of nationality, most police are scared in Australia]

(28) neidisch:

    ... weil   fast   alle Studenten in Berlin neidisch sind.
       because almost all students in Berlin jealous are

    [reading 1: most students from Berlin are jealous]
    [reading 2: most students are jealous when they are in Berlin]
    (Nitschke 2022: 250, exx. (71)-(72))

Nitschke (2022: p. 250) argues that "[(27-28)] show that these adjectives actually are stage-level predicates, at least when used predicatively. We can take (26) to be an analog for the same test for an individual level predicate like *klein* [*(small)*] in (24)."

We can further show that the licensing of *viel* in those cases is a matter of stage-level predication, as we can force the predicate into an individual-level interpretation. We would expect that this would make the usage of *viel* unlicensed, which is precisely what happens in (29):

(29) * Er ist ein viel   neidischer Mensch.
      He is a   much jealous   human.

I should note that in all the cases in (22)-(23), *viel* is synonymous with *often* and speakers will usually prefer to express these utterances with the German word for *often*.

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[20]This explanation is adapted from Nitschke (2022: p. 250).

2.4 Modification of Events and States

Like English *much*,[21] German *viel* can be used adverbially. However, just like in the nominal domain, the adverbial usage is split between *sehr* and *viel* along some curious lines. Roughly, we can state that *viel* modifies dynamic events (30) and *sehr* usually modifies statives (31).

(30) Ich laufe **viel**/*sehr.
     I   run   much
     "I run a lot."

(31) Ich mag dich **sehr**/*viel.
     I   like you very
     "I like you a lot." or "I like you very much."

(32) Du ähnelst ihr **sehr**/*viel.
     You resemble her very.
     "You resemble her very much."

On a closer inspection, this divide is not as clear as it would seem. While *sehr* in the verbal domain seems to exclusively occur with states, not all states allow modification with *sehr* and license *viel* instead (33a)-(33b), and some cases allow modification by both (33c)-(33d).

(33) a. * Ich schlafe sehr.
          I   sleep   very

      b. Ich schlafe viel.
         I   sleep   much
         "I sleep often." OR "I sleep a lot."

      c. Ich freue   mich sehr.
         I   happy me   very
         "I am very happy." (happy here is a verb)

      d. Ich freue   mich viel.
         I   happy me   much
         "I am often happy."

---

[21]English *much* exhibits Negative Polarity Item (NPI) behavior in the verbal and nominal domains. German *viel* does not exhibit any NPI-like behavior.

e. Ich besitze einen Hund (*viel/*sehr)
I   own   a   dog   much/very
(Both *viel* and *sehr* are ungrammatical here.)

(32) Du ähnelst ihr **sehr**/*viel.
You resemble her very
"You resemble her very much."

The data in (33) shows us that this is not a question of statives versus dynamic events, but something else. A reasonable assumption would be that it depends on the *type of state.* Maienborn (2008) discusses two types of states: Davidsonian states and Kimian states. Where Davidsonian states describe some eventuality such as "*sit, stand* or *sleep*" (Maienborn 2008: p. 107) while Kimian states such as "*know, weigh,* and *own*" (Maienborn 2008: ibid) do not. We can see in (33b) that Davidsonian states are modified by *viel.* However, the Kimian state *own* in (33e) does not allow modification at all, while the Kimian state *resemble* in (32) can license *sehr* but not *viel.* Finally, the Kimian state *freuen* (verbal form of *be happy*) can be modified by *viel* and *sehr,* (33c) & (33d). It seems that Kimian states can license *sehr,* if they are gradable, but they do not necessarily ban *viel,* as seen in (33d).

If we want to postulate a divide between states that maps upon modification by *viel* and *sehr,* it seems that verbs of emotion/psych-verbs seem to allow *sehr* modification, see (31) and (33c). However, as we can see in (33d), these verbs can sometimes allow *viel* and at other times disallow *viel* (31). It is therefore unlikely that this is a matter of *category.* For verbs that are not Kimian states, the availability of *viel* is a question of *dynamic/eventive interpretations.* Whereas *sehr* does not seem to be available to non-Kimian states at all.

While one of the aims of Maienborn (2008)'s program is to supercede the stage-level versus individual-level distinction, the availability of *viel* seems to be delineated exactly along those lines. For Kimian-states (k-states), the availability of *viel* is conditioned on whether they are *stage-level or individual-level predicates* (see for discussion of these terms: Carlson 1977, Kratzer 1989). I will argue in section 3.4 that this effect arises due to the fact that a dynamic interpretation or a stage-level interpretation provide a monotonic dimension of measurement. As we have seen in

section 2.3, stage-level predicates license *viel*.

We can apply the same test from Kratzer (1995) here, see (34). I will also apply some tests from Lakoff (1966) meant to test for "statives". However, these inadvertently test for individual-level predicates. These include "statives" (individual level predicates) resisting imperatives and resisting complementation of "persuade", "remind", and similar predicates. We can observe in (36) & (35) that "mögen" (to like) behaves as an individual-level predicate. *Freuen* (*be happy*), however behaves as a stage-level predicate. Unsurprisingly, *freuen* licenses *viel* and *sehr*, whereas *mögen* only licenses *sehr*.

(34)   ...   weil   fast alle   Polizisten in   Australien sich   freuen
           since almost all   police in   Australia self   happy
           "Most police are happy in Australia, regardless of whether they are currently in Australia or not" [reading 1]

           "Most police are happy in Australia. This only pertains to police who are currently there." [reading 2]

(35)   ...   weil   fast alle   Polizisten in   Australien Hunde mögen
           since almost all   police in   Australia dogs   like
           "since most police in Australia like dogs" [only 1 reading]

(36)   a. ? Ich habe Jenny daran erinnert   ihn   zu mögen.[22]
             I   have Jenny daran reminded him to like
          "I've reminded Jenny to like him."

       b. * Mag ihn!
           Like him
          "Like him!"

(37)   a. Ich habe Jenny daran erinnert   sich zu freuen.
          I   have Jenny daran reminded self   to   happy
          "I have reminded Jenny to be happy."

       b. Freue   dich   (doch)!
          Happy yourself (indeed)
          "Be happy!"[23]

---

[23]*Doch* makes this more acceptable, but the utterance is fine without it

Interestingly, it is not the case that individual level predicates automatically license *sehr*, as we can see in (33e). The state must also allow degree modification in general:[24]

(33e) Ich besitze einen Hund (*viel/*sehr).
       I   own   a   dog   much/very

(38)   a. * Ich besitze einen Hund etwas.
              I   own   a   dog   a.little

        b. Du ähnelst   mir etwas.
            You resemble me a.little
            "You resemble me a little."

While we still need the individual-level and stage-level distinction, the Maienborn (2008) program is nevertheless useful, as we can observe that the availability of *sehr* in verbs seems to be mostly constrained to Kimian states. To summarize, we can state that the following generalizations hold for the verbal domain:

(39) *sehr*: licensed in Kimian states that allow degree modification.

(40) *viel*: licensed in dynamic events and states that can be stage-level predicates

2.5   Participial Adjectives

Participial adjectives require their own section, as they do not pattern with lexical adjectives. German allows the adjectival usage of verbal participles. When used adjectivally, these are called participial adjectives:

(41) Den Hund jagen-d, liefen sie gen Abgrund.

      The dog hunt-PART.PRES ran they toward abyss

      Chasing/hunting the dog, they ran toward the abyss. (verbal usage)

---

[23]It's difficult to provide an accurate translation for "daran". It is an obligatory component of transitive "remind" in German, if the complement is a CP.

[24]Presumably, one of the reasons why all psych-verbs seem to allow *sehr* modification is because they represent gradable predicates.

(42)   Mein mich jagen-d-er Hund kann keine Tricks.

My hunt-PART.PRES-NOM.MASC dog can NEG.any tricks

"My dog who chases/hunts me doesn't know any tricks." (adjectival usage)

(43)   Ich habe dich ge-jag-t.
I   have you PART-hunt-PST
"I hunted/chased you" or "I have hunted/chased you."[25] (verbal usage)

(44)   Der ge-jag-t-e Hund kann keine Tricks.

My PART.PST-hunt-PST-NOM.MASC dog can NEG.any tricks

"The hunted/chased dog doesn't know any tricks." (adjectival usage)

For the sake of brevity, I will refer to the perfect participle (43)-(44) as participle II (pII) and the present participle (41)-(42) as participle I (pI).

In this section, we will focus on the adjectival usage of these participials, as they exhibit interesting patterns with regards to *viel* and *sehr*. The verbal usage of these items clearly patterns with their base verbs and is therefore not particularly noteworthy.

There has been some discussion about the adjectival nature of these items, see for example Lübbe & Rapp (2011), Zimmermann (1999), and Sommerfeldt (1988) among others. Here, I will consider them derived adjectives in their adjectival usage, as they inflect like common adjectives when used prenominally. However, the precise categorial status of participial adjectives is irrelevant for the discussion in this dissertation, as the selectional criteria for *viel* and *sehr* I am proposing in chapter 3 act independently from an item's grammatical category.

Participial adjectives formed from the present participle (pI) pattern with their base-verb in regards to *viel* and *sehr*, see (45b) and (46b). Participle adjectives derived from the perfect participle (pII) seem to uniformly allow *viel* modification, see (45d) and (46c). Crucially, the adjectival use of pII seems to allow *viel*-modification even if the verbal use does not, compare (45c) to (45d). If the base verb allows neither *sehr* nor *viel*, then neither do the participial adjectives, see (47).

---

[25]Some German dialects, such as those in the Bavarian dialect family, do not exhibit a preterite and use the perfect in both a simple past tense and present perfect meaning.

(45)   a. Sie liebt dich {**sehr**/*viel}.
       She loves you {very/*much}
       "She loves you very much" (*viel* is not licensed)

     b. Die ihren Vater {**sehr**/*viel} lieben-d-e   Frau
       The her father {very/*much} love-PART.PRES-NOM.FEM woman
       war zu Besuch.
       was to visit
       "The woman who loves her father very much came by for a visit."

     c. Sie hat dich {**sehr**/*viel} ge-lieb-t.
       She has you {very/*much} PART.PST-love-PST
       "She loved you very much." (verbal usage, *viel* not licensed)[26]

     d. Die {sehr/viel} ge-lieb-t-e   Frau war zu
       The {very/much} PART.PST-love-PST-NOM.FEM woman was to
       Besuch.
       visit
       sehr: "The woman who is very loved came by for a visit."

       viel: "The woman who is loved a lot came by for a visit."

(46)   a. Sie giesst die Pflanze {*sehr/**viel**}.
       She waters the plant {*very/much}
       "She waters the plant a lot."

     b. Die die Pflanze {*sehr/**viel**} giessen-d-e
       The the plant {*very/**much**} water-PART.PRES-NOM.FEM
       Frau war zu Besuch.
       woman was to visit
       "The woman who waters the plant a lot came by for a visit."

     c. Die {*sehr/**viel**} ge-gossen-e   Pflanze steht
       The {*very/much} PART.PST-water.PST-NOM.FEM plant stands
       am Tisch.
       on table
       "The plant that was watered a lot is sitting on the table."

(47)   a. Er starb *{sehr/viel}.
       He died *{very/much}
       "He died." (*viel* or *sehr* are not licensed)

---

[26]This can be interpreted with *viel* if the loving is re-interpreted as an activity. She loved you, then stopped loving you, then started loving you again.

b. Die *{sehr/viel} sterben-d-e Frau lag im Bett.
The *{very/much} die-PART.PRES-NOM.FEM was lied in bed
"The dying woman was lying in the bed."

c. Das Bild der *{sehr/viel} ge-storben-en
The picture of.the *{very/much} PART.PST-die.PST-GEN.FEM
Frau hängt im Gang.
woman hangs in hallway
"The picture of the deceased woman hangs in the hallway."

It appears that the availability of *sehr*-modification is conditioned by the availability of *sehr*-modification in the base verb, regardless of participle and use. The availability of *viel*-modification is seemingly licensed in the adjectival use of the perfect participle, even if it is not licensed in the verbal use of that participle. However, this is not quite the case. In fact, the availability of *viel* in pII for verbs that do not allow *viel* already, is conditioned on omitting the external argument of the participial adjective.

(45d) Die {sehr/viel} ge-lieb-t-e Frau war zu
The {very/much} PART.PST-love-PST-NOM.FEM woman was to
Besuch.
visit
sehr: "The woman who is very loved came by for a visit."

viel: "The woman who is loved a lot came by for a visit."

(48) Die von ihrem Vater {**sehr**/*viel} ge-lieb-t-e
The by her father {very/*much} PART.PST-love-PST-NOM.FEM
Frau war zu Besuch.
woman was to visit
"The woman who is very loved by her father came by for a visit." (*viel* not licensed)

(46c) Die {*sehr/**viel**} ge-gossen-e Pflanze steht am
The {*very/much} PART.PST-water.PST-NOM.FEM plant stands on
Tisch.
table
"The plant that was watered a lot is sitting on the table."

(49) Die von mir {*sehr/**viel**} ge-gossen-e   Pflanze
      The by   me {*very/much} PART.PST-water.PST-NOM.FEM plant
      steht   am Tisch.
      stands on table

      "The plant that was watered by me a lot, is sitting on the table."

Compare (45d) and (48) to (46c) and (49). The availability of *viel* in (46c) and (49) stays constant, regardless of the external argument of the participial adjective. However, in (45d) and (48) the availability of *viel* disappears once we make the external argument overt. We will take a closer look at this pattern in section 3.6. For now, we will assume this distribution for participial adjectives:

Participial Adjective	**Sehr**	**Viel**
Present Participle	if licensed in base verb	if licensed in base verb
Perfect Participle	if licensed in base verb	always for reversible events & states [27]

Table 2.2: The distribution of *viel* and *sehr* in participials.

2.5.1 Lexicalized Participials

There are German participial adjectives that have become fully lexicalized adjectives. These pattern with lexical adjectives with respect to *viel* and *sehr*, see (50b). Lexicalized participial adjectives also allow morphological comparatives and superlatives (50c), whereas compositional participial adjectives only allow a periphrastic comparative and superlative (50f)-(50g).

If the lexicalized participial is derived from a base verb that is still in usage,[28] we can force a compositional deverbal interpretation by adding an overt argument in the past participle, as seen in (50d). Once a compositional interpretation is forced, *viel* modification becomes available again (50e):

---

[27]Valid for individual level predicates only if the external argument of the participial adjective is omitted.

[28]There are lexicalized participials such as *ausgemergelt* (*emaciated*), where there is no base verb in use.

(50)   a. Ein ge-stör-t-er   Typ
           A   PART.PST-disturb.PST-NOM.MASC guy
           "A crazy guy"

       b. Ein {**sehr**/*viel}   ge-stör-t-er   Typ
           A   {very/*much} PART.PST-disturb.PST-NOM.MASC guy
           "A very crazy guy"

       c. Du   bist der ge-stör-t-est-e   Typ den ich
           You are the PART.PST-disturb.PST-SUP-NOM.MASC guy that I
           kenne.
           know
           "You are the craziest guy that I know."

       d. Ein von mir ge-stör-t-er   Typ
           A   by   me PART.PST-disturb.PST-NOM.MASC guy
           "A guy that I bothered" (NOT: "a crazy guy")

       e. Ein viel   von mir ge-stör-t-er   Typ
           A   much by   me PART.PST-disturb.PST-NOM.MASC guy
           "A guy that is bothered by me a lot."

       f. * Der von mir ge-stör-t-est-e   Typ
             The by   me PART.PST-disturb.PST-SUP-NOM.MASC guy

       g. Der von mir am meisten ge-stör-t-e   Typ
           The by   me on most   PART.PST-disturb-PST-NOM.MASC guy
           "The guy who is bothered by me the most."

To sunmmarize: Lexicalized participial adjectives behave just as we would expect
a lexical adjective to behave. However, we can force them into a compositional
reading, which makes them behave as a compositional participial adjective.

2.6   Final Remarks on the Distribution

In this chapter I've presented the principal data on the distribution of *viel* and *sehr*
in (presumably) degree modifying positions. The findings so far are summarized in
Table 2.3.

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[29]Valid for individual level predicates only if the external argument of the participial adjective
is omitted.

Context	**Sehr**	**Viel**
Kimian States	licensed if gradable	licensed if stage-level
Dynamic Events	licensed if gradable	licensed for reversible events
Mass Nouns	not licensed	licensed
Sg. Count Nouns	in predicate nominals	not licensed
Pl. Count Nouns	in predicate nominals	licensed
Adjectives	licensed in positive	comparatives & stage-level preds.
Pres. Participial Adj.	if licensed in base verb	if licensed in base verb
Perf. Participial Adj.	if licensed in base verb	if base verb reversible[29]

Table 2.3: The distribution of *viel* and *sehr* in German.

In the next chapter, I will propose that we can explain this distribution once we consider that *viel* and *sehr* select for different types of measurements.

CHAPTER 3

Monotonicity as a Selectional Criterion

In section 1.2, I introduced the term *monotonicity*. In this chapter, I will briefly introduce the version of *Monotonicity* that I will assume going forward in section 3.1. I will then argue that the distribution of *viel* and *sehr* follows if we assume that *viel* selects for monotonic measurements and *sehr* does not in section 3.2. In the remainder of this section, I will show how each instance of data in section 2.1 comes together, if we consider monotonicity as a selectional criterion.

3.1 Monotonicity and Measurements

I will use a definition of monotonicity that was adapted by Schwarzschild (2006) building on earlier observations by Lønning (1987). Schwarzschild (2006)'s *monotonicity* differs from the mathematical definition in that it describes a dimension of measurement that "reflects the part-whole structure of the domain of objects it applies to" (Schwarzschild 2006: p. 73). Schwarzschild (2006) extends the concept of monotonicity to measurement theory, arguing that some measurements can be monotonic or non-monotonic to the part-whole relation of a mass noun. Refer to section 1.2 for an introduction on part-whole relations and Link (1983) for a treatment on why mass nouns denote part-whole relations.

