Modern theoretical linguistics lives by the insight that the meanings of complex expressions derive from the meanings of their parts and the way these are composed. However, the currently dominating theories of the syntax-semantics interface hastily relegate important aspects of meaning which cannot readily be aligned with visible structure to empty projecting heads non-reductively (mainstream Generative Grammar) or to the syntactic construction holistically (Construction Grammar). This book develops an alternative, compositional analysis of the hidden aspectual-temporal, modal and comparative meanings of a range of productive constructions of which pseudoreflexive, excessive and directional complement constructions take center stage. Accordingly, a contradiction-inducing hence semantically problematic part of literally coded meaning is locally ignored and systematically realized “expatriately” with respect to parts of structure that achieve the indexical anchoring of propositional contents in terms of times, worlds and standards of comparison, thus yielding the observed hidden meanings.
Patrick Brandt

Discomposition Redressed

Hidden Change, Modality, and Comparison in German
Preface

The fundamental idea that the meanings of complex expressions derive from the meanings of their parts and their way of combination – a.k.a the principle of compositionality – has come to a crisis: the currently dominating theories of the syntax-semantics interface all too readily relegate aspects of meaning that cannot be traced to visible structure to stipulated primitives or non-reduced wholes. In effect, analysis is replaced by statements that observed meanings are there because they are there. At a theoretical level, such tautological statements are pointless as they could not be proven wrong, viz. falsified.

The alternative main thesis developed here is that prominent part of regularly recurring hidden meanings – namely, specific aspectual-temporal, modal and comparative semantics – result from interface repair mechanisms: syntactic-semantic composition may “go wrong” but be automatically redressed in a defined and logically nearby fashion. The added grammatical value is twofold:

1. *prima facie* corrupt structures are put to productive use

2. highly requisite meanings are economically expressed

Regarding the first benefit, it is important to realize that the grammatical machinery is extremely poor in view of what needs to be accomplished: a handful of rules of composition and transformation operating on a limited lexicon has to suffice to represent an infinite and highly heterogenous stock of concepts and thoughts describing reality and possibility. Furthermore, not all operations yield a useful semantics in all domains – e.g., the grammatical operation of reflexivization cannot meaningfully apply to relations that are asymmetric. However, nothing prevents operations from applying also ‘in the wrong place’, if syntax is autonomous. For example, we make the original proposal that German *zu* ‘to(o)’ marks exactly that reflexivization has applied to an asymmetric relation. The modal interpretation of excessive structures is the consequence of ‘pushing’ part of the problematic (namely, contradictory) logical form of reflexivized comparatives to the indexical level where propositional contents are anchored to times, worlds and standards of comparison (viz. thresholds). The hidden meaning can be expressed as well without the repair step and more transparently, but only with more expressive effort (cf. Reinhart 2006) – this is the second benefit.

Everything is not directly accomplished – not all syntax-semantics mappings, and not all linguistics books. Work on the present monograph started more than 15 years ago when I (thought I) had understood how the two main results of my PhD dissertation – that dative arguments in German ‘bind’ a location argument lower in the structure and that the structures containing them are
interpreted in terms of two dissociated truth intervals – actually relate (namely, the second condition is the reflex of the repair necessitated by complying with the first condition). After many failures, new starts and detours, this work finally became my Habilitationsschrift as submitted to the Department of Philosophy of the University of Mannheim in September 2016.

Some of the central theoretical claims and empirical phenomena discussed here are presented in a more compact yet armchair fashion in Brandt (2016). Schumacher, Weiland-Breckle and Brandt (2018) present experimental work suggesting that there is psychological reality to the analyses put forward here. It is my hope that the publication of this book finds justification in readers who discover something of interest to them in this naturally broader, better founded and more self-contained format. When I prepared the manuscript for print, I tried to eliminate as many mistakes, stylistic shortcomings and redundancies as possible. I am afraid the book still contains many things that one could do much better and at the same time doesn’t contain many things that one should have done or could even only start doing now. May the benevolent reader be able to redress at least some of these shortcomings.

Habilitationss depend on patronage. Angelika Wöllstein and Ludwig Eichinger had the sovereignty to tolerate as well ideas that to some may seem delicate, juvenile or precarious and carried me through the process in the most supportive and friendly yet professional fashion. No less important has been the engaged interest, benevolent reception and positive vote of Angelika Storrer (Mannheim) and Peter Gallmann (Jena), who completed my committee.

It is impossible to recall and mention everybody who had a positive impact on this work. Beyond the personalities mentioned above, I would like to thank Alexis Dimitriadis, Eric Fuß and Nico Spindler for particularly inspiring and encouraging discussions closely related to issues treated here. More specific content-related acknowledgments can be found in situ throughout the book.

Finally, the altruistic engagement of unsung adepts in the \LaTeX{} community and the help of Melanie Kraus and Norbert Cüßler-Volz were indispensable for bringing the content presented here into the required shape.

“And during the few moments that we have left, we want to talk right down to earth in a language that everybody here can easily understand.”

Malcom Little: *Message to the Grass Roots*

(edited quote by Living Colour)
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To Sinje, Felix and Johanna
1. Introduction

The fundamental puzzle of natural language lies in how the meaning of complex expressions derives from the meanings of their parts and the way these parts are put together, a.k.a. compositionality. For many a class of cases, we appear to have a reasonably simple compositional analysis. However, there are as well many highly commonly employed classes of structures that appear to resist a more or less straightforward compositional analysis. For such cases, it has become common to claim a ‘construction meaning’ (Goldberg 1995), i.e., a meaning that is holistically associated with the construction rather than being reducible to the meaning of its parts together with their syntax. Similarly, in mainstream generative grammar, invisible heads are typically postulated to capture meaning aspects that do not appear to be reducible to properties of traceable projecting categories.

This book advances compositional analyses of certain such structures that resist a straightforward analysis in established terms. The central idea is that in the derivational patterns that derive them, an “illegal” step is made that renders the structures generated as such unusable, or, more technically speaking, uninterpretable at the interface to semantic, i.e., truth-conditional representations. The defect – a form of contradiction – is however routinely repaired or compensated for in a certain well-defined and formally nearby manner which, eventually, even delivers an advantage as concerns the efficient coding of information. We emphasize that the mechanism here proposed is quite unlike what is commonly called “coercion”, which conveys that things are “made fit” locally. The central trait of the mechanism of “expatriate interpretation” that we propose is that syntax-semantics pairings are adjusted by interpreting a certain part of a problematic meaning component dislocally, i.e., \textit{ex situ} (while overwhelmingly, the term “coercion” is used for processes or operations that solve certain problems locally, i.e., \textit{in situ}). Let us present the proposal in the briefest fashion, in order to try to explain and justify it on the next 250 or so pages. Expatriate Interpretation (short: EI) is characterized in (1).

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1 Cf. for excellent recent overview and discussion Dowty (2007) or Kracht (2007).
2 A German word that captures the author’s intentions more properly is “Zurechtbiegungsmechanismus” (‘mechanism to bend it right’), suggested by Professor Ludwig M. Eichinger; it has the disadvantage of being quite untranslatable into English.
3 Cf. for detailed exposition section 2.1.2. Cf. for some discussion of the nature of coercion phenomena and relevant references Brandt/Fuß (2013, pp. 16-19).
Introduction

(1) **Expatriate Interpretation (EI)**
Morphosyntactic feature \( [f] \) on expression \( \alpha \) cannot be interpreted in terms of the corresponding semantic feature \( [F] \) with respect to the meaning of \( \alpha \). Part of \( [F] \) is interpreted with respect to the meaning of an element in \( \alpha \)'s linguistic context.

In the classes of cases here discussed – including what are called inchoative, middle, directional complement, excessive or tough-constructions – the feature \( [f] \) is \( \text{Diff} \) (“difference”), defined as the (generalized) quantifier in (2).

\[
\text{Diff} = \lambda S \lambda P \exists x S(x) \land P(x) \land \exists x S(x) \land \neg P(x)
\]

‘The sets \( S \) and \( P \) such that there is an element of \( S \) that is in \( P \) and there is an element of \( S \) that is not in \( P \)’

The meaning of \( \text{Diff} \) is fundamentally relational, and so general that we often do not notice it. However, the assertion of \( P \) and \( \neg P \) of one and the same individual, in different manifestations, violates the law of contradiction (LC).

In reaction, EI ‘pushes’ elsewhere the part of \( \text{Diff} \) that corresponds to the right hand side of the formula. Neglecting the “\( S \)”, we are left with what we refer to as the O-meaning part of \( \text{Diff} \), short \( \text{Diff-O} \).

\[
\text{Diff-O} = \lambda P \exists x \neg P(x)
\]

‘The set \( P \) such that there is something that is not in \( P \)’

\( [f] \) may occur on different categories, including in particular nouns and verbs. In the classes of cases here discussed, \( [f] \) is contributed by closed-class functional elements including verbal and nominal affixes or anaphoric pronouns. Center stage take classes of expressions that we will refer to by the signs in (4).

\[
/\text{er}/, /\text{tsu}/, /\text{zich}/
\]

Although the mechanism is always the same, its effects may appear diverse. The observed variation is just an effect of the domain in which \( \text{Diff-O} \) is eventually interpreted. Choice of the domain is governed in particular by principles of laziness and restricted by more general design features of the syntax-semantics interface: it is arguable that EI happens only within a computational cycle or from one computational cycle to the next (“higher”) computational cycle.

---

4 S serves as a tertium comparationis ensuring that the xs on the left and right hand side are comparable, cf. sections 2.3.1 and 3.3.1 in particular.

5 \( \text{Diff-O} \) is also known as the existential negative, viz. something is not \( P \).

6 The notation is deliberately chosen so as to suggest that the elements have essentially the status of traditional morphemes while parallel form-meaning pairings can be found well beyond German(ic) and its particular phonemic inventory, cf. sections 2.1.1 or 2.3.
The general idea that the structures delivered by the generative engine are sometimes or maybe even often not as such usable but in need of some sort of adjustment is by no means new, to be sure. In fact, repair mechanisms are part and parcel of the bulk of modern theories that are concerned with the interface between morphology and phonology, syntax and morphology, and syntax and phonology. To give just a few examples, we have at the interface between morphology and phonology/phonetics operations of resyllabification, epenthesis as well as various assimilation processes that adapt morphological structures to the needs of articulation and perception (cf., e.g., Wiese 2000 for German); regarding the interface between syntax and morphology, it is customary to assume, e.g., that the suppletion of an accusative object by a reflexive pronoun in certain environments in languages like French, Greek or Basque compensates for the violation of what has come to be known as the “person case constraint”, requiring the direct object to be third person in the presence of a dative argument where both are phonologically weakly expressed (cf. Rezac 2008 and references therein). Regarding relative clauses, case mismatches between relative pronouns seem to be circumvented by case syncretism (Groos/van Riemsdijk 1981); the expression of a first or second person pronoun next to the third person relative pronoun appears to repair for the lack of non-third person relative pronouns in German (cf. Du der Du bist im Himmel ... ‘You who is in heaven ...’; Struckmeier 2013). Regarding the interface between syntax and phonology, analyses encompassing repairs have been proposed for various phenomena, including “repair by ellipsis” in object shift and sluicing constructions (cf. Lasnik 1999 and recently den Dikken 2013) or syntactic haplology as a means to avoid the crosslinguistically unwelcome repetition of morphemes in adjacent positions (Neeleman/van der Koot 2005; Nevins 2012; Fuß/Grewendorf 2014) or more generally (near-) obligatory deletion processes in various structures that minimize expression of redundant features. When it comes to the interface between syntax and semantics, however, the belief in the generative camp in particular seems to have been and still seems to be that relations here are more or less if not completely perfect; the extremely successful theory of types (Russell 1908) and its offspring could hardly have developed without the assumption that there are very strong iconic principles between syntactic and semantic categories and rules. Delaying discussion of how the prejudice of syntax-semantics “perfectionism” is arguably rooted in the logico-empiricist tradition that has prepared the ground for generative grammar, there is no a priori reason why the relation between syntax and semantics should be so exceptionally well designed. What makes the syntax–semantics interface dif-

---

7 Cf. for a collection of recent analyses in terms of repair in different domains the collection of papers in Brandt/Fuß (2013).

8 Cf. chapter 2. Pleas for digressions from ‘perfectivism’ are heard more often now, cf., e.g., Reinhart’s (2006) interface “repair” strategies. Chomsky (2008, p. 10) states that
fient is that potential repairs or compensation mechanisms can only indirectly be observed, as we cannot look at (the building of) meaning representations directly. The only feasible way is comparing theories with regard to the amount of machinery they use in order to account for systematic correlations between forms and meanings, starting from the assumption that scientific progress lies in covering more phenomena with lesser means. Accordingly, a common analysis of a whole range of phenomena hitherto thought unrelated will provide the argument for the partly novel proposals regarding the compositional process that we wish to advance here. Semantically illegal steps may actually appear likely to be taken as there is no little person in our heads that checks whether or not the combination of certain processes makes direct sense or not. Instead, we would expect the basic routines to apply anywhere where they could apply in principle. This said, initial examples for the structures that figure most centrally in this work are given in (5). These are so-called ‘pseudo-reflexive’ constructions (inchoatives and middles as in (5-a)), excessive comparative constructions as in (5-b), constructions featuring directional PP complements as in (5-c), constructions featuring dative case-marked arguments as in (5-d), and ‘existential’ constructions as exemplified in (5-e).

(5) a. Der Koffer öffnet sich (leicht).
   the suitcase opens REFL easily
   ‘The suitcase opens up (easily).’

   b. Otto ist zu schwer (um Jockey zu sein).
   Otto is too heavy (PRF Jockey to be)
   ‘Otto is too heavy to be a Jockey.’

   c. Die Vase fiel auf den Boden.
   the vase fell to the ground.

   d. Der Ede ist dem Otto aufgefallen/sympathisch.
   the Ede is the Otto-DAT struck/sympathetic
   ‘Otto struck Ede./’Otto finds Ede friendly.’

   e. Da/Es ist Bier im Kühlschrank.
   There/It is beer in the refrigerator

[And] expressions that are “deviant” are not only often quite normal but even the best way to express some thought; metaphors, to take a standard example, or such evocative expressions as Veblen’s “perform leisure.” That includes even expressions that crash, often used as literary devices and in informal discourse, with a precise and felicitous interpretation at the interfaces.

In a footnote, Chomsky comments that “these are the earliest assumptions of generative grammar, in Chomsky 1955 and later work”. As the formulation in the citation also shows, however, the use of deviant structures is presented as a matter of the ‘pragmatic periphery’ rather than as a productive strategy that belongs to ‘core grammar’. Cf. sections 2.1.1 as well as 4.2.2 below for more detailed discussion.
Certain meaning aspects of these constructions are highly surprising given not just surface but also somewhat deeper analytical appearances; thus, we can observe a change of state interpretation associated with (5-a) under an inchoative construal that is similarly prominent for the directional PP construction in (5-c) or a modal interpretation associated with (5-a) under a middle construal that is similarly present in the excessive comparative construction in (5-b), regarding (5-d) or (5-e), the question is what it is that licenses the dative case-marked argument and expletive element respectively. As we will try to show in section 4.3, these latter structures live on the mechanism that gives rise to the surprising interpretations of the examples in (5-a) to (5-c). Earlier analyses account for these unexpected interpretations and patterns with construction-specific stipulations, either in the manner hinted at above (i.e., by postulating holistic construction meanings or silent heads that carry out the function that is observed) or by claiming certain elements to be lexically ambiguous in such a way as to give rise to the observed interpretations. Our proposal unites the constructions in (5) under a single common analysis the central idea of which is that structure-building may “go wrong” in derivations and be routinely compensated for. In each case, the illegal step has to do with getting it wrong with relations, in particular, with a basic condition of difference holding, *ceteris paribus*, between the elements in a relation. Here is the basic proposal again in non-technical terms:

- A difference requirement Diff coded by a grammatical formative or transitive configuration is in conflict with other properties of the construction.
- Part of the difference requirement, Diff-O, is not interpreted *in situ* but “moved” in the semantics to a different domain – regularly the domain of times, worlds or thresholds.

Putting the greatest part of what we are advocating here into a slogan, requirements implying what could be called the “Second Condition” are violated in the structures in (5). The condition is given as an imperative in (6).

(6) Second Condition Imperative:

Don’t say “second” before saying “first”

---

9 The following paraphrases bring out the modal meaning component in the middle (i-a) and excessive construction (i-b) respectively:

(i) a. One *can* easily open the suitcase.
    b. Otto is heavier than he *should* be to be a jockey.

10 The middle construction is an exception in disallowing dative arguments (for independent reasons, to be discussed in section 4.1.2).
The “second condition” is really an imperative formulation of the meaning component DIFF(erence) introduced above and discussed in more detail in due course, cf. in particular sections 2.1.2 and 2.3.1.\textsuperscript{11}

We can distinguish two basic crimes regarding (6): one consists in using symbolism that transports something like the meaning of the word “second” without making reference to a well-distinguished first element (i.e., using “second” without justification). The other crime consists in using operations that rely on the “second” property – like, e.g., reflexivization – in domains for which these are not defined. To note, reflexivization does not make sense in environments where the arguments in a relation are asymmetrically ordered (i.e., when it holds that $R< x, y >$ entails $\neg R< y, x >$). In such cases, something astonishingly simple happens, namely, the “second” meaning is interpreted with respect to different domains where such a well-distinguished first element is independently given and which have to be dealt with anyway in the syntactic-semantic derivational process. These are most usually the domains of times, worlds or thresholds, where the respective first elements are given by (anaphoric) utterance time, by the actual world, or by a contextually determined standard of comparison. The derivation of structures such as the directional PP construction in (5-c), but also the dative and existential constructions in (5-d) and (5-e) fall under the first crime of using symbolism coding “second” without justification. The inchoative and middle structures in (5-a) fall under the second crime rather by virtue of being illegally reflexivized; the excessive structure in (5-b) is guilty of both crimes, by virtue of building on the comparative construction the derivation of which, as we argue in section 3.2, generally involves the first crime that in the case of excessive structures is topped by illegal reflexivization.

The compositional mishaps we discuss deliver a result that is intolerably flawed from an interpretive perspective. The case that we are most interested in is the generation of contradictory, i.e., necessarily false structures, although tautological, i.e., necessarily true structures, play an important role as well; the latter case provides a regular basis for a repair mechanism at the syntax-semantics interface that effects strengthening, i.e., a stronger or more exclusive interpretation, by virtue of ruling out alternatives, very much like the focus particle (or quantifier, cf. section 2.1.2) *nur* ‘only’ does. In contrast, contradictions effect the ruling in of alternatives by virtue of leading to the introduction of new variable occurrences, i.e., technically speaking, by rendering independently bindable variables that have not been independently bindable before.

\textsuperscript{11} Suffice it to mention here closely related principles or conditions such as “Obviation” (Hellan 1988), the “Disjoint Reference Presumption” (Farmer/Harnish 1987), or Principle B of generative Binding Theory (Reinhart 1976). Closely related as well is Hurford’s constraint, stating that a proposition A may not be followed up on by a proposition B that is already entailed by A. cf. below and in particular section 3.2.
Contradictions may arise under various circumstances; center stage here take cases that can be characterized as violating requirements of difference. To give the simplest example, a property P and its negation $\neg P$ call for being ascribed to distinguished individuals to the extent that the interpretive coordinates – namely, times and worlds and thresholds – are kept constant. The example in (7) from Autenrieth (1997) violates this basic constraint that is known as the law of contradiction (LC).

(7) Otto is for it and Otto is against it.

We do manage to interpret sentences like (7) nevertheless, by realizing the required difference interpretation elsewhere, and with some possibility of choice – for (7), naturally occurring paraphrases might be the ones in (8).

(8) a. Sometimes Otto is for it and sometimes Otto is against it.
    b. To some extent Otto is for it and to some extent Otto is against it.
    c. In some way Otto is for it and in some way Otto is against it.
    d. ...

(8-a) talks about different times, (8-b) talks about different extents, (8-c) talks about different respects or perspectives. No one of these differences is transparently coded in (7); we argue the respective meanings arise by virtue of dislocating semantically the difference requirement $\text{Diff}$ associated with properties P (being for it) and $\neg P$ (being against it) to domains beyond that of “ordinary” individuals; of such ordinary individuals, only one – Otto – is given in (8), which should be identical to itself, i.e., have all the properties that it has, but no other, in particular, no contradictory properties.

A basic tenet of this work is that properties connected to identity and difference may present themselves abnormally depending on the matter that they apply to (cf. already Jespersen 1924). Generally in the scalar domain, the usual (Boolean) meaning of negation (namely, “complements”) changes to what is expressed by the natural language expression “less”.

In terms of sets, $\text{not}$ does not mean “another” (or “the other”) set in the scalar domain but means instead “an including set”. There is much tautology in the domain of comparative structures for this reason, as well as, in particular, contradiction with regard to requirements of difference. Confusingly, the things in the more including (bigger) sets must have no properties that the things in the more excluding (smaller) sets do not have as well (regarding, of course, only the actually coded properties). This circumstance has far-reaching consequences for the analysis of comparatives (section 3.2), leading to the novel proposal, among other, that excessive structures as in (5-b) above are reflexivized comparatives, hence inherently contradictory structures: being asymmetric, comparatives require...
different individuals to be compared, but reflexivization corresponds to identifying the argument places of the relation. We submit that the robust modal interpretation of excessive structures, much along the lines exemplified with respect to the example in (7), is the effect of this misassembly and ensuing repair (section 3.2.2).

In this way, redress for discomposition may provide for shortcuts to interpretations that, to the extent that they are easy enough to derive as well as attractive enough from the perspective of language use, may make their way into the hard-wired parts of grammar. To the extent that misassembly and its compensation can be shown to be general and systematic (as well as, of course, in keeping with approved assumptions about the meanings of the elements involved and the workings of the syntax-semantics interface more generally), the constructions in question do eventually fall under a compositional analysis and no construction meanings or questionable invisible elements need to be assumed. The logically possible and empirically instantiated variation regarding the choice that particular languages or just groups of speakers may make as to which types of problems are repairable (and how) is open to empirical inquiry which we hope to advance with this work.

The structure of this book is as follows: chapter two (“weaker construction”) argues that next to strengthening by implicature, weakening, i.e., going to entailed meanings to the disadvantage of what appears to be literally asserted, is part of the compositional process proper as well. In particular, semantically dislocating (viz. expatriately interpreting) the content of functional elements that operate in the realm of number provides a shortcut to modal interpretations (viz. “hidden modality”, section 2.1) which are weaker than their nonmodal counterparts and hence in need of marking. Strengthening and weakening may occur with respect to one and the same structure as well as lead to a redistribution of content over different semantic levels (viz. presupposed vs. asserted meaning); this is demonstrated in section 2.2 for tautological structures where weakening is followed up by strengthening by means of exhaustification, building on the analysis of Autenrieth (1997). Section 2.3 lays out the empirically central case for the study, namely, functional elements that come to code what might be called generalized difference or Diff, which we identify with the simultaneous satisfaction of the I and O corners of the traditional square of

\[12\] The title of this work is intended to convey that an element that is present in the morphosyntax “redresses”, i.e., puts on different semantic clothes (or, to say the same thing, does its semantic job in morphosyntactic camouflage). “Discomposition” is a term now out of fashion that expresses “inconsistency”. Similarly double-functioning in accord with the basic idea behind our investigation, “discomposition” has a more actual technical meaning as well in nucleonics, where it describes the knocking of an atom out of its position by nuclear impact.
opposition in the semantics. In a nutshell, Diff requires the simultaneous realization of a property P as well as its negation ¬P, requiring well-distinguished “ordinary” individuals (cf. immediately above and below) for these properties to be predicated of. “Illegal” pluralization of mass nouns illustrates how the semantic dislocation of the O part of the difference meaning, i.e., existential negative quantification, leads to novel interpretations in terms of reference to distinguished referents in terms including (i.e., more general than) those that appear to be coded. The often observed sortal interpretations as well as spatiotemporally distributed interpretations of pluralized mass nouns are cases in point (cf., e.g., Biere ‘beers’ as meaning “different sorts of beer” or “different portions of beer”).

The third chapter (“wrenches and nails”) makes a case that certain prominent apparent irregularities in grammar can be fruitfully analyzed as effects of the “abuse” of well-established grammatical routines, i.e., the application of certain operations in domains for which these operations do not appear to have been designed (or in which they did not evolve but to which they are rather exapted). The background conviction is that grammar is severely limited, implying that a routine once learned, i.e., automatized, will be put to use as much as possible. Section 3.1 is devoted to the distinction between “ordinary” and “phenomenal” individuals; the former are just humdrum objects of reference (like persons or tables or chairs), while the latter can be characterized as giving the coordinates for semantic interpretation, i.e., the times, worlds and thresholds with regard to which semantic content is always interpreted. Most traffic in terms of semantic dislocation flows from ordinary to phenomenal individuals which are subject to the same representational format (viz. logical language); however, the semantic routines yield particular results in the domain of phenomenal individuals because their domains are structured asymmetrically (i.e., if xRy then not:yRx), entailing that identity as well as negation work differently from how they work in the (antisymmetrically structured) ordinary individual domain. Section 3.2. exploits this idea of routine abuse for a novel analysis of comparative constructions, presenting them as tautological before the (largely) automatized calculation of implicatures due to which, again, well-distinguished individuals are needed in the semantics to avoid contradictoriness. Excessive constructions (cf. Otto is too heavy (to be a Jockey)) however furnish just one ordinary individual and can be thought of as illegally reflexivized comparatives. Repair in terms of semantic dislocation of an originally ordinary individual variable to the phenomenal domain is the consequence that explains their modal interpretation (i.e., interpretation in terms of well-distinguished possible worlds). Section 3.3 introduces a new variant to the mechanism of semantic dislocation of difference-related elements, or rather schemata: syntactic transitivity entails distinguished referents in the
semantics unless special operations (namely, reflexivization) apply, but certain syntactically transitive structures – in particular, constructions involving directional prepositional phrases or genitive marked arguments in German – do not furnish such distinguished referents in the semantics, triggering again semantic dislocation that effects a change of state (directional PPs) or modal semantics (genitives).