Bale et al. (2022: p. 2) define a measure function as "monotonic just in case it maps any elements in the nominal domain to a degree that is greater than the degrees to which it maps the element's proper parts within that nominal domain."

In simplified terms: a dimension of measurement is monotonic if adding or subtracting along that dimension of measurement directly adds or subtracts portions of the object that is being measured, strictly along the ordering of a part-whole

relationship. *VOLUME* is a monotonic measurement for rice, because more volume translates to more rice (and crucially more *subparts* of rice).

Wellwood (2018a: p. 84) defines this for predicates in general in a semantic condition she labels "S-monotonicity"[30]:

(51) **S-monotonicity**

$\forall x, y \in D_P$, if $x \prec_p y$, then $\mu(x) < \mu(y)$[31]

We will refine this definition in chapter 4, but for now I will assume "monotonicity" to refer to (51). Measurement that satisfy this relation, I will call "monotonic measurements" or *extensive measurements* (in accordance with Baglini 2015).

Schwarzschild (2008: pp. 88–90) points out that so called 'Q-adjectives' (see: Bresnan 1973), such as *much, many, few,* and *little,*[32] have a special relationship to monotonic measurements. This relationship, Schwarzschild (2008) defines as follows:

> When a QP [Q-adjective] is combined with a substance noun, the interpretation is one in which the dimension is monotonic on the relevant part-whole relation in the domain given by the noun. (Schwarzschild 2008: 89, ex. (76))

Not only is the interpretation confined to a monotonic dimension, Schwarzschild (2008: pp. 90–91) shows that items like *much* allow interpretations along all the monotonic dimensions available. This can result in ambiguity if more than one dimension is available, see (52).

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[30]The 'S' here presumably stands for *Schwarzschild.*

[31]"For all x and y in the domain of predicates (D_P), if x is on a lower point of a scale than y with respect to the predicate then the measurement of x ($\mu(x)$) has to be smaller than the measurement of y."

[32]Depending on the domain, these are sometimes also referred to as *Degree Modifiers* when discussed in relationship to other adjectives.

(52)   "I drink more[33] coffee than you"

Reading 1: In terms of volume.

Reading 2: In terms of cups.

The above behavior is only available for Q-adjectives that are not constrained to one dimension. Schwarzschild (2008: p. 91) argues that *many* and *few* are constrained to the dimension of *Cardinality*, which in itself is a monotonic dimension.

In the literature, monotonicity has been explicitly (see: Schwarzschild 2008, Bale et al. 2022, Rett 2014) or implicitly (see: Wellwood 2018a) tied to the nominal domain. Schwarzschild (2006)'s initial discussion dealt with (pseudo-) partitive constructions and most discussion so far has remained within the boundary of nominals in general, aside from Wellwood (2015) who extends the concept to other domains. In this section, I will argue that monotonicity has effects beyond the nominal domain and can show up in verbs and adjectives. I will further argue that availability of a monotonic dimension is a (selectional) requirement for *viel*. This is implemented by analyzing *viel* as providing a measure function that that requires a monotonic mapping between part-whole ordered domains and degrees. See subsection 4.1.3 and section 4.3 for the concrete implementation.

3.2   Monotonicity and German Degree Modification

So far, we've discussed monotonicity in nominals in the English literature. Schwarzschild (2008) and others (Solt 2019, Rett 2014) consider the relationship between monotonicity and *much* (and other Q-adjectives) in nominals a sort of emergent property. If a monotonic measurement is available, *much* will modify that monotonic measurement. But, there is no requirement for *much* to modify monotonic measurements exclusively. This approach makes sense in the context of English, as we find degree constructions where a monotonic relation between the measurement and the domain being measured is dubious:

---

[33]Schwarzschild (2008: 89, ex. (72)) considers *more* a comparative of *much*. This is a standard assumption in the field.

(53)   Susi is too much of a Semanticist to care for Phonology.

Corver (1997a) (see subsection 4.1.1) treats cases such as (53) as cases of a "dummy-much", an operator that is distinct from "lexical much". This approach would allow for a world where there is contentful *much* that might have a selectional monotonicity constraint and a dummy *much* that does not. For German, this bifurcation seems unlikely with the data, as cases like (53) will use *sehr* if the measurement is non-monotonic.

Wellwood (2018a: p. 81) takes a different approach and makes the condition in (51) a constraint on the assignment of values to *much*. This works similarly to a selectional criterion in practice. She does not discuss cases such as (53), which pose a potential problem for the English data, but for German this is not a problem. I will adopt an approach inspired by Wellwood (2015, 2018a) in this chapter, and more explicitly in chapter 4.

I will defer a proper semantic implementation of *viel* to chapter 4, section 4.3, so for now I will propose two simple conditions:

(54)   **Monotonic Viel Hypothesis**

      a. *viel* may only modify dimensions of measurement that are *S-monotonic* according to (51) with respect to the property they are measuring.

      b. *sehr* may not modify dimensions of measurement that are *S-monotonic*

Note that under these conditions *sehr* may modify predicates that have monotonic measurements, as long as there is a non-monotonic measurement available. This is necessary, as we will find cases where both monotonic and non-monotonic measurements are supplied.

We've spent most of chapter 2 showing that the distribution of *sehr/viel* cannot be due to grammatical category. Now we will spend the remainder of this chapter to show that we can readily explain it through the lens of monotonicity. The remaining sections of this chapter will each try to do the following: recall the relevant distribution, show that cases which allow *viel*-modification are cases where monotonic

measurements are available, and show that cases where *viel*-modification is barred are cases where no monotonic measurements are available.

3.3 Monotonicity in German Nominals

Let us begin this section by recalling the distribution for the nominal domain which we summarized in section 2.2:

(15) *sehr*: licensed only in predicative nominals of count nouns and only under a too-modification

(16) *viel*: licensed with bare mass nouns, bare plural count nouns, too-modified plural count nouns, too-modified mass nouns

Following our hypothesis in (54), we have to show that items in (16) supply a monotonic measurement and items in (15) and singular count nouns in general[34] do not.

We can begin with plural count nouns and their monotonic dimension: cardinality. Schwarzschild (2008) and Wellwood (2018a) point out that cardinality is a monotonic measurement. So there is no additional work we need to do to explain why plural count nouns can be modified by *viel*. In fact, Link (1983) discusses that pluralities have a similar part-whole relationship as mass-nouns. Consider Figure 3.1 for a representation of a plurality as a mereological ordering. Plural count nouns display cardinality and their cardinality can be modified (f.e.: five tickets). Which leads us to mass nouns.

Schwarzschild (2008) deals with mass nouns and partitives, and while they argue that there are special interactions between Q-adjectives[35] and monotonic measurements, they are not necessarily stating that all mass nouns have monotonic measurements. This is what we will argue here.

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[34]Recall that singular count nouns do not allow *sehr*-modification by themselves, but they also do not allow *viel*-modification.

[35]Schwarzschild (2008) calls *much* a Q-adjective.

$$\{dog_a, dog_b, dog_c\}$$

$$\{dog_a, dog_c\} \quad \{dog_a, dog_b\} \quad \{dog_b, dog_c\}$$

$$\{dog_a\} \qquad \{dog_c\} \qquad \{dog_b\}$$
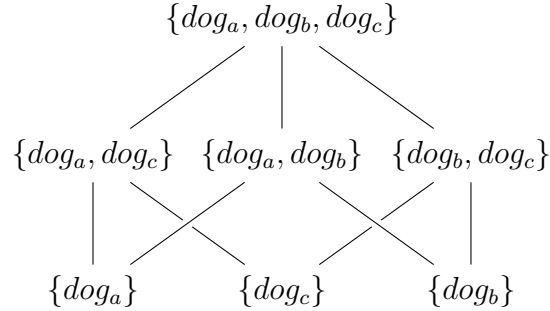
Figure 3.1: A plurality of three dogs represented in a join semi-lattice

If we take a classic mass noun, such as rice, it is easy to see where a monotonic measurement could be supplied: the part-whole relation under which mass nouns are structured, see Link (1983). If you take away some amount of volume from your rice, that will have an equal and proportional effect on how much rice is left. Conversely, we can also take two amounts of rice, put them together and we will have rice again. All your rice can be divided into subparts and all of those subparts are also rice, making a part-whole relationship.[36]

I will postulate that mass nouns *always* supply a monotonic dimension by virtue of their partial part-whole ordering[37] (Link 1983) and their inherent plural nature. This always supplies at the very least a quantity measure which will be monotonic with respect to the part-whole structure.

The properties of count nouns are not transitive to their subparts, they cannot be added or divided and still be an instance of that predicate. A singular count noun cannot be represented as a mereology. Mass nouns on the other hand, are made up of (discreet or non-discreet) sub-parts that all have the same properties as the sum of the subparts and form a mereology. A mereology is the basis of a monotonic/extensive measurement as we have defined it.

In fact, it seems as if mass nouns only have monotonic measurements available

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[36]I will forego discussions surrounding *cumulativity*, *homogoneity*, and *atomicity* (see: Rothstein 2010, Chierchia 1998, Krifka 1998). An in-depth study of mass predicates is beyond the scope of this work, and the established facts of Link 1983 suffice for our purposes here.

[37]Refer to section 1.2 for part-whole orderings.

in their bare form. This is indicated by the fact the we only ever get *viel* and never *sehr* with mass nouns.

Now that we have this distinction available, we can take a new look at the data and derive an explanation for the pattern.

(9) Excessive Modification in German Nominals:

(9a) Wir haben zu **viel**/*sehr Reis.
We have too **much** rice
"We have too much rice".

(9b) Du bist zu **sehr**/*viel Amerikaner, um das zu
You are too **very** American (in order) to that to
verstehen.
understand
"You're too much of an American to understand this."

a. ? Das ist zu sehr Reis um Hummus zu sein.
This is too very rice to hummus to be
intended: "This is too much rice to be hummus."

(17a) Wir haben viel Reis.
We have much rice
"We have a lot of rice"

(17b) Es gibt viel-e Länder auf der Erde.
It exists much-pl countries on the earth
"There are many countries in the world."

(17c) Es gibt zu viel-e Länder auf der Erde.
It exists too much-pl countries on the earth
"There are too many countries in the world."

In (9a) we have a monotonic dimension supplied by virtue of the part-whole ordering. In (9b), no monotonic measurement is available. The property of being American cannot be subdivided into parts. One either is, or is not American. There can be degrees to being American, as one can be "too much of an American", but those degrees are non-monotonic with respect to the entity they are modifying. If Remo is less of an American than Joe, there is not less of Remo. In order to control

for the fact that the example in (9b) is a predicate nominal, we can contrast this with (54a), a predicate nominal over a mass noun.

One unresolved question remaining is why do predicate nominals of plural count nouns not supply monotonic measurements? Recall:

(10) Die Ärzte   in meinem Krankenhaus sind zu **sehr**/*viel Profis
      The doctors in my   hospital   are too very   professionals
      um   so   einen Fehler   zu machen.
      (in order) to such a   mistake to make
      "The doctors in my hospital are too professional to make this kind of mistake."

It seems that in examples such as (10) the plural is a red herring. It appears that the plural in the object nominal is a case of agreement with the subject nominal. This construction does not make the cardinality of the plural count noun accessible and the excessive is not measuring the cardinality measure. It measures the degree to which these doctors are professionals. If we consider other count noun environments in which we encountered *viel*, the measure that was being modified by *viel* was always that of cardinality, even for excessives. See (17c) for an example. We can test the agreement hypothesis by forming a similar construction with a singular object nominal which turns out to be ungrammatical:

(55) * Die Ärzte   in meinem Krankenhaus sind zu sehr **Profi**
        The doctors in my   hospital   are too very **professional.SG**
      um   so   einen Fehler   zu machen.
      (in order) to such a   mistake to make
      intended: "The doctors in my hospital are too professional to make this kind of mistake."

Now that we have shown that monotonicity is the dividing line between *sehr* and *viel* in nominals, we need to do the same for the verbal domain. This will be the subject of section 3.4.

3.4   Monotonic Measurements in German Verbs

As we have observed in section 2.4, it is difficult to delineate the distribution of *sehr* and *viel* along the lines of categories. One generalization we found was that verbs with dynamic readings allow *viel*-modification, see (30), whereas those states that are individual-level predicates do not (32):

(30)   Ich laufe **viel**/*sehr.
      I   run   much
      "I run a lot"

(32)   Du ähnelst   ihr **sehr**/*viel.
      You resemble her very.
      "You resemble her very much"

I will argue that this is in line with the *Monotonic Viel Hypothesis*, as the defining factor is the presence of monotonic measurements. I will show that monotonic measurements are available in all eventive verbs that allow habitual interpretations.

It is not difficult to see where a monotonic measurement would be supplied with a verb such as "run", seen in (30). Running is a directive motion and the dimension of distance will be monotonic with respect to that motion. The more distance, the more running is being performed. However, most events will not conveniently supply a monotonic measurement with their lexical semantics:

(56)   Ich spiele viel.
      I   play   much
      "I play a lot/often"

Playing, (56), does not supply a monotonic measurement by itself. It is in fact only possible to do *viel*-modification if the statement is interpreted habitually, generically, or iteratively. We can show that this is the case, by forcing the statement to be none of the above:

(57)   Stör   mich nicht, ich spiele gerade   (*viel).
      Disturb me   not   I   play   right now much
      "Don't disturb me, I'm playing (a lot) right now." (infelicitous with *viel*)

When a habitual/generic/iterative interpretation is unavailable, *viel* also becomes unavailable, as seen in (57). From this we can predict that verbs that do not license any of these aspects, and do not supply a monotonic measurement independently, will resist *viel* modification:

(58)   Er geht (*viel) in (die Pension/den Ruhestand).[38]
He goes much   in the retirement
intended: "He retires often"

The reason why habitual, generic, and iterative aspects allow *viel*-modification is because they supply a monotonic dimension: frequency which is a form of cardinality which in turn supplies a mereological ordering. Frequency as a form of cardinality has already been shown to be monotonic by the literature (see: Schwarzschild 2008, Wellwood 2018a).

This also explains why individual-level predicates resist *viel*-modification, as they do not allow a frequency/cardinality modification since they exhibit lifetime effects:

(59)   Ich mag dich *oft/*fünfmal.
I   like you often/five times

At the same time, this also allows us to explain why stage-level predicate states allow *viel*-modification. Their temporal nature allows a frequency measurement.

However, since we base our distribution on monotonic measurements and not categories, we predict that if a state lexically supplies a monotonic dimension of measurement, it should allow *viel*-modification. At first glance, possible candidates could include statives that already measure something, such as *weigh*:

(60)   Ich wiege viel.
I   weigh much
"I weigh a lot."

It turns out that (60) is a red herring. *Viel* here does not actually modify the verb,

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[38]Austrian German will use "die Pension" and German German will use "der Ruhestand" or "die Rente".

but rather functions as a measure phrase object to *weigh*.[39] We have to consider that this is a different usage, as *viel* here does not actually modify the event. We can test this by giving *weigh* a different measure phrase object and then attempt to modify the state:[40]

(61)　* Ich wiege siebzig Kilo　　viel.
　　　 I　 weigh seventy kilograms much

In fact, it should follow from the *Monotonic Viel Hypothesis* that *viel* cannot modify individual-level predicates at all. Consider the way we formulated this hypothesis in section 3.2:

(54)　**Monotonic *Viel* Hypothesis 1**

　　　(54a) *viel* may only modify dimensions of measurement that are *S-monotonic* according to (51) with respect to the property they are measuring

In simple terms, a measurement will be *S-monotonic* with respect to a property if going up and down on the scale of that measurement will translate to more or less of that property. The more distance I run, the more of my running event will happen.

States that are individual-level predicates (at least those we have found in German) cannot have *S-monotonic/extensive* measurements because they are already of an indefinite length and cannot be split up into sub-events. Liking somebody more does not translate to more liking (events). Resembling someone closely does not translate to more resembling, and so on. We run into a similar constraint that we saw with singular count nouns. Hence, it seems to be the case that individual-level predicate verbs cannot supply *S-monotonic* measurements.

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[39]In fact, *viel* can function as an object of predicates that have no monotonic measurements, such as *love* (lieben): "Ich liebe viel-es." Meaning, "I love a lot of things." I am omitting these cases as they are instances where *viel* is not modifying the predicate, hence they are irrelevant to the *Monotonic Viel Hypothesis*.

[40]There also exists a different transitive version of *weigh* (f.e.:"I weigh you"), which is dynamic and can take *viel*-modification.

This is in line with Baglini (2015: p. 15) who finds that "stative adjectives and verbs in English [...] can be graded according to intensity rather than spatiotemporal quantity". *Intensity*, she argues, "in predicates [...] fails to evoke a part/whole ordering" (Baglini 2015: p. 228). A part-whole (i.e. mereological) ordering is a crucial part of *S-Monotonicity*. Hence statives do not supply monotonic measurements, they supply *intensity*.[41]

We can draw three significant generalizations from this section so far:

(62)   Verbs that allow a frequency or cardinality modification supply a monotonic dimension in those aspects that make those modifications available (habitual, generic, iterative).

(63)   Verbs that supply a monotonic measurement lexically, allow *viel*-modification along that dimension.

(64)   Individual-level predicates cannot supply measurements that are *S-monotonic* with respect to the predicate itself.

The *Monotonic Viel Hypothesis* in conjunction with (62)-(63) makes an interesting prediction: Eventive verbs with lexical monotonic dimensions should allow *viel*-modification in constructions where no frequency or cardinality is available. This prediction seems to hold:

(65)   Ich laufe jetzt nur ein-mal, aber dafür viel/*oft/*fünfmal.
       I   run   now only one-time but for it much/*often/*five times
       "I'm going to only run one time now, but I'll do a lot of it" (in terms of distance)

(66)   Ich giesse die Pflanze jetzt nur ein-mal, aber dafür
       I   water the plant   now only one-time but for it
       viel/*oft/*fünfmal.
       much/*often/*five times
       "I'm going to water the plant only one time now, but I'll do a lot of it" (in terms of water volume)

---

[41]I want to acknowledge here that the idea that intensity is not subject to mereological ordering is controversial. I will discuss this debate in more detail in chapter 4.

(67) * Ich verpacke den Computer jetzt nur ein-mal, aber dafür viel.
       I   pack   the computer now only one-time but for it much

(68) * Ich drück den Knopf jetzt nur ein-mal, aber dafür viel.
       I   press the button now only one-time but for it much

While both *run* and *water* lexically encode some monotonic dimension (directive motion and water volume respectively), *to pack* and *to press* do not encode such a dimension. Pressing a button harder or longer does not result in more pressing going on. However, more water volume does translate to more watering.

3.5 Monotonicity in German Adjectives

In this section I aim to show that positive gradable adjectives do not provide access to a monotonic dimension of measurements. I will sideline any discussion surrounding adjective-internal *much* (Bresnan 1973, Dunbar & Wellwood 2016: among others) during this section. I will return to the aforementioned discussion in chapter 4. At this point, we are solely interested in the overt occurences of *viel* and *sehr*.

In order to achieve this goal we will need to engage with a more technical discussion on the nature of the semantics of adjectives, the POS morpheme, and comparatives in order to explain the following distribution:

(69) a. Peter ist sehr groß.
         Peter is very tall
         "Peter is very tall."

      b. * Peter ist viel   groß.
           Peter is much tall
         (Can only be interpreted if Peter is habitually tall)

(70) a. Peter ist viel   gröss-er   als   ich.
         Peter is much tall-COMP than I
         "Peter is much taller than me."

      b. * Peter ist sehr gröss-er   als   ich.
           Peter is very tall-COMP than I

3.5.1 Stage-level Predicate Adjectives

Before we engage in the above discussion, we need to briefly address the positive stage-level predicates we discussed in (22)-(23)

(22) Ich bin viel ängstlich.
      I   am much fearful
      "I am often fearful/afraid"

(23) Sie ist viel   neidisch.
      She is much jealous
      "She is often jealous"

Stage-level predicates allow a dynamic interpretation by virtue of being temporal states, as I have discussed in section 3.4. This gives access to a frequency dimension that we also found with dynamic verbs such as *run* and *play*. I have proposed in section 3.4 that frequency is a monotonic dimension of measurement. We can apply a test we used in that section to test if the availability of *viel* disappears when no frequency reading is available:

(71) Schenk mir einen Schnapps ein, ich bin gerade   (*viel)   ängstlich.
      Pour   me a   schnapps in   I   am right now (*much) fearful
      "Pour me a drink, I'm scared (*often) right now."[42]

From this we can conclude that stage-level predicates provide a monotonic measurement via frequency. Following we will control for frequency-induced monotonicity in positive adjectives by using only individual-level gradable adjectives in our tests below. We now turn to the question of why positive forms of gradable adjectives resist modification with "viel", which will be the topic of subsection 3.5.2.

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[42]Note that this can be felicitous if the "right now" is interpreted as covering a range of times surrounding the present moment, thereby allowing a habitual reading for 'bin ängslich' provides a frequency.

3.5.2 Positives

German positive (gradable)[43] adjectives (stage-level predicates exempted) resist modification with *viel* and only permit *sehr*, see (69).

The *Monotonic Viel Hypothesis* then claims that positive adjectives do not provide a dimension of measurement that is monotonic with respect to the adjective. This may be counter-intuitive at first glance as it is uncontroversial in a degree semantics framework to assume that gradable adjectives operate on scales, scales which are thought to be monotonic in nature (on the monotonicity of adjectival degrees: Heim & Katz 2001). However, the fact that the adjectival scale itself may be monotonic, does not necessarily entail that a positive adjective provides a monotonic dimension of measurement that may be accessed.

In degree semantics, adjectives are often assumed to map entities onto degrees (Cresswell 1976), see (72) and (73) for examples. (72)-(73) by themselves do not give us the full interpretation of a positive adjective. It has long been understood that positive adjectives are context dependent. Their meaning depends on a contextual standard that can be overtly defined.

(72) $[\![GradableAdjective]\!] = \lambda d \lambda x.GA(x) = d$ [44]
       (adapted from: Kennedy & McNally 2005: 349, ex. (12))

(73) $[\![GradableAdjective]\!] = \lambda d \lambda x.GA(x) \geq d$
       (adapted from: Lechner 2020: 3, ex. (2))

Considering (74a) and (74b) we understand that these entities are *tall* for their respective comparison classes. Susie is tall with respect to the class of humans and the Burja Khalifa is tall with respect to the class of skyscrapers. However, we cannot expect (74a) to mean that Susie is tall with respect to another comparison class, such as large buildings. This kind of contextual standard can be overtly supplied, (74c), and is an important part of adjectival semantics.

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[43]We are exclusively discussing gradable adjectives here. Non-gradable adjectives such as *dead* or *former* resist modification by *viel* and *sehr*.

[44]In simplified terms: x fulfils the property of the adjective to the degree of d.

(74) a. Susie is tall.

   b. The Burja Khalifa is tall.

   c. Peter is tall for a linguist.

The contextual standard for positive adjectives is often assumed to be introduced by a separate head, the POS morpheme (see: von Stechow 1984).[45] The POS head allows us to compare the degree to which an entity is *tall* to the degree to which the relevant comparison class is *tall*. The degree to which the entity is tall has to be larger than the contextual standard, see (75) and (76)[46].

(75) $[\![POS]\!] = \lambda G \lambda x. \exists d[\mathbf{standard}(d)(G)(C) \wedge G(d)(x)]$[47]
   (Kennedy & McNally 2005: 350, ex. (13))

(76) $[\![POS]\!] = \lambda d_d. \lambda g_{<d,<e,t>>}. \lambda x_e. \mathrm{MAX}(\lambda d'.g(d')(x)) > \mathrm{standard}(g)$[48]
   Lechner (2020: 6, footnote (i)) based on von Stechow (1984)

Since we assume degrees to operate on strictly ordered scales, the amount by which a given entity exceeds its contextual standard should be a monotonic measurement if adjectives constitute a mereology, regardless of the type of gradable adjective.[49] Given that *viel* is blocked in positive adjectives, this could be taken to mean that the Monotonic *Viel* Hypothesis is wrong. However, this line of thinking assumes that the measurement by which an entity exceeds its contextual standard is accessible. This is actually not the case (at least for the languages we are discussing here).

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[45]Some authors use different ways to supply the contextual standard, such as Neeleman et al. (2004). In this chapter we will stick to a POS morpheme for convenience's sake. The question of whether a POS morpheme is necessary or not has little bearing on the discussion at hand.

[46]Under the Kennedy & McNally (2005) formulation, the requirement to exceed the standard is encoded in the standard function.

[47]There exists a degree such that this degree fulfils a contextual standard for G and such that it is the degree to which x is G.

[48]The maximal degree of x on the scale relevant to g exceeds some standard applied to g. The MAX operator picks out the maximal degree of x on the respective scale.

[49]Even adjectives that are mapped on abstract categories such as *pretty*, should still provide this measurement.

Considering the Kennedy & McNally (2005) formulation, we can see that under this treatment the amount to which an entity exceeds its contextual standard is not accessible as that work is done inside the **standard** function.[50] However, under the Lechner (2020) approach, seen in (76),[51] this is not immediately obvious. These approaches treat the POS morpheme similarly to a comparative morpheme, the difference mainly being that the degree that is being compared to is supplied by the standard function, rather than the degree clause. In principle, one could assume that this makes the amount by which the comparison is surpassed accessible in some way. However, this is not borne out in the data:

(77) a. Peter is tall (*by 50 centimeters).

  b. This deodorant is (? 20 cent) expensive. (meaning it exceeds the contextual standard of expensiveness by 20 cent)

(78) a. Joseph ist 20 kilo schwer.
    Joseph is 20 kilograms heavy
    "Joseph weighs 20 kilograms" ⟶ This cannot mean that Joseph exceeds the weight of his comparison class by 20 kilograms.

If we attempt to measure the amount by which an entity exceeds its contextual standard, we either yield ungrammatical constructions (77a) or we end up specifying an exact degree to which the entity can be found on the scale with respect to the property independent of the relation to the contextual standard, see (78). It is seemingly impossible to specify the measurement by which the contextual standard is exceeded. It pays to compare this to comparatives and excessives, that readily allow us to specify the degree by which a comparison standard is being exceeded:

(79) "Zhou is 5 inches taller than Peter." ⟶ The amount by which Zhou's tallness exceeds Peter's tallness is 5 inches.

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[50]Kennedy & McNally (2005) do not explicitly define the **standard** function, however we can assume that the **standard** function is not accessible (i) due to it presumably being a semantic primitive (ii) due to rules of composition.

[51]Kennedy (2007) assumes a similar analysis: $[\![POS]\!] = \lambda g \lambda x . g(x) \succeq s(g)$ (Kennedy 2007: 17, ex. (27))

(80) "Zhou is 5 inches too tall to ride the rollercoaster." $\longrightarrow$ The amount by which Zhou's tallness exceeds the maximum height for rollercoaster rider is 5 inches.

Lechner (2020: p. 6) details that within the the maximization family of analyses (von Stechow 1984: among others) comparatives introduce an additional differential degree argument, d in (81), which allows for the kind of modification we see in (79). This argument would be missing for positives. Kennedy & McNally (2005) do not discuss these differential arguments and it is unclear how they would fit them into their analysis in (82). It is unclear why positives do not allow a similar argument, but the data seems to indicate that they do not.

(81) $[\![MORE]\!]^{52} = \lambda d_d.\lambda d'_d.\lambda g_{<d,<e,t>>}.\lambda x_e.\text{MAX}(\lambda d'.g(d')(x)) > d + d'^{53}$
      (Lechner 2020: 6, ex. (10))

(82) $[\![\text{ er/more than } d_c]\!] = \lambda G\lambda x.\exists d[d \succ d_c \wedge G(d)(x)]^{54}$
      (Kennedy & McNally 2005: 369, ex. (61a))

The degree by which an entity exceeds a comparison standard[55] will be monotonic with respect to the property that introduces the degree. However, this measurement is not accessible for positives, as we have seen. We will take a closer look at comparatives in the next section (subsection 3.5.3).

While the degree to which a positive exceeds the contextual standard is seemingly not accessible, this does not mean other monotonic measurements are not potentially available. One could feasibly imagine that there is some measurement accessible in the contextual standard. Under the Kennedy & McNally (2005: p. 350) formulation, the *standard* relation in (75) "requires a degree d to exceed a norm or average on the

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[52]MORE here functions as a stand-in for both periphrastic/analytic comparatives as well as morphological comparatives.

[53]The maximal degree of x on the scale relevant to g exceeds $d + d'$.

[54]There exists a degree d such that d_c precedes d and such that d is the degree to which x is G.

[55]This is unrelated to whether the comparison standard is the degree to which another entity satisfies the property (comparatives) or the degree to which a contextual standard satisfies the property (positives).

scale associated with G that is computed based on the comparison class identified by C." Under this view, we cannot access by how much the degree d exceeds this norm, as this work is done inside the standard relation. Approaches such as (76) and Kennedy (2007) equally do not provide any access to this measurement. This is reflected in the data in (77)-(78).

I have shown here that positive adjectives do not give access to the amount by which the positive exceeds a contextual standard. This is one way of deriving the unavailability of *viel* in these cases. However, Baglini (2015) offers another potential explanation: Baglini (2015: p. 15): "stative adjectives and verbs in English [...] can be graded according to intensity rather than spatiotemporal quantity". This seems to also be true of German, considering the data at hand and would also explain why *viel* is not available here, as it seemingly cannot modify intensity, which we assume to be non-monotonic.

We can see why *viel* is not available in positives, as there is no monotonic measurement available. However, what about *sehr*? We can consider one standard argument from Kennedy & McNally (see: 2005: p. 370) who posit that *very* simply modifies the contextual standard by lexically specifying the comparison class C as "those objects that have the property G in the context of the utterance." (Kennedy & McNally 2005: p. 370) In other words, to be "a very tall girl" is to be "tall for a tall girl".

(83) $[\![very]\!] = \lambda G \lambda x. \exists d[\textbf{standard}(d)(G)(\lambda y.[\![pos(G)(y)]\!]) \wedge G(d)(x)]$[56]
(Kennedy & McNally 2005: 370, ex. (64))

This analysis aligns well with the intuition that all we can access for positive adjectives is their contextual standard, but not by how much an entity exceeds that standard. However, if we assume an analysis like this for German, we will not have a good explanation for the data in (10) and (84).

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[56]There exists a degree d such that this degree fulfils a contextual standard for G, this contextual standard is defined as $POS(d)(x)$ and d is such that it is the degree to which x is G.

(10) Die Ärzte   in meinem Krankenhaus sind zu **sehr**/*viel Profis
      The doctors in my   hospital   are too very   professionals
      um   so   einen Fehler   zu machen.
      (in order) to such a   mistake to make
      "The doctors in my hospital are too professional to make this kind of mis-
      take."

(84) Ich mag dich zu sehr.
      I   like you too very
      "I like you too much"

If we want to keep a Kennedy & McNally (2005)-style approach to *sehr*, we would
have to posit that the above cases involve a contextual standard/POS-morpheme,
or that German has in fact two distinct morphemes that are externalized as *sehr*,
one that requires a POS-morpheme and one that does not. Examples of excessives
such as (10) & (84) are standardly not assumed to contain a POS-morpheme, as
they are a kind of comparative. A *sehr* in the style of (83) would not find the POS-
morpheme it requires in (10) & (84). For now we will simply assume that positives
do not provide monotonic measurements and defer a discussion of *sehr* to chapter 4
and specifically section 4.4.

3.5.3   Comparatives and *Viel*

As discussed in subsection 3.5.2, the comparative allows access to a differential
degree argument that allows us to specify the degree by which the compared to
degree is exceeded. This allows us to account for data such as (79).

(79) "Zhou is 5 inches taller than Peter." ⟶ The amount by which Zhou's
      tallness exceeds Peter's tallness is 5 inches.

(85) "Zhou is 5 inches too tall to ride the rollercoaster." ⟶ The amount by
      which Zhou's tallness exceeds the maximum height for rollercoaster rider is
      5 inches.

Differentials as seen in (79) are in complementary distribution with *much* in
English and *viel* in German, which suggests that they may occupy a similar role:

(86)   "Zhou is (*much) 5 inches (*much) taller than Peter.

(87)   Mergin ist (*viel) fünf Kilo (*viel) schwer-er als Asma.

Mergim is (*much) five kilograms (*much) heavy-COMP than Asma

"Mergim is five kilograms heavuer than Asma."

We should note that many adjectives do not allow the type of differential we see in (87), as they are not ordered on scales that have clearly defined units in the language. We can sort tallness in centimeters, inches, feet, and a myriad of other units, but the same is not true for more abstract scales such as beauty. Nevertheless, even those adjectives allow differentials:

(88)   Die Anden sind {fünfmal/um einiges/viel} schön-er als die Alpen.

The Andes are {five times/by a lot/much} beautiful-COMP than the Alps

"The Andes are (five times/a lot/much) more beautiful than the Alps.."

In the previous section, we discussed that comparatives introduce an additional differential degree measurement. We used Lechner (2020: 6, ex. (10)) as an example for a semantic treatment of this argument, see (81).

(81) $[\![MORE]\!]^{57} = \lambda d_d.\lambda d'_d.\lambda g_{<d,<e,t>>}.\lambda x_e.\text{MAX}(\lambda d'.g(d')(x)) > d + d'$
(Lechner 2020: 6, ex. (10))

If adjectives constitute a mereology, then the differential degree measurement has to be monotonic with respect to the adjectival property. The more Zhou's tallness exceeds Peter's, the more tallness Zhou has. This is in contrast to the positive where such a measurement is not available as we have seen. Under this view, we can uphold the *Monotonic Viel Hypothesis* for gradable adjectives.

However, *if adjectives do not constitute a mereology* as Baglini (2015) argues, then we have no good explanation as to why *viel* can surface in the comparative. This poses a real problem, as I will argue in chapter 4 that German supports Baglini

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[57]MORE here functions as a stand-in for both periphrastic/analytic comparatives as well as morphological comparatives.

(2015)'s claims. In order to address this issue, I will re-visit differential comparatives in subsection 4.6.1.

3.6 Monotonicity in Participial Adjectives

I argued in section 2.5 that there are lexicalized participial adjectives that pattern as standard adjectives. We can extend the treatment in section 3.5 to these, as we will assume that they have no special properties as long as they are interpreted lexically. This is borne out in the data, these lexicalized participials allow *sehr* in the positive and *viel* in the comparative:

(50b) Ein {**sehr**/*viel} ge-stör-t-er   Typ
       A   {very/*much} PART.PST-disturb.PST-NOM.MASC guy
       "A very crazy guy"

(89)   Er ist ein viel   ge-stör-t-er-er   Typ als
       He is a   much PART.PST-disturb.PST-COMP-NOM.MASC guy than
       du   glaubst.
       you think
       "He is a much crazier guy than you think."

Participial adjectives formed from the present participle, uniformly pattern with their base verbs.

(45a) Sie liebt dich {**sehr**/*viel}
       She loves you {very/*much}
       "She loves you very much" (*viel* is not licensed)

(45b) Die ihren Vater {**sehr**/*viel} lieben-d-e   Frau   war
       The her   father {very/*much} love-PART.PRES-NOM.FEM woman was
       zu Besuch
       to visit
       "The woman who loves her father very much came by for a visit."

(46a) Sie giesst die Pflanze {*sehr/**viel**}
       She waters the plant   {*very/much}
       "She waters the plant a lot."