Chapter 4 (“bound to contradict”) discusses further classes of cases that lend themselves to the analysis proposed here, and thus gives more empirical flesh to the approach that derives certain hidden meanings (here: of the temporal/aspectual, modal or comparative kind) in terms of misassembly and ensuing repair. Section 4.1 argues that similar to the case of comparatives, inchoative as well as middle structures that are reflexive on the surface are indeed reflexive, but again illegally so. This time the problem lies in “binding” the subject (first argument) of a transitive relation to the object (second argument) in violation of the principle that subjects must be positively distinguished from objects (i.e., have properties that objects do not have as stated in the second condition). Section 4.2. closes the case of semantic dislocation by way of, first, discussing the infamous so-called tough-constructions that turn out to be analyzable in parallel to the earlier-discussed excessive constructions. We then take a somewhat broader perspective and relate the interface mechanism argued for here to figures of speech that similarly to but more transparently than the cases centrally discussed here rely on “getting it wrong” systematically with scales and negation. Section 4.3, finally, proposes that what is commonly called existential there as well as what are called “free datives” act as expressions that relate to the slot that is created by semantic dislocation; to use a technical metaphor, these expressions are licensed as binders of phenomenal variables which, beyond being expressly coded, may become part of the pertinent logical form as a consequence of misassembly and repair. Existential there as well as “free dative” arguments (but arguably datives more generally) themselves turn out to be expressions that carry Diff but disallow interpretation of Diff with respect to themselves. Accordingly, the environments in which these expressions occur must be such that they furnish accommodation of the dislocated (O) meaning, which is responsible for what are called “definiteness effects”.
2. **Weaker construction**

There must be a systematic relation between what we call syntax, i.e., the arrangement and manipulation of expression-related symbols, and what we call semantics, and this will here taken to be, among other, the arrangement and manipulation of meaning-related symbols, i.e., formulas coding truth conditions. The advantage of syntax is that we can see its results more or less directly in the structures that can be produced by means of the grammar that relates the structures of syntax and semantics in a systematic fashion. Specifically, we assume that

- Syntax and Semantics are both generative, i.e., capable of producing an infinite set of complex expressions on the basis of a finite set of basic expressions and rules of combination (cf. Jackendoff 1972, 1997).
- The interface as such (the association of syntactic and semantic categories or structures) is blind to semantic well-formedness.
- When propositional units are evaluated, logical forms can be manipulated in certain nearby fashions so as to overcome certain basic interpretive problems, such as in particular violations of the law of contradiction.

It would seem most straightforward to assume that in speaking, we mean what we say. It turns out, however, that compositionality involves reference to and manipulations of symbols that do not represent “what was literally said” but in particular more general or weaker meanings compared to “what was literally said”. For one thing, silently, we access meaning representations that one would traditionally call entailment or presupposition. As we will see, also entailed or presupposed meanings can be exhaustified or negated. To note, negating entailed or presupposed meanings goes against well-established laws of logic, in particular, the law of contradiction. There is no reason, however, why the symbol-manipulating operations of grammar should follow logical laws before it comes to evaluation in propositional (i.e., truth-assessable) terms. Speaking with Reichenbach (1938, p. 159):

> Propositions are tools with which we operate; all we can demand is to be able to manipulate [sic!] these tools.

According to common wisdom, speakers do not say something weaker than what they already said, to the disadvantage of that coded stronger meaning that
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would seem to have been transparently expressed by means of the particular (complex) sign that was actually used. Indeed speakers say many a weaker thing all the time, but they usually do not say the weaker things only, i.e., instead of but not along with the stronger literally coded meanings. From a Gricean hearer-perspective it appears irrational to weaken; Gricean implicature theory is all about how one can get the most of an utterance; this is so because the literal meaning is often too general, i.e., inclusive, to be interesting. If this is so, then weakening on the hearer’s side appears to be nonsensical. Grice (1978, p. 119 [1989, p. 48]) comments the matter as follows:

If one makes the further assumption that it is more generally feasible to strengthen one’s meaning by achieving a superimposed implicature, than to make a relaxed use of an expression (and I don’t know how this assumption would be justified), then Modified Occam’s Razor would bring in its train the principle that one should suppose a word to have a less restrictive rather than a more restrictive meaning, where choice is possible.

In sum, common prejudice has it that we strengthen, generally, and that this is one reason why we can afford word meanings to be general (cf. section 2.2 below). We should assume given Occam’s Razor and strengthening that word meanings are general rather than restrictive. We argue here that weakening and using the weaker meaning only (but not the stronger meaning that would seem to have been expressed) happens very systematically in what we would maybe want to call core regions of grammar, where we conceive of much of the productive part of grammar to be modelable as an automatic symbol-manipulating device.

With the exception of some endeavors in the framework of Relevance Theory (Sperber/Wilson 1986, cf. in particular Carston 1997), weakening to the disadvantage of what was literally said is almost completely ignored in the semantics/pragmatics literature. It is not supposed to exist as it appears to be already the problem of the interface that the meaning that appears to be literally conveyed (for all we know) is too weak to be actually usable. What we do a lot and can model with some success within what has come to be known as Gricean pragmatics is strenghtening, explaining successfully how we most generally appear to mean more than we actually say when we speak. That there is also weakening cannot be doubted, however, if it is often hard to see. Carston (1997) gives rather straightforward examples where weakening (“loosening” in her terms) applies so as to arrive at a meaningful interpretation.¹

¹ Carston comments that “this relaxing of a linguistically encoded meaning has been pretty much ignored outside the relevance-theoretic framework, though a general unease with any process of pragmatic loosening has been expressed.”
(1)  a. France is hexagonal.
    b. I love bald men.
    c. This steak is raw.
    d. Have you eaten my chocolate heart?
    e. Here is my new flatmate. [referring to a newly acquired cat]

The cases in (1-a) to (1-c) can be described as idealization and exaggeration respectively. Particularly pertinent to our discussion is the case in (1-d) that (like (1-e)) necessitates the negation of certain properties associated with the head noun (e.g., being organic and alive) or, alternatively, regarding as relevant only certain entailed properties (e.g., being shaped like a heart), i.e., weakening the literal meaning so as to make sense in construction with the modifying adjective. This going to entailments to the disadvantage of certain literally coded aspects of meaning appears to be what Grice (1975, p. 53) had in mind when he sketched a theory of metaphor in the context of a discussion of irony:

Examples like *You are the cream in my coffee* characteristically involve categorial falsity, so the contradictory of what the speaker has made as if to say will, strictly speaking, be a truism; so it cannot be that such a speaker is trying to get across.

Grice suggests that to the extent that a nearby logical variant of an obviously nonsensical sentence – like, in the case of irony, its (wide scope) negation – does not help, the hearer is entitled to access certain entailed meaning aspects of the expressions used to the exclusion of others until the complex expression becomes meaningful. We will use well-established mechanisms of strengthening in combination with weakening in addressing the problems concerning the constructions introduced above. In addition, the meanings of lexical elements – in particular, the meanings of grammatical formatives – will be argued here to be weaker from the start, or more underspecified semantically, than is usually assumed. For example, and speaking informally, /zich/ is standardly taken to help code the concept of identity. Identity can be taken to be mutual inclusion, and according to our analysis /zich/ codes only one half of this, i.e., one-way inclusion, namely, essentially, inclusion of the object properties in the subject properties. More precisely, the element /zich/ is usually taken to signal an operation of establishing identity (i.e., “x = y” is part of the formula giving the meaning of /zich/). We propose instead that the meaning of /zich/ is given by a formula like “x \(\supseteq\) y \(\lor\) y \(\supseteq\) x”, which makes a weaker contribution to truth conditions in that it is unilaterally entailed by the formula stating identity (identity is “x \(\supseteq\) y \(\land\) y \(\supseteq\) x” (cf. below section 4.1). The assumption of more general meanings of in particular functional elements is unproblematic as long as it is weathered by an increased “filtering” capacity of elements in the
local linguistic context (viz. “combinatoric interpretation”, cf. section 2.1.1); in effect, the assumption of weaker meanings in combination with combinatoric interpretation serves the reduction of homonomy, which is good news for the language learner.

What we call ‘construction’ following tradition will turn out not to fall under the term “construction” as understood in Construction Grammar. Here, calling a complex structure a construction is equivalent to saying that certain properties of the structure cannot be reduced to properties of its parts or known principles of composition, i.e., that there is no compositional analysis of these properties. According to Goldberg (1995), one of the main representatives of construction grammar, “construction” in this sense is defined as in (2).²

\[
(2) \quad \text{C is a construction iff} \quad \text{C is a form-meaning pair } \langle F_i, S_i \rangle \text{ such that some aspect of } F_i \text{ or some aspect of } S_i \text{ is not strictly predictable from C’s component parts or from other previously established constructions.}
\]

To the extent that the meanings of in particular grammatical formatives are highly general, they will also be widely applicable. According to our proposal, this includes the possibility that they are ‘abused’ as well, i.e., that they are used dysfunctionally in places where they do not make sense, straightforwardly, but instead lead to a result that is not interpretable without further ado. This further ado – the repair – effects what appears at first sight to be an unrelated meaning, but which can be reduced, using simple and well-defined quasi-known means, to known pairs of signs and meanings. As a side result, what is sometimes called “uniformity” (Mayerthaler 1981), i.e., a one-to-one relation between forms on the expressive side and functions or meanings on the interpretive side will turn out to be much closer to the truth than the surface suggests and than is usually assumed.³

² Similarly Jacobs (2008, pp. 9-10, who contrasts constructions with laws:

Gesetze [beschreiben per definitionem Regularitäten], während Konstruktionen dadurch, dass sie bestimmte Eigenschaften einer Zeichenklasse direkt festlegen, dem Grammatiker die Möglichkeit geben, idiosynkratische Züge der jeweiligen Zeichenklasse festzuhalten, also solche, die sich nicht aus generellen grammatischen Mechanismen ergeben.

Laws [describe regularities by definition] while constructions open the possibility to the grammarian to capture idiosyncratic traits of certain classes of signs, i.e., traits that do not follow from general grammatical mechanisms, by determining the properties of these classes of signs directly.

³ Technically, uniformity can be implemented as “one-to-one interpretability” as in (i); I owe this formalization to an anonymous reviewer of Linguistische Berichte.
2.1 Hiding modality

Time, Modality and Comparison are very noble and important things [sic!] to talk about. But our language may be not fit to talk about them, as it has evolved, plausibly, from abstraction over rules and routines that are associated with ordinary things (tables, chairs, and persons) as they have proven useful as well as had a chance to make their way into an automated device called a particular grammar of a particular natural language.

Talk about ordinary individuals is where Boolean semantics and the logic of the syllogisms work, but talk about what we could call phenomenal individuals (what we may take to be what change, modality and comparison are about) is where Boolean semantics and the logic of the syllogisms go astray. Including the need to code less stringent thought (about, e.g., causality and agentivity), natural language proves to gain from the wronggoing in that the wronggoing may lead to more economic coding of thought, i.e., evenly brief or briefer ways of expressing the same or a stronger thoughts that can be used truth-preservingly in the situations at hand (cf. section 2.2).

In this way, e.g., a contradiction that has been produced by the blindly symbol-manipulating syntax may be resolved by existentially quantifying over something that is known as a variable over possible worlds (or times or thresholds) in the formal semantics tradition and not so easily quantified over in the general case, according to common wisdom. Something else – strengthening by exhaustification – may happen in case a tautology has been produced (section 2.2.2). When we say “contradiction” or “tautology”, we mean “structure that can only be interpreted in terms of a contradiction or tautology as is”, i.e.,

(i) **One-to-one Interpretability (1T1I)**
A feature F is one-to-one interpretable (1T1I) for a grammatical class of expressions if for every member M of that class, and for every value v of that feature, there is a set P of properties p₁,...,pₙ such that the interpretation of M[F:v] has some p ∈ P, but none of the other p′ ∈ P.

4 It would be interesting to see how far it can be argued that argument alternations are a product of this as well. More generally, we may ask with Dowty (2001, p. 185):

- Do ALL argument alternations (in English) that admit some semantic classes of verbs but reject others do so because the “derived” construction in the alternation has some such semantic filtering effect?

- If so, then all semantically-restricted argument alternations must consist in (i) one syntactic pattern that is semantically basic (or “purely compositional”, or “semantically unmarked”) and (ii) a syntactic alternate that is semantically potent (adds to or changes the meaning of the verb). That is, all alternations are asymmetric. Is this true?

- Do the semantic effects produced by the semantically potent constructions fall into natural semantic classes?
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without further ado. Such “further ado” may however have made its way into the grammar over time as an automatized repair mechanism that renders structures informative or interpretable the first pass literal interpretation of which would be uninformative or uninterpretable.

Regarding the constructions that we are centrally concerned with here, the problem is that we can observe that systematically, there appears to be something present in the meaning that has no correspondent in the form. Conversely, it appears there is something present in the form that has no correspondent in the meaning. Starting with the formal side, we are dealing with two types of cases that might be pretheoretically characterized as involving uninterpreted ‘plural’ or ‘reflexive’ morphology respectively as in (3) and (4).

(3) The rains did not stop.
(4) Die Tür öffnet sich leicht.
    ‘The door opens up easily.’

Concerning (3), it would appear to make little difference whether we said instead the rain did not stop, i.e., use the morphologically singular variant. But this is not true at second sight – namely, (3) transports that there were well-distinguished stretches of rain that were interrupted by stretches of no rain, while the singular alternative captures that there was one ongoing or further indistinguishable raining eventuality that did not stop.\(^5\) For (3) to be usable, we need to distribute over time and space. This is what plural morphology does here: It signals Diff in the realm of time and space rather than in the realm of ‘ordinary’ objects (arranged in sets, as defined by their characteristic functions). It is a kind of reinterpretation, to the extent that we would be ready to take distinction among (or manifoldedness of) objects as basic.\(^6\) The more involved cases of this type that we discuss involve ‘existential’ constructions as well as constructions featuring certain case marking patterns involving in particular dative and genitive arguments (section 4.3).

As to the middle example in (4), /zich/ is plural-related in that it stems from a particular type of Diff-coding sign, namely, a transitive (nominative-accusative) structure. However, (4) involves interpretation in terms of possibility. (5) appears to be a fair natural language paraphrase of (4).

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\(^5\) It is purely conventional eventually to decide what counts as a stretch of ongoing rain.
\(^6\) Cf. for more discussion in particular section 2.3.1.
In (5), we have, for one thing, the modal expression *can* that serves to present the situation that someone open the door as possible rather than actual. There is no expression in (4), however, that is known to be associated with this interpretation in terms of possibility. Conversely, there is something in the form of (4) that does not appear to have a correspondent in the meaning, namely, the reflexive morphology that is characteristic of middles. (4) does not appear to mean that the referent of the subject expression does something to itself as we would expect given surface appearances. The question is what is the function of, or what happens to, the reflexive morphology, given that signs are usually there to be interpreted – to note, expressing the type of passive meaning we observe with inchoative or middle structures is a crosslinguistically common strategy. Kotin (1998, p. 164) writes:

Die Überlappungen der Felder der Inaktivität (Passivität) und der Reflexivität sind Ergebnis einer längeren historischen Entwicklung. Das entsprechende Reflexivformans dient in nahezu allen indogermanischen Sprachen sowohl zum Ausdruck einer reflexiven als auch zum Ausdruck einer inaktiven bzw. passiven Semantik.

The overlapping of the fields of inactivity (passivity) and reflexivity are the result of a longer historical development. In nearly all indogermanic languages, the corresponding reflexive formative serves to express a reflexive as well as an inactive or passive semantics.

Assuming the validity of what is known as the Projection Principle in generative approaches, an element is needed in the structure that is responsible for the meaning observed. If one does not want to postulate an invisible element or elements that achieve this – and this is the mainstream solution in generative work, cf. e.g. Lekakou (2005) and references therein – one appears to be left with the option of claiming the reflexive anaphor to be ambiguous such that it somehow comes to project the observed meaning (cf. Steinbach 2002). Even though we propose that it is the reflexive morphology that comes to code the modality – or, to say the same thing, that the modal interpretation stems from the reflexive morphology – in cases such as (4), this does not mean that there is something like “modal *sich*” or the like in German. Digressing somewhat from the assumption of a straightforward form-meaning mapping at the cost of assuming ambiguity, we argue that the reflexive morphology signals what it always signals, namely, that reflexivization – the derivation of a certain property from a relation – has applied. However, it has applied “the wrong way around”, so to speak, in that it is not the object that is bound to the subject but the subject that is bound to the object, in violation of
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a basic mapping principle that the argument mapped to subject position is more specific in certain grammatically relevant semantic respects (viz. more "agentive") than the argument mapped to object position (cf. section 3.3). This reduces, technically, to a form of contradiction (i.e., the derivation of a formula containing the strings $P(x)$ and $\neg P(x)$), effecting the regular way of repairing or compensating for the defect of contradictoriness that lies in making reference to situations (worlds) that are not actual but merely possible; put differently, modalization in terms of possibility saves the interpretation, similarly to what we see in examples like (6).

(6) Computers are the boon and bane of modern life.

≈Computers can be the boon of modern life and computers can be the bane of modern life.

Literally interpreted, (6) is a contradiction to the extent that we assume that the sets of things that are the boon of something and the bane of something respectively do not intersect. We regularly interpret such superficially contradictory statements in terms of possibility, thereby escaping the contradiction, be it a formal or an analytical one.\(^7\)

We propose and argue that in this way, certain systematically observable aspects of interpretation that are not directly coded in the sign are the effect of specific repair strategies that compensate for the violation of certain conditions on the semantic/pragmatic side of the interface, namely, in particular, the law of contradiction. Eventually, we do arrive at a compositional derivation of the form-meaning pairs in question, albeit that the composition may involve a detour that consists in generating a structure that is interpretatively defective in a certain manner but can be repaired, in a specific automatic manner, so that it does become interpretable after all. For the middle example, we say

\(^7\) The idea that the law of contradiction can be circumvented by modal talk can already be found in Aristotle and is formulated clearly by Peirce:

... that which characterizes and defines an assertion of possibility is its emancipation from the Principle of Contradiction.

C.S. Peirce (MS 678, p. 34, 1910)

Note that formally, modality is captured by existential quantification over possible worlds. It is well known that existential quantification over other entities or qualities or aspects may yield analogous effects; (6) could thus as well be paraphrased as one of e.g. (i-a) or (i-b), or just (i-c) which talks about possibly different subject referents.

(i) a. Computers are the boon of modern life in some respects and computers are the bane of modern life in some respects.

b. Computers are sometimes the boon of modern life and computers are sometimes the bane of modern life.

c. Some computers are the boon of modern life and some computers are the bane of modern life.
that the "hidden modality" is in the reflexive morphology after all, which gets redirected so to speak because its original meaning delivers no usable result.

To repeat, it is widely accepted since the work of Grice that language users regularly strengthen the meanings of literally weaker structures in order for them to be purposefully usable. Our point here is that language users weaken as well systematically, i.e., go to more inclusive meanings than what appear to be the coded ones, to the disadvantage of (or along with negating) the literally coded meanings. In fact, this is nothing but applying the ubiquitous scheme of quantity implicature at the wrong levels in that now what actually is said is negated, as opposed to what could have been said in the spirit of informativity (cf. section 2.2.1). We can see this on the surface in certain classes of cases, most obviously as well as most deeply entrenched in the case of lexically stored private predicates like fake or false but also maybe bad (cf. Geach 1956), as well as in other ways of construction which are commonly treated under the rubriques of pragmatics like hyperbole or irony (cf. section 4.2.2). These latter figures are, in Grice’s theory, products of the violation of maxims of quality, i.e., maxims having to do with telling the truth as well as with how one is telling the truth, if at all (as opposed to the quantity-related informativity imperative from which the most robust types of implicatures arise). It is eventually unsurprising to realize that modal – and generally marked – readings are weaker than their nonmodal – often situation-related and generally unmarked – counterparts. “Hidden modality” is a better-known cover term for unexpected, i.e., not transparently coded but intuitively felt modal interpretations (cf. Bhatt 2006). But we also hide change (perfectivity) and comparison. Modality allows us to escape from the here and now of reality and talk about things that are thus independent of actual situations. Modalization allows an escape as well in a more technical sense, namely, it allows escape from the Law of Contradiction (cf. footnote 7). The contradiction-repairing effect of possibility interpretation, and of existential quantification more generally, shows in examples like (7-a) and (8-a) as compared to the contradictory sentences in (7-b) and (8-b).

(7)  a. Otto can/may be there and Otto can/may not be there.
 b. #Otto is there/must be there and Otto is/must not be there.
(8)  a. Someone is there and someone is not there.
 b. #Otto is there and Otto is not there.
 c. #Everyone is there and everyone is not there.

The examples show that, generally speaking, existential quantification as opposed to universal quantification (comprising, following the Russelian analysis, the use of proper names) provides a way around violations of LC. It is for this reason that Peirce formulates LC with respect to “definite” subjects, cf. (9).
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(9) Principle of Contradiction

Material mode: For any property and for any definite subject, it is not the case both that the subject possesses that property and that the subject does not possess that property.

Formal mode: For any pair of contradictory predicates “P” and “not-P” and for any definite subject-term “S”, “S is P” and “S is not-P” are not both true.

Simpler and easier to remember, LC can be rendered as the verdict in (10) that a proposition p and its negation ¬p must not both be true at the same time.

(10) ¬(p ∧ ¬p)

As soon as p and ¬p respectively are differently indexed as indicating evaluation with respect to different models (times or possible worlds), there is no problem of having p and ¬p in one formula of course. In this connection, we note that modal interpretations in terms of possibility are weaker than their nonmodal counterparts, and that they are more elaborately coded generally (in analogy, e.g., to plural marking, cf. section 2.3 below). To illustrate, (11-a) is simpler than and entails (11-b).

(11) a. Otto is there.
b. Otto can be there.

Similarly, comparative constructions are weaker systematically than their positive counterparts, although they involve more expressive effort. E.g., (12-a) is felt to be a weaker statement than (12-b) (although it is not easy to pin this intuition down, cf. section 3.2, and statements containing comparative forms generally do not entail their absolute counterparts (cf. (13-a) and (13-b)).

(12) a. Otto ist ein älterer Kater.
    Otto is an older tomcat.
b. Otto ist ein alter Kater.
    Otto is an old tomcat.

(13) a. Otto is heavier than Ede.
b. Otto is heavy.

Regarding the aspectual-/temporal domain, we expect change-of-state interpretations to be weaker in a relevant sense than their stative counterparts. This is not so easy to see, as we argue that productively, change-of-state interpretations are the result of repairing stative constructions that are contradictory, i.e., too strong to be straightforwardly interpretable at all. We return to the issue in more detail in section 3.3.2 below.
2.1.1 Matching outputs

We assume that syntax and semantics are both generative systems with their own languages (i.e., vocabulary and rules of combination). The syntactic and semantic symbolic representations are the products of the respective languages of syntax and semantics. Quite evidently, there are “ideal matches” between syntactic and semantic structures, like, e.g., that between a nominative–accusative structure and a semantics that expresses a relation of a certain kind between individuals that are clearly distinct. It is just as evident that not all pairings of syntactic and semantic structures are ideal in such a sense. Plausibly, this is rooted in the circumstance that the languages of syntax and semantics are very limited. At a methodological level and regarding syntax, the attempt to generalize over the specifics of constructions to ever more general phrase structure grammars has been the lead in much modern grammatical research. Regarding semantics, quite the opposite seems to be true – there has been a tendency to develop ever new machinery for particular domains, much like different logics are commonly assumed for different domains in the analytic tradition (“ordinary” vs. temporal vs. modal etc. logics). Very pertinent to some phenomena playing a prominent role for our discussion, there is a rich tradition that attempts to overcome certain problems associated with mass nouns, plurals and distribution, cf. the seminal paper of Link (1983) or more recent proposals of specifically designed logics for pluralities or masses (Schwarzchild 1992, Nicolas 2008). While such efforts often do arrive at very precise descriptions of particular sets of facts that are amenable to formal logico-semantic analysis to start (such as, e.g., scope relations), it must be kept in mind that the ultimate objective lies in explaining linguistic phenomena, which entails reducing them to elements and processes that are more basic as well as independently established or plausible.

This work takes the view that the language of semantics is just as limited as the language of syntax is commonly taken to be. In particular, even though speakers do talk and reason about all sorts of different things and matters, we argue that the basic schemes and routines that are behind this speaking and reasoning are always the same – or, to put it briefly with (the early) Wittgenstein, that there is just one logic. Having just one logic entails using it for everything, even if it does not appear to be quite the right tool for large sets of phenomena – the situation thus compares to someone who is equipped with just a wrench but needs to hammer nails into the wall; for lack of alternatives, that person will be forced to use the wrench for the hammering (cf. the heading of the next chapter). Similarly, we argue, we use the one logic for things that it has not been designed for (or, speaking maybe more appropriately, along with which it has not evolved) simply because there is no choice to be made.
Weaker construction

Following Carnap (1931), we may say that grammar is what is responsible for the generation of an infinite set of linguistic structures on the basis of a finite set of basic elements and a finite set of rules of combination.

In order to characterize a particular language, one has to specify its vocabulary and its syntax, that is, the words that occur in it and the rules according to which sentences can be built from these words and according to which such sentences can be transformed into other sentences of that same language or a different language (so-called rules of inference and rules of translation). (Carnap 1931, p. 435 (my translation))

We are concerned here mostly with Carnap’s “rules of translation”, i.e., translations from the language of syntax into the language of semantics. We collect data and then look what goes together in the data, taking into account a certain set of aspects. The basic generalization is ‘Whenever A, then B’. E.g. for the syntax of Germanic: Whenever there is accusative in a tensed sentential structure, then there is also nominative in that structure. Concerning the syntax-semantics interface, we may observe, e.g., that whenever a relation between an agent and a patient is coded, the agent will be coded nominative and the patient accusative. Generalizations are about certain ‘agreements’ between the aspects that we observe or that we have reason to assume. In semantics, there is no knowing a priori what the aspects that are coded are. There are certain traditions (e.g. using some type of predicate logic with variables and quantifiers for the representation of truth conditions) that are developed (e.g. adding quantification over sets and generalized quantifiers) to more iconically represent the composition of what we believe to be the meanings of the parts of speech according to their syntax, which we have developed methods to unravel, e.g., we can infer c-command relations and thereby the whole-part structure of the syntactic representation from certain types of binding relations between elements of the structure (cf. Brandt et al. 2006, pp. 212ff).

Icons can do a great job on many occasions. But for intelligent talk, you need symbols. Similarly, if interpretation were just translating representations into their alphabetical variants, language couldn’t have gotten us as far as it actually did. The point is that a one-to-one correspondence between symbols (morphemes) and aspects of the pictured situation is completely unfeasible quite simply because the world out there is way too complex to be one-to-one representable symbolically. Next to underdetermining reality, i.e., being vague, a way of ameliorating the conflict between the complexity of reality and the severe limitation of grammar lies in rendering usable structures that are not straightforwardly usable for the coding of meanings; this includes certain detours in the mapping to semantics which, however, may eventually even prove to be preferable from the perspective of economy.
The reason for having categories is the observation that classes of symbols behave more or less homogeneously; if we are to capture the distribution of linguistic elements, then it appears that we need categories. While there is by no means agreement what the categories of syntax are, and while categories may also differ between languages, most scholars would agree that there is a limited set of such categories, comprising, e.g., the categories noun and verb and adjective and maybe more. Next to these content categories or lexical categories, we can observe that natural languages strive for what are called functional categories – what is often taken to be the “glue” grammar needs to do its job efficiently. As opposed to lexical categories, functional categories are always closed class, which is due to the fact that these expressions serve to code distinctions within an a priori limited set of choices. E.g., we do not observe that there are languages with an infinite set of number or aspect or tense markers. The set of functional categories, including what is called inflection, is typically very small. The vocabulary of the generative procedures producing syntactic or semantic structures is limited, and this is particularly true of inflectional elements which grossly seem to underdetermine the diversity of functions they give rise to. When we talk about inflectional elements, we talk about the “cogwheels” of grammar that next to gluing the parts of speech together also make syntax and semantics speak to each other (by way of, e.g., indicating the roles of subject or predicate in the structure). Depending on how one counts, there are around ten suffixes for all of the regular inflection in German. Heidolph et al (1981, p. 485) provide a list that they comment as follows (their emphasis).