(46b) Die die Pflanze {*sehr/**viel**}   giessen-d-e   Frau
        The the plant   {*very/**much**} water-PART.PRES-NOM.FEM woman
        war zu Besuch
        was to visit
        "The woman who waters the plant a lot came by for a visit."

Since these pI derived adjectives pattern with their base verbs, we will extend our analysis for verbs in section 3.4 to them. This predicts that individual level predicates will not allow *viel* as they do not supply monotonic measurements, and allow *sehr* if they are gradable, (45a)-(45b). We expect stage level predicates to allow *viel*, (46a)-(46b), and we expect those verbs that allow both *viel* and *sehr* (such as *freuen*, see (33c)-(33d)) to allow both in their pI adjectival form:

(90) Die sich {sehr/viel} freuen-d-e Frau geht nach Hause.
      The self {very/much} happy-PART.PRES-NOM.FEM woman goes to home
      sehr: "The very happy woman is going home." *viel*: "The often happy woman is going home."

This leaves the perfect participials, which seem to allow *viel*-modification, even if the base verb does not. However, we found in section 2.5, that this is only true if the external argument of the participial is omitted, see (48):

(45c) Sie hat dich {**sehr**/*viel}   ge-lieb-t
        She has you {very/*much} PART.PST-love-PST
        "She loved you very much." (verbal usage, *viel* not licensed)

(45d) Die {sehr/viel}   ge-lieb-t-e   Frau   war zu Besuch
        The {very/much} PART.PST-love-PST-NOM.FEM woman was to visit
        sehr: "The woman who is very loved came by for a visit."

        viel: "The woman who is loved a lot came by for a visit."

(48) Die von ihrem Vater {**sehr**/*viel}   ge-lieb-t-e
        The by   her   father {very/*much} PART.PST-love-PST-NOM.FEM
        Frau   war zu Besuch.
        woman was to visit
        "The woman who is very loved by her father came by for a visit." (*viel* not licensed)

It is particularly curious, that the verbal usage of the participle does not allow *viel*, whereas the adjectival usage of the participle does as long as the external argument is omitted.

A brief search for "viel geliebt" in the German Reference Corpus (Lüngen 2017) via the COSMAS II search engine is instructive on this matter. It yields 164 hits (COSMAS n.d.: accessed on June 21st, 2023). In those results, we find a blend of adjectival usage and also verbal usage in examples such as this:

(91) Menschen, die viel   ge-lieb-t   und nie   ge-schlagen
      humans   the much PART.PST-love-PST and never PART.PST-hit
      wurden
      were
      "People that were loved a lot and never hit" Lüngen (2017: U19/NOV.00019)

(92) Und in seinen Büchern wird   viel   ge-lieb-t
      And in his   books   be.FUT much PART.PST-love-PST
      "And in his books there is a lot of loving." Lüngen (2017: A18/JAN.03743)

We can make two crucial observations here: (I) We get a frequency interpretation, which is clearly monotonic. (II) There is no overt external argument in these examples. The implicit arguments seem to be the key here:

(93) * Menschen, die von ihren Eltern   viel   ge-lieb-t   und nie
        humans   the by   their parents much PART.PST-love-PST and never
      ge-schlagen   wurden
      PART.PST-hit were
      intended: "People that were loved a lot by their parents and never hit"

(94) * Und in seinen Büchern wird   ein Hund von einer Katze viel
        And in his   books   be.FUT a   dog by a   cat   much
      ge-lieb-t
      PART.PST-love-PST
      intended: "And in his books a god is loved loved by a cat a lot"

It appears that the implicit argument allows a stage-level interpretation of the predicate, as it gives access to a frequency reading. When frequency is available, we can have pluralities which are merologically ordered domains and allow monotonic

measures. *This is not strictly a feature of the participial adjectives, but a feature of verbs themselves.* The example in (92) is a verbal usage of the participle.

It is not the case that the perfect participial adjectives allow access to a monotonic dimension that is not present in the verbal usage. It is simply the case that speakers are more likely to omit the external argument in the adjectival attributive usage.

This effect seems to not be limited to implicit external arguments, but also appears to extend to implicit internal arguments:

(95)   Liebt viel und feiert viel!
       love much and celebrate much
       "Love a lot and celebrate a lot!"

(96)   * Liebt eure Eltern viel und feiert viel!
       love your parents much and celebrate much
       intended: "Love your parents a lot and celebrate a lot!"

(97)   Sie war Prostituierte und hat viel ge-lieb-t
       She was prostitute and has much PART.PST-love-PST
       "She was a prostitute and loved a lot." Lüngen (2017: T17/OKT.02222)

(98)   * Sie war Prostituierte und hat ihren Hund viel ge-lieb-t
       She was prostitute and has much PART.PST-love-PST
       intended: "She was a prostitute and loved her dog a lot."

If it is the case that implicit internal arguments also allow a stage level interpretations, then we would expect this effect to extend to adjectives formed from the present participle as well:

(99)   Sie war ein viel lieben-d-er Mensch.
       She was a much love-PART.PRES-NOM.MASC "She was a human who loved a lot"

Implicit arguments appear to give access to a stage level interpretation of the predicate. This in turn gives access to a monotonic dimension: frequency. Consid-

ering this, we need to revise our table for participial adjectives to account for the fact that participial adjectives pattern just like their base verbs:

Participial Adjective	**Sehr**	**Viel**
Present Participle	if licensed in base verb	if licensed in base verb
Perfect Participle	if licensed in base verb	if licensed in base verb

Table 3.1: The distribution of *viel* and *sehr* in participials.

3.7 Final Remarks on Chapter 3

I have shown that assuming a requirement for monotonic/extensive measurements for *viel* gives us a good handle on the distribution of both *viel* and *sehr* in German. One exception to this rule is posed by differential comparatives with *viel*, which are potentially problematic. I will revisit these in chapter 4, section 4.6.

CHAPTER 4

Towards a Semantics for *VIEL* (and *SEHR*)

In this chapter I will introduce some influential treatments of *much* and discuss how these approaches could be applied to *viel*. I then discuss Baglini (2015)'s proposal that states introduce intensive measurements in the context of the findings of this dissertation. In section 4.3, I provide a formal semantics for *viel* based on a proposal by Wellwood (2015) and discuss the implications following from this. In section 4.4, I provide a semantics for *sehr*, based on insights drawn from Baglini (2015). Then in section 4.6, I discuss some potential problems and open questions. Lastly, I provide a final discussion of the findings of this dissertation.

4.1 Approaches to the Semantics of *MUCH* (and *VERY*)

In this section I will describe three families of approaches to the semantics of English *much*. While *much* and its role in degree semantics has received a significant amount of attention in the field over the past 50 years (see: Bresnan 1973, Cresswell 1976, Neeleman et al. 2004, Rett 2008, Solt 2015, Wellwood 2018b: among others), the investigations and arguments made have mostly been constrained to English. Hence, all the proposals I discuss in this section will be based on English data [58] and pertain to English *much*.

We have already found in chapter 2 that German *viel* and English *much* diverge in their distribution on some crucial points. Regardless, the proposals for English *much* provide a good starting point for a semantics of *viel*.

While English *much* has received a good amount of attention, English *very* has not been subjected to extensive discussions. Still, some of the authors I discuss in

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[58]Exceptions include Corver (1997b) and Wellwood (2018a) who do use some cross-linguistic data and Baglini (2015) who performed a cross-linguistic study.

this section do provide treatments for *very* and I will discuss whether these could be used as a basis for a treatment of *sehr*.

4.1.1   The Scale Enrichment Approach

Neeleman et al. (2004) propose a unitary account of (English) *much* that aims to re-cast Corver (1997a,b)'s findings of a "semantically empty dummy-*much*" as an effect of 'scale-enrichment rules'. Corver (1997a) observes that there are certain constructions under which the presence of *much* seems to make no semantic contribution:

(100)   John is *fond of Mary*. Maybe he is [too **much** *so*].
        (Corver 1997a: 127, ex. (24a))

Corver (1997a) assumes that *so* is anaphoric to the gradable adjective *fond* and that *much* does not contribute to the semantics in this case. From this he argues that there are two kinds of *much*: (i) a semantically empty dummy-*much* and (ii) a lexical *much*.[59] Neeleman et al. (2004) attempt to explain Corver (1997a)'s findings from a unitary approach. Instead of assuming a dummy-*much* and a lexical *much* they propose a single *much* that has an underspecified meaning and gets its semantically salient interpretation from 'scale-enrichment rules' and existential closure:

(101)   *Scale enrichment rule I*
        $\mathrm{SCALE}_{bare} \longrightarrow Up(\mathrm{P}_{average},\mathrm{SCALE})$
        Scale enrichment rule II
        $\mathrm{SCALE}_{derived} \longrightarrow Distance(\mathrm{Considerable},\mathrm{SCALE})$ (Neeleman et al. 2004: 31, ex. (72))

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[59]Corver (see: 1997a: p. 129) argues that the dummy-*much* becomes necessary due to an interaction between economy constraints and an English specific rule for *much* insertion. Corver (1997a) argues that there is a requirement for the adjective to raise to a higher projection (Q). If there is no adjective to raise (because it has been substituted or deleted), then English will insert dummy-*much* directly into the functional projection Q. This insertion is blocked for economy reasons if an adjectival head is present.

Under Neeleman et al. (2004)s framework, the rules in (101) do the work of the POS-morpheme in Kennedy & McNally (2005) and Kennedy (2007)-style approaches. Together with existential closure, they derive the meaning of a phrase such as "John is tall":

(102) Derivation adapted from Neeleman et al. (2004: pp. 29–30)

    a. $[\![tall_A]\!] = \lambda x.\text{tall}(x)$[60]

    b. Existential Closure: $\exists P$ [P$\in [\![tall_A]\!]$ & P(John)]

    c. Scale Enrichment Rules:
        $\exists P$ [P$\in Distance$(Considerable, Up(P$_{average}$,$[\![tall_A]\!]$)) & P(John)][61]

With this infrastructure in place, they argue that *much* has an impoverished semantics as such:

(103) $[\![much_A]\!] = \lambda PP$

    (Neeleman et al. 2004: 48, ex. (117a))

(103) represents the semantically empty "dummy-*much*". This we only get if *much* is not combined with a degree expression. If it is combined with a degree expression, the enrichment rule II in (101) applies and we get the "semantically charged *much* (Neeleman et al. 2004: p. 48):

(104) $[\![much_{AP}]\!] = \lambda P\lambda x\ \exists P$ [P $\in Distance$(Considerable, $P_{derived}$ & P(x)]

From this they can also derive the ban on *much* with positive adjectives, as this would give rise to identical semantics, see Neeleman et al. (2004: 49 and ex. (121)).

Their formulation of *very* is quite similar to that of the semantically charged *much*, with a slight change, the distance is not defined as "considerable", but rather as "large":

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[60]Neeleman et al. (2004) include in the meaning of *tall* and other gradable adjectives the notion of scale, which I skip here for brevities sake.

[61]There exists a P that is considerably above the average for tallness and it is the P that applies to John.

(105) $[\![very]\!]$ $\lambda P \lambda x \, \exists \, P \, [P \in Distance(\text{Large}, P_{derived}) \, \& \, P(x)]$

The Neeleman et al. (2004) approach, when applied to German, can capture the intuition that *viel* and *sehr* seem to be closely related semantically, but it cannot explain the relationship between their selectional criteria and monotonic measurements. The type of "dummy" constructions employed to argue for the semantically impoverished *much* utilize *sehr* or *viel*, depending on the kind of measurement that is being modified:

(106)   Megh ist fröhlich.
        Megh is   happy
        "Megh is happy"

    a. Megh ist fröhlich, sie ist es sogar zu   sehr.
        Megh is   happy   she is it even too very
        "Megh is happy, in fact too much so" (in terms of intensity)

    b. Megh ist fröhlich, sie ist es sogar zu   viel.
        Megh is   happy   she is it even too much
        "Megh is happy, in fact too much so" (in terms of frequency)[62]

There may be a way to adapt the Neeleman et al. (2004) analysis to the German data, by also proposing a similar underspecification as in (103) to *sehr*, however this would not explain the apparent selectional requirements of *viel*. One could consider introducing the notion of monotonic measurements to their framework, at first glance there is nothing that would prevent such an addition. I will propose a Wellwood (2015) and Dunbar & Wellwood (2016) inspired approach instead, as it lends itself more naturally to these requirements, but it should be said that a Neeleman et al. (2004) style treatment could in principle also account for the German data.

4.1.2   The Scale Based Approach

Kennedy & McNally (2005) base their analysis of English *much* on their findings about the different scalar properties of adjectives. They distinguish between relative

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[62]This reading requires that Megh is habitually happy, as opposed to happy specifically at speaking time.

and absolute gradable adjectives, also referred to as open-scale and (partially) closed-scale adjectives respectively.

Relative standard (open-scale) adjectives are adjectives that operate on scales with no endpoints. These include adjectives such as *tall* or *beautiful*. Open-scale adjectives allow an individual to be on different locations of the scale and be considered to satisfy the property via the contextual standard discussed in subsection 3.5.2. Consider *tall*, which operates on the scale of *HEIGHT*:

(107)   a. Pete is tall. (Pete is 30 cm tall, he is a Chihuahua)

         b. Pete is not tall. (Pete is 140cm tall, he is a human)

Absolute standard adjectives have at least one endpoint on their scale. They can be fully closed (two endpoints), or partially closed. These different scale types can be identified by the semantic properties they exhibit under certain tests. Consider the following examples taken from Kennedy & McNally (2005: 355, exx. (25)-(28)):

(108)   Open scale pattern

         a. Her brother is completely ??tall/??short.

(109)   Lower closed scale pattern

         a. The pipe is fully ??bent/straight.

(110)   Upper closed scale pattern

         a. This product is 100% pure/??impure.

(111)   Closed scale pattern

         a. The figure was completely visible/invisible.

We will forego a thorough review of the attested properties of different scale-types and consider how Kennedy & McNally (2005) relate this to *much*. Based on the patterns they identify in English deverbal (participial) adjectives, Kennedy & McNally (2005) argue that English *much* selects minimum-standard absolute ($\longrightarrow$ lower closed scale) adjectives:

(112) $[\![MUCH]\!] = \lambda G \lambda x. \exists d[d >!!min(S_G) \wedge G(d)(x)]$[63]

 (Kennedy & McNally 2005: 373, ex. (78))

(113) The money was much needed.

(114) # The meat is much done.

In (112), $min(S_G)$ ensures that *much* selects for adjectives that have a minimal point on their scale, see (113), while predicting the unacceptability of examples such as (114). It also allows for *much* to modify closed-scale adjectives, as this formulation makes no statement on the upper end of the scale. However, Kennedy & McNally (see: 2005: p. 373) remark that the data on closed-scale adjectives is dubious.

The biggest weakness of this analysis is one they concede themselves: "*much* also differs from *very* in that it is more often than not infelicitous with underived adjectives, even if they satisfy the lower closed scale requirement (cf. Bolinger 1972)." (Kennedy & McNally 2005: p. 374). It is unclear why they use the verbage *more often than not*, as Bolinger (1972: 22, footnote 4) explicitly states: "[much] is restricted to comparatives and past participles". Kennedy & McNally (2005: p. 375) express uncertainty as to why *much* is infelicitous with underived adjectives, but also remark: "there is significant overlap in the few underived adjectives that permit *much* and those that permit *well*, as we discuss below". However, they do not provide any examples of those underived adjectives that permit *much* and I am not aware of such examples in English. Regardless of whether any such examples exist, this analysis of *much* does not align well with the characterization of *viel* I have provided for German so far.

In fact, we do find underived adjectives in German that allow *viel*-modification— those that allow stage-level predication—but this seems to be unrelated to their scalar properties. German, just like English, has underived adjectives of the correct

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[63]There exists a degree such that this degree is greater than $min(S_G)$ (the minimal point of the Scale related to G) by a large amount (this is conditioned by $>!!$) and such that it is the degree to which x is G.

scale-structure (minimum standard absolute gradable adjectives) that are infelicitous with *viel*. Consider the following pair of adjectives:

(115)   Die viel   ge-bogen-e   Stange
           The much PART.PST-bend.PST-NOM.FEM rail
           "The much bent rail" ("The rail bent in a lot of places")

(116)   * Die viel   krumme Stange
            The much bent   rail
           "krumm" is an underived adjective

We can ensure that both these items are of the correct type, by using a test from Kennedy & McNally (2005: p. 360) that leverages entailments from comparisons. A comparative over a minimum standard absolute gradable adjectives triggers a positive entailment:

(117)   Die Stange ist mehr ge-bogen als der Draht.

       The rail is more PART.PST-bend.PST than the wire

       "The rail is more bent than the wire." $\models$[64] The rail is bent

(118)   Die Stange ist krumm-er als der Draht.

       The rail is bent-COMP than the wire

       "The rail is more bent than the wire." $\models$ The rail is bent

(119)   Die Stange ist läng-er als der Draht.

       The rail is long-COMP than the wire

       "The rail is longer than the wire." $\not\models$ The rail is (not) long

       (adapted from: Kennedy & McNally 2005: 360, ex. (43))

We can observe that (117)-(118) yield positive entailments, while (119) does not. This marks *krumm* and *gebogen* as minimum standard absolute gradable adjectives. Yet only the participial adjective allows *viel*-modification. I propose that this is because the participial adjective provides a monotonic dimension via its base verb, as argued in section 3.6, whereas *krumm* does not give access to such a dimension.