§48 Für die Flexionsformative steht im Deutschen nur ein sehr begrenztes Inventar von lautlich-graphischen Einheiten zur Verfügung, nämlich: Ø, -e, -(e)n, -(e)r, -(e)s, -(e)t, -(e)st, -(e)ns, -(e)n, -em. [...]

Lehmann (2002, pp. 1f) formulates to the point:

The essential difference between grammar and lexicon is the following: The grammar is concerned with those signs which are formed regularly and which are handled analytically, while the lexicon is concerned with those signs which are formed irregularly and which are handled holistically. A sign is lexicalized if it is withdrawn from analytic access and inventorized. On the other hand, for a sign to be grammatization means for it to acquire functions in the analytic formation of more comprehensive signs. [...]

Given an object of cognition of some complexity, the human mind has two ways of accessing it. The analytic approach consists in considering each part of the object and the contribution that it makes to the assemblage by its nature and function, and thus to arrive at a mental representation of the whole by applying rules of composition to its parts. The holistic approach is to directly grasp the whole without consideration of the parts.
Weaker construction

§48 For the inflectional formatives, only a very limited inventory of phonemic-graphemic units is available, namely: Ø, -(e)n-, -(e)r, -(e)s, -(e)t, -(e)st, -(e)ns, -(e)n, -(e)m. […] Einzelne Flexionsaffixe haben daher mehrere grammatische Morpheme oder Morphemverbündungen zu repräsentieren und sind deshalb auch in hohem Grade mehrdeutig. Individual inflectional affixes must therefore represent several grammatical morphemes or morpheme complexes and are ambiguous to a high degree accordingly. […] Heidolph et al. further note that inflectional formatives are characterized by a high degree of ambiguity, or, more neutrally, multifunctionality – this can be said to be a genuine property of inflectional languages (as opposed to agglutinating or isolating languages):


§49 3. Functional principles. Given the high degree of ambiguity that inflectional elements exhibit in German, their “functionality” is only guaranteed to the extent that a relatively definite interpretation is ensured. That a relatively small stock of inflectional formatives may represent the entirety of inflectional morphemes and morpheme complexes is possible only on the basis of the special organizational form and functionality of the inflectional system. The inflectional morphemes that are ambiguous when considered in isolation get relatively definite, i.e., settled to a particular meaning of a morpheme or a limited such set, when they convene with particular contextual elements in particular contexts and may thus be combinatorially interpreted.

We might say the role of inflection lies in indicating a certain choice among a restricted set of choices (e.g., “plural” as opposed to “singular” in the domain of number, “past” as opposed to “present” in the domain of aspect and tense).
Very plausibly, it is because the logical space that inflectional elements cover is so limited that it is useful to have them as expressions that introduce highly general, semi-logical and very generally applying meanings or operations. Suiting the task of semantics to represent truth conditions and relations between representations (in particular: entailment) capturing truth conditions, there has evolved in the course of history a broad consensus that there are certain categories that one would not want to be missing in a semantics language. We give some examples together with some natural expressions in the table in (14), where here, “PL” stands for “predicate-logical”.

<table>
<thead>
<tr>
<th>expression</th>
<th>PL equivalent</th>
<th>denotation</th>
<th>type equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>he, John</td>
<td>variable</td>
<td>individual</td>
<td>e</td>
</tr>
<tr>
<td>sleep, yellow</td>
<td>property</td>
<td>set</td>
<td>e,t</td>
</tr>
<tr>
<td>kiss, follow</td>
<td>relation</td>
<td>set of pairs</td>
<td>e,(e,t)</td>
</tr>
<tr>
<td>every, no</td>
<td>quantifier</td>
<td>set of pairs of sets</td>
<td>e,t,((e,t),t)</td>
</tr>
</tbody>
</table>

We see already in the table in (14) that there is no one-to-one correspondence between syntactic and semantic categories. E.g., nouns like verbs as well as adjectives of a certain type may all correspond to one semantic category, namely that of a property (that can be modelled with a set or with a function from individuals into truth values). While we can easily give a recursive procedure for the generation of semantic types, we do not observe an infinite set of types.

Incidentally, many scholars would agree that what we have in (14) is pretty much all there is to the language of semantics. There are individuals and sets of them and sets of relations and sets of relations between sets of individuals (generalized quantifiers), and that is it. Regarding the relation between syntactic and semantic categories and structures, Sauerland/von Stechow (2001, p. 15414) write:

> Though syntax and semantics are two autonomous recursive procedures, most researchers assume that there is a relationship between the two to be captured by the theory of the syntax-semantics interface. In particular, it seems to be the case that the steps of the recursion are largely the same. In other words, two phrases that form a syntactic constituent usually form a semantic constituent as well (Partee (1975) and others). [...] As far as we know, there is no language where the adjectives occurring with the subject modify the object, and vice versa.

The idea of local parallelism may be less true than it appears obvious, in particular, if one acknowledges the interaction between different levels of meaning, i.e., between “what is literally said”, “what is entailed”, “what is presupposed”, “what is implicated” etc. (cf. section 2.2.1) – note the hedge expression “largely” in the citation. There is the usual tradeoff: the more we insist on
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locality, the more (accidental) homonymy as well as the more unmotivated logico-semantic forms we will have to suffer. The less we insist on keeping levels apart and the less we insist on a strict homomorphism between syntax and semantics, the less unmotivated homonymy we will need. This is exactly the kind of problem that we are concerned with: We have what appears to be familiar syntax, but the semantics is unfamiliar. E.g., the surface form of middles suggests a reflexive interpretation, but a reflexive interpretation is not observed. Instead, we have a modal and generic interpretation. The question is whether we just write this into the semantics and say it is what this particular construction happens to mean or whether we can derive it from more basic assumptions that are in accord with everything else we know and that take the syntactic side of the interface seriously. We should keep in mind that the learner has no choice but to rely on the meanings that he or she has learned to be associated with certain signs and the syntax that combines them.

In the context of learnability, it is worth stressing that the homonymy (≈ accidental ambiguity) vs. polysemy (≈ motivated ambiguity) issue takes center stage in synchronic, as opposed to diachronic, linguistics, as the idea that apparently unrelated meanings are really cases of systematic polysemy is often countered by demonstrations that two identical (or very similar) forms do not share a common historical root. But this is a mistake. The learner cares less (if he cares at all) about history than about the system that he is actually learning; as a matter of fact, it could be said that learners keep on systematizing the language (which need not mean that everything becomes simpler, at least not in an obvious fashion). This is nicely put by Augst (1975, pp. 35, 48):

[S]o wird klar, daß jede Sprachgeneration den gesamten Wortschatz der “Väter” nur in der Weise besitzt, daß sie ihn neu durcharbeitet und durchstrukturiert. Das gilt auch für die kleinsten, nicht weiter aufteilbaren semantischen Elemente, die Morpheme.

It thus becomes clear that each generation of speakers possesses the vocabulary of the “fathers” in its entirety only in the way that it works it over and restructures it anew. This goes as well for the smallest semantic element that cannot be further divided, the morphemes.

In the generative literature, the idea that generic construals may have a repair effect can be found in Chomsky (1965, p. 157), discussing contrasts like between the highly odd (i) and the acceptable, generic (ii).

(i) John frightened sincerity.

(ii) One cannot frighten sincerity.

More recently, Härtl (2013) has argued that generic interpretations may serve as compensations for the violation of selection restrictions as in (iii).

(iii) Lions hunt (to survive).

The participator in language alone rules about language; his classificatory criteria, his linguistic measures and the pertaining practices alone are decisive. This may sometimes be unhistorical, from a diachronic perspective, but not, as a consequence, false. If the participator in language does not know whether this or that entity is still a word or a syntagm, or whether this word, this derivation or composition is still transparent, then this expresses that in such a multilayered entity like language, the used measures can never be captured exactly eventually.

Augst’s point is well taken: speakers work at systematizing their language on the basis of what they find – the systematization observable in e.g. creolization has been and still is one of the strong arguments for an innate grammatical system. Regarding again the connex between syntax and semantics and acknowledging all justified skepticism or qualification, we strongly tend to believe in certain iconicity principles when we do research into the relation between form and meaning. We are used to believing that an excess in marking points to an excess in meaning, known as ‘constructional iconicity’, characterized by Wurzel (1994, pp. 31f) as follows:

**Konstruktioneller Ikonismus** liegt immer dann vor, wenn die Asymmetrie zweier Kategorien hinsichtlich ihrer semantischen Markiertheit auf eine Asymmetrie ihrer Symbolisierung dergestalt abgebildet wird, daß die markiertere Kategorie durch ein Mehr an formalen Mitteln gegenüber der weniger markierten symbolisiert wird. [...]  

**Constructional Iconicity** obtains whenever the asymmetry between two categories regarding their semantic markedness is mapped onto an asymmetry of their symbolization in such a way that the more marked category is symbolized by an excess of formal means compared to the less marked category.

While constructional iconicity appears quite natural and intuitive, it is worth noting that it is clearly false in any absolute sense. To take a case in point, plural marking may turn out to be a counterexample as we can observe that the morphologically marked plural appears to express the more general meaning
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(cf. below section 2.3). The question remains whether something stronger can be said about the relation between syntax and semantics than what we find in the casually skeptical passage in Jennings (2004, p. 670):

On whatever account we give of meaning, the meaning of a sentence has something to do with the meanings of its component vocabulary together with its syntax, even if the connection between the two is a little murky.

It will turn out that the compositional process presents itself as less murky than sometimes assumed once we acknowledge that weakening and automatized repair mechanisms are an integral part of it. In particular, this will allow us to have less homonymy than is generally assumed. Mayerthaler (1981) defines the central principle of Uniformity as in (15).

(15) Uniformity: The symbolization/encoding of a paradigm P is uniform to the extent that P is organized according to ‘one function – one form’, otherwise it is more or less non-uniform.

We speak of homonymy when we appear to be forced to associate with a certain expression not just one, but several meanings that are not systematically related to each other (in a known fashion). “In a known fashion” is of course as superfluous as the “unless there is evidence to the contrary” in what Alexiadou/Müller (2008) call the “principle of syncretism”, cited here with some context (ibid., p. 103, (5.1)).

The question arises to what extent syncretism should be considered systematic. We adopt the meta-grammatical principle in (16).

(16) Syncretism Principle:
Identity of form implies identity of function (within a certain domain, and unless there is evidence to the contrary).

We take the syncretism Principle to be the null hypothesis for the child acquiring a language as well as for the linguist investigating it. In both respects, it plays an important role outside morphology, e.g., in syntax and semantics.

We may wonder about the qualification “within a certain domain”. Why should something like the syncretism principle not hold across domains as well, or across what we believe to be different domains but maybe wrongly so? Eventually, the question is what “necessity” means in Grice’s 1989b:47 formulation of “modified Occam’s razor”, given in (17).

(17) Senses are not to be multiplied beyond necessity.
Let us try again and assign uniform meanings to the grammatical formatives in particular. One half of the trick is to identify as the cause for superficially diverse meanings as occurring with specific formatives not properties of these formatives themselves but instead properties of their linguistic context and associated meaning composition, i.e., endorse the role of combinatory interpretation that was just discussed. The other half is to acknowledge that the process of meaning composition is not always straightforward but involves as well discomposition, in particular, the combination of elements and operations the properties of which may actually contradict each other or be unfit for the domains in which they apply. As we argue specifically, a locally problematic surplus of meaning may be redressed in nonlocally coded terms, effecting thus intuitively present meanings that are surprising vis a vis the superficially observable linguistic material and structure. As a consequence, putative ambiguities can be reduced to the interplay of properties and processes that are independently justified, and meanings hitherto unexplained and thought unrelated become but locally problematic meaning representations that are redressed.

2.1.2 Cutting short

Writing something into the truth conditions that cannot be traced to the syntax is a post-hoc patch (den Dikken 2013) that appears to lack explanatory value and that quite possibly blocks gaining deeper insights into the real mechanisms that natural language grammars can make use of to bridge the considerable gap between the expression- and meaning-related sides of the interface. The situation is presented as follows in Brandt/Fuß (2013, p. 1):

Grammatical structures connect systems of thought and reasoning and systems of articulation and perception. It appears obvious that the specific conditions of these systems hardly fit each other. The quality of what needs to be done seems so different, even if we do not know much about the representation of thought, independently of how it might translate into natural language expressions. We know of syntactic structures that they are built recursively with very restricted resources – across languages, grammars appear to use a small set of lexical categories, an even smaller set of functional vocabulary and a small wet of ever-similar restrictions and rules that condition or manipulate the structure-building process.

Asking what it is that conditions the respective representational levels, it seems clear that what is produced by the language of syntax has to be at least utterable. What is produced by the language of of semantics should serve reasoning, i.e., enable drawing conclusions from given assumptions and rules of inference.
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Semantic representations should capture truth-conditions. Manipulation of semantic representations so as to bend linguistic expressions more toward being actually usable include:

- Non-logical inference that leads to more exclusive, i.e., stronger meanings. A paradigm example is the introduction of the O corner of the square of opposition in the case of existential quantification (from “some” infer “not all” hence “some not”).

- Exhaustification that similarly leads to stronger meanings. It lets us exclude alternatives which are compatible with the logical meaning of the literal expression (e.g., from “three” infer “not: more than three”, i.e., “only three” (N.B. that in the scalar case, “lesser” meanings are entailed hence do not count as alternatives).

- Modalization that leads to weakening. As discussed above, weakening does exist but appears undesirable in view of the conviction that the actually coded literal meanings are already too weak to be really useful.

As already suggested by the cases of strengthening just cited, manipulating semantic representations in accordance with logical reasoning schemes is very relevant to grammars of natural languages. To note, many if not all languages have signs that appear to express quantification – even if the quantification is not or not obviously noun-related, as Westerners are most used to see it.¹⁰ The traditional square of opposition is given in the following scheme:

¹⁰ There appear to be languages lacking nominal but featuring adverbial quantifiers, like Mohawk (cf. Baker 1995).
The fact that we can model the core quantificational meanings in different domains with the help of the square of opposition already shows the generality with which the reasoning schemes that it depicts apply. Jespersen (1924, pp. 324f) gives the tables in (18) and (19) exhibiting what he calls the ‘quantificational’ and ‘modal and deontic’ (possible world quantification) values that the variables in the scheme may assume (A corresponds to the A corner, B to the I corner and C to the E corner):

(18) ‘Quantificational’ values:
   A: all everything everybody always everywhere
   B: some/a something somebody sometimes somewhere
   C: none/no nothing nobody never nowhere

(19) ‘Modal and Deontic’ values:
   A: necessity must/need command must
   B: possibility can/may permission may
   C: impossibility cannot prohibition must not/may not

Interestingly, Jespersen groups times and places together with ‘ordinary’ things to be quantified over and regards as parallel the particular epistemic and deontic modal readings. Each time, the O corner of the square remains void, i.e., does not model a naturally expressed quantificational meaning. That the O corner or particular negative of the square stands apart from the other corners has been noted elsewhere. For one thing, O does not seem to find lexicalized linguistic expression, unlike A (every), E (no), and I (some). The O-corner corresponds to some not, and this is two words but not one. Rather than being expressed, it seems O makes it into the machinery – most often, we see it derived as a scalar implicature as sketched again in (20).
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(20) S has said that I
    If S had been in a position to say A, he should have said so as A → I
    Therefore: \( \neg A \), i.e., O

It is worthwhile to note that having O in the semantics/pragmatics representation appears to be particularly cheap: one can get there from I as well as from E, and from A \textit{modulo} negation. Aristotle allowed for an operation of ‘complementary conversion’ that made the I and O corners of the square interderivable, well-known logical problems notwithstanding.\(^{11}\) Complementary conversion takes the forms in (21) and (22) for the ordinary individual and modal (possible worlds) domain respectively.

(21) \( \exists x \ P(x) \iff \exists x \ \neg P(x) \)
    ‘If something is P, then also something isn’t P’

(22) \( \exists w \ p(w) \iff \exists w \ \neg p(w) \)
    ‘If it is possible that p, then it is also possible that not p’

Regarding the question of lexicalization of the O corner, we may note that interpreting the (generalized) quantifier \textit{most} appears to involve reference to the O corner of the square, i.e., reference to the intersection of S and \( \neg P \). While MOST is particular in being context-dependent (like most quantifiers are), it is clearly one word.

(23) MOST A B = \(| S \cap P | > | S \cap \neg P | \)

It is generally believed that quantifiers are conservative, meaning that nothing outside the restriction together with the intersection of the restriction and the scope matters for determining whether they apply (yield truth) or do not (yield falsity). This is expressed in (24) (from Szabolcsi 2010, p. 63).

(24) The relation DET is conservative if Det (NP')(Pred') is true if and only if DET (NP')(NP' \cap Pred) is true.

As Szabolcsi (ibid.) points out, (24) amounts to the same as saying that DET does not care about anything that is in region iii in the Venn-diagram in figure

\(^{11}\) Parsons puts the core problem of deriving O from I as follows in his 2006 Stanford Encyclopedia of Philosophy article on the square of opposition:

(i) Suppose S is empty. Then I (Some S is P) is false. But then E (No S is P) must be true. Therefore, O (Some S are not P) must be true. But there aren’t any Ss.

A way out of the dilemma consists in saying “Not every S is P” instead of “Some S are not P” as negative statements have no existential import. Cf. Kneale/Kneale (1962, p. 87): Horn (1989, p. 211).
2.1, adopted here unaltered from Szabolcsi’s comprehensive exposition (ibid.).\(^{12}\)

Note, e.g., that while MOST is presuppositional, it is still conservative, cf. (25).

\[(25)\] Most Dutch can swim = Most Dutch are Dutch that can swim.

Conservativity is often taken to be a universal which has its roots in the need for efficient processing. If quantifiers are conservative, then this will make it much easier for us to interpret them, as now many logically possible options will not have to be considered. But let us look at some rather clear examples of dislocated restrictions. Focus particles \((\text{only})\) as well as “privative” predicates \((\text{fake}, \text{alleged})\) are cases in point. Privative predicates provide a particularly obvious case in that they require going beyond what is denoted by the head noun that is modified by the predicate: a fake president is not a president. Privative predicates will be discussed some more promptly and in some detail in sections 3.2 and 4.2.2; let us here look at focus constructions, starting with the example in (26).

\[(26)\] Only OTTO ate the cake

\[(27)\] \(\neg \exists x \text{ ALT(OTTO}(x) \wedge \text{ATC}(x)\)

Assume we treat \(\text{only}\) as a quantifier, and note that it is not conservative: It says that there is no individual outside the restrictor set that is in the scope, i.e., falls under the predicate. To falsify this, we have to look at region iii in the Venn scheme of predication. The quick test yields the same result, namely, treating \(\text{only}\) like a quantifier, the statement in (28-a) is contingent but the statement in (28-b) featuring \(\text{only}\) is not; (28-b) is a tautology, i.e., a necessarily true statement.

\(^{12}\) Not being affected by anything outside the union of restriction and scope (= inside region iv) is known as the property of “extension”, cf. ibid.
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(28)  
   a. Norwegians can swim.  
     = All Norwegians are Norwegians that can swim.  \forall  
     = Some Norwegians are Norwegians that can swim.  \exists  
   b. Only Norwegians can swim  
     = Only Norwegians are Norwegians that can swim.  \top

Analyzing only as a quantifier in spite of its non-conservative behavior is the route taken in the work of Rooth (1992); the core of his proposal concerning the function of only is summed up by Szabolcsi (2010, p. 67) as follows.

[T]he VP-adverb only is a universal quantifier whose restriction is a set of focus-alternatives computed from the interpretation of its sister VP.

On Rooth’s analysis, the restriction is not literally given but computed instead on the basis of the expression in focus. This just means that in order to interpret a structure containing only, you have to go not only to sets that are actually in the extension of what only applies to (has in its scope) but to sets outside this set, and in particular, the alternatives to this set (i.e., the nonoverlapping or complementary sets that could have been made reference to at the point in the structure where the expression in the scope of only is sitting). In this way, only can be seen as a tool to shortcut reference to meanings that are not expressly given by the expressions it combines with. Presumably, only is rarely treated as a quantifier because it would be non-conservative.13 But we are arguing here that going nonconservative, including a wider interpretation of “going beyond what is denoted by the given linguistic expressions” is a real option that is systematically made use of by the grammars of natural languages.

Privative predicates like fake or alleged make for a clear case of expressions that force going beyond literally coded content. Consider the patterns in (29).

(29)  
   a. Otto is a surgeon.  
   b. Otto is a young surgeon. \to (a)  
   c. Otto is a false surgeon. \to \neg (a)

In the usual case (intersective predicates (black, pregnant) or subsective predicates (tall, heavy)), adjectival modification leads to a set included in the meaning expressed by the head noun (or nominal projection) modified by the adjective. However, privative adjectives lead us outside the denotation of what they modify; a false surgeon is first and foremost not a surgeon.14 As Geach (1956, p. 32) puts it in his analysis of the English adjectives good and bad:

13 Language acquisition experiments carried out by Hollebrandse/Spenader/Hendriks (2013) suggest that conservativity of quantifiers is not a linguistic universal.
14 Privative predicates thus violate what Kamp/Partee (1995, p. 161) call the “Head Primacy Principle” – really a version of the projection principle – given in (i).
“bad” is something like an alienans adjective; we cannot safely predicate of a bad A what we predicate of an A, any more than we can predicate of a forged banknote or a putative father what we predicate of a banknote or a father. We actually call forged money “bad”; and we cannot infer e.g. that because food supplies life bad food supports life.

More examples of privative (or nonsubsective) predicates are given in (30).

(30) privative (nonsubsective) predicates:
fake, false, forged, alleged, former, future, presumed, putative, reputed falsch, gefälscht, angeblich, zukünftig, tot, vermeintlich, mutmaßlich

Note that the linguistic context may play an important role as regards privative behavior; e.g., the use of falsch in (31) is not privative.

(31) Otto gab eine falsche Antwort.
Otto gave a wrong answer.

The headline in (32) combines both uses in a single mad magazine sentence.

(32) Falsche Frau von falschem Arzt verpfuscht.
wrong woman by false doctor booped
(Banner ad for the Rhein-Neckar BILD newspaper, seen in Mannheim city centre January 2016)

It seems nearby to capture the meaning of constructions containing privative predicates by a modal semantics; e.g., a false surgeon could be said to be a surgeon in certain possible worlds of e.g. television or fraud, but not in the actual world. Privative predicates could then be regarded as shortcuts to modal interpretations, which are weaker than their nonmodal counterparts. Put differently, privative predicates could be said to be instructions to subtract certain meaning aspects from what they modify. While the set of simple (i.e., one-word) privative predicates is rather small, the last-mentioned phenomenon is completely productive, cf. the well-discussed cases of wooden doves or chocolate hearts (cf. for discussion Kamp/Partee 1995).

(33) a. Ferdi is a dove.  
   b. Ferdi is a young dove.  → (a)  
   c. Ferdi is a wooden dove.  → ¬(a)

(i) The Head primacy principle (HPP): In a modifier-head structure, the head is interpreted relative to the context of the whole constituent, and the modifier is interpreted relative to the local context created from the former context by the interpretation of the head.
Privative predicates could be said to be lexical elements serving as shortcuts to particular non-expressly coded meanings. By way of illustrating the same thing for more complex structures (the level of ‘constructions’), let us return to transitive structures and their reflexivized versions, cf. (34-a) and (34-b).

\[(34)\]
\[
a. \text{Otto rasierte Anna.} \\
\quad \text{Otto shaved Anna.}
\]
\[
b. \text{Otto rasierte sich.} \\
\quad \text{Otto shaved REFL.}
\]

Reflexivization can be described as an operation that results in the identification of the referenced objects or situations of the argument places of a relation. As such, the expressions expressing relations appear to come with a requirement that has come to be known as “obviation” (Hellan 1988; Farmer/Harnish 1987; Reinhart/Reuland 1993), stated informally in (35).  

\[(35)\] Coarguments of transitive relations have disjoint reference.

We will have reason to return to the question of what it means to be transitive as well as about what it means for arguments to have disjoint reference (cf. in particular section 3.3). The point is that to the extent that we regard reflexivized structures as being transitive (as we do), they clearly violate obviation. Indeed a common idea is that reflexivity must be marked because of this (cf. Reinhart/Reuland 1993; Reuland 2011). It is violated in a certain manner, namely, it is the meaning of the reflexive element that appears to be included in the meaning of the full NP that serves as the antecedent; this is true in

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15 Reinhart/Reuland’s definitions are the following:

(i) Definitions

a. The syntactic predicate formed of (a head) P is P, all its syntactic arguments, and an external argument of P (subject). The syntactic arguments of P are the projections assigned theta-role or Case by P.

b. The semantic predicate formed of P is P and all its arguments at the relevant semantic level.

c. A predicate is reflexive iff two of its arguments are coindexed.

d. A predicate (formed of P) is reflexive-marked iff either P is lexically reflexive or one of P’s arguments is a SELF-anaphor.

(ii) Conditions

a. A: A reflexive-marked syntactic predicate is reflexive.

b. B: A reflexive semantic predicate is reflexive-marked.

To capture Principle B, an extra condition is introduced:

(iii) a. No pronominal can be used where a reflexive would yield the same meaning.

b. Unless a transitive verb V has a reflexive pronoun as its argument, interpret it as $\lambda x.\lambda y. \llbracket V \rrbracket^\theta(x)(y) \land x \neq y$. 

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Hiding modality

an almost trivial sense because basically any NP can serve as the antecedent of /zich/ (abstracting from some special cases involving, for the most part, oblique cases in German). Morphosyntactically, /zich/ codes no more than third person, i.e., it excludes only interpretations in terms of the speaker or the addressee (cf. again Reinhart/Reuland 1993). Like transitive structures more generally, “regularly” reflexive structures conform then with what appears to be a universally valid principle responsible for the mapping from semantic to syntactic structures that is informally given in (36).

(36) The referent(s) of the argument mapped onto subject position must have certain semantic properties that the referent(s) of the argument mapped onto object position need not have.

(36) is a version of the ubiquitous observation that subjects outrank objects in relevant grammatical respects. We will abbreviate this as “SU > OB” and discuss the issue in more detail in section 3.3. There is thus a symmetry between the subject being more specific than the object generally and the antecedent being more specific than the anaphor in the regular case. From a formal perspective, things could as well be the other way around, i.e., the subject could be more general than the object. This is a nearby option as it corresponds to the negation of the ‘standard’ option. We propose now that this “doing it the other way around” is what happens in the case of inchoatives and middles. As this is in conflict with a central mapping principle, it necessitates an adjustment at the interface to semantic interpretation. The violation and adjustment are like a twist that gets one to an interesting meaning in a highly economic way: expression-wise, we observe a saving on the part of material needed to express in particular modality. At the level of the system, the structure that is used is simply there. In light of the scarcity of structural options that grammar has at its disposal, it would seem strange if it didn’t make use of the option.