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[64]'$\models$' = *entails*

Another piece of evidence that points away from a scale-based selection is the fact that participial adjectives with maximum standards can be modified by *viel* if a habitual interpretation is available:[65]

(120) ?? Das Glas ist viel ge-füll-t.
        The glass is much PART.PST-fill-PST
       intended: "The glass is much/often filled"

(121) Ein viel ge-füll-t-es   Glas ist der Freund
       A   much PART.PST-fill-PST-NOM.NEUT.INDEF glass is the friend
       des   Spiegel-trinkers.
       of.the level/mirror-drinker
       "An often filled glass is the friend of the alcoholic."[66]

I introduced Kennedy & McNally (2005)'s analysis of *very* in subsection 3.5.2, see (83) below for their proposal. This treatment is reliant on the presence of a *POS* morpheme, which makes this a non-starter for German *sehr*. We have seen in chapter 2, section 2.4 that *sehr* can modify stative verbs, see (33c). Utilizing a Kennedy & McNally (2005) approach would necessitate postulating the presence of a POS morpheme in all stative verbs that allow *sehr*-modification, an undesirable requirement.

(83) $[\![very]\!] = \lambda G \lambda x.\exists d[\mathbf{standard}(d)(G)(\lambda y.[\![pos(G)(y)]\!]) \wedge G(d)(x)]$[67]
      (Kennedy & McNally 2005: 370, ex. (64))

(33c) Ich freue mich sehr.
       I   happy me   very
       "I am very happy."

It appears that *viel* (and for that matter *sehr*) occur largely independently of the type of scale that the predicate provides. The types of adjectives (participial or

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[65]The habitual gives access to a temporal dimension of pluralities of events, which will be ordered in a mereology. This allows a monotonic measurement.

[66]A "Spiegeltrinker" is a type of alcoholic who does not necessarily drink a lot at once but has to maintain a certain constant level of intoxication to be comfortable.

[67]There exists a degree d such that this degree fulfils a contextual standard for G, this contextual standard is defined as $POS(d)(x)$ and d is such that it is the degree to which x is G.

not) and adjectival constructions that *viel* can modify are better categorized along the availability of a monotonic measurement, rather than the scalar properties of the adjective itself. Hence, I will propose a Wellwood (2015) style of analysis with some added caveats based on Baglini (2015) to propose a semantic analysis of both *viel* and *sehr* in section 4.3 and section 4.4 respectively.

4.1.3   The Measure Function Approach

This approach is proposed by Wellwood (2015) and developed further in later work (see: Dunbar & Wellwood 2016, Wellwood 2016, 2018a). It is based on observations made by Schwarzschild (2006), Nakanishi (2007), and Wellwood et al. (2012) that verbal and nominal comparatives allow comparisons along different dimensions as long as these dimensions are 'S-Monotonic' according to (51).

Wellwood et al. (2012), building on work by Hackl (2000) and Nakanishi (2007), posit these comparatives are internally de-composable into {-er, *many/much*}, where *many/much* introduces a measure function that requires monotonic measurements and a non-trivially mereologically ordered domain (i.e. with a part-whole relation). This analysis is in line with a tradition on the field to assume that *much* is a compositional part of nominal and verbal comparatives and other degree modification, based on observations by Bresnan (1973).

Wellwood (2015) and later work[68] proposes that $much^{69}$ introduces this measure function not only in nominal and verbal comparatives, but in adjectival comparatives as well.[70]

With this view Wellwood (2015) and following work departs from the classical degree semantic view that adjectives introduce their measure functions lexically (Cresswell 1976, Kennedy 1999, Kennedy & McNally 2005), instead Wellwood posits that degrees in adjectives are introduced compositionally via $[\![much_\mu]\!]$:

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[68]Wellwood (2016), Dunbar & Wellwood (2016), and Wellwood (2018a)

[69]Wellwood (2018a) claims that *many/much* are allomorphies of the same morpheme. While this is not explicitly claimed in Wellwood (2015), I will use *much* as a representation of both *much* and *many* while discussing the Wellwood approach.

[70]See Dunbar & Wellwood (2016) for a morphosyntactic approach to this proposal.

(122) $[\![much_\mu]\!]^A = A(\mu)$ [71]

(123)   Example values for (122)

       a. $A(\mu) =$ VOLUME

       b. $A'(\mu) =$ TEMPERATURE

       c. $A''(\mu) =$ TEMPORAL DURATION

         (Wellwood 2015: 74, exx. (28)-(29))

In (122), $[\![much_\mu]\!]$ is underspecified, only applying the assignment function $A(\mu)$. A assigns a measure function type depending on context, see (123). The assignment function A is restricted to measure functions that are *S-monotonic*. This requires that there is a non-trivial mereological ordering that is preserved between the scale that is being measured and the entity to which the measurement is applied. This prevents "for example, TEMPERATURE as a possible value for $A(\mu)$ when [the thing being measured] is a portion of coffee" (Wellwood 2015: p. 74). The value of $A(\mu)$ is further context dependent in the sense that only measurements which are *permitted* measurements for the entity(ies) are possible. We cannot measure dogs in TIME as dogs are not within the measurement domain of that function and hence *more dogs* cannot mean more "dog time".

This *much* then introduces comparative meaning compositionally together with the comparative morpheme $[\![-er]\!]$ and the *than*-clause.[72]

(124) $[\![-er]\!]^A = \lambda g \lambda d \lambda \alpha . g(\alpha) \succ d$[73]

(125) $[\![much_\mu]\!]^A + [\![-er]\!]^A =$ [74]

       $\lambda d \lambda \alpha . A(\mu)(\alpha) \succ d$[75]

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[71]This is similar to *Meas* proposed by Solt (2015), however Solt (2015)'s *Meas* is a separate functional head from *much*.

[72]We will sidestep the *than*-clause here as its exact nature is not relevant to this discussion. Suffice to say that the *than*-clause introduces the comparative standard.

[73]Similar formulations can be applied to other degree modification expressions such as excessives and equatives.

[74]After Functional Application, see Heim & Kratzer (1998)

[75]There is a measurement of α such that that measurement succeeds a degree d on their relevant

The appeal of this approach is that it allows a unified way to introduce measures in comparatives and degree modification cross-categorically. Wellwood's *much* introduces measurements in adjectival, nominal, and verbal comparatives. Earlier approaches, such as Wellwood et al. (2012), that posited similar semantics for *much*, but assumed that adjectives introduced their measure functions lexically, had to posit that the *more* in adjectival comparatives is different from the *more* in other comparatives.

The underspecified measure function gives the added benefit of explaining the availability of different measurements in comparatives where multiple measurements are available:

(126)   Jen runs more than Ahmed.
        (in terms of distance)
        (in terms of frequency)

Under a Wellwood-type analysis the assignment function $A(\mu)$ can pick out different possible measure functions as long as their respective measures are monotonic and the measured entity/predicate is within the domain of the measure function. Since running events can be measured in terms of distance and in terms of frequency, the assignment of a measure function can be variable. Other approaches, such as Solt (2015), have similar explanatory power, however Wellwood (2015) unifies this observation with adjectival comparatives, offering a unified view of degree modification across lexical domains.

The compositional treatment of degree necessitates a different ontological view of adjectives than is usually the norm in degree semantics. Traditionally, adjectives are assumed to introduce degrees lexically, either as predicates that map entities to degrees ($< d, et >$)(among others: Cresswell 1976, Bhatt & Pancheva 2004), or as measure functions ($< e, d >$) directly (among others: Kennedy 1999, Kennedy & McNally 2005, Kennedy 2007, Bale 2008). Wellwood (2015) introduces degrees compositionally, so she proposes to treat adjectives as predicates of states:

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scale. Read α to be the measured thing and d to be the comparative standard.

(127) $[\![hot]\!]^A = \lambda s.hot(s)$

      (Wellwood 2015: 81, ex. (57))

The unified approach, however, introduces a potential problem for the German data. Wellwood's *much* requires monotonic measurements, even for adjectives and states. This entails a mereological ordering for states and adjectives. For Wellwood (2015: pp. 79–80), the mereology that makes these measurements monotonic follows from her proposal that gradable adjectives represent an ordering of states that is ordered in a non-trivially order preserving relationship with respect to their measurements: "The states predicated of by GAs are quantities that there may be more or less of: states satisfying $[\![hot]\!]$ are in the domain of an ordering by 'how much' heat they represent" (Wellwood 2015: p. 80).

Baglini (2015) calls this into question and proposes that states (and adjectives) are in fact not mereologically structured (see section 4.2 for a discussion of Baglini (2015)). Dunbar & Wellwood (2016) defend monotonic measurements for adjectives, positing that the variability in comparative dimensions that we observe in nouns and verbs can also be observed in adjectives with examples such as these:

(128)   a. This lipstick is redder than that lipstick (by brightness).

        b. That lipstick is redder than this lipstick (by saturation).

(129)   a. Mount Everest is taller than Mauna Kea (in extent above sea level).

        b. Mauna Kea is taller than Mount Everest (in absolute extent).

        (Dunbar & Wellwood 2016: 18, exx. (52) & (54))

Regarding (128), it is unclear to me how these measurements correspond to a mereology. For Dunbar & Wellwood (2016), this follows automatically as they assume states to be mereologically ordered in accordance with Wellwood (2015). For the example in (129), I would caution that this is the same effect that we get in (130) and that these tend to actually require the bracketed context in order to have the second, more unusual reading licensed, as we are modifying the scale along we measure via a context.

(130)   a. Jo is taller than Kaylene. (in absolute extent)

         b. Kaylene is taller than Jo. (when they are sitting down)

Note that variability in measurement is not a unique effect of monotonic mere-ologically ordered measurements. Consider the following examples:

(131)   Chomsky is more of a linguist than me.

         a. (in terms of papers published)

         b. (in terms of academic rigor)

         c. (in terms of academic interest in linguistics)

There is no doubt a way to treat (131) as a case of monotonic measurement in the sense of Wellwood (2015). However, in section 4.2, I will show that the German data really suggests that these are cases of non-monotonic measurement and that the language is sensitive to this difference.

Since Wellwood assumes that *much* is the head that introduces measure functions, this does not explain the bare usage of *much* in cases like (132). For the bare usage of *much* Dunbar & Wellwood (2016: 16, footnote 18) propose that these constructions involve a covert POS-morpheme (see subsection 3.5.2 for the POS-morpheme). This allows them to unify the usage of "dummy-much" and "lexical much" (see: Corver 1997a) under one morpheme. What Corver would call "lexical much" would involve an additional POS-morpheme under the Wellwood approach.

(132)   We don't have much rice at home.

On the question of *very*, Wellwood (2015: p. 94) proposes to treat *very* as a type of comparative morpheme that needs to combine with *much* first (in order to receive a measure function). This analysis is convenient for English, where we sometimes see an obligatory overt *much* with degree constructions involving very, as seen in (133). However, in the German data, *sehr* can appear independently of *viel*—as seen in (45a)—and seems to fill a similar role as *viel* does in those degree modification constructions where it surfaces. German does allow co-occurence of *sehr* and

viel, as seen in (136). In those constructions, *sehr* modifies *viel* and *viel* provides the measurement. This is suggested by the fact that *sehr viel* is only licensed in environments that license *viel* itself: compare (134) and (136). *Sehr* may modify *viel*, (136), because *viel* as an adjective does not supply a monotonic measurement itself. By contrast, *viel* cannot modify *sehr*, (135), because *sehr* equally does not provide a monotonic measurement. See subsection 4.6.2 for a more in-depth discussion of *sehr + viel*.

(133)   I love her very much.

(45a)   Sie liebt dich {**sehr**/*viel}.
         She loves you {very/*much}
         "She loves you very much" (*viel* is not licensed)

(134)   ?? Sie liebt dich sehr viel.
             She loves you very much

(135)   * Sie liebt dich viel   sehr.
             She loves you much very

(136)   Sie läuft sehr viel.
         she runs very much
         "She runs quite a lot."

The Wellwood approach gives us a unified view of *much* and gives us the tools to frame *much* within the context of monotonicity. However, we cannot apply this for German *viel* in a direct fashion, as the data does not support *much/viel* in adjectives and individual level predicates. I will adopt a Wellwood-style approach to *viel* in section 4.3, but I will agree with Baglini (2015) in that statives do not provide monotonic measurement. The German distribution will then fall out for free once we consider that stage-level predication allows a frequency measurement even in the absence of any lexically provided monotonic measurement.

4.2   On the Nature of Statives and Intensive Measurements

As mentioned in the prior section, Wellwood (2015) assumes that *much* as a measure function always requires monotonic measurements, meaning measurements that

non-trivially preserve a part-whole ordering (i.e. mereological ordering). This necessitates an analysis where adjectives (and verbal statives) provide such measurements.

I argue that the German data calls this generalization into question. We seem to find two distinct measure function introducing heads *viel* and *sehr* which are *sensitive* to the *type of measurement* even in the same predicate:

(33c)   Ich freue mich sehr.
         I   happy me   very
         "I am very happy." (happy here is a verb)

(33d)   Ich freue mich viel.
         I   happy me   much
         "I am often happy."

(137)   a. Ich freue mich zu sehr.
             I   happy me   too very
             "I am too happy." (in terms of intensity)

         b. Ich freue mich zu viel.
             I   happy me   too much
             "I am happy too often."

There are two possible ways to deal with this problem, while still preserving a compositional measure function analysis in the style of Wellwood: (i) assume that *viel/sehr* are allomorphical reflexes of the same head that exhibits an allomorphy based on stativity (ii) assume that occurences of *sehr* involve a different type of measurement.[76] I will propose an analysis in the style of (ii), but let us consider option (i) first.

Under (i), we would assume with Wellwood (2015) that states and adjectives are mereologically ordered. Just like in English, we'd assume *VIEL*[77] introduces a measure function for degree modification construction. We would also assume that *VIEL* surfaces as *sehr* in the context of a stative and as *viel* in the context of a

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[76]I should note that while I will assume *sehr* and *viel* to be separate heads, there is another analysis that assumes them to be the same head with a contextual suppletion based on monotonic measurements. This analysis would have similar predictive power to the one I will suggest later.

[77]Take *VIEL* here to be an underlying form, and lowercase *viel/sehr* to be surface forms.

non-stative. This analysis would preserve the idea that states can be subject to monotonic measurements in the style of Wellwood (2015).

However, we face some non-trivial issues with this unary analysis. First, consider the data in (137a) & (137b). We would have to argue, that in (137b), *freuen* (to be happy) is not a stative, but a dynamic event of some kind, hence we get the surface form *viel*. We can save the analysis by arguing that *sehr* is a suppletive form of *VIEL* and positing that (137b) is a case where *VIEL* attaches at a higher projection. In fact, Wellwood (2016) suggests that stage-level predicate states are *eventized* at the copula level, see (154) for a discussion of this proposal. We could assume that *viel* in (33d), attaches at the level of the *eventizing* head. Subsequently, we get *viel* in (33d), as at that projection the state has been eventized. In fact, I will propose a similar analysis for the difference between (137a) and (137b) in section 4.5. However, the unary analysis becomes more troublesome when we consider the following data:

(138)   Der Topf wackelt zu **sehr**, ich habe Angst um die Pflanze.
        The pot   jiggles too **very** I   have fear   for the plant
        "The pot jiggles too much, I fear for the plant" (jiggling intensely ⟶ in terms of directional extent)

(139)   Der Topf wackelt zu **viel**, ich habe Angst um die Pflanze.
        The pot   jiggles too **much** I   have fear   for the plant
        "The pot jiggles too much, I fear for the plant" (jiggling a lot ⟶ in terms of frequency)[78]

The allomorphy analysis of *VIEL* does not have a straightforward way of dealing with (138)-(139). The data points towards the *kind of measurement* being the issue and not *the grammatical class* of the thing being measured. Instead I propose we adopt analysis (ii): "occurences of *sehr* involve a different type of measurement". It appears we need to allow for a different class of measurement: intensive measurements.

Baglini (2015) proposes that statives do not introduce a mereological structure,

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[78]I would like to acknowledge here that the difference between (138) and (139) is hard to derive for speakers. These are usually interpreted as the same meaning, unless they are directly contrasted.

meaning they do not exhibit the kinds of part-whole relationships that are necessary for monotonic measurements under the Wellwood (2015) and Schwarzschild (2006) definitions. Baglini (2015: p. 79) considers states their own separate ontological category that is not ordered along a part-whole relationship, but rather is measured *intensively*. Her analysis is largely based on a study of *Wolof*, where she finds two comparative operators: *gën* and *ëpp*. Baglini 2015 shows that *gën* selects for states (and stative nouns). Compare (140) and (141) for examples. She also finds other operators such as the intensifier *lool* and the wh-term *nen*, which display this selectional criterion.[79]

(140) a. Fanta mu-a gën-a-rafet Aïda
     Fanta 3SG-FOC EXC-*a*-pretty Aïda
     "Fanta is prettier than Aïda." (Baglini 2015: 143, ex. (39a))

    b. * Ali mu-a gën-a-lekk jën Aïda
      Ali 3SF-FOC EXC-*a*-eat fish Aïda
      Intended: 'Ali eats more fish than Aïda" (Baglini 2015: 143, ex. (41a))

(141) Binta ginaar l-a-∅   ëpp l-i mu-i   lekk ci jën
   Binta chicken XPL-COP-3SG EXC-*a* FREL SBJ.3SG-IMPF eat *ci* fish
   "Binta eats more chicken than she eats fish." (Baglini 2015: 149, ex. (61))

Baglini (2015) does not distinguish between monotonic and non-monotonic measurements, but rather between *extensive* and *intensive* measurements.[80] Extensive measurements entail "that a greater or lesser degree of the property correlates with an increase or decrease in the part-structure of the measured domain." (Baglini 2015: p. 124), which makes them S-monotonic in the sense we have discussed so far. Intensive measurements however, "involve intensive dimensions, where an increase in degree does not correlate with a predictable increase in the part-structure of the

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[79]See Baglini 2015: pp. 179–185 for a summary of her Wolof findings.

[80]She considers all of these monotonic (see: Baglini 2015: pp. 197&183), but since *intensive* measurements are not linked to a mereological order, they are not S-monotonic for the purposes of Wellwood (2015) and Schwarzschild (2006). In order to avoid confusion, I will not use Baglini (2015)'s definition of monotonicity. Instead, I will use her terminology of extensive vs intensive to refer to monotonic and non-monotonic measurements respectively.

entity it modifies" (Baglini 2015: p. 79). Hence, Baglini's intensive measurements are not monotonic for our purposes.