The tie between the discompositions at the level of constructions (transitivity and reflexivization as well as directional complement configurations) and at the level of inflectional morphology (plural marking, including as we argue what is standardly taken to be dative or genitive case-marking) is established by the definition of difference. We can identify the difference requirement with the requirement that the I and O corner of the square of opposition are satisfied together in the semantics, i.e., more specifically, apply simultaneously to one and the same restriction (S) and scope (P), cf. (37):

(37) $\text{DIFF} = \lambda S \lambda P \exists x \ S(x) \land P(x) \land \exists x \ S(x) \land \neg P(x)$

Returning to the issue of non-conservativity or interpretation in terms of concepts not expressly given in the linguistic sign, the logical form in (37) suggests
that Diff is a quantifier, and depending on what one is ready to call quantifier this is even true. However, (37) should not be understood to transport that
the expression – if any – that realizes Diff exclusively combines with its set-
denoting complement to yield a function from a set – that is again denoted by
its complement expression – into a truth value. It is one of the central ideas
of this work that while the grammar may be most happy to interpret Diff
locally, it may resort as well to less obvious ways of satisfying it; specifically,
the sets that Diff combines with may not be expressed explicitly at all but, in
particular, be entailed or presupposed by expressions in its context. We see
this elsewhere, cf. cases like

(38) He is a good dancer. That’s a fast car etc.

Anticipating, we see that the paradigm expression of Diff is /er/ in German
and that /er/ may easily combine with other set-relating (i.e., “quantifying” or
“determining” expressions, such as je or d-). Diff

(39) jeder, der, einer...
everybody, the, one...

Diff is not specialized as regards what it applies to, a property that it shares
with the focus particle only which also plays a major role for our discussion.
However, to satisfy Diff in the individual (count) domain, a set containing dif-
ferent individuals will be needed (“plural”), while this is not the case in strictly
ordered, i.e., scalar domains. Quite paradoxically, in the latter, whatever is P
is also not P (in actuality: less P). Given any P, then, ¬P is trivially satisfied and
can be safely assumed. Therefore, the negated meaning is turned into a presup-
position, as we see also in the case of change of state meaning (the pre-state is
presuppositional, cf. Kenny 1963, Givón 1972, Dowty 1979). In the domain of
comparison, difference is degenerate, as it is more generally in ordered domains.
In comparatives, the difference requirement Diff is not carried by the config-
uration but by inflectional morphology, in particular, /er/, a morpheme that
we know as well from the nominal domain: pronominal inflection (NOM masc.
sg. demonstrative, determiner or pronoun) or plural marking in particular.
Moreover, in ordered domains, reflexivization – a symmetry-creating operation
– is disallowed. But the syntax does not know this. We submit that /tsu/

16 It is not even true of paradigm quantifiers that they combine locally with what they
find in their syntactic environment. To achieve that every, after combining with its
complement NP, finds the other needed set in its complement, the whole expression
(i.e., the generalized quantifier NP) has to undergo raising to a higher position in the
tree (as every does strictly speaking not c-command anything beyond the NP constituent
of which it is part).

17 Modulo expatriate interpretation, /er/ is expected to combine with distributive elements,
as these require difference within the extension of what is distributed over.
Strengthening and weakening

Strengthening and weakening does mark symmetry (reflexivization), and illegally so in ordered domains (cf. section 3.2). Reflexivization in ordered domains gives us a truly free variable. /er/ and its siblings may also be degenerate on nominals. This is what we see when mass nouns are pluralized (cf. section 2.3.2), and it is, as we argue, what we see much more generally on genitive and dative case-marked arguments (cf. sections 3.3.2 and 4.3.2 respectively). Namely, there is a sign here that signals difference Diff in the semantics/pragmatics that can never be interpreted with respect to what the expression it attaches to appears to denote, namely, ordinary individuals. It is therefore pushed elsewhere by a mechanism that we call “expatriate interpretation” (EI), repeated in (40).

(40) **Expatriate Interpretation (EI)**

Morphosyntactic feature [f] on expression α cannot be interpreted in terms of the corresponding semantic feature [F] with respect to the meaning of α. Part of [F] is interpreted with respect to the meaning of an element in α’s linguistic context.

EI “frees” a variable from its binder for it to be interpreted as something else – most often, an indexical variable that is going to be taken care of independently in the calculation at a later stage. Silent modality, comparison and even change is often a consequence of this mechanism: A variable is interpreted as a time, world or threshold that may be bound by a mechanism akin to what is known as existential closure, only now we do not close existentially “ordinary” individual variables but rather phenomenal individual variables (times, worlds, thresholds). I.e., we have existential closure as well at higher levels, and it happens to variables that have been “disclosed” because the “original” binding proves to be problematic for the semantics as it involves contradiction.

### 2.2 Strengthening and weakening

It appears to be a basic fact of the relation between language on the one hand and reality and possibility on the other that the former grossly underdetermines the latter. As Russell (1940, p. 87) puts it:

> Owing to the fact that words are general, the correspondence of fact and sentence which constitutes truth is many-one, i.e., the truth of the sentence leaves the fact more or less indeterminate.

If language underdetermines reality wholesale, it is clear that weakening as an operation on meanings is questionable. In particular, Hurford’s constraint describes that speakers do not accept weakening when they see it before them, as in the example in (41) the basic logical form of which is given in (42).
Weaker construction

(41) John is a bachelor or (John is) unmarried.

(42) \( A \supset A \lor B \)

Under the exclusive interpretation of “or”, (42) is not valid. Gricean reasoning explains this as well: It is odd to let a stronger claim be followed by a weaker one as according to informativity, we should always make the strongest possible statement. On the other hand, it appears clear that there are environments where weakening is possible. Crain/Khlentzos (2008, p. 30) provide the following argument in the context of the interpretation of disjunction:

Consider a domain containing 2 people, Max and Jon. Suppose that Jon laughs, so \( L_j \) is true. But if \( L_j \) is true (i.e., Jon laughs) then it follows that ‘someone laughs’ is true, so \( \exists x L_x \) is true. Yet, there are only 2 objects in the domain, Max and Jon, so the existential claim that ‘someone laughs’ is logically equivalent to the claim that ‘Jon laughs or Max laughs’. That is, from \( \exists x L_x \), we can infer the truth of \( L_M \lor L_j \). In short, we began with the statement \( L_j \), and derived the disjunctive statement \( L_j \lor L_M \).

QED: Weakening holds for ‘or’. Therefore ‘or’ is \( \lor \) [inclusive] disjunction.

To the extent that we can imagine a transparent relation between signs and meanings at all, a one-one relation between elements of language and reality appears an outrageous thought: we would need, eventually, a name for everything “out there”, which appears already impossible due to the sheer number of things in their manyfoldedness and diversity. Instead of giving everything a name, we employ certain words that are multi-use in that they collect different things on different occasions. But even so: there are – depending on how one counts – between five and ten syntactic categories in German, but it appears quite unlikely that whatever falls under reality or possibility could be fruitfully described in terms of a similar number of categories.\(^{18}\) The grammar takes care of combining classes of symbols (categories) in a very restricted fashion. The systems behind reality (if any) and possibility (if any) may be restricted as well, but in ways that are largely hidden to us and very possibly too complicated in their interaction to really see through and make predictions about.\(^{19}\)

\(^{18}\) If we look at the proposals of some of the grand philosophers, we are most often left with around ten categories, Aristoteles: Substance, Quantity, Quality, Relation, Place, Time, Posture, State, Action, Passion. Kant: Quantity (Unity, Plurality, Totality), Quality (Reality, Negation, Limitation), Relation (Inherence and Subsistence, Causality and Dependence, Community (Reciprocity)), Modality (Possibility, Existence, Necessity). Cf. further below for Husserl’s treatment of expression and meaning categories.

\(^{19}\) Take, e.g., the problem of forecasting the weather, although much progress can be said to have been made in this field. E.g., it is possible nowadays if expensive to insure oneself against certain weather conditions as it is possible to sue companies specialized in weather forecasting if they have predicted the wrong weather.
We keep discovering new structures, new primitives and new kinds of matter in reality. We do not keep discovering new structures or categories in natural language, or to the extent that we do, at a very different pace and within restricted limits. Natural language grammars cannot keep extending their means as they are simply too limited. Similarly, the structure of the state of affairs or thing that we try to describe most often hardly resembles the structure of the thing we use to describe it (linguistic structures), unless we happen to be describing a tree. There appear to be simply too few ways of expressing the infinite meanings feasibly in any fashion that would appear to adhere to iconicity. But it might still be a good idea to start from some iconicity assumption when figuring out the relation between language and reality, and we can observe that children do it when they produce, e.g., a humming sound say on observing a truck passing by. Even if we are forced eventually to accept being wrong about our conception of reality, we all start from naive realism following Einstein, i.e., the doctrine that things are what they seem (cf. Schilpp 1944, p. 282).

Grammar does help to bridge the gap between words and meanings, if only in an imperfect way. An important technique consists in having designated words that refer to different things depending on the utterance situation, i.e., indicator words like in particular this. As important are outerlinguistic mechanisms that, according to the Gricean tradition, make more out of a statement than it literally codes, i.e., lead to increased informativity. Informativity is defined as exclusivity. The more exclusive an expression, the more informative it is. Thus, e.g., the logical conjunction “∧” is more informative than the logical conjunction “∨”, as the cases where the former yields truth (namely, when both conjoined sentences are true) are a subset of the cases where the latter yields truth (namely, when at least one of the conjuncts is true). More generally, an expression α is more exclusive than an expression β when the denotation of α is a subset of the denotation of β. Strengthening then means increasing exclusivity, i.e., going to subsets. Accordingly, weakening means increasing inclusivity, i.e., going to supersets.

There is a general tradeoff: One may very well be brief and vague (inclusive/weak) or elaborate and specific (exclusive/strong), but it is usually somewhat odd to be elaborate and vague.20 There are exceptions beyond polite speech, among which, prominently, cases that are central to our discussion, such as plural or comparative marking or the expression of modality. As we argue for these cases, they carry a meaning that is weaker than that of their unmarked cousins (singular, positive and indicative, respectively).

20 An important factor to be taken into account is of course the context (more precisely, the common ground between speaker and hearer); note that in the general case, communication becomes the more economic, i.e., less elaborate, the better known the context is to the interlocutors, i.e., the more knowledge is shared between them.
Weaker construction

Strengthening should never be marked, as we derive the stronger (as opposed to the weaker, logical) meanings “outside” of language. But we accomplish strengthening on the basis of our knowledge of language, namely, by comparing alternative expressions that might have been chosen instead of the actually used expressions. If strengthening is in terms of implicature, generally, we expect it not to be marked. It is clear that it couldn’t be marked, as the calculation of implicatures is a striclty extralinguistic process. Making strengthening explicit is allowed in the sign, though, cf., e.g., (43).

(43) John has three children, and no more.

A case of strengthening that has been argued to involve marking is that of conditional perfection (Horn 2000). Essentially, Horn’s idea is that what appears to be literally said could have been put more succinctly. (44) is a conditional that strongly tends to be interpreted as a biconditional (which, incidentally, can be formed from the plain conditional by inserting only, cf. section 2.1.2 above as well as section 3.1.2 further below.

(44) If you lean out more, you’ll fall down!

As Horn points out, a more economic expression as well as stronger statement can be made by just leaving away the if-clause, as in (45).

(45) You’ll fall down.

Such exceptional cases notwithstanding, we are lead to assume given Occam’s Razor and strengthening that word meanings are general rather than restrictive. There are very obvious cases suggesting that remaining silent (i.e., the absence of marking) produces stronger meanings rather than weaker ones. We saw already that modal meanings as usually marked are weaker than their non-modal counterparts, and we will see later on that plural marking may actually support that weaker meanings are in need of marking rather than stronger ones, cf. section 2.3. As a quite obvious case of illustration, let us look at the relation between the conjunctions and or, where from a logical perspective a conjunct built with and entails the conjunct built with or. We see that while conjunctive statements need not be marked, disjunctive ones always do; consider, e.g., (46).

(46) We want a gun, a car, a ticket to Cuba.

This means the same as (47-a), but not (47-b).

(47) a. We want a gun and a car and a ticket to Cuba.
b. We want a gun or a car or a ticket to Cuba.
Strengthening and weakening

We observe that (46) (and thus the example without conjunction as well) entails (47)—we see again that if a speaker wants to convey a weaker meaning, she is going to have to mark this. We see this again and again: the weaker meanings are more in need of marking than the stronger ones. Broadly speaking, ‘modalized’ statements require marking as a rule, i.e., expressions that indicate an intended modal interpretation, like a special auxiliary or verb form, a hedge or a construction signalling, e.g., indirect speech. (48) gives some examples of so-called hedges, i.e., parts of utterances that lower the degree of committal on the part of the speaker.

(48) I believe/I’ve heard/possibly ...

Note it appears that markers of weakening can be placed before or after what a speaker wants to qualify, with largely the same effect (except that of possible surprise in case it is suffixed). But this is not always so. Take, e.g., (49).

(49) ... so to speak/or so they say.

The expressions in (49) can only be suffixed, and they are like a post-hoc imperative to relax the strict rules of transparent hence very possibly cumbersome expression. Or take the case in (50).

(50) p, will sagen, q.

Using the construction in (50), the speaker indicates that he is looking for a better way to express p, and believes to have found such better expression in q. Other means to weakening are as obvious: temporal or modal expressions, phrases indicating indirect speech, or rhetorical figures like irony or litotes. Last not least, politeness, which can be understood as a technique of leaving choice to the hearer, is a domain where we see weakening happen a lot, cf. the following passage from Jean Paul Friedrich Richter’s Vorschule der Ästhetik.

Will der Mensch im Ernste eine Meinung behaupten, zumal ein Gelehrter, so tut er’s nur verschämt — er zweifelt — er fragt — er hofft — er fürchtet — er verneint die Verneinung oder auch den Superlativ des Gegners — er sagt, er unterfange sich nicht, zu behaupten, daß — oder, denk’ er Unrecht, wenn — oder, andere mögen entscheiden, ob — oder, er möchte nicht gern sagen, daß — und es woll’ ihm vorkommen, als ob — —

If someone, in particular, an erudite, seriously wants to put forward an opinion, he does this only bashfully — he doubts — he asks — he hopes — he fears — he negates the negation or the superlative of the opponent — he says, he does not undertake to claim that — or, is he wrong, if — or, others may decide, whether — or, he doesn’t fancy to say that — and it would seem to him, as if
The speaker may expect strengthening to happen on the part of the hearer, and therefore say something weaker than he could actually have said (which, if it were strengthened, would become maybe too strong, i.e., get in conflict with quality). Similarly, a common politeness practice consists in negating an exaggeration, as in (51).

(51) Ich muss nicht unbedingt sitzen.
    I must not unconditionally sit
    ‘I need not necessarily have a seat.’

Similarly to the case of litotes, (51) leaves a broad interpretive spectrum, excluding merely an interpretation that is obviously inappropriately strong. This is politeness, consisting, essentially, in giving the hearer more interpretive choice. Weakening on the part of the hearer would appear strange indeed, but we see this as well; (52) is a case in point.

(52) Melden Sie sich jetzt auch mit Email und SMS an.
    register You REFLEXIVE now also with email and sms PRT
    ‘Register now by email and sms as well.’
    (Advertisement of the German Mail 2012)

Intended here is the meaning of “or”. But (52) sounds stronger, and politeness is rarely seen in advertising these days. Note as well that we have a modal context here, specifically, an imperative, which is not very polite. (53) is another case where and ‘and’ is used but oder ‘or’ is actually intended:

(53) Wir spielen heute nur Nummer-Eins-Hits aus Deutschland,
    we play today only number-one-hits from Germany,
    England und USA.
    England and USA
    ‘Today we play only number one hits from Germany, England and the USA.’ (SWR 1, 01.05.2012)

What we see happen in (53) is quite the opposite though of what appears to happen in (52). Similarly, weakening applies in cases of irony as in (54).

(54) Das ist ja eine schöne Bescherung!
    That is a beautiful mess

Having seen that strengthening and weakening both exist and that strengthening as opposed to weakening appears to be unmarked, let us turn to the question whether strengthening and weakening operations respectively may embed, i.e., become part of the recursive procedure calculating meanings. Arguments have been given that strengthening may happen before the semantics is “closed”. As pointed out in Reinhart (2006, section 5.3), the strongest cases for embed-
Strengthening and weakening 53

ded implicature are cases of Q(uantity) implicature, leading to exhaustification of certain meanings (e.g., strengthening some as logically compatible with all to only some as logically incompatible with all). Landman (2000, p. 232) gives the example in (55) among other to demonstrate how a global (i.e., post-syntactic/semantic) computation of implicature, corresponding to wide scope negation of the stronger meaning, delivers the wrong results.

(55) a. Every boy kissed three girls.
    b. It is not the case that every boy kissed more than three girls.

The paraphrase in (55-b), featuring the logical meaning three or more of the numeral, allows for boys who kissed less than three girls, contra our intuitions what (55-a) actually means. What is needed to achieve the intuitively right meaning is strengthening the meaning of the numeral by exhaustifying it (compare three and no more or exactly three. In a similar vein, Chierchia (2004) gives examples like in (56) featuring some under or.

(56) Our employees are either paid by the hour or given some of the profits.

One of the prominent readings of (56) is that the employees are either paid by the hour or given some, but not all of the profits; again, what is needed is strengthening by exhaustifying at an embedded level.

To capture the apparently local computation of implicature, Chierchia proposes that linguistic elements are associated not only with their lexical meaning (what he calls the “plain value”) but also with a scalar meaning (“scalar value”) that is essentially the plain value plus exhaustivity. E.g., three means “three or more” but carries the implicature “no more than three”, which is the same as “only three”, due to informativity: “Four N Ved” is true in fewer models than “three N Ved”. If S had been in a position to assert “Four N Ved”, she should have done so as this would have been more informative. This type of implicature works very well and appears to be automatically generated. It does not appear to produce extra cost. Rather, cancelling it appears to produce a cost (cf. already Gazdar (1979) for argument that cancellation of implicatures is costly rather than generating them).21

21 Essentially, this type of theory goes as follows, following a classroom exposition of Reinhart. First, something as in (i) is assumed.

(i) For any English expression α, [[α]] is its standard semantic or plain value.
    If α contains a scalar item, α is also assigned compositionally a scalar value.
    [[α]]s, which is computed on the basis of the scale associated with α.

A condition like in (ii) explains why scalar implicatures disappear under negation.

(ii) Strength condition (Reinhart 2006):
    The scalar value of α cannot be weaker than its plain value (where a representation α is stronger than a representation β iff α entails β).
Let us now look in more detail at weakening. The question is whether we access meanings weaker than what is literally said in the compositional process and to the disadvantage of these stronger meanings. As we mentioned already in section 2, examples of the following kind provide strong cases that entailments must be accessible and manipulable during meaning composition.

(57) a. wooden dove
    b. fake gun
    c. open secret

Here what seems to happen is that an entailment is negated, e.g., “being animate” for (57-a) or “being deadly” for (57-b). In the case of tautologies, following Autenrieth (1997), we go to an entailment and then strengthen it by way of exclusion of alternatives (i.e., insert only, cf. Ward/Hirschberg 1991). In the cases given in (57), we go to an entailment and then negate it. This leads to a contradiction. We have to go outside the denotation of the head noun to make sense of the NP as a whole (cf. above section 2.1.2).

We argue in section 3.2 that the same mechanisms apply in comparative structures. According to that analysis, equatives are formally trivial structures as they arrive at the interface (on their “first reading”) that are automatically strengthened (by inserting only). The comparative negates the embedded meaning, yielding a form that is contradictory when used on ordinary individuals. In ordered domains it is differently problematic, as here, what is in the set of things meeting the stronger condition is also in the set meeting the weaker condition, while the opposite need not be true (but may be true of course).

But let us recall, first, that weakening appears to be what is not allowed in certain signs, namely, sentences that are conjoined by the known conjunctions under what seems to be their “ordinary”, i.e., boolean interpretation. This is what has become known as Hurford’s constraint, given in its original formulation in (58) (Hurford 1974, p. 410) and illustrated in (59).

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Making a set smaller by strengthening and then going to its complement (negation) leads to a more inclusive set than the complement of the original set, i.e., it leads to weakening eventually which however is generally considered to be forbidden (contra though to what we argue here). Cf. Gazdar (1979), Horn (1989) as well as section 2.2.

The opposite case – adding something to the meaning that is not entailed – also appears to exist, as in (i).

(i) Jannik Höntsch (15) ist der Sieger des eigentlich gar nicht als
    Jannik Höntsch (15) is the winner of the actually even not as
    Wettkampf gedachten Ereignisses der DLRG Allensbach.
    competition thought event by the DLRG Allensbach
(Südkurier, 22.07.2013)
The joining of two sentences by *or* is unacceptable if one sentence entails the other; otherwise the use of *or* is acceptable.

#Otto is a bachelor or he is unmarried.

Hurford’s constraint only talks about disjunction, as his original contribution was intended as an argument that there are really two *ors* in natural language, i.e., an inclusive and an exclusive one. An ambiguity issue does not arise for conjunction in this way, which might explain why conjunction has not been considered in the kind of pattern used by Hurford. Nevertheless, conjunction works very much like disjunction as regards the oddity of joining sentences that entertain an entailment relation, *modulo* Gazdar’s amendment. When something is asserted, we do not weaken it to something that is entailed by what is asserted and forget about the stronger (asserted) meaning. Hurford’s constraint is a consequence of a much more general imperative, rooted in economy, that appears to obtain when we speak and that we could formulate as in (60).

Don’t say what can be easily inferred.

Formulated differently, (60) could be put as well as in (61).

Say only something that adds to informativity.

Where with regard to (61), “difference” can be rendered as “difference in truth conditions”. It is in special contexts only that weakening is allowed, e.g., in definitions as in (62).

A bachelor is an unmarried man.

Note that it is allowed more generally in comparative talk, cf. (63-a) vs. (63-b).

a. #Otto is a bachelor and (he is) male and (he is) unmarried.

b. Otto is a bachelor as he is male and (as he is) unmarried.

Thus, while it is generally disallowed to follow up on a statement with a weaker statement (Hurford’s constraint), we see it is allowed when we use the expressive tools known from the domain of comparison. In German we see the same thing, only the (equative) comparative-like structure in (64-b) sounds archaic.

Motivating Hurford’s Constraint on the basis of economy provides an explanation of different degrees of oddity associated with the joining of two sentences (or, more generally, concepts) of which one entails the other. Thus, joining by *or* is plausibly felt to be worse than joining by *and* as use of *or* suggests difference of truth values of the sentences (containing the concepts) that are joined, while use of *and* does not. Use of *and* is still marked as given that one of the sentences entails the other, uttering the other sentence to start is superfluous from the perspective of informativity.
Weaker construction

(64)  a. #Otto ist ein Junggeselle und er ist männlich und verheiratet.
    Otto is a bachelor and he is male and unmarried.

   b. Otto ist ein Junggeselle so er männlich und verheiratet ist.
      Otto is a bachelor as he male and unmarried is.

   c. Otto ist ein Junggeselle indem er männlich und verheiratet ist.
      Otto is a bachelor in that he male and unmarried is.

*Indem* ‘in that’ in (64-c) makes it most obvious: speaking set language, [[bachelor]] is included in [[male]] and [[unmarried]]. It is worth noting that we see the element *als* ‘as’ act as a conjunction between a stronger and a weaker meaning in other contexts; in particular, *als* or *as* acts in this fashion prominently in so-called ‘subsumptive constructions’, cf. the examples in (65) or (66).

(65)    Otto kennt Ede als einen Lehrer.
    Otto knows Ede as a teacher

(66)    Als Lehrer muss Ede widersprechen.
    ‘As a teacher, Ede must contradict.’

Part of the meaning of (65) and (66) is that Ede is in the set of teachers (in Otto’s belief worlds for (65)). In other words, the meaning of the complement of *als* and *as* subsumes, i.e., is less informative or more inclusive than the meaning of the NP that is connected to this complement.24 Note as well that it is odd to turn relations around, i.e., have the more exclusive term act as the complement of *als* or *as* respectively, cf. (67).25

(67)  a. Als Beamte sind Richter in der Regel staatstreu.
    As civil servants are judges in the rule loyal to the state

   b. #Als Richter sind Beamte in der Regel staatstreu.
    ‘As judges are civil servants in the rule loyal to the state.’

(67-b) is odd because generally, a German judge is a civil servant but it is by no means generally the case that a civil servant is a judge.

24 This is true of predication relations as well as of modifying constructions. Interestingly, the formative *as* may function as a relativizer in English dialects, i.e., it may create a ‘predicate’ subsuming its ‘subject’, cf. (i) (from Biber et al. 1999, p. 609).

(i)    Well I know one person as’ll eat it.
        ‘I know one person that will eat it.’

25 ‘Subsumption’ is a central technical descriptive term in grammar models working with attribute-value matrices where a matrix A subsumes a matrix B if and only if matrix B is at least as informative as matrix A.
Let us remind ourselves what being informative means. It means excluding cases and in this way restricting the possible interpretations. Again, this is dependent on the linguistic context: an expression with a very broad meaning may exclude quite a few, i.e., many cases depending on context. There are domains where saying something really weak in an elaborate fashion is very common, like politics. E.g., the statement in (68) doesn’t really say anything positively at all (i.e., there is no existential claim associated with (68)), which is hard to see though as it features double negation (cf. section 4.2.2).

(68) Von der Destruktivität und der Unproduktivität, die man uns nachsagt, ist buchstäblich nichts vorhanden. ‘The destructivity and unproductivity that we are ascribed is literally nonexistent.’

(Kölner Stadtanzeiger, 28.12.2012)

We should stress that it is in particular in the realm of interaction between scope-bearing elements – specifically, when negation is involved – where different possibilities of disambiguation arise. We take it that it is a general fact of language that interlocutors by no means always disambiguate the same way (cf. already Horn’s 1989 distinction between hearer- vs. speaker-oriented maxims). The places where this happens most systematically are expected to be the places of innovative language use.

There should be two basic cases: An utterance could be too weak. The repair lies in strengthening it. Next to that, an utterance could be too strong. The repair lies in weakening it. In the extreme case, an utterance could be so weak as to exclude nothing at all – this holds if the utterance is true with respect to all possible worlds, i.e., if it is tautological. As we argue, the interface reacts to this kind of situation by executing a particular strengthening operation, namely it exhaustifies or, speaking more figuratively, inserts a silent “only”. Incidentally, “only” serves to nicely demonstrate the vicinity of asserted and presupposed material as it turns what would be asserted if “only” weren’t there into a presupposition and asserts the negation of the alternatives to it.

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26 E.g., /sich/, that appears to give rise to many a reading, cannot be interpreted in terms of many of them in case the domain in which the relation is to be interpreted is ordered. Here, it cannot be reflexive, and not reciprocal. IAO “minus” these meanings remains as the range of interpretations that are possible. Cf. for further discussion section 4.1.1.

27 N.B. that the alternatives are the stronger meanings if we are on a scale. The negation of alternatives yields the “universal” effect: All x satisfying the condition are the same as the individual caught by the existential quantifier = There is no x that satisfies the condition and is not the individual caught by the existential quantifier.
The focus particle (alternatively, quantifier, cf. section 2.1.2) only does something to truth functional meaning, and it does something to where meaning is represented by switching the assertive vs. presuppositional status of parts of the meaning of the sentence where it appears. The core properties of only as bearing on our discussion are given in (69).

(69) Only
a) turns asserted into presupposed meaning.
b) yields exhaustive readings.

The structure comprising only may now carry a meaning that is actually too strong, namely, in particular, it is contradictory. This we argue is the case with comparatives that do not talk about well-distinguished individuals, i.e., excessives or /tsu/ comparatives, which are discussed in detail in section 3.2.