Degrees require an ordering, see section 1.1. In order to allow states to have degrees, Baglini (2015) adapts a similar proposal as Anderson & Morzycki (2015): treat states as ordered by equivalence classes. This goes back to Cresswell (1976), who proposed to treat degrees as equivalence classes of individuals.

(142) **Ordering relation for sets of states**

   a. Let D_s be a non-empty set of states

   b. For all sets S_δ in D_s, S is the set of all states s which are ordered under the binary relation $\succeq_\delta$ (intuitively 'more intense or equal to'), where δ is a stative dimension

   c. A relation $\succeq_\delta$ is a total preorder on S_δ: it is reflexive, transitive, and neither symmetric nor antisymmetric
   (Baglini 2015: 116, ex. (65))

She defines states as equivalent in "terms of the relation $\succeq_\delta$ [iff] they can substitute for one another without changing the truth values of statements involving $\succeq_\delta$" (Baglini 2015: pp. 116–117). In simple terms, there can be two equivalent states of "being beautiful", without those being the same states. Vitally and Hans can be equally beautiful, meaning their states of being beautiful are in the same equivalence class, while their respective states of being beautiful are separate states. She formally defines equivalence as such:

(143) **Eqivalence**
   For any $q, r, \in S_{\succeq_\delta}$
   $q \sim_\delta r$ iff $\forall p((q \succeq_\delta p) \leftrightarrow (r \succeq_\delta p) \wedge (p \succeq_\delta q) \leftrightarrow (p \succeq_\delta r))$
   (Baglini 2015: 117, ex. (66))

From this we can derive degrees, by assuming that each equivalence class corresponds to a degree.

(144) Degrees from S_δ

$\forall p, q \in S_{\succeq_\delta} [p]_\delta = \{q | q \sim_\delta p\}$

(145) The set of degrees Σ_δ

$\Sigma_\delta = \{[p]_\delta | p \in S_{\succeq_\delta}\}$[81]

(Baglini 2015: 117, exx. (67)-(68))

This constitutes a weak ordering, which means that the objects in the order can be assigned to classes (here: equivalence classes). Each class consists of a set of items (here: states) that share some relationship (here: equivalence). The separate classes are ordered, each class has one immediate predecessor and one immediate successor class. We derive degrees by assigning each class a degree on a scale. All items (states) in a class are equivalent and are associated with the same degree, but they are *not the same state.* The classes are ordered with respect to each other. We can illustrate this as shown in Figure 4.1.

This allows us to derive a scale and hence degrees, without the kind of part-whole ordering we see in extensive/monotonic measurements. As Baglini (2015) puts it:

> if Ben has a state of beauty s corresponding to his beauty and Claire has a state s' corresponding to her beauty, these states may be equal in intensity but not be the same state. [...] Ben and Claire stand in a relation to the same equivalence class: *they are beautiful to the same degree.* (Baglini 2015: p. 119)

We can compare this to the kinds of measurements we find in eventives, dynamic events, pluralities, and mass nouns, all of which can be expressed in a join-semi lattice that we can then map onto degrees as well.

Whether $\{a, b, c\}$ here belongs to the domain of events, entities, or otherwise is irrelevant at this point. What is relevant is that measuring along the scale $d_0 - d_2$ will preserve the part-whole structure of the semi-lattice. Just as in Figure 4.1, the sets that map onto d_1 are equivalent with respect to the degree they map onto.

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[81]The set of degrees is the set of all equivalence classes [p] that are a part of the relation $S_{\succeq_\delta}$.

$$\{a_{\succeq state}, b_{\succeq state}\} \dashdash \{[d]_{state}\}$$

$$\{c_{\succeq state}, d_{\succeq state}, e_{\succeq state}\} \dashdash \{[d']_{state}\}$$

$$\{f_{\succeq state}\} \dashdash \{[d'']_{state}\}$$

$$\{g_{\succeq state}, h_{\succeq state}\} \dashdash \{[d''']_{state}\}$$
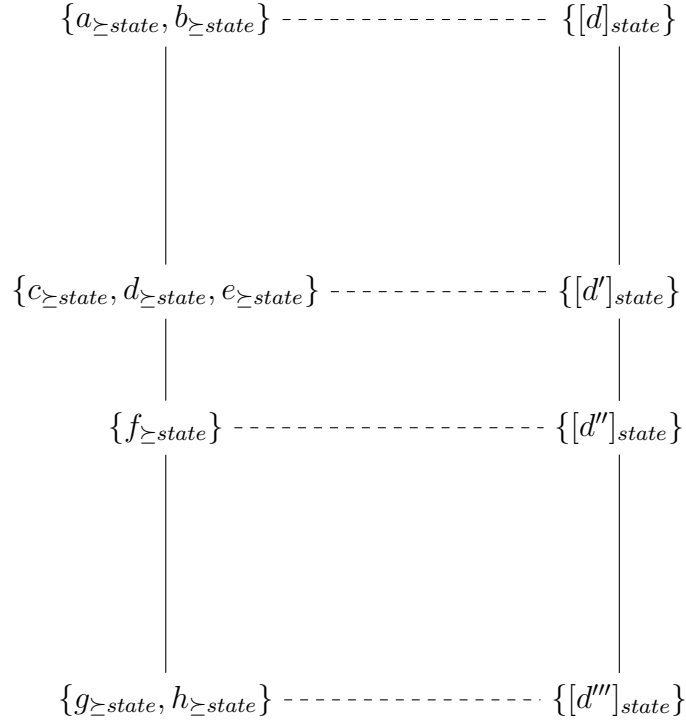
Figure 4.1: States grouped by their equivalence class (left side) and respective degree (right side). Adapted from Baglini (2015: 118, fig. 3.2).

$$\{a, b, c\} \dashdash d_2$$

$$\{a, c\} \quad \{a, b\} \quad \{b, c\} \dashdash d_1$$

$$\{a\} \quad \{c\} \quad \{b\} \dashdash d_0$$
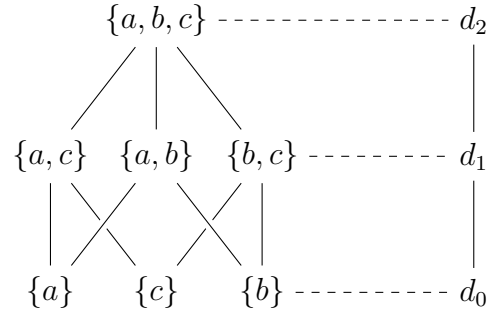
Figure 4.2: Join semi-lattice mapped onto degrees

However, the sets in Figure 4.2 preserve a part-whole ordering along the scale. The set that maps onto d_2 contains all the members of the sets that map onto d_0. This is not the case with the equivalence class ordered states in Figure 4.1, as they are not ordered in a part-whole relationship. The equivalence class of beauty that is at the highest point of the beauty scale, does not contain all other states

	Stative	Non-Stative
scalar meanings lexicalized	✓	x
extent entailments	x	✓
additive interpretations	x	✓
identity conditions independent of the bearer	x	✓
antonym pairs	✓	x

Table 4.1: The empirical properties of statives (Baglini 2015: 20, tab. 1.3)

of beauty. The set of rice that is at the highest point of the rice-volume scale will contain all other sets of rice. Ordering by equivalence classes provides *intensive* (non-S-monotonic) measurements and ordering by part-whole relationship provides *extensive* (S-monotonic) measurements.

(146) **Additivity**

    (146) I ate 3 bowls of rice yesterday and 2 more today.

        i. I ate 8 bowls of rice in total. (Comparative Reading)

        ii. I ate 5 bowls of rice in total. I ate 3 bowls yesterday and I ate 2 bowls today. (Additive Reading)

    (147) Girl Scout squad 19 had courage, but squad 20 has more!
        Only one interpretation available.
        Baglini (adapted from: 2015: 123–124, exx. (75)-(76))

This contrast between part-whole orderings and equivalence class orderings allows us to derive some of the empirical properties that Baglini (2015) notes, see Table 4.1. Additive interpretations, see (146), are available for mereologically ordered domains because they exhibit identity conditions between the subparts. Consider a minimal example for the additive and comparative readings to be: "I ate one bowl of rice yesterday and I will eat one more tomorrow.". Take the additive reading to be: "Tomorrow, I will have eaten two bowls of rice total", and the comparative reading to be: "Tomorrow, I will have eaten three bowls of rice in total.". In Figure 4.3, I present two lattice structures for the two readings. Under the additive reading, the comparative *adds* to the set of bowls of rice I have already eaten. Under the

comparative reading, the comparative is interpreted so that the set of bowls of rice I ate yesterday is separate from the set of bowls of rice I will eat tomorrow. The two separate readings are possible because of the identity conditions established by the part-whole ordering. Statives do not exhibit a part-whole ordering and hence do not exhibit additive readings.
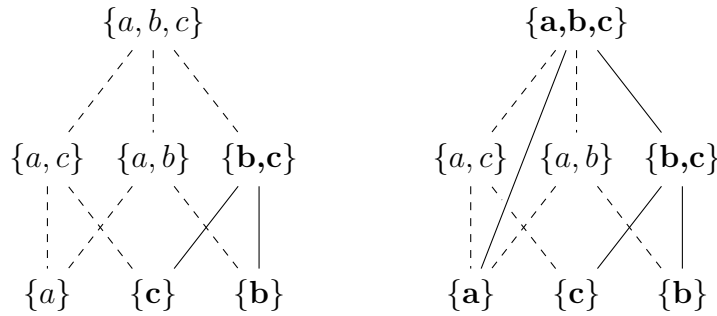

Figure 4.3: Semi Lattice for Additive (left) and Comparative (right) Reading.

I will assume with Baglini (2015) that states are pre-ordered by equivalence classes. I will also assume that the Domain of states for German includes *Kimian states* according to Maienborn (2008), which I take to minimally include all German adjectives and stative predicates. I also assume with Baglini (2015) that not all states are gradable, as some may only have one equivalence class, this would include predicates such as *dead*. I will assume that measuring on a scale requires at least two points on that scale, hence states with only one equivalence class are not gradable.

In section 4.3 and section 4.4 I will show how we can fully account for the German pattern by adopting a Wellwood (2015)-style analysis and incorporate insights from Baglini (2015). In section 4.6 I will discuss some potential issues of this analysis and address open questions from chapter 3, such as the question of differential comparatives.

4.3   A Semantics for *VIEL*

I will assume, based on Wellwood (2015), that *viel* provides an assignment over measure functions and is restricted to measurements that are strictly S-monotonic.

I will adapt the definition of *MUCH* given in Dunbar & Wellwood (2016: 17, ex. (43)) and adapt it for German, see (149). However, we will make the requirement for a part-whole ordering explicit, in order to avoid confusion. So we will make a slight adjustment to our definition of S-monotonicity:[82]

(148) **S-monotonicity (final version)**

$\forall x, y \in D_{\leq part}$, if $x \leq_{part} y$, then $\mu(x) < \mu(y)$[83]

(149) $[\![viel]\!]^A = \lambda\alpha.A(\mu)(\alpha)$ $< \eta, d >$

$\mu : D_{\leq part} \underset{s-mon}{\to} D_d$

$A(\mu)$ is restricted to measures that exhibit S-monotonic mapping with regard to α by restricting it to map from the domain of part-whole orderings to degrees. I assume with Dunbar & Wellwood (2016), that η indicates neutrality with respect to entities and eventualities (see: Dunbar & Wellwood 2016: p. 16)

This allows us to leverage Wellwood (2015)'s analysis for *viel* and gives us a way to explain why *viel* surfaces in the degree modification of plural nouns, mass nouns, eventives, and (with some added explanation) stage-level predicates. We will deal with stage-level predicates later in this section. Let us first consider how this works for degree modification constructions. I will assume that excessives (too-constructions) and equatives (-as constructions[84] are fundamentally comparatives and share similar (but not equal) semantics to the comparative. I will assume a meaning for the comparative as given in (150):

(150) $[\![-er]\!] = \lambda g\lambda d\lambda\alpha.g(\alpha) > d$[85]

With these mechanics in place, we can provide a sample semantic tree for "mehr Reis" ("more rice") in Figure 4.4. Note that I do not provide exact semantics for

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[82]This is not strictly necessary, as the part-whole ordering was always a requirement, see Wellwood (2015) and Schwarzschild (2006), but it serves to make this explicit.

[83]"For all x and y in the domain of partially part-whole ordered items, if x is smaller than y with respect to the part-whole ordering then the measurement of x has to be smaller than the measurement of y."

[84]See Schwarzschild (2008) for a discussion.

[85]See Kennedy (1999) for the basis of this formulation.

the the "than-phrase". I simply assume it introduces a degree δ. I am also agnostic on the syntactic position of the "than-phrase", see Bhatt & Pancheva (2004) and Schwarzschild (2008) for discussions on this, the current position of this phrase can be understood as a placeholder. Similarly I am agnostic on the exact position of the DegP within the context of the NP/DP. The steps of the semantic derivation can be found in (151a)-(151c). I take Functional Application (FA) and Predicate Modification (PM) to apply in the sense of Heim & Kratzer (1998).
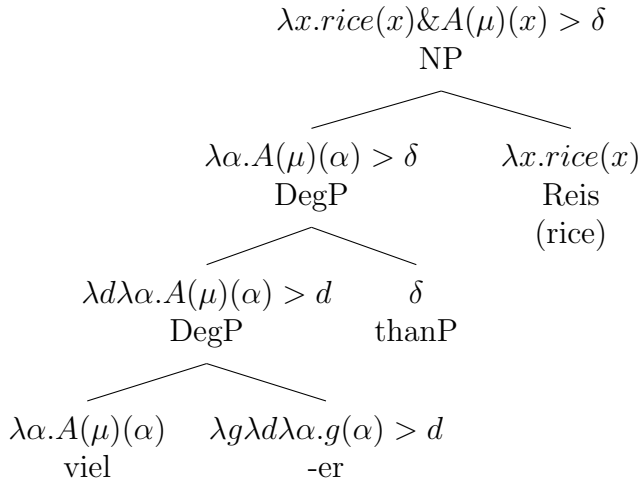
$$\lambda x.rice(x)\&A(\mu)(x) > \delta$$
NP

$\lambda\alpha.A(\mu)(\alpha) > \delta$ $\lambda x.rice(x)$
DegP   Reis
              (rice)

$\lambda d\lambda\alpha.A(\mu)(\alpha) > d$ δ
DegP   thanP

$\lambda\alpha.A(\mu)(\alpha)$ $\lambda g\lambda d\lambda\alpha.g(\alpha) > d$
viel   -er

Figure 4.4: Sample Comparative Tree

(151)   Steps for deriving the meaning of a nominal comparative

     a. FA: $\lambda d\lambda\alpha.A(\mu)(\alpha) > d$

     b. FA: $\lambda\alpha.A(\mu)(\alpha) > \delta$

     c. PM: $\lambda x.rice(x)$ & $A(\mu)(x) > \delta$

We have so far established that *viel* requires monotonic measurements and *sehr* does not. I have also assumed with Baglini (2015) that states do not provide monotonic/extensive measurements. However, in the course of our data section, we have found states that allow modification by either. Those are states that represent stage level predicates and we find them in the adjectival as well as the verbal domain:

(33c)   Ich freue   mich sehr.
      I   happy me   very
      "I am very happy." (happy here is a verb)

(33d)   Ich freue   mich viel.
      I   happy me   much
      "I am often happy."

(137a)   Ich freue   mich zu sehr.
       I   happy me   too very
       "I am too happy." (in terms of intensity)

(137b)   Ich freue   mich zu viel.
       I   happy me   too much
       "I am happy too often."

(22)   Ich bin viel   ängstlich.
      I   am much fearful
      "I am often fearful/afraid" (Nitschke 2022: 249, ex. (63))

(23)   Sie ist viel   neidisch.
      She is much jealous
      "She is often jealous." (Nitschke 2022: 249, ex. (65))

Both Baglini (2015) and Wellwood (2016) note a similar pattern in English comparatives, see (152). Wellwood (2016) notes that stage-level predicates in English can have different interpretations depending on the position of the comparative morpheme. She argues that there is a "high" and a "low" reading, where the "low" reading corresponds to a direct comparative with the adjective, whereas the high reading corresponds to a comparative that is formed after the adjective has combined with a POS-morpheme.

Baglini (2015: p. 199) offers an analysis that is similar in spirit. However, since the interpretation of the high comparative in (152b) corresponds to a plurality, which indicates an extensive/monotonic measurement, Baglini (2015) has to explain where this measurement is derived from. Since Baglini (2015) limits states to intensive (non-monotonic) measurements, she needs to derive a way for the high attachment to result in an extensive measurement. She does this by leveraging a proposal for the copula introduced by Rothstein (1999), seen in (153). Baglini (2015: p. 200)

argues that (153) "denotes an 'instantiation' function from the domain of states to the domain of (atomic) Davidsonian eventualities. This has the effect of 'packaging' non-atomic states into atomic eventualities". Once the states are 'packaged' in this way, they can be ordered in a part-whole relationship via frequency (which denotes a plurality).