Regarding weakening, we may say it amounts to going to meanings that stand in a relation of subsumption to meanings that are literally coded; clearly going to weaker meanings is part and parcel of everyday run-of-the-mill meaning calculations; what has not hitherto been established is that we can go to entailments without insisting that the stronger literal meaning apply. As we also mentioned above in section 2.1.2, Cases for which this has been argued include metaphor according to a Gricean (1975) analysis; hyperbole is a clear if originally rhethoric case where entailed meanings are understood to hold to the disadvantage of the actually literally coded meanings.

2.2.1 Levels of meaning

It will be clear by now that more is involved in the syntax-semantics interface than translating material of type X (“syntax”) into material of type Y (“semantics”). Like there are different categories and different levels of projection in syntax, different types of contributors to meaning must be distinguished: there is what is asserted, there is what is presupposed, and there is what is implicated. These different types or levels of meaning behave differently with regard to their “period of activity” regarding meaning composition. This shows particularly clearly in the different interaction exhibited with regard to certain operations like in particular negation. Negation is therefore a useful tool to distinguish the different levels of meaning, to the extent that this is generally possible. To start, what is asserted gets annihilated by standard negation un-

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28 By “exhaustive readings” we mean universal readings of originally existential structures.

We can distinguish two cases, namely a focus interpretation and an interpretation in terms of definiteness. The two interpretations are given in (i).

(i) a. $\exists x \ P(x) \land Q(x) \land \forall y \ (y \neq x) \land P(y) \rightarrow \neg Q(x))$ focus
b. $\exists x \ P(x) \land Q(x) \land \forall y \ P(y) \land Q(y) \rightarrow x = y$ definiteness
Strengthening and weakening

like what is presupposed. But negating what is asserted brings in its train
alternatives to what is negated to the extent that the domain talked about can
be partitioned into nonoverlapping parts, cf. (70) and the discussion about the
focus particle or quantifier only above in section 2.1.2; to the extent that the
property that is negated lives on a scale, negation leads to an interpretation in
terms of a “lesser” instantiation of the property that is predicated, cf. (71).

(70) It is not red (but some other color).

(71) It is not superbly cool (but still quite cool).

Presuppositions are defined traditionally as the kind of meaning that survives
negation. What is implicated generally disappears under negation. We should
note immediately though that different types of negation have to be distin-
guished: Next to the “standard” presupposition-keeping and assertion-denying
negation, there is both presupposition-denying and assertion-denying negation,
as in (72), cf. the examples with the “phase quantifiers” schon and noch (cf.
Löbner 1989, Max 1996 and section 3.3.2 below).

(72) S1: Aha, das Licht ist schon aus. S2: Nein, das Licht ist NICHT
S1: Ah the light is already out. S2: No, the light is no
MEHR aus.

Presupposition: the light was on. Assertion: the light is out.

(73) S1: Das Licht ist schon aus. S2: Nein, das Licht ist NOCH aus.
S1: the light is already out. S2: No, the light is still out
Presupposition: the light was on. Assertion: the light is out.

Providing another example for the modular nature of grammar, different levels
of meaning may pull in different directions, i.e., contribute to meaning in ways
that are in fact incongruous. Structures of comparison, to be discussed in some
detail in section 3.2 are a case in point, cf. the positive in (74).

29 It is a common idea that negative assertions somehow bring in their train their positive
counterparts, if only by depending on them. Horn (1989, p. 203) writes in this regard:

Not every negation is a speaker denial, nor is every speaker denial a linguis-
tic negation, but the prototypic use [...] of negation is indeed as a denial of a
proposition previously asserted, or subscribed to, or held plausible by, or at least
mentioned by, someone relevant in the discourse context. Thus, while affirma-
tion not only can but standardly does function to introduce a proposition into
the discourse model, negation – in its ‘chief use’ (Jespersen), its ‘most common
use’ (Ayer), its ‘primary and standard use’ (Strawson), its ‘straightforward use’
(Kissin) – is directed at a proposition already in the discourse model.

Cf. as well section 4.2.2 on the conceptually particularly close if logically contradictory
relation of negated propositional meanings and their positive counterparts.
Weaker construction

(74) Otto ist hundert Kilo schwer.
    Otto is hundred kilos heavy

At the level of asserted meaning, (74) yields an “at least” interpretation, i.e., it rules out only the worlds where Otto weighs less than a hundred kilos. The implicatures associated with (74) pull in the opposite direction though, yielding an “at most” interpretation (as if Otto weighed more than a hundred kilos, the speaker should have said so in accordance with informativity). It appears that exhaustification, which has its roots in pragmatics, presumably, may become lexically associated with certain items beyond designated elements like only. Such are numerals and more generally gradable predicates (cf. for a recent presentation of the pertinent discussion Spector 2013).

There are grey zones between the levels, in particular, between implicature and presupposition. It is well known that grammaticalization may turn generalized implicatures into lexical meaning, i.e., conventionalize something that is pragmatic in origin (cf. Levinson 2000; Traugott/Dasher 2002). The pertinent grammaticalization path can be roughly described as follows: There is a conversational implicature. Then it gets generalized and becomes a kind of default meaning, as has been argued for the case of Obviation (Hellan 1988) or the “Disjoint Reference Presumption” of Farmer/Harnish (1987, cf. below section 3.3.1). Finally, the meaning may get conventionalized, i.e., it may be associated with particular forms (a.k.a. “lexicalized”). Now it is similar to conventional implicature or presupposition. The difference to standard implicature is that these cannot be cancelled (a.k.a. “negated”). It is not surprising then that there is something like a grey area between what are clear cases of presupposition and what are clear cases of implicature, such that there is now talk of ‘soft presuppositions’ and ‘hard implicatures’.

But is this really true? It appears to be true of Conversational Implicatures (CIs) that they cannot be negated. But then it is not so clear they have an effect on truth conditions actually. Regarding presuppositions, some will agree that they have an effect on truth conditions (“meaning”). At least, to the extent that presuppositions are acknowledged at all, they will constitute conditions for meaningfulness. (75) gives the classical definition of presupposition inference.

(75) \[ p \vdash q \text{ iff } p \models q \land \neg p \vdash q \]

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Cf. e.g. Romoli/Schwarz (2015) and the references therein. Specifically, certain scalar implicatures like those associated with numerals present themselves as particularly hard, i.e., generalized up to conventionalization. According to what we argue, comparatives are a case where a scalar implicature turns into a presupposition, i.e., is generated ‘automatically’ at the interface to semantic interpretation. Cf. sections 2.2, 3.2.
(75) says that any world that makes p true makes q true and that any world that makes p false makes q true. Presupposition is thus like entailment that is defined by its special behavior with respect to negation, namely, scoping it out. The presuppositions are what we are led to take for granted when using certain lexical expressions. Therefore, they also belong to the realm of lexical knowledge. Geurts (1999, p. 10) characterizes presuppositions as follows:

To presuppose something is like making a promise. [...] a speaker who presupposes something incurs a commitment (to use Hamblin’s expression) regardless whether he really believes what he presupposes.

The speaker’s promise is that she is using the expression in a meaningful way, e.g., non-vacuously in case it carries an existential presupposition. The definition in (75) suggests that presupposition can be looked at as a special form of entailment, namely, an entailment surviving negation (cf. below). Now it may have an effect on truth conditions (cf. section 2.2).

(76) The king of France is not bald because there is no King of France.

In (76) we see that one can negate presuppositions, contrary to the basic definition of presuppositional material as material that remains unaffected by negation. It is well known that one can do this, although one will have to use special means like specific particles or intonation (cf. above (72) and (73)).

To repeat, presupposition can be regarded as a special type of entailment, namely an entailment that remains unaffected by negation. Negating an entailment on the other hand appears to be nonsensical exactly as it leads straightforwardly to contradiction. Nonetheless, negating entailments appears to be a perfectly productive grammatical phenomenon. In particular, three productive classes of cases are particularly pertinent:

- privative predicates like fake or alleged
  At first sight, privative predicates appear to be just a small set, but it turns out that the mechanism at work here – negating particular entailments – is much more widely used: there is the case of wooden doves and similarly literally contradictory attribute-noun combinations as well as the completely productive case of excessives that we argue are just like privative predicates with a little more syntactically visible structure.

- irony
  Ironic use of expressions clearly makes for an infinite set. It is also quite clearly a matter of the interface between truth conditions and “what is actually the case” in the utterance situation. Namely, what is said contradicts the context when it is interpreted literally.
Weaker construction

- comparatives

Comparative structures clearly are an infinite set. As we argue, comparatives live exactly on negating an entailment; to note, negation in ordered domains leads to more inclusive sets (supersets), i.e., weaker meanings (rather than complements as in the domain of ordinary individuals).

The close relation between entailment and presupposition shows in in (77) and (78), discussed by Gazdar (1979, pp. 120f) and later Levinson (1983, p. 194):

(77) John doesn’t regret doing a useless PhD in linguistics because in fact he never did one!

(78) *John regrets doing a PhD because in fact he never did one.

As Levinson points out, (77) and (78) should be on a par, where each time what we have is presupposition negation. But why is (78) bad, then? Levinson suggests this might be so since in (78), the presupposition (that he did a PhD) is turned into an entailment (ibid):

A simple but important explanation of this is to claim that, at least in these cases, the affirmative sentences entail what we have hitherto called the presuppositions of each of them. Thus (121)–(123) [(78)] are simply contradictions and therefore semantically anomalous. This claim leaves it open whether in addition to being entailed the alleged presuppositions are also (redundantly) presupposed in the affirmative sentences, although most presuppositional theorists would claim that they are.

Gazdar proposes that factive verbs both entail and presuppose their complements. Now (78) is contradictory while its negation is not. To repeat, we see the vicinity of assertion/entailment and presupposition as well in the case of focus particles like only that among other things switch the assertive and presuppositional status respectively of what is coded.

It is probably fair to say that one of the chief tasks in learning adult language lies in learning what can be concluded from what has actually not been expressly said, and this is what implicature is all about. Implicature is also about lexical knowledge. However, it involves not single expressions but expressions that are part of scales of logical strength; implicature makes reference to alternatives as of nature and its workings are in this way indirect. There is more variation as well than with other types of meaning as regards the conditions under which implicatures "go through", i.e., survive, or do not; regarding negation, it is generally assumed that it does cancel implicature. We noted

31 It is the standard view that what is presupposed is generally entailed as well but not the other way around, as Irene Heim (p.c.) assures me.
above that presupposition and entailment are very close in nature; certain kinds of implicature are very close to presupposition as well, namely what are called conventional implicatures that could be taken to correspond to “lexicalized” implicatures or implicatures made unconditional, cf. immediately below. Our central figure Diff is a case in point in that it serves to make sure that an implicature that is generally taken for granted in the case of existential quantification – namely, the O corner of the traditional square of opposition – cannot be cancelled but must be strictly semantically interpreted (if, as we argue, in a different place). Accordingly, we can observe that conventionalized implicatures may embed and take scope under other syntactically represented operators (cf. Karttunen/Peters 1979 for the proposal to look at supposed presuppositions as conventionalized implicatures). The well-known and much celebrated Gricean conversational implicatures, in contrast, tend to be blocked systematically in negative (decreasing) environments. 32

Even more important than what has been said is often what has not been said but could have been said, if the speaker had had anything more interesting or informative to say. But this is only quantity implicature, the type that is most robust and best researched. What kinds of implicature matter? There is conversational (extralinguistic) vs. conventional implicature (linguistic/lexical/grammaticized) and there are different types within conversational implicature. Fundamentally, a useful partitioning can be drawn along the lines of Horn’s (1989, p. 195) distinction between Q vs. R implicatures.

Q-based implicature is essentially negative in character, proceeding from a speaker’s nonuse of a stronger or more informative form to the inference that the speaker was not in an epistemic position to have employed the stronger form. [...] [R-based implicature], where a speaker’s use of a weaker form may be filled in by an addressee who recognizes that some particular stronger or more informative meaning may have been intended. Because there is no essential reference here to what a speaker might have said but did not say, R inferences are essentially positive in character.

As loci classici Horn gives scalar implicature for Q-based implicature and indirect speech acts and/or euphemisms (including, according to Horn, conditional perfection and neg-raising). Oftentimes, it seems all too natural to generate implicature, so much so that we do not generally notice (“generalization” or

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32 This is usually explained on the basis of the assumption that a meaning together with its implicatures may not be weaker than the meaning without the implicature. Strengthening by means of implicature and then negating however does yield a weaker meaning than just negating the “literal” meaning, in disagreement with the general belief that weakening is not allowed. Cf. footnote 21 above for an implementation.
“presumptiveness”). Still it generates a cost, namely, it must be derived or represented. Of course, the same goes for presuppositions. Let us then turn finally to conventional implicatures, which are very close to presupposition as we noted. Levinson (91, pp. 127ff) writes concerning conventional implicatures:

Conventional implicatures are non-truth-conditional inferences that are not derived from superordinate pragmatic principles like the maxims, but are simply attached by convention to particular lexical items or expressions. Grice provides just two examples: the word *but* has the same truth-conditional (or truth-functional) content as the word *and*, with an additional conventional implicature to the effect that there is some contrast between the conjuncts (Grice, 1961); the other example is the word *therefore* which Grice holds contributes nothing to the truth conditions of the expression it occurs within (Grice, 1975: 44). Other examples that have been suggested are the meanings of *even* (Kempson, 1975; Karttunen & Peters, 1979) and *yet* (Wilson, 1975). [...]

On the account suggested here, lexical items will often have non-truth-conditional but nevertheless conventional features of meaning: so a lexicon for a natural language will contain reference to pragmatic components of meaning. Secondly, syntactic rules seem to be sensitive to such elements of meaning. But in that case syntax is not autonomous with respect to pragmatics, a claim that most linguists would resist. The issue is important because the inter-relation between conventional implicature and syntax is one of the clearest areas where pragmatics impinges deeply on grammatical processes.

Many linguists today are not worried to assume that syntax is not autonomous with respect to pragmatics. Highlighting the question what the impact of conventional implicatures is on truth conditions, Bach (1999, p. 351) writes:

With sentences containing ACIDS [= alleged conventional implicature devices] like ‘but’, ‘so’, ‘even’, and ‘still’, there is no such thing as the proposition expressed – in these cases what is said comprises more than one proposition. And when the sentence does so without expressing the conjunction of these propositions, and these sentences differ in truth value, the sentence as a whole is not assessable as simply true or simply false.

The question is how the different propositions interact with each other. While one will be ready to side with Levinson (2000, pp. 6, 27-30) that inference is cheap (fast) compared to coding that is expensive (slow), it is by no means costless. In particular, inferences may not be arbitrarily complex, and they may well “go wrong” from a logical perspective – purely technically, our reasoning
resources have limits, and quite modest ones, judging from the surface, cf., e.g.,
the following example from Reichenbach (1947, pp. 54f).

When we are told, for instance: \textit{it will rain tomorrow, and there will be an earthquake or it will rain}, we do not easily realize that this sen-
tence actually says nothing about the earthquake and is equivalent to the statement: \textit{it will rain tomorrow}.

Interestingly, the clearest cases where conventional implicatures appear to bear on truth conditions involve embedding of the ACID:

(79) Mary believes that he is Scottish and therefore brave.

Note that (79) may well be false while (80) is true:

(80) Mary believes that he is Scottish and brave.

Cf. Bach’s original examples (1999, pp. 332, 339):

(81) John is a philosopher but he is rich.

(82) John is a philosopher so he is rich.

The worlds that are described by (81) and (82) clearly differ, hence it appears CIs do matter for truth conditions. Similarly, the Indirect Quotation test suggests that CIs have an impact on truth conditions, cf. (83) and (84), which clearly depict different kinds of situations.

(83) Marv said that Shaq is huge but that he is agile.

(84) Marv said that Shaq is huge and that he is agile.

Another example given by Levinson (2000, p. 18) involves comparison, cf. (85).

(85) Driving home and drinking is better than drinking and driving home.

The point of (85) is that \textit{and} here is interpreted as \textit{and then} and that for this reason the order of reporting makes a difference to truth conditions. We see that this effect depends on the properties of other elements in the clause comparing to (86), where the order of reporting does not seem to matter.

(86) ?Driving and drinking is better than drinking and driving.

The point is that the “sequence” interpretation of eventualities connected by \textit{and} depends on properties of the eventualities, in particular, the change of state (accomplishment, achievement) versus stative (process, state) interpretation of the eventuality. It appears that what is generally taken to be a conventional implica
cature may be softer or harder with regard to its impact on truth conditions.
depending on properties of the linguistic context. In sum, conventional implicatures do have an impact on truth conditions, i.e., semantics, under particular conditions. As Kemmerling (1991, p. 330) notes, the idea that conventional implicatures belong to the realm of semantics rather than that of pragmatics is already intrinsic in Grice’s original conception.

In this vein, Recanati (2010, pp. 151ff) describes the path from conversational implicature to conventional implicature – his “default implicature” – as follows:

Still, once a certain degree of conventionalization has been reached, a new possibility will arise. The ‘implicature’ will tend to be routinely generated even in configurations in which it could not result from a global inference à la Grice. [...] At this point we no longer have a GGI [Gricean Generalized Implicature], but a DI [default implicature], characterized by the loss of the nondetachability feature. [...] The default implicatures are not consciously available because they result from a ‘cryptic and heuristic procedure’, not from a macropragmatic inference conducted at the personal level; and they can arise locally because they are not generated through a global inference using as premiss the fact that the speaker has said that p, but are automatically triggered by certain expressions during the online processing of the utterance. [...] [T]hey are computed phrase by phrase in tandem with truth-conditions (or whatever compositional semantics computes)’ (Chierchia 2004:40). They are ‘introduced locally and projected upwards in a way that mirrors the standard semantic recursion’ (ibid).

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33 According to Carlson’s (1978) original proposal, stage level predicates (SLP) are apt to change over time, while individual level predicates (ILP) are temporally stable. Cf. as well section 4.3.1 below.
Quite arguably, then, conventional implicatures stem from pragmatics but have made their way into the semantics – they thus provide a label that is useful to capture the status of **Diff** as figuring centrally in our discussion. Furthermore, we see that it is not extraordinary for certain meaning aspects to change their status: to repeat a case from above, the particle *only* turns what would be asserted were it not for the presence of *only* into what is presupposed and vice versa. Note as well in this respect that the central mechanism that we argue for here – weakening to the exclusion of the literally coded stronger meaning – is just like implicature, the sole difference being that in the case of the latter, the stronger meaning is not directly coded but stems from our knowledge of the use of alternative expressions (namely, when “q” is asserted and there is an alternative expression “p” such that p entails q, then it can be assumed that p does not hold). In crude contrast in cases of weakening as taking center stage here, the stronger meaning that gets negated is actually coded, while the weaker meaning that does get asserted is not directly coded.

### 2.2.2 Tautologies and contradictions

Tautologies are sentences that are true in all possible worlds. Contradictions are sentences that are false in all possible worlds. Therefore, tautologies are the negations of contradictions and vice versa. Formally speaking, a contradiction is a formula that can be transformed such that it contains as part of its logical form the sequence “p and not p”. Semantically speaking, we can subsume under contradictions as well structures that do not deliver an interpretable result for the reason that operations associated with one element are not defined for an other element that it combines with, if we take a Russelian (1905) perspective according to which structures that involve presupposition violation are actually false rather than lacking a truth value altogether (as Strawson would have it); like *bona fide* contradictory sentences, sentences involving undefined compositional steps will be always false according to this practice.

Regarding informativity, there are two extreme cases: there are structures that yield tautological interpretations, and there are structures that yield contradictory interpretations. Tautologies are too weak: being necessarily true, they do not exclude anything and are completely uninformative. Contradictions are too strong: being necessarily false, they exclude everything hence are just as uninformative. The natural way of repairing structures that yield interpretations that are too weak to be usable lies in strengthening them; Grice’s theory of implicatures tells us how this happens, and there is a rich tradition in the study of strengthening mechanisms. For reasons of logical prejudice, apparently, structures that yield interpretations that are too strong to be usable have rarely been recognized or studied (but cf. Carston 1997 or Abrusan 2007). Structures
that yield contradictory interpretations are the main concern of this book. We may ask the following broad questions to start:

- Which structures yield contradictory interpretations at the interface?
- How are these structures made fit for interpretation, if at all?

Regarding the first question, it would seem to be progress already to list classes of structures that end up contradictory at the interface; the next step is to give more general criteria for the identification of such structures. We argue that certain comparative and reflexive structures, as well as certain structures featuring “lexical” case marking (dative and genitive) are contradictory modulo repair. Regarding the second question, the natural way of repairing contradictory structures lies in weakening them. We can observe this as well, but are not so trained to see it, due, presumably, to the Gricean heritage. E.g., sentences like in (87) are prone to be false but nevertheless heard quite frequently.

(87) You never shave / clean up / listen to me.

We argue for the availability of a mechanism at the interface that we call “expatriate interpretation” (EI) that achieves what one might call the semantic dislocation of part of the contradictory logical form (the eventual syntactic representation that gets translated into semantics, i.e., truth conditions). Most commonly, it turns out, the dislocation is from the semantic domain of “ordinary” individuals (tables, chairs and persons) to what we call echoing Husserl (1928) “phenomenal” individuals (times, worlds and thresholds). The observable effect of this dislocation are special aspectual, temporal or modal (TAM) interpretations that we do not see coded in the sign, viz. “hidden change” and “hidden modality”, but also interpretations in terms of comparison that we do not see coded in the sign, viz. “hidden comparativity”. Putting it differently, the interface does something very similar to what it would do if it interpreted the structures straightforwardly, but not quite the same.

We see here how the delivery of something that is as such not interpretable hence useful opens up what we might call a trickspace, namely, the possibility of applying certain operations that are not logically harmless or even generally opportune. Strengthening is a case in point, but we see as well more dramatic instances; e.g., following Autenrieth (1997), we can see in the case of tautologies how local weakening together with the (extralogical) exclusion of the actually asserted meaning may eventually lead to global strengthening. Let us look in some more detail at Autenrieth’s analysis of tautologies to see how this works, considering her example in (88).

(88) A car is a car.
As a matter of form, an equative tautology (“A is A”) as in (88) cannot be false; it thus excludes nothing and is not informative. What Autenrieth proposes now is that according to context, the hearer will weaken the predicative expression to a weaker property that is stereotypical for the kind of thing falling under it in the particular context. E.g., this will deliver one of (89-a) or (89-b).

(89)  
  a. A car is bad for the environment.
  b. A car is a means of transport.

In (89), we replaced the predicative noun from (88) by a more inclusive (i.e., entailed) predicate B. Judging by form only, the result is potentially informative – whether or not A is a member of B is a contingent matter.

(90) A is B.

Given that able speakers will know generally that being an A entails being a B, the statement of the form in (90) may still not seem informative; but this is a matter now of the meanings of the words that the speakers have learnt (a.k.a. “analytical” tautology). Note that (90) is just an instance of the more general scheme in (91) that we saw already in section 2.2.1.

(91) p → p ∨ q

Extending ideas of Ward/Hirschberg (1991), Autenrieth (1997) proposes that in the case of tautologies we do not just go to a more inclusive predicate but that we also exhaustify the predicate – in prose, we insert a silent “only” or “just”, getting thus one of (92-a) or (92-b) for our example.

(92)  
  a. A car is just/only bad for the environment.
  b. A car is just/only a means of transport.

Exhaustification is a form of strengthening in that it leads to the exclusion of meanings that are logically compatible with the non-exhaustified form.34 In sum, in Autenrieth’s cases, we ascribe a property to the subject that we know already applies to it and then exhaustify it, i.e., pretend that whatever other properties our subject may have, these do not matter.

34 The embedded implicatures discussion can be regarded as an example for the need to exhaustify at embedded levels. Looking from the other side, overt exhaustification suggests that the “naked” meaning is too weak to be interesting, hence the ironical effect in statements as in (i).

(i) I am only the boss.

We may note as well that adding exhaustification may have to do with an effect that is often observed with tautological utterances, namely, that “it doesn’t matter what you do” or that “there is nothing you can do about it”.

Strengthening and weakening  69
It is important to note that we see weakening and strengthening interact here. Weakening delivers a formally stronger but analytically weaker meaning that is ensuingly further strengthened by exhaustification, i.e., putting in an operator that has the effect that words like just or only have. Incidentally, Robert Frost’s (1928) poem “The rose family” plays with the quasi-automatic technique of strengthening tautologies by deliberately ignoring it:

The rose is a rose,
And was always a rose.
But the theory now goes
That the apple’s a rose,
And the pear is, and so’s
The plum, I suppose.
The dear only knows
What will next prove a rose.
You, of course, are a rose –
But were always a rose.

Like in the poem, it makes more sense for all practical purposes to first weaken and then go to the alternatives of these weaker meanings. This would seem less trouble of course than going to the (presumably more numerous) alternatives first and then weaken them each.

Turning to contradictions, it is less easy to find examples that sound natural. Much in the spirit of Peirce who stated that the law of the excluded middle does not apply to the general we do find “don’t-care” contradictions occasionally in the realm of generic statements like the one in (93), found at the Frankfurt airport long distance railway station in 2012.\footnote{Cf. footnote 23 in section 3.2 for an interesting case of a “standard” contradiction arising with superlatives.}

\[(93)\quad \text{Zur Verbesserung der Sauberkeit und aus Rücksichtnahme für den \textit{improvement of the cleanliness and out of respect auf Nichtraucher ist das Rauchen in diesem Bahnhof grundsätzlich for non-smokers is the smoking in this station generally nicht gestattet. Bitte benutzen Sie die gekennzeichneten not allowed. Please use you the designated Raucherbereiche. smoking areas}}

A straightforward case of a contradiction given by Autenrieth (1997) is (94).

\[(94)\quad \text{Er ist dafür und er ist nicht dafür.} \quad \text{He is for it and he is not for it}}

\[23\quad 35\]
Evaluated with respect to just one phenomenal variable of each sort, this is contradictory. It is no longer when we introduce additional phenomenal individuals, cf. the paraphrases in (95).

(95) a. He is for it in some respects and he is not for it in some respects.
    b. He is for it sometimes and he is not for it sometimes.

Testing with more examples, what we observe can be described in more traditional semantic terms as quantification over variables that do not belong to the ordinary individual argument structure of the predicational/quantificational structure, but to the indexical structure with respect to which the ordinary argument predicational or quantificational structure will be interpreted.

Contradictions are the negations of tautologies: a tautology is necessarily true (hence excludes nothing), and a contradiction is necessarily false, hence excludes everything. But not so. A contradiction also includes something, namely, it is on the left hand side of the introduction rule in (96).

(96) \( \bot \rightarrow p \)

What is written in (96) is the well known ex falso quod libet – from wrong assumptions, derive anything – as it holds that the truth value of the formula in (96) will always be “true”, no matter what the truth value of \( p \), given the definition of material implication.

In actual practice, not any proposition is introduced. Instead, a propositional formula which is already around is manipulated such that it does not talk about what its immediate/local linguistic environment provides but about something that is (prone to be) independently negotiated. The latter case is that of shifting to phenomenal individuals. Quantification over a fresh phenomenal individual is weakening, as it holds that

(97) \( \exists w \ p(w) \land q(w) \rightarrow \exists w \ p(w) \land \exists w \ q(w) \)

This is as it should be: contradictions are too strong as they exclude everything. For a contradictory structure to be useful, weakening must apply. Often we observe a weakening effect that arises through putting the O meaning to the phenomenal domain, i.e., times, worlds, or thresholds (cf. section 3.1). It is via the detour of deriving a structure that when interpreted in terms of real semantics yields an impossible world where \( p \) and \( \neg p \) hold at the same time. Contrary to what is most generally assumed then in the analytical tradition,\(^{36}\) we welcome structures that are contradictory modulo well-defined mechanisms

\(^{36}\) E.g., Kaplan (1979, p. 83) advances an explicit restriction that there be nothing like impossible worlds any time:
Weaker construction

repairing them, as these *prima derivatie* contradictory structures provide short-cuts to certain meanings that could maybe be expressed otherwise, but only so with more effort. These meanings are arrived at very systematically on the basis of what is independently around in the derivation, by the mechanism that we call Expatriate Interpretation (EI), repeated in (98) for convenience.

(98) **Expatriate Interpretation (EI)**

Morphosyntactic feature [f] on expression \(\alpha\) cannot be interpreted in terms of the corresponding semantic feature \([F]\) with respect to the meaning of \(\alpha\). Part of \([F]\) is interpreted with respect to the meaning of an element in \(\alpha\)’s linguistic context.

Technically, EI “frees” a variable from its binder for it to be interpreted as something else that is going to be taken care of independently, if at a later stage. Most frequently, silently modal, comparative and change-of-state interpretations are a consequence of this mechanism.

2.3 Plural matters

We argue that what we call change, modality and comparison is really a phenomenal plural. But what does “plural” mean to start? A ready answer is that a pluralized expression conveys that there is more than one element in its extension. Thus we find in Corbett (2000, p. 4):

> The main part of the meaning of the singular is that it refers to one real world entity, while the plural refers to more than one distinct real world entity.

Even looking at ordinary count nouns, however, there are well known problems with this intuitively appealing idea. Cf. examples like the following which exhibit plural forms that serve to refer to singular individuals.

(99)  

\[ \begin{align*}
\text{a. Pete has no horses.} \\
\text{b. Pete has exactly 1.0 horses.} \\
\text{c. Does Pete have horses? Yes, one.}
\end{align*} \]

Similarly, it appears that plural anaphora are compatible with singular reference in certain constructions, like in the relative clause structure in (100).

\[ \text{Let the class of indices be narrowed to include only the proper ones – namely, those } <w,x,p,t> \text{ such that in the world } w, x \text{ is located at } p \text{ at the time } t. \text{ Such a move may have been intended originally since improper indices are like improper worlds; no such contexts could exist and thus there is no interest in evaluating the extensions of expressions with respect to them.} \]
Sauerland (2003) argues that [singular] and [plural] features are interpreted the same way semantically, namely, as existential quantifiers, cf. (99). The difference is that [singular] carries a presupposition that the expression it appears on denotes an atom or a substance. As a consequence, true ‘plural’ exists only in the count domain, where distribution down to atoms is possible.

That the meaning of plural morphology is very close to the meaning of “more than one” is very much common coin. But there are different and independently useful components to plurality: these are Cumulativity (Cum), Distributivity (Dist), and Difference (Diff), respectively, to be discussed in some detail in section 2.3.1. Very arguably, we see in what is traditionally called plural marking the workings of the mechanism of implicature (that may be projected as well on binding principles A and B, cf. Levinson 2000). There is initial reason to believe then that semantically, plural is really the weaker case. Similarly, the modal expression is felt to be weaker (and hence more polite, cf. below) than the non-modal expression in the presumably basic case of existential quantification (If p holds, then p also possibly holds).

While traditionally, “plural” is a nominal notion, it is becoming more common to speak of plurality elsewhere, specifically with reference to the verbal domain. There is good reason to assume that there is a unique grammatically relevant notion of plurality that applies across different domains; in particular, taking uniformity to be the basic case, it is arguable that morphemes (really: morphs) that are prototypical for the marking of plural in the nominal domain do analogous work elsewhere, e.g., via exaptation. In the seminal paper that introduced the idea of exaptation to linguistics (Lass 1990, p. 81), the idea was that something loses its function and is then “free” to take over a new function.

Say a language has a grammatical distinction of some sort, coded by means of morphology. Then say that distinction is jettisoned, PRIOR TO the loss of the morphological material that codes it. This morphology is now, functionally speaking, junk; and there are three things that can in principle be done with it:

(i) it can be dumped entirely;

(ii) it can be kept as marginal garbage or nonfunctional/nonexpressive residue (suppletion, ‘irregularity’);

(iii) it can be kept, but instead of being relegated as in (ii), it can be used for something else, perhaps just as systematic.

(The new uses may be purely structural or intralinguistic, which is my main concern here; or they may have a pragmatic/sociolinguistic dimen-
Option (iii) is linguistic exaptation. The point of course is that it is an option: languages may operate ‘wastefully’, dumping material that no longer does anything useful, or in a ‘conservationist’ mode, by recycling. This might prove to be a useful parameter for the typology of change.

And later in that paper he says (p. 98) that

Historical junk, in any case, may be one of the significant back doors through which structural change gets into systems, by the re-deployment for new purposes of idle material.

In another possible scenario, one form comes to serve different functions at the same time, as acknowledged by Lass in a later book (1997, p. 316).

Exaptation […] is opportunistic: it is a kind of conceptual renovation, as it were, of material that is already there, but either serving some other purpose, or serving no purpose at all. Thus perfectly ‘good’ structures can be exapted, as can junk of various kinds.

Indeed almost the same insight can be found in Vincent (1995, p. 438):

Changes catalogued under the rubric of exaptation […] involve the assignment of new morphosyntactic functions to elements which are already centrally part of the grammar, and typically part of the paradigmatic core of the morphological system.

Much in our spirit, Traugott (2004, p. 139) comments this as follows:

For Vincent, what differentiates the two kinds of change is that in grammaticalization a lexical item is given a new form as well as a new function relative to the system, whereas in exaptation an old grammatical form is retained and given a new function. […] What may seem like a radical or disjoint change may in actual fact be so only because we do not understand (or have access to) the intermediate steps leading to the new structure.

Giving Traugott’s qualification a yet different twist, we may ask what leads to just the observed different functions but not others. Ideally, and as we argue for our cases, the different functions would be nothing but a consequence of matters extralinguistic, namely, e.g., a reflex of domain properties. Such is the case with /er/ and /tsu/. The answer to the question how “plural” /er/ and “comparative” /er/ are related is simply this: They are the same at LF, and the
different functions that emerge are really the result of properties of the domain with respect to which /er/ (more precisely, the O part of it) is interpreted.

Consider how DIFF marking and its (expatriate) interpretation as envisaged here present themselves against the exaptation background, i.e., how they might have developed within a grammatical system such as that of German.

1. There are strong conversational implicatures – i.e., extralinguistic routines that are executed so generally under certain oft-obtaining conditions that they get automaticized (hence conventional implicatures, but with relevance for truth conditions (only) – that are associated with linguistic structure in certain domains to the effect that certain properties of the expression require unconditionally that the semantics/pragmatics realizes a notion of difference. Following Leibniz (1696), for x to be different from y means for x to have a property that y does not have. We will see that difference is not quite the same across domains of things or matter that we talk about using language.

2. The coding of difference may be grammaticized in a language L like, e.g., German: besides there being content expressions that rely on there being distinguished referents – these are, in particular, relational expressions, i.e., expressions denoting pairs of individuals – the coding of difference may – and often does – also become part of the combinatorics of a language, as in the case of plural marking on nouns, i.e., inflectional morphology, or as in the case of pronouns that require their referents to be nonidentical to the referents of expressions in the linguistic context.

The meaning of interest is very general (which may be why we do not tend to see it), namely, that of difference, i.e., distinguished referents.

3. If difference is grammaticized in L in such a way that there is functional vocabulary expressing it, then the syntax of L – as it is autonomous and does not know about semantics – may use the expression coding difference dysfunctionally: the expression may be used in contexts as well where its local interpretation yields a funny result, or it may be used in contexts where it cannot be interpreted locally at all.

A local problem (contradictory interpretation) is repaired by means of a less local (or more global) operation, where, technically, part of the problematic representation is “freed” by disclosing a variable and interpreting

Implicatures may come to feel very natural, through conventionalization (cf. the concepts of Generalized Implicatures or “presumptive meaning” (Levinson 2000)). The less than systematic behavior of implicatures with respect to negation shows the thinness of the line between pragmatic routine and lexical meaning (as where presupposition and entailment are located). Cf. for some discussion section 2.2.1.
Weaker construction

it in the realm of indices, i.e., possible worlds/times/thresholds to be bound, if nothing better is available, by existential closure eventually.\footnote{One may wonder in how far this is similar to procrastination, i.e., the idea that a basic motivation for the shape of grammatical structure is to put off operations as long as possible. Cf. Chomsky (1993).}

4. Whether or not the difference denoting expression can be interpreted locally or not depends on the semantics of the expressions that it combines with. There are two basic cases: a) $\text{DIFF}$ yields a trivial result, i.e., a weaker meaning is locally introduced. This is the case in comparatives, which, incidentally, provide just one prominent example of how local weakening may lead to global strengthening. b) $\text{DIFF}$ yields a contradictory result. This is the case with dative- or genitive-marked arguments.

5. The grammar of L – more specifically: the interface between syntax and semantics/pragmatics – may now do something special with part of the semantics of the expression carrying the difference meaning, namely “push it aside”:

   a) Turn it into a backgrounded meaning, in particular, a presupposition – namely, if it turns out to deliver a meaning that is weaker than what is independently asserted, i.e., if it gives rise to a tautology together with what is asserted.

   b) Interpret it with respect to an expression of the linguistic context with which it does not directly combine, up to interpreting it with respect to the extralinguistic context – namely, if it turns out to deliver a meaning that contradicts what is independently asserted.

It is obvious that there is some leeway as regards the question where the locally problematic meaning is pushed; within limits, this is a matter of convention, i.e., arbitrary. In certain cases falling under (b) in the description above, the “abuse” of the difference-coding expression – together, possibly, with other mechanisms that are available to the grammar – may give rise to meanings that could possibly have been coded otherwise as well, but only so with more effort. The added value lies in the economic coding of content, taking it that the general economy principle at work can be formulated as in the Reinhartian tradition, i.e., like in (101), where $X$ and $Y$ may be taken to range over representations or operations on representations unequivocally.

\begin{equation}
X \text{ is allowed only if there is no } Y \text{ such that } Y \text{ serves to express the intended interpretation and is simpler than } X.
\end{equation}

We might expect that while the “original” marker in its “original” function (e.g., “plural” marking) may change within or disappear from its “original” domain

\footnote{One may wonder in how far this is similar to procrastination, i.e., the idea that a basic motivation for the shape of grammatical structure is to put off operations as long as possible. Cf. Chomsky (1993).}
(as its effect may be independently available as an implicature), it will turn out
to be more stable and enduring in its “innovative” use, as being dysfunctional, it
ends up serving economy (i.e., the informativeness of the conveyed information
\textit{vis-a-vis} the brevity of its expression). We expect (102) to hold.

(102) Dysfunctional markings are more stable and systematic than func-
tional ones (their system has not developed along necessities of use
hence is also less likely to adapt to them).

Getting back to the issue of systematic polysemy that we discussed to some
extent in the context of the German inflectional morphemes in section 2.1.1,
remember it would appear to be ideal if particular morphemes coded one single
logical form (meaning proper) that would yield different functions depending
on what it applies to. By way of illustration in the domain of Difference, take
the German morpheme /er/. In a companion for teachers of alphabetization
courses, Waldmann (1985, pp. 25, 30) writes concerning the morpheme:

\begin{quote}
Das Steigern wird mit der Mehrzahlbildung verwechselt, da sowohl die
Form häufig übereinstimmt [...] als auch gedanklich Mehrzahlbildung
und Steigerung verwandt sind. [...] Diese [-er] Buchstabenkombination
haben wir keiner Bausteingruppe zugeordnet, da -er in vielen verschiede-
nen Zusammenhängen vorkommt.

Personenwort er
Endungen (Steigerung) groß | er
Endungen (Mehrzahl) Häus | er
am Anfang eines Wortes er | leben
\end{quote}

Die Zuordnung zu einer Bausteingruppe würde zu Verwirrungen führen,
daher besprechen wir nur die Schreibweise.

Comparison gets confused with pluralization as the form often coincides and as
pluralization and comparison are conceptually related. We have not assigned
this [-er] combination of letters to a group of building blocks because -er occurs
in many different contexts.

\begin{tabular}{ll}
pronoun & er \\
endings (comparison) & groß | er \\
endings (plural) & Häus | er \\
at the beginning of a word & er | leben
\end{tabular}

The assignment to a group of building blocks would lead to confusion, hence
we only discuss the spelling.

It is interesting to note that Waldmann speaks of a confusion or mishap re-
garding the categorization /er/. Indeed, using a morpheme or element on the
“wrong” category appears to be a regular vehicle to generate new structures,
Weaker construction

However, the reasons why forms and meanings like to end up isomorphically (i.e., in one-to-one relations) are probably diverse, including at least competition (elements with similar forms but different meanings fight each other off), attraction (formally similar elements cover similar functions) and blending (different elements are ‘lumped together’ in single elements).

Bittner (1995) argues that the apparently diverse uses of /er/ share a meaning of ‘plural’. Bittner collects 11 different uses that have been identified in the literature, providing the most complete list of /er/-uses to my knowledge. These uses are shown in (103).

(103) -er in the plural of non-feminines
-er in iteratives and intensifications -er in the comparative -er in nomina agentis -er in nomina instrumenti -er in nomina actionis -er in inchoatives -er in prefixed verbs -er in nominalizations of adjectives -er as agreement in adjectival inflexion -er in pronominal inflexion

das Brett ‘board’ – die Bretter
der Wurm ‘worm’ – die Würmer
der ‘the’, dies-er ‘this’, welch-er ‘which one’

---

39 E.g., Transposition designates the use of an element in a syntactic role that is not its “original” one. Cf. Eichinger (1982).
40 /er/ seems to stem from Gothic /ur/ (aus/heraus ‘out of’) that became the Old Germanic Plural morpheme /ir/ that in turn gave rise to Umlaut via assimilation. Cf. for the development and acquisition of /er/ Meibauer/Guttropf/Scherer (2004).
Bittner’s idea is that there is a basic connection between (nominal) plural and (verbal) iterativity, broadly understood, that she calls *Mehrzahligkeit* “Many-count” (p. 136). /er/ is something like the prototypical representative of what we take to be behind plurality, namely, Difference, to be discussed in some detail in section 2.3.1. Let us try to briefly and informally sketch what one would want to say about each of the uses of /er/ in terms of DIFF which we regard as a relation between sets with certain properties.\(^\text{41}\)

Starting with syntax, the uses of /er/ that take center stage here are the inflectional-suffixal use as an ‘ordinary’ plural morpheme (this section, section 2.3.2), the inflectional-derivational-suffixal (but cf. there) use as a comparative morpheme (section 3.2), the derivational-prefixal use as an ‘inchoativizing’ morpheme (section 3.3.2 and section 4.1.2), and the inflectional-suffixal use as a pronominal or case morpheme that we find instantiated in dative case in particular (section 4.3.2) as well as, we argue, in case of the ‘expletive’ element *there* and its cousins (section 4.3.1).\(^\text{42}\)

**PLURAL** An entity of a certain kind has a property that an other entity, usually of the same kind (or falling under the same principle of collection), does not have. We generally take it for granted that the same object cannot be in different locations at the same time, as we take for granted that different objects can be at the same location at the same time; this is a first principle put into the mouth of Philateles in Leibniz’ dialogue on identity, cf. below. Accordingly, spatiotemporal locatedness gives us satisfaction of DIFF in case there are two concrete and spatiotemporally constant and identifiable individuals.

---

\(^\text{41}\) Eichinger (1982) characterizes the function of the German adjective-deriving suffix *-isch* in terms of a list of relations between their subject referents and things falling under the nominal restriction. E.g., *das ist metallisch* might say that what is referred to by *das* shares certain properties with what the nominal *Metall* denotes.

\(^\text{42}\) We do not draw a sharp line between inflection and derivation nor, in all cases, between prefixation and suffixation. The case that appears most difficult in both dimensions is that of comparatives, (cf. for relevant discussion of the derivation/inflection distinction Isacenko 1962 and of the prefix/suffix distinction Bresnan 1973). Examples for the main uses of /er/ in German are given in (i), including the referentially deictic or anaphoric use as a pronoun in the lower right corner.

\[(i) \text{ inflectional} \quad \text{derivational} \quad \text{denotative} \]

<table>
<thead>
<tr>
<th>suffix</th>
<th>inflectional</th>
<th>derivational</th>
<th>denotative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann -er</td>
<td>Geb -er</td>
<td>Misch -er</td>
<td></td>
</tr>
<tr>
<td>d(ies) -er</td>
<td>klüg -er</td>
<td></td>
<td></td>
</tr>
<tr>
<td>alt -er</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>klüg -er</td>
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<table>
<thead>
<tr>
<th>prefix</th>
<th>inflectional</th>
<th>derivational</th>
<th>denotative</th>
</tr>
</thead>
<tbody>
<tr>
<td>er- reichen</td>
<td>er- roeten</td>
<td>er- mannen</td>
<td></td>
</tr>
</tbody>
</table>

| free | Er  |
Weaker construction

(104)  there is an x Q(x) and (there is an x) not:Q(x)

In contrast, parts of matter are not spatiotemporally constant and identifiable. One meaning of gold (in subject position, in particular) is “all the gold there is”, i.e., an individual that has scattered reference (cf. Quine 1960). We don’t know, however, where it all is. Or think of the example in (105).

(105)  The gold and the silver melted.

Even if we may have developed sophisticated means to separate them again, we don’t look at gold or silver and their parts as individuals.

(106)  That piece of gold and that piece of silver melted

(106) is a modal statement: the pieces are not there any longer when the utterance is made as there will only be one single piece of matter. Note the absence of certain anaphors in constructions such as (106): What one might call “amalgamating predicates” such as melt or join do appear to forbid use of “each other” (as well as “sich” in German), which depends on the antecedent to be distributable, presupposing that DIFF can be established with respect to what it denotes. However, as we argue for the mass domain, this fails.

ITERATIVE  Iterativity can be captured by the paraphrase “p and again p”. A “¬p” has to be in between (p ∧ ¬p define changes of state following von Wright 1965). The intensifying function is likely a default that applies for lack of alternatives, as in the case of emphasis more generally. The reason why it is not allowed to say “p and again p” is that this would be another violation Hurford’s constraint in that p entails p. Note as well that we cannot but interpret iterativity progressively, i.e., as progressing (rather than say regressing) in time. This is the “growing bigger” effect (cf. immediately below).

COMP  Comparative /er/ is necessarily asymmetric, as opposed to the positive/equative /so...as/ (which is possibly, but not necessarily symmetric). Therefore, an entity with a property that an other entity does not have is needed. The subject is that entity, in accord with the subject rule. (that something else doesn’t have the property is presupposed). Cf. for more detailed discussion of comparatives and comparative morphology section 3.2.

NOM ag/inst  Nomina agentis or instrumentis denote agents or instruments V-ing an other entity (the object), i.e., they are basically transitive.

(107)  a.  Beobachter ‘observer’, Tänzer ‘dancer’
   b.  *Hinfaller ‘faller’, *Sterber ‘dyer’
Nomina actionis appear to denote eventualities that occur punctually, i.e., they involve assertion of p against the background of \( \neg p \) (recall that we can conceive of propositional meanings as properties of times or worlds with Carnap 1964).

(108) Lacher ‘burst of laughter’, Treffer ‘hit’, Kratzer ‘scratch’

PREFIX

(109) erzählen ‘tell’, erlauben ‘allow’, erjagen ‘hunt down’

er- prefixed verbs will be discussed in some detail in section 3.3.2; we may note here already that according to Kühnhold’s (1973) impressive corpus study, more than 90 percent of the er- prefixed verbs receive a change of state interpretation (reordering Kühnhold’s distinctions as involving terms like ‘completion’ or ‘end state’ along the change of state (Vendlerian accomplishment or achievement) vs. state (Vendlerian process or state) distinction. The ‘perfectivizing’ function of the er- prefix is so prominent that Kühnhold (1973, p. 342) draws a parallel to the inflectional prefix ge- as occurring regularly to derive perfect participles:

Dieser Typ ist äußerst produktiv. Ihm folgt fast die Hälfte der er- Bildungen. In dieser Funktion ist er- (bis auf eine einzige systemminderhebliche Ausnahme, s.u.) ohne jede Konkurrenz durch irgendein anderes Präfix. Es erscheint hier in einer grammatischen Funktion, grammaticalsiert ähnlich wie das schwachtonige Präfix ge-. er- tritt nahezu unbeschränkt sowohl vor transitive Grundverben wie vor intransitive, die dadurch transitiert werden, und signalisiert, daß der jeweilige Verbalprozeß zu einem bestimmten Effekt führt.

This type is extremely productive. Almost half of the er- derivates follows its pattern. In this function, er- has no competing other prefix (with the exception of one case that is irrelevant to the system, cf. below). It appears here in a grammatical function, grammaticized similarly to the weak prefix ge-. er- combines nearly without restrictions with transitive as well as intransitive verbs that are thereby transitivized and signals that the pertaining verbal process leads to a certain effect.

ADJ→N

(110) Blinder ‘blind one’, Gelehrter ‘educated one’, Brauner ‘brown one’

We see a criterion for distinction as furnishing alternatives must be there in examples like in (111) (cf. the non-vacuity principle, section 3.1.1).
82  Weak construction

(111)  a. *(guter) Esser
good eater
b. *(Warm)duscher
warm shower
‘milksop’ (lit.: someone who takes only warm showers)

ADJ-INFL

(112)  a. ein großer Tag
great day
b. der große Tag
the great day

We would expect for /er/ to occur only once per interpretative unit with regard to which alternatives can be established. One may ask in how far this might be behind the distinction between strong and weak inflection.

PRON-INFL

(113)  der, dieser, welcher
the masc, this masc, which masc

As suggested above for weak vs. strong adjectival inflection as well, it seems that the appearance of /er/ here is associated with the presence of alternatives; note thus the effect of slightly modifying Nietzsche’s famous statement by the addition of a definite determiner in (114-b) to the effect of an inference that there are different gods (as opposed to a single god, cf. (114-a)).

(114)  a. Gott ist tot.
god is dead
b. Der Gott ist tot.
the god is dead

Our intention here is merely to suggest how what appear to be completely different functions of a multiply homonymic formative do not look so different any more on a proposal like the one made here. Thorough corpus research would have to show whether the majority of occurrences of /er/ can be subsumed under the analysis that takes /er/ to be the expression of Diff, i.e., the I and O corner of the square of opposition.⁴³ Diff may give rise to apparently quine (1960, p. 101) writes concerning demonstratives:

In learning the indicator words he [= the child] learns a higher-level technique: how to switch the reference of a term according to systematic cues of context or environment.

⁴³
different and distant meanings depending on where the logical form that it carries is actually interpreted.\footnote{In the case of demonstratives (as well as, arguably, definites), then, we are guaranteed to have different referents at hand. E.g., when someone says

\begin{itemize}
  \item[(i)] This bird is yellow and this bird is big.
\end{itemize}

Then we are prone to understand that there are two different birds being talked about here. If we look at Russell’s formula for definite descriptions, we realize it would not make any sense at all if there were no other individuals that could have been made reference to in principle that shared a restriction with the individual actually talked about.}

Looking across languages, it appears that overwhelmingly, plural is morphosyntactically marked, as opposed to singular. According to some recent work in formal semantics, however, “plural” is the more general meaning, encompassing both what we call traditionally plural and singular reference. The plural (“more than one”) meaning arises as a scalar implicature. Thus while we would say (115) is maybe a little misleading when Otto has only one child actually, (116) is more than misleading (unless accented in a particular way) to plainly false if Otto does have exactly one child.

\begin{align*}
(115) & \quad \begin{array}{l}
  a. \text{ Otto has children.} \\
  b. \text{ Otto doesn’t have children.}
\end{array} \\
\end{align*}

The mechanism is the usual one: the speaker has used the weaker (and more marked!) expression, therefore the hearer should subtract the stronger meaning from the more general one used. In (115-b) we see this implicature disappear under negation as negating a bigger set (weaker expression) yields a meaning stronger than negating a smaller set (stronger expression).

\subsection*{2.3.1 Making Difference}

Let us now explain \textsc{Diff} in more detail. It is a bit complicated to do this because what we take to be the logical form that it is carrying will end up meaning different things depending on what it combines with – this is what Heidolph et al. call “combinatoric interpretation”, a core feature of the machine achieving compositionality (section 2.1.1).

Recall that we define the meaning of \textsc{Diff} as a quantifier combining the I and O corners, i.e., the particular positive and particular negative respectively of what we know as the square of opposition, cf. (116), repeated from above.

\begin{align*}
(116) \quad \textsc{Diff} & = \lambda S \lambda P \exists x S(x) \land P(x) \land \exists x \neg S(x) \land \neg P(x)
\end{align*}
As we explained above (cf. section 2.2), (116) is like an implicature that has turned into a presupposition (an entailment that survives negation). The inference goes through in the verbal-relational domain unless there is special marking (reflexivization). In the nominal (i.e., number) domain, the special marking is either definiteness or “nothing at all” (bare expression)! Plural (better: nonmodal difference) is the weaker meaning when we talk about sets, namely, it is just the cumulativity property, i.e., closure under join/union:

(117) A predicate “VP” is **cumulative** if and only if “X VP” and “Y VP” entails “X and Y VP”.
(Nouwen 2015)

N.B. that this brings plural close to mass semantics. As we are at it, let us note what is called distributivity goes the other way around. It is closure under meet/intersection:

(118) A predicate “VP” is **distributive** if and only if “X and Y VP” entails “X VP” and “Y VP”.
(Nouwen 2015)

Most formal semanticists would say “plural” is the cumulativity property. Cumulativity is trivial, however, if there is just one individual. But if there is more than one individual, then you have as well Difference, in the general case, to the extent that portions of the matter that you are talking about are persistent in time and space in such a way that one would be willing to say that they are occupying certain (but no other) coordinates.

(119) The absence of difference implies cumulativity as well as distributivity (as these are now trivially satisfied)

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45 Distributivity is closely linked to scope. We say that A has scope over B if we observe that the values of B vary with different parts of (i.e., different choices within the denotation of) A. You can only see B vary depending on A to the extent that A has different parts to begin with [N.B. that otherwise, in case there are no different parts, distributivity is trivially satisfied].

Distributivity can but need not go down to atoms. Atoms are the sets that have only themselves as parts.

46 Cumulativity as defined here is not to be confused with the intuitive notion of collectivity although the latter is similarly taken to be opposed to distributivity generally. Corbett (2000, p. 119) writes:

Distributives and collectives have often been considered opposites. Distributive markers indicate that entities are to be construed individually, as separate and distinct. Collectives indicate that they are to be construed together, as a unit.