Wellwood (2016) analysis is quite similar in spirit, as she also argues that the 'high' reading constitutes states that have been 'eventized' (Wellwood 2016: p. 176) the $[\![EV]\!]$ formalized in (154).[86]

(152)   (Wellwood 2016: 167, ex. (4))

    a. Ann was happier than Bill was. [intensity]

    b. Ann was happy more than Bill was. [frequency]

(153) $[\![be]\!] = \lambda S \lambda e \exists s.S(s)(e)$

(154)   *Eventizer* (Wellwood 2016: 176, ex. (28))
    $[\![EV]\!] = \lambda P_{v,t} : Stative(P).\lambda e_v : Atom(e).\exists s[e \triangleright \tau s \& P(s)]$[87]

Baglini (2015)'s analysis works well for stage-level predicates that are adjectives, however it struggles to explain the data with verbal states in German seen in (137a) & (137b). We would have to propose that these states contain some type of hidden copula. The Wellwood (2016) approach seems more suited here. I will neglect a precise semantic implementation here, it suffices to say that stage-level predication for statives involves eventivization of some kind, which allows pluralization and hence mereological ordering. Stage-level predicates become *eventized*, via an operator like Wellwood (2016)'s *eventizer*, which allows them to be mereologically ordered. Crucially, the equivalence class ordering still needs to be accessible for *states*, even when

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[86]Wellwood (2016: p. 176) references a 'covert eventizer' from Kratzer (2004) here. I could not find a mention of such an operator in Kratzer (2004) explicitly. However, as Kratzer (1989, 1995) notes, the difference in temporality between stage-level predicates and individual level predicates has to be derived somehow. An eventizer such as specified here, can be a way to achieve this.

[87]Wellwood (2016) also includes a second operator, $[\![PL]\!]$, which is responsible for transforming the result of $[\![EV]\!]$ into a plurality.

they are stage-level predicates, see (155). This is why stage-level predicates of states allow modification both by *viel* and *sehr* whereas other events regularly only license *viel* and individual-level predicates only license *sehr*:

(30)   Ich laufe **viel**/*sehr.
       I   run   much
       "I run a lot"

(31)   Ich mag dich **sehr**/*viel.
       I   like you very
       "I like you a lot" or "I like you very much"

(33c) Ich freue   mich sehr.
       I   happy me   very
       "I am very happy." (happy here is a verb)

(33d) Ich freue   mich viel.
       I   happy me   much
       "I am often happy."

(155) Ich freue   mich heute sehr.
       I   happy me   today very
       "I am very happy today."

For occurrences of bare degree-modification by *viel* (and *sehr*), as in (30), (31), (33c) and (33d), I will assume Dunbar & Wellwood (2016)'s proposal for bare *much*: Bare degree modification by these operators involves a covert POS-morpheme. This ensures that the measurement provided exceeds some contextual standard. Importantly, even in the case of bare modification, the operators are sensitive to the kinds of measurements provided by the predicate, as seen in the examples above.

I will show in section 4.5, that modifications with *viel* in stage-level predicate adjectives exhibit different syntactic behavior to stage-level predicates modified by *sehr*. I propose that this is supportive evidence that those two items attach at different projections in those constructions, as proposed by both Baglini (2015) and Wellwood (2016),[88] which lends credence to the analysis that the extensive/monotonic

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[88]Baglini (2015) and Wellwood (2016) discuss this primarily from the perspective of *more*-comparatives, but I propose that this is true for bare degree-modification by *viel/sehr* as well.

measurement in stage-level predicate statives is provided by a separate head, as both Baglini (2015) and Wellwood (2016) suggest.

4.4 A Semantics for *SEHR*

With a semantics for *viel* in place, I will propose a similar analysis for *sehr*. I will take *sehr* to provide a measure function in the style of a Wellwood (2015)-type *much*, with the added caveat that it is restricted to non-monotonic measurements, based on insights from Baglini (2015).

(156) $[\![sehr]\!]^A = \lambda\alpha.A(\mu)(\alpha)$ $< \eta, d >$

   $\mu : D_{\leq part} \underset{s-mon}{\not\rightarrow} D_d$[89]

We could equally restrict *sehr* to *intensive* measurements, however, I would like to remain as general as possible. Hence I propose that *sehr* simply requires a measure that does not monotonically map from a part-whole ordering to a set of degrees. A third option would be to propose that *sehr* simply has no restrictions, making it a type of *elsewhere*-case. The pattern would then be derived from a blocking effect by *viel* in contexts that match *viel*'s selectional criteria.

I argue that we want to keep α as general as possible. One could propose to simply argue that *sehr* requires a state, and have the measurement effects derived from the proposal that states only provide intensive measures. I will abstain from this analysis, because speakers can sometimes use *sehr* in dynamic contexts

(138)   Der Topf wackelt zu **sehr**, ich habe Angst um die Pflanze.
        The pot   jiggles too **very** I   have fear   for the plant
        "The pot jiggles too much, I fear for the plant" (jiggling intensely)

(157)   Du rennst mir **zu sehr**, kannst du ein bisschen langsamer gehen?
        You run   me to   **very**   can you a   little   slower   walk
        "You're going too fast for me, can you slow down?"[90]

---

[89] μ such that μ does *not* map from the domain of part-whole orderings to the domain of degrees.

[90] "Laufen" and "rennen" are synonyms for *run*, there are some regional differences as to the exact meanings. In some regions "laufen" can be used synonymous with *walk*.

In the above examples, we seem to find intensive measurements in non-stative predicates, suggesting that these kinds of measurements can be available to speakers even if there is a part-whole ordering. If we limit *sehr* to statives, we would have to argue that (138) & (157) are states in these examples. The simple claim that *sehr* does not allow *monotonic/extensive* measurement can explain the above examples without any additional mechanisms.

Adjectives are typically considered to introduce their measure functions lexically in the literature, see for example Kennedy (1999) and Kennedy & McNally (2005). I argue that the distribution of *sehr* is supportive evidence for the Wellwood (2015) and Dunbar & Wellwood (2016) claim that even in adjectives degree measurements are introduced compositionally. In English, this happens via ⟦*much*⟧, which does not distinguish between non-monotonic/intensive measurements and monotonic/extensive measurements, see Baglini (2015).[91] In German, the language is sensitive to the *type* of measurement and has two separate measure function introducing heads, *viel* for monotonic measurements and *sehr* for non-monotonic measurements. We can support the claim that German adjectives compositionally introduce their measure functions via *sehr* by leveraging ellipsis constructions:

(158)   Robert ist fröhlich, er ist es sogar zu sehr.
        Robert is happy   he is it even too very
        "Robert is happy, even too much so."

(159)   Robert ist fröhlich, er ist sogar zu (*sehr) fröhlich.
        Robert is happy   he is even too (*very) happy
        "Robert is happy, too happy even."

(137a) Ich freue mich zu sehr.
        I   happy me   too very
        "I am too happy." (in terms of intensity, happy here is a verb)

(137b) Ich freue mich zu viel.
        I   happy me   too much
        "I am happy too often." (happy here is a verb)

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[91]It is important to note that Baglini (2015) does not explicitly claim that measure functions are introduced lexically by adjectives. Her claim is that English *much* does not distinguish between these two types of measurements.

Due to the binary analysis I propose here, where two separate heads introduce two types of measure functions, we predict that different measures will give rise to the *viel* and *sehr* respectively in degree modification constructions, which is exactly what we find in (137a) & (137b).

In this section I have provided a formalism for *sehr*. Due to the similarity to the proposed semantics of *viel* in section 4.3, I will forego an example derivation here. This operator would work the exact same way as *viel* does in Figure 4.4. In the next section, I will argue that stage-level predicates do not lexically give access to their part-whole ordered interpretations, such as (137b). I argue that these are provided by a higher projection and show supportive evidence from syntactic behavior for this claim.

4.5 Syntax and Measurement in Stage-Level Predicates

In this section I will briefly discuss data from analytic comparatives and attributive adjectives which indicate that the extensive/monotonic measurement we find in stage-level predicate is introduced by a higher projection. I am agnostic on the exact nature of that process, but a treatment in the style of Wellwood (2016), as seen in (154) would achieve this task. As Kratzer (1995) points out, stage-level predicates have a Davidsonian argument that allows for their (spatio)temporal nature. I assume that this is introduced compositionally, based on the data I will present below.

The first piece of evidence we find in "high" and "low" comparatives. I have mentioned these in section 4.3. Both Baglini (2015) and Wellwood (2016) discuss these and come to the conclusion that different types of measures are derived from different projections. I will agree with their analysis. The extensive/monotonic measurement is introduced at a higher projection than the intensive one. Due to the fact that the German morphological comparative is obligatory for adjectives, we predict that for stage-level adjectives a comparative over extensive measurements will be analytic, as the comparative morpheme will not be local enough to the

adjective to condition a morphological comparative. This prediction is borne out in the data:

(160) Aise ist fröhlich-er als Kevin.
       Aise is happy-COMP than Kevin
       "Aise is happier than Kevin." (intensity)

(161) Aise ist mehr fröhlich als Kevin.
       Aise is more happy than Kevin
       "Aise is happy more than Kevin." (frequency)

Another piece of evidence we find in the attributive usage of stage level adjectives. While bare modification by *viel* is generally licensed in the predicative use, the availability of *viel* goes away in the attributive use. Presumably, since stage-level adjectives receive their Davidsonian argument compositionally, the attributive use does not contain the projection that does this work. Hence attributive adjectives do not provide monotonic measurements. We can test this hypothesis with general temporal modification, as seen in (164):

(162) Agamemnon ist {viel/sehr} neidisch.
       Agamemnon is {much/very} jealous
       "Agamemnon is {often/very} jealous"

(163) * Agamemnon ist ein viel neidischer Mensch.
       Agamemnon is a much jealous human
       intended: "Agamemnon is a man who is often jealous."

(164) * Agamemnon ist ein heute neidscher Mensch.
       Agamemnon is a today jealous human
       intended: "Agamemnon is a man who is jealous today."

(165) Agamemnon ist ein sehr neidischer Mensch.
       Agamemnon is a very jealous human
       "Agamemnon is a very jealous man."

The availability of *sehr* in attributive usage, see (165), shows that this is not
an issue of a general ban on degree modification. Interestingly, we do not have this
type of test for verbal stage-level predicates. They cannot be used attributively, and
their comparative constructions are (on the surface) the same for both readings:

(166)   Ich fürchte mich mehr als   du.
        I   fear   me   more than you
        "I am afraid more than you" (frequency or intensity)

Whether the above facts are an accident or are evidence that for verbal stage-level
predicates the Davidsonian argument is introduced lexically, is a topic for a different
time. However, I argue that for adjectival stage-level predicates we can observe that
parts of their stage-level meaning are clearly compositionally introduced by account
of the data presented here. Let me now turn to address some remaining open
questions in section 4.6.

4.6   Tying Up Loose Ends

In this section I will address leftover problems and open questions. I will begin
with two open questions related to Baglini (2015)'s proposal. The first being the
status of stative nouns in German, and the second being the question of whether
some adjectives do allow a kind of extensive measurement. I propose that German
stative nouns, while providing intensive measurements, are solidly mass nouns and
hence can be measured extensively. I will also argue that positive German adjectives
cannot be measured extensively (putting aside measures introduced by stage-level
predication).

In the second half of this section I will address predicate nominals. Finally in
subsection 4.6.1 I will discuss the issue of *differential comparatives* with *viel*, that
was raised in subsection 3.5.3.

Baglini (2015) discusses stative nouns at length, especially within the context of
Wolof. She builds on insights by Tovena (2001), who showed that stative nouns in
Romance pattern differently with regards to some quantifiers than other mass nouns.

Baglini (2015) shows that Wolof is sensitive to this distinction as well, and utilizes this fact as part of her argument that states are distinct from other predicates. I will forego a description of her argument here, and directly move to the German data.

Stative nouns are nouns that denote some state-like property. Usually these have a verbal and adjectival counterpart. This is also true for German. A minimal example is provided in (167).

(167)   Concept: *hunger*

      a. Ich habe Hunger.
         I   have hunger
         "I have hunger." (stative noun)

      b. Ich hungere.
         I   hunger
         "I hunger." (verbal state)

      c. Ich bin hungrig.

         I am hungry

         "I am hungry." (adjectival state)

I assume with Baglini (2015) that states are ordered by equivalence classes and hence provide intensive measurements. For stative nouns, this would predict that these nouns license *sehr*. This seems to be generally the case, see (168a). However, speakers prefer to generate constructions like (168b), when using German stative nouns. A quick corpus search shows evidence of this in Table 4.2. It appears that German does not quite pattern like Wolof.

(168)   a. Ich habe sehr Hunger.
         I   have very hunger
         "I am very hungry."

      b. Ich habe viel   Hunger.
         I   have much hunger
         "I have a lot of hunger." idiomatic: "I am very hungry."

Stative Noun	+ *sehr*	+ *viel*
Hunger (hunger)	8	429
Angst (fear)	171	6.108
Mut (courage)	15	8.073
Geduld (patience)	1 (4)[92]	18.234
Reis (rice: **non-stative**)	0	276
Wasser (water: **non-stative**	0 (17)[93]	21.489

Table 4.2: Results of a co-occurence search of stative nouns with *viel/sehr* contrasted with non-stative mass nouns. Results drawn from the German Reference Corpus (Lüngen 2017) via the COSMAS II search engine (COSMAS n.d.: accessed on July 23rd, 2023).

While German stative nouns seem to give access to *intensive* measurements, as most of them license some modification by *sehr*, they are disproportionately more likely to co-occur with *viel*. German seems to treat stative nouns as mass nouns. While their stative quality potentially gives access to an *intensive* dimension, the fact that the language treats them as mass nouns allows for *extensive* measurement via *viel*. The exact mechanisms of this distribution I leave to further research.

Baglini (2015) assumes that some dimensional adjectives, such as *tall*, which are associated with predefined units of measurement (such as feet, meters, etc.) can invoke *extensive* measurements in their interpretation (see: Baglini 2015: pp. 209–212). To be precise, Baglini (2015) does not assume that these states are mereologically ordered (they are ordered in equivalence classes), but that their association with culturally defined measure scales invokes *extensive/monotonic* measurements. I argue that this is actually not the case, at least for English and German. Even adjectives that are associated with pre-defined units are measured non-montonically/intensively.

A test for mereological orderings, utilized by Baglini (2015), comes from *additivity*, see (146) for an example. In section 4.2, I have argued that additive readings are a result of the identity conditions imposed by part-whole orderings. We can use this

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[92]Out of the 4 hits, 3 are instances where it seems likely that *sehr* modifies the verb rather than the noun.

[93]All 17 hits are cases where *sehr* modifies the verb and not the noun.

test, to see whether adjectives such as *tall* actually provide *extensive* interpretations.

(169) Robert ran 2 miles and Roberta ran 5 miles more.

  a. Roberta ran 5 miles (additive).

  b. Roberta ran 7 miles (comparative).

(170) Robert is 5ft tall and Roberta is 2ft taller.

  a. * Roberta is 2ft tall (additive unavailable).

  b. **Roberta is 7ft tall.**

(171) The wire is bent 45 degrees and the rail is bent 5 degrees more.

  a. * The rail is bent 5 degrees (additive unavailable).

  b. **The rail is bent 50 degrees.**

We can see that the *additive* reading is unavailable in (170) and (171). This strengthens Baglini (2015)'s case that adjectives are equivalence class ordered states. The *extensive* interpretation of dimensional adjectives with pre-defined measure units is a superficial effect.

In chapter 2 and chapter 3, I briefly discussed predicate nominals and their behavior such that they employ *sehr* in constructions that include plurals, see (10). I concluded that the plural is a result of agreement, based on data such as (55).

(10) Die Ärzte in meinem Krankenhaus sind zu **sehr**/*viel Profis
The doctors in my hospital are too very professionals
um so einen Fehler zu machen.
(in order) to such a mistake to make
"The doctors in my hospital are too professional to make this kind of mistake."[94]

(55) * Die Ärzte in meinem Krankenhaus sind zu sehr **Profi**
The doctors in my hospital are too very **professional.SG**
um so einen Fehler zu machen.
(in order) to such a mistake to make
intended: "The doctors in my hospital are too professional to make this kind of mistake."

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[94]The more literal translation here would be: "They are too much of professionals to..."

However, the assumption of a Baglini (2015) style analysis for states gives us an added tool to discuss predicate nominals over count nouns. Predicate nominals of count nouns treat their object nouns as states, hence we get intensive measurements and *sehr*.

4.6.1 The Issue of Differential Comparatives

In subsection 3.5.3, I mentioned that the occurence of *viel* with differential comparatives is a potential issue for Baglini (2015)'s proposal. As I have argued in favor of her view of states, I need to address this. Recall that *viel* is in complementary distribution with other measure phrases in these constructions:

(86) "Zhou is (*much) 5 inches (*much) taller than Peter.

(87) Mergin ist (*viel) fünf Kilo (*viel) schwer-er als Asma.
    Mergim is (*much) five kilograms (*much) heavy-COMP than Asma
    "Mergim is five kilograms heavuer than Asma."

(88) Die Anden sind {fünfmal/um einiges/viel} schön-er als die Alpen.
    The Andes are {five times/by a lot/much} beautiful-COMP than the Alps
    "The Andes are (five times/a lot/much) more beautiful than the Alps.."

As I previously mentioned, a typical treatment for these constructions in one such as Lechner (2020: 6, ex. (10))'s, where the comparative introduces a differential degree argument.

(81) $[\![MORE]\!]= \lambda d_d.\lambda d'_d.\lambda g_{<d,<e,t>>}.\lambda x_e.\text{MAX}(\lambda d'.g(d')(x)) > d + d'$
    (Lechner 2020: 6, ex. (10))

If we want to adapt this to the kind of Wellwood (2015) treatment I introduced in section 4.3, example (150), then the differential comparative would look something like (172), where d is introduced by the "than-phrase" and d' is introduced by the differential phrase.

(172) $[\![-er_{diff}]\!] = \lambda g\lambda d\lambda d'\lambda\alpha.g(\alpha) > d + d'$

Now the question then is, why can d' be introduced via *viel* and not via *sehr* in comparatives. Importantly, this distribution is true for *all* comparatives, regardless of category:

(173)   Ich spiele {fünfmal/um einiges/viel/***sehr**} mehr als du.
       I play {five times/by a lot/much/***very**} more than you
       "I play (five times/a lot/much) more than you"

(174)   Ich liebe sie {fünfmal/um einiges/viel/***sehr**} mehr als du.
       I love her {five times/by a lot/much/***very**} more than you
       "I love her (five times/a lot/much) more than you"

It turns out that this is not a behavior of adjectival comparatives, but of comparatives (and excessives) in general. They uniformly allow their differential argument to be introduced by *viel*. I argue that this is because the *differential argument is a measure phrase object*. We have already seen in chapter 3, that states such as *weigh* can have *viel* as a measure phrase object. In fact they also resist *sehr* as a measure phrase object.