Notions that are closely related to distributivity and cumulativity are homogeneity and divisibility respectively as opposed to atomicity, defined in (i) to (iv).
Let us now look at how DIFF will generally be satisfied in case of ordinary count nouns. Namely, we get the S and P and ¬P “for free” as concrete things obey most basic observational laws, e.g., they will be in different spaces and they will be at a particular spaces as well, even if we do not know the exact location. As Philateles puts it in Leibniz’ (1765, p. 229) dialogue,

Nous ne trouvons jamais et ne pouvons concevoir qu’il soit possible que deux choses de la même espece existent en même temps dans le même lieu.

We never find and cannot conceive that it is possible that two things in the same space exist at the same time in the same place.

Strawson (1959, pp. 25f, 39) stresses the epistemic lead of spacetime location.

To this it may be replied that the system of spatio-temporal relations has a peculiar comprehensiveness and pervasiveness, which qualify it uniquely to serve as the framework within which we can organize our individuating thought about particulars. Every particular either has its place in this system, or is of a kind the members [sic!] of which cannot in general be identified except by reference to particulars of other kinds which have their place in it; and every particular which has its place in the system has a unique place there. [...]

Though we may freely depend on heterogenous relations in framing identifying descriptions, the system of spatiotemporal relations remains the groundwork of these additions; most other relations between particulars incorporate spatio-temporal elements, involve or are symbolized by spatio-temporal transactions, the relative movements of bodies. [...]

It seems that we can construct an argument from the premise that identification rests ultimately on location in a unitary spatio-temporal framework of four dimensions, to the conclusion that a certain class of particulars is basic in the sense I have explained.

That is to say, they must be three-dimensional objects with some endurance through time. Of the categories of objects which we recognize, only those satisfy these requirements which are, or possess, material bodies – in a broad sense of the expression.

(i) A nonempty set is divisive iff \( \forall x, y \in X \land y < x \rightarrow y \in X \) (Cheng 1973)

(ii) A nonempty set is homogeneous iff it is cumulative and divisive.

(iii) a is an atom in a set X iff \( \neg \exists x \in X \land x < a \land x \neq a \)

(iv) A set X is atomic iff \( \forall x \in X, x = \text{sum}(Y) \) for a set Y of atoms in X.
Chomsky discusses the possibility that “proper names, in any language, must designate objects meeting a condition of spatiotemporal contiguity, and that the same is true of other terms designating objects” (1965, p. 29) in the context of the question of what might constitute a linguistic universal. Spatiotemporal locatedness (and contiguity) thus does appear to be a or even the paradigm property behind individuation and everything that individuation implies, such as the possibility of being counted or pluralized etc.

Generally speaking, what it takes for two things to be identical is, thus, for them to have all the same properties; taking properties to be representable as sets (namely, the sets of things falling under the property), as is usual, they have to be in all the same sets. In symbols, the principle of identity can be put down as in (120).

\[(120) \forall P \forall x \forall y (P(x) \leftrightarrow P(y)) \leftrightarrow (x = y)\]

(120) appears to give us a simple answer as well to the question what difference means: something \(x\) will be different from something \(y\) if \(x\) has a property that \(y\) does not have; after McTaggart (1921), this is called the Principle of the dissimilarity of the diverse. In symbols:

\[(121) \forall x \forall y (\exists P P(x) \land \neg P(y)) \leftrightarrow (x \neq y)\]

Like the principle of identity, the principle of the dissimilarity of the diverse is generally taken to be symmetric. This seems alright, as long as we move about in the domain of ordinary individuals: Assuming, by way of example, that the only reason that Ede is different from Otto is that Ede wears glasses while Otto doesn’t, Ede, unlike Otto, will be in the set of people wearing glasses; conversely, Otto, unlike Ede, will be in the set of people not wearing glasses, which is just the complement of the set of people wearing glasses.\(^47\) Depending on what one is talking about, however, difference is not actually symmetric; more specifically, it is asymmetric in domains that – unlike the domain of ordinary individuals – are ordered by whole-part structure.

\(^{47}\) Given symmetry of identity as well as difference, it is tautologous to say that “\(a\) is \(b\) and \(b\) is \(a\)” or “\(a\) is not \(b\) and \(b\) is not \(a\)”.

Given symmetry of identity as well as difference, asserting “\(a\) is \(b\) and \(b\) is \(a\)” or “\(a\) is not \(b\) and \(b\) is not \(a\)” is tautologous. In certain domains (like, e.g., politics), uttering tautologies appears to be quite prominent. E.g., we found the following in the paper the other day (Peter Carstens: *Die Würde der Partei*, FAZ 22.01.2013, S.3):

“Brüderle and er seien unterschiedlich, erläutert Rösler das Offensichtliche. "Rainer Brüderle ist anders als Philipp Rösler, und Philipp Rösler ist anders als Rainer Brüderle."

B. and he are different, said R., explaining the obvious. “R.B. is different from P.R., and P.R. is different from R.B.”
2.3.2 Repairs en masse

The interpretation of signs or constellations that come to code DIFF goes wrong as soon as there is only one individual available or if individuals that are related stand to each other in an inclusion relation. A case that is better known is the pluralization of mass nouns, generally deemed illegal, assuming that what mass nouns denote can be represented by means of a lattice structure.

Generally speaking, the theories view the kinds of M as forming an upper semilattice of kinds with M at the top. This is a “formal” semilattice in that the union of any two elements of it is a member of the semilattice, and we view is wine as being true of of any of these formal kinds. (Pelletier/Schubert 1989, p. 310).

It is a – maybe the – defining property of mass nouns that they resist pluralization, cf., e.g., (122). We see that combining a mass noun with a distributive quantifier is ungrammatical as well generally.

(122) gold – *golds – *every gold

What is special about mass nouns is that what is in their extension, i.e., falls under them, are not individuals with clear criteria of identification but really the sum total of property instantiations of a certain sort – to speak with Quine 1960, mass terms refer to singular individuals with scattered reference. In modern analyses of NP structure, this idea is implemented by a classifier head that takes as its argument the individual-denoting mass noun to deliver a set, i.e., a function from ordinary individuals into truth values, cf. (123).48

(123) N

The lower N in (123) might denote the sum total of matter that is beer, the upper N denoting portions of this matter; or the lower N might denote the sum total of matter that is lamb and the upper N might denote individual animals. In between the two denotations is the classifier, a function taking the sum total of instantiations and delivering atoms or other units made up of the matter denoted by the lower N. Importantly, in some form or other, it appears to be agreed that the property that differentiates count nouns from mass nouns is that of distinguishability of referents; we take it that in the basic case, distinguishability entails spatiotemporal persistence hence localizability.

48 The idea is of course that the structure in (123) is universal but visible only in so-called classifier languages like Chinese.
We cannot tell what the smallest parts are from which the matter referred to by mass nouns is made up, and there is also indication that Quine’s “object with scattered reference” – the sum total of matter falling under a mass noun – is quite different from an ordinary individual from the grammatical point of view. Thus, it is noted in the Duden in the chapter about subject-verb agreement that while coordinated subjects generally give rise to plural agreement, conjoined mass nouns or abstract terms allow as well singular agreement, i.e., do not necessarily count as two different individuals. The examples in (124) are taken from the Duden Grammar (2009, pp. 1007f).

(124) a. Der Hass und die Gewalt wird auf sie selber zurückfallen. the hate and the violence will onto them selves back.fall ‘The hate and violence will turn back against (them) themselves.’
b. Die Korruption und die Verkennung der Lage fraß nach the corruption and the misjudgment of.the situation ate to unten weiter. below further ‘The corruption and misjudgment of the situation percolated down.’ (K. Tucholsky)

Interesting in this context is the fact that in cases where the finite verb is constructed with a singular part of the subject that includes the other part of the subject, singular agreement prevails, cf. (125) (from Duden 2009, p. 1006).

(125) a. Er und alle Welt redet darüber schon seit Wochen. he and all world talks about.it already for weeks. ‘He and all the world is talking about it for weeks already.’
b. Die Mitschüler und jedermann gab zu... the classmates and everybody gave to... ‘The classmates and everybody admitted...’ (H. Hesse)

Chierchia (1985) embodies a concrete proposal regarding the modelling of the Janus-faced character of mass nouns along the lines expressed in the following quote (p. 435).

Thus, although mass CNPs semantically are propositional functions, for each such propositional function there must be a corresponding individual that acts as the semantic value of the corresponding mass NP. [...] The individual correlates of such propositional functions (i.e. the individuals that mass NPs purport to refer to) can be thought of as kinds or substances, with the warning that they may, but need not, be natural kinds (cf. Fake gold is common.

[...] Now, according to the analysis just sketched, mass predicates must have an individual correlate (to be regarded as a kind, I suggest).

Similar effects are discussed in connection with nouns that denote ‘degrees’ or ‘measures’ in particular languages, cf., e.g., Etxebarria/Etxepare (2012) for Basque. Cf. for discussion of the semantics of comparison section 3.2.
We submit that these effects reflect a deeper defect of mass nouns, namely, that they resist the establishment of structure within what they denote in the manner that is common for ordinary individuals and which can easily be represented within some version of set theory alongside the reasoning schemes coming with it (deriving valid consequences using quantificational or Boolean operations). The predominant reason for this defect consists in the circumstance that we do not know about the spatiotemporal location of what falls under mass nouns, and this is also pretty much the commonly held doctrine regarding the semantics of mass nouns, which is nicely captured by Chierchia (1998, p. 54):

It is generally held that the denotation of a mass noun is in some sense qualitatively different from that of a count noun, even in the case of near synonyms like coins vs. change or curtains vs. drapery. [...] A singular count noun is usually taken to denote a class of objects and its plural counterpart a class of groups or sets of such objects; so, while a singular count noun has singular individuals in its extension (e.g. “coin” is true of single coins), a plural one has plural individuals or groups in its extension (e.g. “coins” is true of pluralities of coins). A mass noun is instead generally interpreted either as a mereological whole of some kind; or else its extension is drawn from a domain of substances whose minimal components are somehow more elusive than ordinary individuals. For example, the denotation of “change” can be taken to be some kind of substance whose minimal parts don’t have the same identification criteria as coins. On this view, the minimal parts of mass noun extensions are surrounded by mystery and this is why we cannot count them.

Mass nouns are somehow unfit for pluralization, and this seems due to their denotations. We take the line here that the basic condition for pluralization is the possibility of spatiotemporal location, which is really behind ‘individuation’. We may ask then whether and where we can see that there is a problem with Mass Nouns and spatiotemporal location. In this vein, Bunt (1981, p. 236) gives examples like in (126) and (127) to suggest that whatever falls under mass terms is not spatiotemporally determined like count nouns.

(126) *There is round pancake on the plate.
(127) *Don’t put such big onion in the salad.

51 Or learn to disregard it, as the dialogue in (i) suggests.

(i) Father: This is the same (honey in the jar and honey on the spoon).
Child: No, it is not the same!
Father: It IS the same.
Child: No, it is not ...
Weaker construction

While it appears possible to assert the instantiation of what falls under a mass noun by having it as an associate in an existential sentence, it is often hard to have the mass term serve as a subject proper, cf. (128-a) vs. (128-b).

(128)  a. There is butter/beer in the fridge.
   b. ?Butter/beer is in the fridge

Finally, asking for the location of what falls under a mass term is odd, cf. (129).

(129)  a. # Where is beer?
   b. # Where is butter?

Of course we can do all this to what falls under a mass term if we have identified a portion earlier, as indicated by the definite article.

(130) The beer/butter is in the fridge.
(131) Where is the beer/butter?

Having addressed the question of why it would be odd to pluralize mass nouns, let us turn to the fact that in certain cases, mass nouns may actually be pluralized; three subcases are given in (132).

(132)  a. beer – beers
   b. rain – rains
   c. wage – wages

The plural in (132-a) has two prominent readings: beers could refer to different containers of beer and hence portions of beer in different spatiotemporal locations – this is known as the “universal packager” reading (Pelletier 1975 (after suggestion of David Lewis), or it could refer to different sorts of beer, known as a “sortal plural”.

Rains in (132-b) will typically refer to different periods, i.e., spatiotemporal stretches of rain, like in “the rains of last season were long and heavy” (as opposed to, say, “the rain of last season did not fill the reservoirs”); wages in (132-c) will typically refer to what different people are paid or maybe to payments from different sources. For both (132-b) and (132-c), sortal plural readings are available as well in expert contexts. The point is that it is not the substance as such that is referred to with regard to which difference is established. Instead, it is the spatiotemporal location of portions of what falls under it (universal packager reading viz. spatiotemporal

52 The sortal plural is a most prominent way of interpreting “illegal” plural marking. This is as our analysis would predict: Negating one of the essential (necessary, individual level etc.) properties of mass nouns, you end up with a different sort.

53 Reference to sorts will always satisfy Difference as it is the point of having a sort that there is a different sort as well.
distribution), or something else that is provided argument-structurally (beneficiaries, sources), or difference is established between the sort of substance mentioned and some other sort that is contextually provided. Assuming that plural morphology entails a notion of difference, we see again that the respective semantics/pragmatics is not provided for by what the expression to which the morphology attaches but that it is “pushed aside” and satisfied with regard to something else that is provided by the linguistic (or extralinguistic) context.

In basic respects, properties seem to be like mass nouns. E.g., they cannot be pluralized or distributed over also if nominalization has applied, cf. (133).

(133) *wisdoms, *every wisdom

Then there are suggestive locutions like the following suggesting that at least as far as our grammar-relevant conceptualization goes, we treat properties much like the matter falling under mass nouns.

(134) Peter ist ganz/voll klug.
Peter is wholly/fully clever.

Cf. as well the examples in (135) or (136).54

(135) Peter ist voller Blödsinn.
Peter is full of nonsense

(136) a. The movie has the full length.
b. Otto is completely/absolutely mad.

Such examples suggest that we conceptualize gradable properties very much like containers that may be more or less full. The formalization of property instantiations in terms of extents can be thought of as the fanning out of properties between their minimal and maximal instantiations.55

In sum, the O-meaning part of the Difference requirement Diff-O must be pushed elsewhere in case of mass nouns as their extensions do not host good individuals, i.e., things that are differenly located spatiotemporally. Whichever properties define the matter falling under the mass noun is thus essential, hence negating one of them (P) will give rise to contradiction. E.g.,

(137) This gold is not valuable.

54 Or (i), uttered by a 2;10 year old child.

(i) Mein Freund ist auch so‘n bischen mittelgroß aber nicht so ganz.
my friend is also so a little middle big but not so completely

55 Cf. Meier (2003), Schwarzschild (2008), section 3.2 below.
Assuming that what falls under gold is what meets a list of properties among which is being valuable, what happens if we negate one of these is that we go beyond what falls under gold. The gold talked about in (137) must be fake.

With this, we have the requisite analytical ingredients in place. To note, we defined the (generalized) quantifier meaning DIFF associated with certain (grammatical) expressions that requires there to be distinguishable referents in the semantics. Misassembly of DIFF has been illustrated with “illegally” pluralized mass nouns where the combination of a DIFF-carrying sign with an element that does not furnish distinguishable referents locally leads to a ‘shifted’ sortal or spatiotemporally distributive interpretation. The reason why part of DIFF, namely DIFF-O, gets to be interpreted ex situ by means of expatriate interpretation is that locally interpreted in full, DIFF would lead to a contradiction. Expatriate Interpretation (EI) yields a weaker meaning than what would be the literal meaning. We have seen first evidence that weakening to the disadvantage of what is literally asserted – witness extra quantification over indexical variables in transparently contradictory structures – applies as well at embedded and hidden levels.
3. Wrenches and nails

D.R. Hofstadter (1979, p. 60) writes in his famous book Gödel, Escher, Bach the following about the quantifier-word all:

We use the word “all” in a few ways which are defined by the thought process of reasoning. That is, there are rules which our usage of “all” obeys. We may be unconscious of them, and tend to claim we operate on the basis of the meaning of the word; but that, after all, is only a circumlocution for saying that we are guided by rules which we never make explicit. We have used words all our lives in certain patterns, and instead of calling the patterns “rules”, we attribute the courses of our thought processes to the “meanings” of words.

Hofstadter suggests that knowing the meaning of certain – specifically, the “logical” – words is knowing to apply the rules that are associated with them (rather than recovering their ‘static’ meaning). The very fact that the rules operate unconsciously makes it likely for them to apply “wrongly”.

3.1 Phenomenal and ordinary individuals

Humans appear to be the only animals that have a concept of time, like humans appear to be the only animals who have a device generating an infinite set of expressions from a limited set of symbols and rules of combination. Time is hard to understand if at all, using the kind of logical reasoning that we are used to using (cf. for seminal and still actual discussion of the most central paradoxes regarding reasoning about time Augustinus’ 11th book of the confessions). Humans also stand out as animals who compare things, in particular, as regards their appropriateness of certain kinds of things for certain purposes.¹

We make a distinction between “ordinary” and “phenomenal” individuals, respectively (cf. sections 2.1, 2.2.2, 2.3). As the name suggests, ordinary individuals are what we tend to talk about ordinarily, i.e., tables and chairs and persons and the like – for the most part, ordinary individuals are those individuals that are spatiotemporally locatable. Phenomenal individuals are not

¹ Kant (1781) distinguished three types of rationality: “animalistic” (concerned with eating and being eaten), comparative (involving comparison of oneself to others) and absolute rationality (cf. the categorical imperative, requiring of the individual that her way of acting should be such that no harm would arise if it were elevated to general law).
concrete material things, but rather what helps us coordinate and order the concrete material things. Specifically, and following the tradition, phenomenal individuals are times, worlds, and thresholds. As we already mentioned above, a key idea of this work is that interpretations may be “pushed” from ordinary to phenomenal individual structure. The distinction is therefore of utmost importance for what is to follow and will be elaborated to some extent in this section. Two points are central for us, namely:

- Phenomenal individual argument structure is coded higher structurally than ordinary individual argument structure, and phenomenal individual argument structure is much more context-affine than ordinary individual argument structure.

The operations that apply higher up in the structure, i.e., operate on phenomenal individuals, are the same as the operations that apply lower down in the structure, i.e., operate on ordinary individuals.\(^2\) Certain operations ‘go wrong’ upstairs as the matter that is coded there – TAM, essentially – is strictly ordered (or this is how we conceptualize it).

- The reasoning schemes that we are using as humans work very differently when applied to phenomenal individuals than when applied to ordinary individuals. Essentially, this is because ordinary individual structure – which we model with ordinary sets – has the property of being weakly ordered as opposed to strictly ordered phenomenal individual structure.\(^3\)

The most important consequences are the following:

- The arguably most prominent reasoning scheme “All S P” or “Whenever S, P”, also known as (one way) generalization or implication, universal statement or A-corner of the square of opposition, is contradictory when we set the scope \((P)\) as \(¬S\), i.e., the negation of the restriction, in weakly ordered domains, but it turns out to be tautologous (in ways to be qualified below) when applied to matter that is strictly ordered. For this reason, we may say that A is ill-defined in the realm of phenomenal individuals.

\(^2\) There are many precedent works providing evidence and arguments that ordinary and phenomenal individuals are subject to essentially the same principles and operations, including Jespersen (1924, cf. above section 2.1.2), Partee (1973) or Kratzer (1998) regarding binding relations and Schlenker (2006) or Cresswell (2010) regarding quantification. Cf. Szabolcsi (2010: chapter 3) for a concise overview and further references.

\(^3\) It may be for this reason that we actually do not observe the sophistication of expression of ordinary individual structure (featuring an infinite set of quantifier expressions for example) in the phenomenal domain. Cf. section 3.2. This goes against the ideas of scholars like Cresswell (e.g., 2010), who claims that all the machinery that is available for individual quantification is available for temporal or modal quantification as well.
Reflexivization, i.e., setting the arguments of a binary relation as equal, is allowed and much used by the grammar in the realm of ordinary argument structure, but it is not provided for in the realm of phenomenal argument structure. Still the grammar reflexivizes structures that talk about phenomenal individuals.

3.1.1 Not: high and weak

Diesing (1992) brought into the discussion the idea that a certain syntactic property, namely, being merged above or below the VP level corresponds with certain types of interpretation, viz. the weak/strong, (non)presuppositional, (un)specific etc. distinction. Ross’ (1973) penthouse principle says that “more is possible upstairs”, i.e. when you live in the penthouse. We propose that regarding subsentential structure, in certain respects, the opposite is true.

In terms of reference, though, Ross is right in that more interpretations, and more specific ones, are available upstairs – as a simple matter of fact, these stronger readings will entail hence bring in their train propositional structures with weaker meanings, such as e.g. existential interpretations (cf. on semantic incorporation van Geenhoven 1998). Diesing’s conjecture captures the basic facts as far as German is concerned:

(1) Material above the VP is interpreted in independent quantificational (presuppositional) terms (as opposed to existential (non-presuppositional) interpretation relative to other operators in the structure).

The matter is complicated by an interfering factor, and this factor has maybe confused the right perception of the whole matter of phenomenal quantification. Namely, as a rule, matter that is coded high in the structure is usually strictly ordered. Matter coded low in the structure (ordinary individuals) is more typically weakly ordered. Incidentally, the labels “weak” and “strong” are used not only for orderings but as well for referential properties (cf. Milsark 1977 Barwise/Cooper 1981). In this dimension, the title of this subsection subsumes Diesing’s conjecture: An NP that is high in the structure, i.e., outside the VP/vP, will be strong (end up in the restriction of a tripartite structure). An NP that is low in the structure, i.e., inside the VP/vP, may be weak (but it may as well be strong, according to de Hoop 1992, if it carries “strong case”).

Phenomenal individuals are generally high in the tree and context affine. Regarding graded property instantiation, however, thresholds appear to be available also at more deeply embedded levels. This is not surprising as what is more deeply embedded in the case of comparatives is just an entailed meaning (cf. section 3.2). Times though are strictly ordered, and much of what one
talks about in terms of worlds as well. Sometimes expressions appear to code phenomenal information low in the tree, like in the case of complements that code directionality (cf. section 3.3.2). This may be the result of the kind of repair mechanism that we are describing here.

Next to the ordering distinction, ordinary vs. phenomenal individuals are set apart along another dimension that concerns the locus of where they and the relations between them are coded. In traditional formal semantics treatments, the distinction is that of belonging to the propositional content proper (what is known as predicate-argument and quantificational structure) or to the interpretation function that determines with respect to which “coordinates” propositional contents are to be interpreted (cf., in particular, Lewis 1972). In standard generative-syntactic work, it is the VP (or vP) that talks about relations between ordinary individuals, and it is functional projections higher up in the tree that talk about phenomenal individuals and thus establish a link to the context, namely, the C/T domain. A syntactic tree featuring only the most generally accepted categories looks as in (2), where vP/VP is regarded as being responsible for the coding of ordinary argument relations (properties of and relations between objects), AspP is responsible for the coding of aspectual structure (the inner temporal structure of eventualities), TP speaks about temporal structure (the relation of the time of the eventuality to reference and speech time), and CP links propositional contents to the utterance situation.

\[
\begin{array}{c}
\text{CP} \\
\text{TP} \\
\text{AspP} \\
\text{vP} \\
\text{VP}
\end{array}
\]

The tree reflects that there is “ascension” from ordinary individual structure to the higher structures, where the information coded becomes more and more context-affine the higher one climbs in the tree. The different levels are related by are expressions that belong to inflection, i.e., markers that determine

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4 It is possible to write indices into the propositional formula, but this doesn’t help in that now times or worlds or thresholds (the things we are used to thinking of as what makes propositions true) will appear in the scope of expressions that we are used to thinking of as what makes up just these propositions (namely, ordinary individual quantifiers).

5 In more recent treatments, CP and TP splits into diverse projections such as TopicPhrase, FocusPhrase or Fin(iteness)Phrase. The most fine-grained clause structure is given by Cinque 1999 as depicted in the following bracketing structure.
Phenomenal and ordinary individuals

a choice between a principally restricted set of choices. E.g., however we want to think of temporal relations, it appears to be true that they are severely restricted crosslinguistically. Reichenbach’s successful model predicts this in counting three primitives and just one relation (“earlier than”). What is traditionally called subject-predicate agreement belongs here as well. Turning now to the interpretatively relevant dimensions of adjectives, Zimmermann (1991, p. 164) characterizes the meaning of heavy as in (3).

(3) Let $s_o$ be an utterance situation, $s$ an evaluation situation, and $X$ that dimension of comparison from the set \{weight, level of difficulty, ...\} that is most important in $s_o$. Then $\chi_{\text{heavy}}(s_o)(s)$ is a function that assigns to an arbitrary set $M$ those things $y$ for which it holds that $y$ is in $M$, and $s$ receives a higher value with respect to $X$ than the standard value that is relevant in $s_o$.

Zimmermann speaks of a standard value that is contextually given. We could just as well say we agree on an arbitrary value. E.g., we could agree that if you are a person and you are in the set of things weighing as much or more than a hundred kilos, you are heavy. Now we put this on the interpretation function pace Lewis’ (1972, pp. 220f) setup of delineation coordinates (cf. section 3.2):

Let the indices contain a delineation coordinate: a positive real number, regarded as the boundary temperature between cool and warm things. Thus at an index $i$ the extension of ‘cool’ is the set of things at the world and time coordinates of $i$ having temperatures (in degrees Kelvin) less than or equal to the delineation coordinate of $i$; the extension of ‘warm’ is the set of such things having temperatures greater than the delineation coordinate. [...] The delineation coordinate is non-contextual. It resembles the assignment coordinate, in that we will ordinarily generalize over it rather than hold it fixed.

It is common though to abstract as well over “contextual coordinates” such as times or worlds to represent aspectual or temporal or modal relations (Cresswell 1976). Klein (1991, p. 683) explains regarding thresholds (“delineations”):
A delineation is intended as a contextual parameter that plays a role in the evaluation of degree predicates. Just as the interpretation of *That is a sock* requires a specification of the object indexically invoked by *that*, so – according to this view – the interpretation of *Sue is tall* requires a specification of the standard according to which something is judged as tall. A delineation for *tall* determines where, according to the dimension of height, the cut-off point between ‘tall’ and ‘not tall’ is to be set, and it is claimed that this point can vary with context.

Thresholds or delineations are cutoff points on a scale. Two delineations will be able to make a difference, truth-conditionally, if the sets of individuals that they deliver will be different. Note this is already a strong imperative, but no presupposition or entailment, in positive or equative structures; it is what Kamp/Partee (1995, p. 161) call the non-vacuity principle, given in (4) (cf. Klein 1980, p. 23 Kennedy 2007, p. 18).

(4) Non-vacuity principle (NVP):
In any given context, try to interpret any predicate so that both its positive and negative extension are non-empty.

As individuals that pass a certain threshold pass all lower thresholds as well, the sets of individuals will be different in a special way, namely, one of them will include the other as an individual meeting or exceeding a certain threshold meets or exceeds all lower thresholds as well, or so we conceptualize it.

Formally, the different orderings are distinguished as orderings in the sense of < ‘smaller than’, and orderings in the sense of ≤ ‘smaller or equal’. Strict orderings are defined as in (5) (from Ebbinghaus 2003, p. 52).

(5) *R* is an ordering relation in the sense of < (short: *R*_<) iff it is irreflexive (a), transitive (b) and connected (c):

a. There is no x such that xRx 
   Irreflexivity

b. For all x,y,z, if xRy and yRz then xRz 
   Transitivity

c. For all x,y xRy or yRx 
   Connectivity

Importantly for our purposes, and as stated in (5-a), strict ordering relations are irreflexive, meaning that no element can stand in the ordering relation to itself (e.g., there is no element that is greater or smaller than itself). Irreflexivity follows from the property of asymmetry, stating that if x stands in the relation to y, then y does not stand in the relation to x (e.g., if x is greater than y, then it follows that y is not greater than x), cf. (6).