(60)   Ich wiege viel.
      I   weigh much
      "I weigh a lot."

(61)   * Ich wiege siebzig Kilo   viel.
        I   weigh seventy kilograms much

(175)   * Ich wiege sehr.
        I   weigh very

In these constructions, *viel* is not in a degree modification relationship, hence its selectional properties are not at issue. Why *sehr* is banned in these constructions is unclear. It is perhaps the case that a measure phrase object needs to allow for a quantificational interpretation, which *viel* provides via its requirements for a mereological mapping. However, the exact mechanisms I leave to future research.

4.6.2 On the Nature of *Sehr + Viel*

At the end of subsection 4.1.3, I briefly mentioned that *sehr* may modify *viel*, but not the other way around, based on data seen below. I argued that this is due to the fact that *viel* functions as a kind of adjective in these constructions and hence does not supply a monotonic measurement. A brief explanation as to how this works in practice is warranted here.

(133)   I love her very much.

(45a)   Sie liebt dich {**sehr**/*viel}.
        She loves you {very/*much}
        "She loves you very much" (*viel* is not licensed)

(134)   ?? Sie liebt dich sehr viel.
              She loves you very much

(135)   * Sie liebt dich viel   sehr.
            She loves you much very

(136)   Sie läuft sehr viel.
        she runs very much
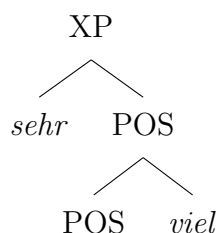   "She runs quite a lot."

Figure 4.5: Rudimentary sketch of the syntax of *sehr viel*

I assume based on Dunbar & Wellwood (2016: 16, footnote 18) that overt bare modification by *viel* (and *sehr*) involves a covert *POS-morpheme* on top of the operator. See Figure 4.5 for a sketch of *sehr viel* under these assumptions.[95]   I

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[95]I am labeling the highest projection as XP in this figure as I want to remain agnostic on the hierarchical relationship between *sehr* and *POS* in this configuration.

argue that this is the reason why *sehr viel* can be licensed, as the POS-morpheme in combination with *viel* creates an adjective-like meaning. This predicts that *sehr viel* is not licensed in comparative/excessive constructions as in those environments *viel* provides a measure function for the comparative morpheme and we do not expect a POS-morpheme to be present. This is borne out in the data:

(136)   Sie läuft sehr viel.
        she runs very much
        "She runs quite a lot."

(176)   Sie läuft zu viel.
        she runs too much
        "She runs too much."

(177)   * Sie läuft zu sehr viel.
          she runs too very much
        intended: "She runs way too much."

It then also follows why *viel + sehr* is not licensed. The bare occurence of *sehr* necessitates a POS-morpheme, just as the bare occurrence of *viel*. There is no monotonic measurement available in this configuration. The availability of *sehr viel* is limited to contexts of bare *viel*-modification due to the availability of a POS-morpheme in those constructions.

CHAPTER 5

Discussion

I have shown that German provides evidence for Baglini (2015)'s claim that states are ordered via equivalence classes rather than part-whole relationships. I have argued that we can explain the German distribution of *viel* and *sehr* by assuming a Wellwood (2015)-type treatment with the added caveat that *sehr* involves intensive measures and Baglini (2015) is correct about states.

I have assumed with Wellwood (2015) that degrees are introduced compositionally, even in adjectives, however the analysis does not hinge on extending this compositionality to adjectives.

The arguments brought forward here do not necessarily challenge a *more-internal-much*-hypothesis (see: Bresnan 1973), but it does assume that in German the comparatives for states are built involving *sehr* and not *viel*. This assumption seems to withstand superficial investigation:

(178) Er ist schön,   er ist es sogar zu *sehr.*
       He is beautiful he is it even too very
       "He is beautiful, in fact too much so."

While Baglini (2015) is correct that states do not provide *extensive/s-monotonic* measurements lexically, they can provide them compositionally if they are stage-level adjectives, see section 4.5.

With regards to measurements, the intuitive semantics of a concept seem to be somewhat divorced from how languages measure that concept. The grammatical category has an influence on the degree semantics. Even though conceptually *hunger* is a state, German treats the nominal as a mass noun, see (179). Wolof, on the other hand, as Baglini (2015) shows, can treat stative nouns as proper states with regards to measurements.

(179)   Concept: *hunger*

    a. Ich habe **viel** Hunger.
       I   have much hunger
       "I have a lot of hunger." (nominal)

    b. Ich hungere **sehr**.
       I   hunger very
       "I hunger very much." (verbal state)

    c. Ich bin **sehr** hungrig.

       I am very hungry

       "I am very hungry." (adjectival state)

Consider English *furniture.* Conceptually, furniture should be a count noun, but the language treats it as a mass noun. This has an impact on how the language allows speakers to measure furniture.

(180)   We don't have much furniture at home.

(181)   * We don't have much dog at home.

We observe a similar effect with adjectives that are graded along dimensions that have culturally defined units of measurement, such as *heavy, tall, short.* Intuitively one may expect that these adjectives behave more like mereologies. After all, we can add five feet and six feet together and yield eleven feet. But, as shown in section 4.6, these adjectives do not have the types of additive readings we would expect from their pre-defined measurement units.

Equally, speakers can create new meanings, by using a measure function that is not associated with the grammatical category, such as the example in (157).

(157)   Du rennst mir **zu sehr**, kannst du ein bisschen langsamer gehen?
       You run   me to   very   can you a   little   slower walk
       "You're going too fast for me, can you slow down?"[96]

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[96]"Laufen" and "rennen" are synonyms for *run,* there are some regional differences as to the exact meanings. In some regions "laufen" can be used synonymous with *walk.*

Languages can be (overtly) sensitive to the differences in measurements, as we see in German or Wolof. English does not seem to have a morphological reflex sensitive to *extensive* and *intensive* measurements. However, this does not entail that this difference is not present in the language covertly.

Bibliography

Anderson, Curt & Marcin Morzycki. 2015. Degrees as kinds. *Natural language and linguistic theory* 33(3). 791–828. `https://doi.org/10.1007/s11049-015-9290-z`.

Baglini, Rebekah. 2015. *Stative predication and semantic ontology: a cross-linguistic study*. University of Chicago Dissertation.

Bale, Alan C., Bernhard Schwarz & David Shanks. 2022. Monotonicity revisited: mass nouns and comparisons of purity. *J. Semant.* 38. 681–708.

Bale, Alan Clinton. 2008. A universal scale of comparison. *Linguistics and Philosophy* 31(1). 1–55. `https://doi.org/10.1007/s10988-008-9028-z`.

Bartsch, Renate & Theo Vennemann. 1972. The grammar of relative adjectives and comparison. *Linguistische Berichte* 20. 19–32.

Bhatt, Rajesh & Roumyana Pancheva. 2004. Late merger of degree clauses. *Linguistic Inquiry* 35(1). 1–45.

Bolinger, Dwight. 1972. *Degree words*. eng. Reprint 2013. Includes bibliographical references and indexes. The Hague: Mouton.

Bresnan, Joan. 1973. Syntax of the comparative clause construction in english. *Linguistic Inquiry* 4(3). 275–343.

Carlson, Gregory N. 1977. *References to kinds in english*. University of Massachusetts Amherst dissertation.

Chierchia, Gennaro. 1998. Plurality of Mass Nouns and the Notion of "Semantic Parameter". In Susan Rothstein (ed.), *Events and Grammar*, 53–103. Dordrecht: Springer Netherlands. `https://doi.org/10.1007/978-94-011-3969-4_4`. `https://doi.org/10.1007/978-94-011-3969-4_4`.

Corver, Norbert. 1997a. Much-support as last resort. *Linguistic Inquiry* 28. 119–164.

Corver, Norbert. 1997b. The internal syntax of the dutch extended adjectival projection. *Natural Language and Linguistic Theory* 15. 289–368.

COSMAS. N.d. *COSMAS I/II (Corpus Search, Management and Analysis System)*. Mannheim. `http://www.ids-mannheim.de/cosmas2/`.

Cresswell, M.J. 1976. The semantics of degree. In Barbara H. Partee (ed.), *Montague grammar*, 261–292. Academic Press. `https://doi.org/https://doi.org/10.1016/B978-0-12-545850-4.50015-7`. `https://www.sciencedirect.com/science/article/pii/B9780125458504500157`.

Dunbar, Ewan & Alexis Wellwood. 2016. Addressing the 'two interface' problem: comparatives and superlatives. *Glossa: a journal of general linguistics* 1(1). `https://doi.org/10.5334/gjgl.9`. `https://www.glossa-journal.org/article/id/4816/` (2 January, 2022).

Hackl, Martin. 2000. *Comparative quantifiers*. Massachusetts Institute of Technology dissertation. `https://web.mit.edu/hackl/www/papers/files/NThesis5.pdf`.

Heim, Irene. 1985. *Notes on comparatives and related matters*. Ms. Austin.

Heim, Irene & Graham Katz. 2001. Degree Operators and Scope (A)temporal Complements. In Caroline Féry & Wolfgang Sternefeld (eds.), *A Festschrift for Arnim von Stechow*, 214–258. Berlin, Boston: Akademie Verlag. `https://doi.org/doi:10.1515/9783050080116.214`. `https://doi.org/10.1515/9783050080116.214`.

Heim, Irene & Angelika Kratzer. 1998. *Semantics in generative grammar*. Oxford: Blackwell.

Kennedy, Christopher (ed.). 1999. *Projecting the adjective : the syntax and semantics of gradability and comparison*. New York: Garland.

Kennedy, Christopher. 2007. Vagueness and grammar: the semantics of relative and absolute gradable adjectives. *Linguistics and Philosophy* 30. 1–45. `https://doi.org/10.1007/s10988-006-9008-0`.

Kennedy, Christopher & Louise McNally. 2005. Scale structure, degree modification, and the semantics of gradable predicates. *Language* 81(2). 345–381.

Kratzer, Angelika. 1989. Stage-level and individual-level predicates. *University of Massachusetts Occasional Papers in Linguistics* 15.

Kratzer, Angelika. 1995. Stage-level and individual-level predicates. In Greg N. Carlson & Francis Jeffry Pelletier (eds.), *The generic book*, chap. 2, 125–175. Chicago: Chicago University Press.

Kratzer, Angelika. 2004. Telicity and the Meaning of Objective Case. In Jacqueline Guéron & Jacqueline Lecarme (eds.), *The Syntax of Time.* The MIT Press. `https://doi.org/10.7551/mitpress/6598.003.0017`. `https://doi.org/10.7551/mitpress/6598.003.0017`.

Krifka, Manfred. 1998. The Origins of Telicity. In Susan Rothstein (ed.), *Events and Grammar*, 197–235. Dordrecht: Springer Netherlands. `https://doi.org/10.1007/978-94-011-3969-4_9`. `https://doi.org/10.1007/978-94-011-3969-4_9`.

Kuno, Susumu. 1970. Some properties of non-referential noun phrases. In *Studies in general and oriental linguistics, presented to Shirô Hattori*.

Lakoff, George. 1966. Stative adjectives and verbs in english. In *Mathematical linguistics and automatic translation* (Harvard University Computation Laboratory Report NSF-17). Cambridge, Massachusetts.

Lechner, Winfried. 2020. Clausal vs Phrasal Comparatives. In *The Wiley Blackwell Companion to Semantics*, 1–39. John Wiley & Sons, Ltd. `https://doi.org/https://doi.org/10.1002/9781118788516.sem076`. `https://onlinelibrary.wiley.com/doi/abs/10.1002/9781118788516.sem076`.

Link, Godehard. 1983. The Logical Analysis of Plurals and Mass Terms: A Lattice-theoretical Approach. In Rainer Bäuerle, Christoph Schwarze & Arnim von Stechow (eds.), *Meaning, Use, and Interpretation of Language*, 302–323. Berlin,

Boston: De Gruyter. `https://doi.org/doi:10.1515/9783110852820.302`. `https://doi.org/10.1515/9783110852820.302`.

Lønning, Jan Tore. 1987. Mass terms and quantification. *Linguistics and Philosophy* 10(1). 1–52. `http://www.jstor.org/stable/25001261` (3 May, 2023).

Lübbe, Anja & Irene Rapp. 2011. Aspekt, temporalität und argumentstruktur bei attributiven partizipien des deutschen. *Zeitschrift für Sprachwissenschaft* 30. 259–299.

Lüngen, Harald. 2017. Dereko – das deutsche referenzkorpus: schriftkorpora der deutschen gegenwartssprache am institut für deutsche sprache in mannheim. *Zeitschrift für germanistische Linguistik* 45(1). 161–170. `https://doi.org/doi:10.1515/zgl-2017-0008`. `https://doi.org/10.1515/zgl-2017-0008`.

Maienborn, Claudia. 2008. On Davidsonian and Kimian States. In *Existence: Semantics and Syntax*, 107–130. Dordrecht: Springer Netherlands. `https://doi.org/10.1007/978-1-4020-6197-4_4`.

Nakanishi, Kimiko. 2007. Measurement in the nominal and verbal domains. *Linguistics and Philosophy* 30(2). 235–276. `https://doi.org/10.1007/s10988-007-9016-8`.

Neeleman, Ad, Hans van de Koot & Jenny Doetjes. 2004. Degree expressions. *Linguistic Review* 21(1). 1–66.

Nitschke, Remo. 2022. On the extended projection of german adjectives. In Phoevos Panagiotidis & Moreno Mitrović (eds.), *A0: the lexical status of adjectives* (Language Faculty and Beyond), 219–256. Amsterdam & Philadelphia: J. Benjamins.

Rett, Jessica. 2008. *Degree modification in natural language*. Rutgers University dissertation. `https://rucore.libraries.rutgers.edu/rutgers-lib/24864/`.

Rett, Jessica. 2014. The polysemy of measurement. *Lingua* 143. 242–266. `https://doi.org/https://doi.org/10.1016/j.lingua.2014.02.001`. `https://www.sciencedirect.com/science/article/pii/S002438411400031X`.

Rothstein, Susan. 1999. Fine-grained structure in the eventuality domain: the semantics of predicative adjective phrases and be. *Natural Language Semantics* 7. 347–420.

Rothstein, Susan. 2010. Counting and the mass/count distinction. *Journal of Semantics* 27(3). 343–397. `https://doi.org/10.1093/jos/ffq007`. `https://doi.org/10.1093/jos/ffq007`.

Schwarzschild, Roger. 2006. The role of dimensions in the syntax of noun phrases. eng. *Syntax (Oxford, England)* 9(1). 67–110. `https://doi.org/10.1111/j.1467-9612.2006.00083.x`.

Schwarzschild, Roger. 2008. The semantics of comparatives and other degree constructions. *Language and Linguistics Compass* 2(2). 308–331.

Solt, Stephanie. 2015. Q-adjectives and the semantics of quantity. eng. *Journal of semantics (Nijmegen)* 32(2). 221–273. `https://doi.org/10.1093/jos/fft018`.

Solt, Stephanie. 2019. Proportional comparatives and relative scales. *Proceedings of Sinn und Bedeutung* 21(2). 1123–1140. `https://ojs.ub.uni-konstanz.de/sub/index.php/sub/article/view/188`.

Sommerfeldt, Karl-Ernst. 1988. Zur wortklassifikation des deutschen: untersuchungen zur wortzugehörigkeit partizipialer bildungen. *ZPSK* 41(2). 221–229.

von Stechow, Arnim. 1984. Comparing semantic theories of comparison. *Journal of Semantics* 3. 1–77.

Tovena, Lucia M. 2001. Between mass and count. In K. Megerdoomian & L.A. Bar-e (eds.), *Proceedings of the 29th west coast conference on formal linguistics (wccfl)*, 565–578. Somerville, Mass.

Wellwood, Alexis. 2015. On the semantics of comparison across categories. *Linguistics and Philosophy* 38(1). 67–101. `https://doi.org/10.1007/s10988-015-9165-0`. `http://link.springer.com/10.1007/s10988-015-9165-0` (2 January, 2022).

Wellwood, Alexis. 2016. States and events for s-level gradable adjectives. *Semantics and Linguistic Theory* 26. 166. `https://doi.org/10.3765/salt.v26i0.3802`. `http://journals.linguisticsociety.org/proceedings/index.php/SALT/article/view/26.166` (2 January, 2022).

Wellwood, Alexis. 2018a. Structure preservation in comparatives. *Semantics and Linguistic Theory* 28. 78. `https://doi.org/10.3765/salt.v28i0.4413`. `https://journals.linguisticsociety.org/proceedings/index.php/SALT/article/view/28.78` (2 January, 2022).

Wellwood, Alexis. 2018b. WHAT *more* IS. *Philosophical Perspectives* 32(1). 454–486. `https://doi.org/10.1111/phpe.12121`. `https://onlinelibrary.wiley.com/doi/10.1111/phpe.12121` (2 January, 2022).

Wellwood, Alexis, Valentine Hacquard & Roumyana Pancheva. 2012. Measuring and Comparing Individuals and Events. *Journal of Semantics* 29(2). 207–228. `https://doi.org/10.1093/jos/ffr006`. `https://doi.org/10.1093/jos/ffr006`.

Yusa, Noriaki. 1992. The syntax of predicate nominals. eng. *ENGLISH LINGUISTICS* 9. 84–109. `https://doi.org/10.9793/elsj1984.9.84`.

Zimmermann, Ilse. 1999. Partizip ii - konstruktionen des deutschen als modifikatoren. *ZAS papers in linguistics* 14. 123–146.