(6) xRy → ¬(yRx)
Naturally examples of relations that give rise to strict orderings are given in (7).

(7) *be greater than, be heavier than, follow*

We see immediately the consequence of the irreflexivity property when we try the natural language operation of reflexivization on predicates giving rise to strict orderings, cf. the highly dubious sentences in (8).\(^6\)

(8) a. ??Otto is greater than himself.
    b. ??Otto is heavier than himself.
    c. ??Otto is following himself.

Reflexivizing a relation amounts to identifying its first and second place. As the examples in (8) illustrate, this operation is at odds with the property of asymmetry (viz. irreflexivity); nevertheless, the examples in (8) are not ungrammatical; rather, they do not furnish ‘first pass’ meaningful interpretations. An example parallel to those in (8) that is not at all unusual is given in (9).

(9) a. Otto kam zu Ede/him.
    Otto came to Ede/him
    ‘Otto came to Ede/him.’
    b. Otto kam zu sich.
    Otto came to REFL
    ‘Otto regained consciousness.’

If it is the case that Otto came to Ede, then it is not the case that Ede came to Otto, i.e., the relation expressed by the natural language expression *come to* is asymmetric hence irreflexive. Interestingly, (9-b), which is the ‘illegally’ reflexive version of (9-a) is not meaningless at all but has special metaphorical meaning that corresponds to English *regaining consciousness*. We need not to worry how this comes about exactly; the point is that it appears certain ‘special’ – in this case, metaphorical – interpretations are assignable to structures that do not seem to be literally interpretable at all due to semantic properties of the elements making them up. An interesting case is provided by German (10).

(10) Sie standen neben sich.
    they stood next.to REFL
    ‘They weren’t themselves.’

---

\(^6\) Interestingly, Felix (2:10) finds nothing wrong apparently with the sentence in (i) that he produced to pay his mother a particularly charming compliment (the case of the subject in the comparative clause is wrong, but what is of interest here is the nonchalance with which the child produces the logically impossible sentence).

(i) Ich find Dich netter als Du.
    I find you-ACC nicer than you-NOM.
Wrenches and nails

(10) does not appear to be asymmetric (hence irreflexive) at all: If x stands next to y, then by all means y stands next to x as well. However, (10) still gets a special interpretation amounting to something like *not being in one’s right mind*. What is special about the relation in (10) is that it talks about spacetime that is arguably asymmetric by nature hence reflexivization is actually unfit for that domain. Another case in point are comparatives (cf. 3.2), which, being asymmetric by nature, may not be reflexivized. We argue that the system nevertheless does apply the reflexivization operation, marking it with the “excessive marker” zu. *Otto is too heavy* is thus underlingly (11) (we use the “‡” symbol to designate contradictoriness).7

(11) ‡Otto is heavier than Otto.

Let us give as well what corresponds to the standard case that we are used to from reasoning with sets, i.e., the case of a weak ordering as produced by a Boolean Algebra,8 defined in (12).9

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7 The assumption that *too* in comparative structures occupies the same slot as the comparative morpheme *er* is more or less standard, cf. already Bresnan (1973). Additional evidence for the vicinity between the two elements comes from German sentences like (i) where zu selects a sentence introduced by the element als (than) that we know from comparative structures.

(i) Otto ist zu schwer als dass er Jockey werden könnte.
Oto is too heavy than that he Jockey become could.

‘Otto is too heavy to become a Jockey.’


In formal terms, a Boolean algebra is a structure containing a set B, two binary functions ∧ (intersection or meet) and ∨ (union or join) on B, a unary function ’ (complementation) on B, and two distinguished elements Ø (the null-element) and 1 (the unit element) of B, satisfying the following axioms for all x, y, z ∈ B:

1. x ∨ (y ∧ z) = (x ∨ y) ∧ (x ∨ z) and x ∧ (y ∨ z) = (x ∧ y) ∧ (x ∧ z).
2. x ∨ y = y ∨ x and x ∧ y = y ∧ x.
3. x ∨ (y ∧ z) = (x ∨ y) ∧ (x ∨ z) and x ∧ (y ∨ z) = (x ∧ y) ∨ (x ∧ z).
4. x ∨ x’ = 1 and x ∧ x’ = Ø.
5. x ∨ Ø = 1 and x ∧ 1 = x.

A binary relation ≤ is defined as x ≤ y ↔ x ∧ y = x; ≤ partially orders B. To see that the algebra of sets is a Boolean algebra let B be the power set of any set S; ∧ be set-theoretic intersection, ∨ be set-theoretic union, ’ be complementation with respect to S; Ø be the null set, and 1 be S. Then ≤ is set-theoretic inclusion.

9 Note that here, unlike in the case of strict orderings (cf. 3.1.1), Connectivity includes the identity case where xRy as well as yRx.
(12) R is an ordering relation in the sense of \( \leq \) (short: \( R \leq \)) iff it is reflexive (a), antisymmetric (b), transitive (c) and connected (d):

a. For all \( x \) \( xRx \)  
   Reflexivity
b. For all \( x, y \) if \( xRy \) and \( yRx \) then \( x=y \)  
   Antisymmetry
c. For all \( x, y, z \), if \( xRy \) and \( yRz \) then \( xRz \)  
   Transitivity
d. For all \( x, y \) \( xRy \) or \( yRx \)  
   Connectivity

Natural examples of relations giving rise to weak orders are given in (13).

(13) be a subset of, know, scratch

For relations that give rise to weak orderings, it is generally fine to identify the first and second place of the relation, i.e., reflexivize, cf. (14).

(14) a. Each set is a subset of itself.  
b. Otto knows himself.  
c. Otto is scratching himself

The distinction between weak and strong orders is of great importance, tiny as it may seem, and it plays an eminent role in the discussion of “illegal reflexivization” (cf. section 4.1 further below). Generally, identity is fine when we talk about sets of ordinary sets. But it is not when we talk about strictly ordered matter. We do follow certain laws of thinking and project them onto natural language expressions, and these laws may well be similar or even identical to what scholars like Boole took them to be. However, we follow these laws and use their natural language pendants as well when the matter that we are dealing with is not “of the right kind”, opening up the option of associating with the ill-defined structure a meaning that we are keen on coding.

3.1.2 Identity and negation

It is most common to look at identity as a primitive relation that speaks for itself and can be most naturally assumed without further ado (cf., e.g., the habit in formal semantics of assuming the identity function to apply when something should apply but should not change anything). But in fact identity and negation belong to the most irritating if basic concepts which we rely on as much as we do not seem to understand them (but cf. Leibniz 1696). When we take the relational view and compare operators within this realm, identity as well as negation present themselves as degenerate, as the truth value of the whole formula, i.e., the range or output, depends only on one of the truth values in the domain or input. Reichenbach (1947, p. 34) presents the system of binary operators as follows:
We see easily that $2^4 = 16$ such arrangements can be made, and that therefore 16 operations between two propositions can be defined.

Among the 16 possible distributions of the letters ‘T’ and ‘F’, one consists of the letters ‘T’ only and another one consists of the letters ‘F’ only. We said that these extreme cases [tautology and contradiction] do not define operations and will be dealt with later. Then there is one distribution such that the ‘T’ corresponds to the ‘T’ of proposition ‘$a$’, and another one such that the ‘T’ corresponds to the ‘T’ of ‘$b$’; similarly there are two distributions such that the ‘T’ corresponds to the ‘F’ of ‘$a$’ or of ‘$b$’. These four are degenerate cases, as the truth of the operation is determined by one of the elementary propositions alone [identity and negation]. There remain ten distributions of the letters ‘T’ and ‘F’. Of these one half contains [sic!] the negations of the operations of the other half; thus there remain only five operations.

Instead of taking identity as an orientation point, it may be more helpful to take for granted the concept of Difference DIFF that squares with other core grammatical configurations like, e.g., Transitivity, as relating to apparently most central grammatical principles like “Obviation” or Principle B of Binding Theory (cf. sections 2.3 as well as 3.3 and 4.1).10 Regarding negation, we described above in section 2.2.1 how it behaves differently with respect to different levels of meaning representation, namely, it annihilates what is asserted and generally cancels what is implicated but leaves untouched what is presupposed. But there are as well special instances like metalinguistic or explicit presupposition negation that appear to negate information at other levels. Nothing in principal prevents the system from “mistaking” one for the other. And we see that whatever use the system makes from negation, it is clearly not just the use or function presented in books on logic and set theory, namely, “complements”. Maybe (15) could be taken to express this meaning of complements.

(15) Otto is not dead.

(15) asserts that Otto is in the complement set of the set of dead entities. Sometimes though negation appears to do nothing at all, i.e., the negated statement appears to mean the same as the non-negated statement, as in (16).

(16) Was haben wir nicht alles versucht.
    what have we not all tried
    ‘We tried everything.’

---

10 In contrast, grammatical constructions that appear to be reserved for the expression of identity like, maybe, the German Gleichsetzungsnominativ are defined by quite peculiar or idiosyncratic marking.
Sometimes, negation delivers more than what it should given its surface position, namely, e.g., in so-called Neg-raising contexts like (17) that appears to convey that Otto believes that it will not rain, which is the “internal” (or predicate) negation reading as opposed to the “external” (or proposition) negation reading that appears to be actually coded.

(17) Otto doesn’t believe it will rain.

Crucially regarding the phenomena under discussion here, negation sometimes delivers less of what the nonnegated expression delivers, i.e., it amounts to what “less” means – this is so in the case of predicate negation where the predicate is a gradable ("scalar") adjective.

(18) Otto is not very smart.

‘Otto is less than smart.’

In the last case, the ‘abnormal’ meaning of negation is an effect of the structure of the ontological domain that the negation operates on: in the case of scalar adjectives, the matter talked about is linearly (i.e., strictly and totally) ordered as opposed to the domain of “ordinary individuals” which is weakly and partially ordered (by set containment). Negation is interpreted in terms of complements in the domain of ordinary individuals, but it has a different meaning in ordered domains where it is interpreted in terms of “less”, i.e., an including instead of a complement set. This gets us confused. Also in ordered domains, negating a relation corresponds to exchanging the argument positions; i.e., the negation of $xR_\prec y$ is $yR_\prec x$. We see the connection here to reflexivization, understood as assigning both roles to one referent: it is asserting $xRy$ as well as $yRx$, i.e., a formula that amounts to $p$ and $\neg p$, i.e., a contradiction. The negation of identity (being the same) is difference (not being the same). Like identity, difference is symmetric in the ordinary individual domain but asymmetric in the phenomenal individual domain. Ngation is a scope bearing element the surface scope of which may differ from its semantic scope. The semantic scope may be ambiguous as in (19) which under its usual interpretation transports that it is not necessary for the addressee to wear a tie (the negation takes (non-surface) scope over must) but has a “surface” interpretation as well that transports that it is necessary that the addressee wears no tie.

(19) Du musst keine Krawatte tragen.

you must no tie wear.

The surface interpretation is less likely but appears to be the regular interpretation in certain dialects like Westfalian. The probability of misunderstanding and confusion increases with structural ambiguity that makes it possible or likely
for different speakers to disambiguate differently. To note, the disambiguation intended by the speaker may not generally correspond to the disambiguation carried out by the hearer. As R.E. Jennings (2004, pp. 678f) puts it:

Usually, we may assume, the syntax produced by a speaker is the syntax received by the hearer. Sometimes, however, this is not so. [...] If the error is not syntactically negligible, then we might suppose that one of two conditions must obtain: either the error is satisfaction-conditionally negligible, or it is not. [...] If the difference is not satisfaction-conditionally negligible, then one of two conditions must arise: either the syntactic error is eventually corrected, or the hearer persists for a while in satisfaction-conditional error as to what was said. [...] In fact, there seems to be an intermediate case: namely that, roughly speaking, the syntactic error would be satisfaction-conditionally compensated for by a semantic one. [...] Under certain conditions, when the syntactic error is compensated for by a novel or nonstandard construal, new meanings can be introduced, which are appropriately thought of as mutations in something very close to the molecular biological sense of the word.

Under negation specifically we can observe such mutations or novel construals of originally differently used constructions. E.g., according to Jennings, the complementizer unless developed from something like on a less condition than, meaning “A with the condition that B is not met”, giving for the negated construction the ‘conjunctive’ form “not (A and not B). This is the same, truth-conditionally, as the current ‘disjunctive’ form “not A if not B” or “not A or B”, but sponsored uses according to Jennings that did without the originally compulsory negative element (such as, e.g., “I’ll leave unless you sing”). In German, the case presents itself more dramatically in that it is easy to construct an analogous schema where in fact it does not appear to matter at all for the interpretation whether or not there is a negative element in the embedded sentence or not; in other words, the constructions in (20) come out meaning the same, as if the embedded negation were not interpreted at all (cf. for a similar effect in comparative constructions section 3.2.

(20) Es gibt nichts mehr, bis Du Dein Brot gegessen hast.
= Es gibt nichts mehr, bis Du Dein Brot nicht gegessen hast
‘There won’t be any more unless you (do not) eat your bread.’

Incidentally, we see here how “less” appears to be interpreted as “not”; as we argue in a moment, the converse – “not” being interpreted as “less” is generally the case in strictly ordered domains.

A closely related case where a negation appears to have been ‘smuggled in’ via what one could call a mutation is provided by the German conjunction sonst ‘else’, which, according to Kluge, meant the same as deictic so originally and may have developed its new meaning in elliptical threats as sketched in (i) (cf. Kluge 89, p. 680).
Most scholars take identity for granted and do not worry about it.\footnote{When we ask about the semantics of identity, we find two extreme stands: some will say it is trivial, i.e., there is nothing to be said about it. Some will say it is meaningless ("unsinnig") to speak of identity at all, as it is clear that “A=A” and that the form “A=B” is not warranted since it makes no sense to introduce a name for something that has a name already, as Wittgenstein remarks as well in the \textit{Tractatus Logico Philosophicus}.} Frege is an exception, beginning his famous article \textit{Über Sinn und Bedeutung} (1892 (1994, p. 40)) as follows:

Die Gleichheit fordert das Nachdenken heraus durch Fragen, die sich daran knüpfen und nicht ganz leicht zu beantworten sind. Ist sie eine Beziehung? eine Beziehung zwischen Gegenständen? oder zwischen Namen oder Zeichen für Gegenstände? Das letzte hatte ich in meiner Begriffsschrift angenommen. Die Gründe, die dafür zu sprechen scheinen, sind folgende: \(a=a\) und \(a=b\) sind offenbar Sätze von verschiedenem Erkenntniswert: \(a=a\) gilt \textit{a priori} und ist nach Kant analytisch zu nennen, während Sätze von der Form \(a=b\) oft sehr wertvolle Erweiterungen unserer Erkenntnis enthalten und \textit{a priori} nicht immer zu begründen sind.

Sameness provokes contemplation with questions tied to it that are not at all easy to answer. Is it a relation? a relation between things? or between names or signs for things? I had assumed the latter in my Begriffsschrift. The reasons that seem to speak for it are the following: \(a = a\) and \(a = b\) are obviously sentences of different epistemic value: \(a = a\) is valid \textit{a priori} and is to be called analytic after Kant, while sentences of the form \(a = b\) often contain very valuable extensions of our understanding and cannot always be justified \textit{a priori}.

Natural language expression suggests that we should look at identity as a relation. E.g., we can say things like (21-a) or (21-b), where we appear to express that two argument expressions have the same meaning (reference).

\begin{enumerate}[a.]
\item The morning star is the evening star.
\item Water is \(H_2O\).
\end{enumerate}

Note that the construction coding identity in this manner is special in that it features two NPs in nominative case. There is only one nominative usually in tensed clauses, warranting the German name "Gleichsetzungs-nominativ"
Wrenches and nails

(‘Nominative of equation’) for what we see in (21) in English. From a grammatical perspective, the structures behind (21-a) and (21-b) appear to be the same as the structures behind (22-a) and (22-b).

(22)  
   a. The morning star is a star.  
   b. Water is fluid.

What differentiates the examples in (21) and those in (22) is the semantics: (21-a) and (21-b) express identity, whereas (22-a) and (22-b) express “subsumption” (cf. sections 2.2 and 3.2.2; cf. as well footnote 25): Everything that is the morning star is a star but not the other way around, and everything that is water is fluid but not the other way around. In terms of properties, the copula relates identical properties in (21), but a more specific and a less specific property in (22). The circumstance that identity and subsumption are expressed by the same natural language means has troubled logicians a lot; a central issue is whether the copula is ambiguous in natural language or whether it has one common general meaning. It is independently attractive to adopt the “general meaning” view: After all, identity (equivalence) is nothing but subsumption (implication) that goes both ways, i.e., A is the same as B iff everything falling under A falls under B and everything falling under B falls under A. The difference we observe between the examples in (21) and the ones in (22) is that subsumption goes both ways in (21) but only one way in (22): Everything that is water is H₂O, and everything that is H₂O is water; however, while everything that is water is fluid, not everything that is fluid is also water.

In the realm of ordered matter, we get from a construction coding identity, i.e., two-way subsumption, to a construction coding one way subsumption by means of negating one of the terms related. To compare, in the realm of weakly ordered matter, if A and B are identical (cover all the same cases), then A and ¬B are different (have no cases in common). In the realm of strictly ordered matter, in contrast, we have it that if A and B are identical (cover all the same cases), then A one-way implicates ¬B, i.e., something that is identical to something is at the same time included in the negation of that something. This is confusing, and it does confuse us and “corrupts” the grammar we submit when it deals with ordered matter as in the realm of (spatio-)temporal relations or the comparison of property instantiations. In order to develop the problems connected to identity in the context of strict orders, let us take up again Leibniz’ (1696) principle of identity as repeated in (23).

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14 Somewhat ironically, it appears that relations that have the ‘confusing’ property just mentioned are particularly easy to learn. Thus, a computer program DORA (‘Discovery Of Relations by Analogy’) that was designed to discover and learn new relations on the basis of established ones was particularly successful in the realm of asymmetric relations (Doumas/Hummel/Sandhofer 2008, p. 35):
Phenomenal and ordinary individuals

∀P (P(x) ≡ P(y) → x = y)
If x and y have all the same properties, then they are identical.

(23) makes it easy to see how identity and contradiction are interdefinable: For something to differ from itself, it has to have a property it does not have. But this is a contradiction. The principle of contradiction is given in the formulation of Peirce again in (24) (cf. above section 2.1).

(24) Principle of Contradiction
Material mode: For any property and for any definite subject, it is not the case both that the subject possesses that property and that the subject does not possess that property.
Formal mode: For any pair of contradictory predicates “P” and “not-P” and for any definite subject-term “S”, “S is P” and “S is not-P” are not both true.

A brief way to put LC is to formulate it as the verdict in (25).

(25) ¬∃x P(x) ∧ ¬P(x)

(25) is generally taken as one of the most reliable if not the most reliable principle ruling our thinking. We argue, however, that in domains of matters that are ordered, (25) is not a contradiction but a tautology (cf. section 3.2). The consequences of the ‘corruption’ of negation in ordered domains have gone largely unnoticed. In traditional semantics, the denotations of common nouns are like those of adjectives, namely, sets of individuals. Geach (1962) however points out a fundamental difference between what he called “substantive” and “adjectival” categories, arguing that only nominals supply criteria of identity that make it meaningful to talk about sameness – and, accordingly, difference – to begin with. Baker (2003, pp. 95f) puts this as follows (cf. as well Gupta 1980 and Larson/Segal 1995):15

The idea in a nutshell is that only common nouns have a component of meaning that makes it legitimate to ask whether some X is the same (whatever) as Y. This lexical semantic property is the precondition that makes nouns particularly suited to the job of referring.

15 To note, mass nouns do furnish criteria of identity according to Geach or Baker, even if they resist pluralization or counting (cf. above section 2.3.2). Here is what Geach (1962, p. 39) says concerning the matter:

Most of the relations DORA learned in the simulations reported here were relations with an underlying metric dimension (e.g., bigger-than). In the case of a relation like bigger-than, the semantic content of the relational roles is intuitive: The larger role entails more of the dimension size and the smaller role entails less of that dimension.
Whether or not an expression furnishes a criterion of identity can be seen in certain contexts of use, involving in particular the relation of sameness. The examples in (26) and (27) from Baker (2003, p. 101) illustrate that lexical nouns behave dramatically differently from adjectives in these contexts.

(26)  
   a. That is the same man as you saw yesterday.
   b. That is the same water as was in the cup this morning.

(27)  
   a. # That is the same long as this.
   b. # She is the same intelligent as he is.

Beyond elements expressing sameness, certain quantifiers as well as determiners give rise to contexts where only lexical nouns as furnishing criteria of identity according to Geach are appropriate. To note, nominal expressions that are derived from adjectives behave funnily in these contexts when compared to lexical nouns.\(^\text{16}\)

(28)  
   a. That is (not) the same girl as I saw yesterday.
      #That is (not) the same best as I ate yesterday.
   b. Every girl gets a candy.
      #Every best gets a candy.
   c. The/a girl came in.
      The/*a best came in.

Assuming that talk of sameness, as well as difference Diff (cf. the negation sign in (28-a)) presupposes criteria of identity, it is straightforward to hypothesize that lexical adjectives as well as expressions derived from lexical adjectives furnish no criteria of identity hence make talk of sameness or difference mute, which is not quite but almost what we argue. Specifically, we propose that we may use certain constructions and operations that would seem to depend on nominal criteria of reference also with the “wrong” types of expression, which effects particular repairs at the interface to semantic/pragmatic interpretation.

Turning back to LC, cf. (25) above, there is at least one class of cases where we appear to be able to say something that has a logical form similar to the one

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\(^{16}\) There are obviously grey zones here as expressions may as well be recategorized lexically, i.e., derived nominals may become lexical nominals.
given in (28), i.e., that constitutes a straightforward violation of LC. Autenrieth (1997) observes that transparently expressed equative tautologies resist negation as a rule; only if a bare nominal appears in subject and predicate position does it appear possible to negate the tautological statement without further ado.\footnote{We may assume for concreteness that the subject expression here corresponds to the kind, i.e., the sum total of instantiations of “kidness”, and that the predicate corresponds to the set of kids. Cf. section 2.3.2.} Autenrieth (ibid., p. 22) gives the examples in (29) and (30).

(29) a. ?Kinder sind nicht Kinder.
   kids are not kids
b. ?Mehrheiten sind nicht Mehrheiten.
   Majorities are not majorities
c. ?Pizzas sind nicht Pizzas.
   pizzas are not pizzas

If we assume that the NP referent in (29) is a kind – a singular individual with essentially rigid designational properties, but that NP reference in (30) involves some form of existential quantification over sets of individuals with members that are possibly distinct, then the qualitative difference between the examples shows how existential quantification again leads out of \textit{prima facie} (i.e., in the non-quantificational case) contradictory situations.

(30) a. Kind ist nicht Kind.
   kid is not kid
b. Mehrheit ist nicht Mehrheit.
   Majority is not majority
c. Pizza ist nicht Pizza.
   pizza is not pizza

Autenrieth proposes that the examples in (30) constitute cases of hidden comparatives, i.e., they are interpreted analogously to the cases in (31).

(31) a. Kind ist nicht gleich Kind.
   kid is not like kid
b. Mehrheit ist nicht gleich Mehrheit.
   Majority is not like majority
c. Pizza ist nicht gleich Pizza.
   pizza is not like pizza

Comparative constructions are paradigm examples of existential quantification, cf. section 3.2. We see here again how “shifting” the meaning of what is a plain contradiction superficially to a comparative as is possible in the bare nominal
case ameliorates the contradiction. In contrast, no such amelioration is possible with bare plural nominals or other singularly referring NPs (definites, etc.). The question is why it is only the bare nominal cases that allow the shift, and how exactly it comes about. An expression that is contradictory at surface can become fine when interpreted as a comparative because comparatives talk about strictly ordered matter; negation does not mean what it usually means (complements) here, but it means “less”. Therefore, negating a predicate expressing a certain gradable property and asserting it of some individual together with the nonnegated predicate does not yield a contradiction, but just a weaker meaning than what is expressed by the non-negated predicate. The alert reader will object that comparative structures violate Hurford’s constraint then, which they do indeed modulo the computation of implicatures. The next section develops the idea that comparatives are an instantiation of Gazdar’s version of Hurford’s Constraint, repeated in (32).¹⁸

(32) “S or S’” is infelicitous if S’ entails S, unless S’ contradicts S together with the implicatures of S.

As we argue presently, comparative clauses are entailed by their matrix clauses, but contradict these when the implicature of exhaustification is added. Staying with negation in the scalar domain for the moment, the altered interpretation of negation in ordered domains was seen already by Jespersen (1924) and appreciated by outstanding scholars like Horn (1989), even if the insight was not taken to its full consequences afterwards. Here are two central quotations:

Not means ‘less than’, or in other words ‘between the terms qualified and nothing’. Thus not good means ‘inferior’, but does not comprise ‘excellent’. ... This is especially obvious if we consider the ordinary meaning of negated numerals: He does not read three books in a year/the hill is not two hundred feet high/his income is not £200 a year... – all these expressions mean less than three, etc. (Jespersen 1924, p. 325)

¹⁸ In its original formulation, Gazdar’s version of Hurford’s constraint (for short, GHC) goes as in (i) (cf. Gazdar 1979, p. 81).

(i) The joining of two sentences by or is unacceptable if one entails the other but the entailed sentence does not potentially implicate the negation of the entailing sentence; otherwise the use of or is acceptable.

Examples that motivate Gazdar’s version of Hurford’s constraint are (ii) and (iii).

(ii) Inmates may smoke or drink or both.

(iii) Some or all of them were there.

(ii) is fine according to GHC under the assumption that use of or potentially implicates the negation of the corresponding conjunction. (iii) is fine under the assumption that the occurrence of some potentially implicates the negation of all.
The negation of a scalar predication, $\neg p_i$, is true if its contradictory $p_i$ is false; this amounts to the claim that no proposition of this type containing $p_i$ or any stronger value on its scale is true. Just as it is warm means that (is true iff) it is at least warm, its negation it is not warm means ‘it is not at least warm’, that is, ‘it is less than warm’. In the same way, not pretty is interpreted as ‘less than pretty’, not happy as ‘less than happy’, and – as Jespersen points out in the epigraph to this chapter – not good as ‘less than good’, and not three as ‘less than three’. (Horn 1989, p. 243)

The fact that negation means “less” in scalar predications (viz. ordered domains) leads to the disturbing circumstance that certain states of affairs are truthmakers of certain predicates as well as their negations. Thus, e.g., if it is true that “Otto has three kids”, then it is necessarily true that “Otto has two kids”. But this latter state of affairs is perfectly compatible with the truth of “Otto does not have three kids”, i.e., the negation of the original sentence, as well. Putting it more generally, we have (33), where “d” stands for a degree of instantiation (a threshold) associated with a predicate $P$.

\[(33) \quad \text{Everything d-}P \text{ is also less than d-}P \]
\[\text{things in the set of d-}P \text{ things are in the sets of less-than-d-}P \text{ things}\]
\[\text{Everything meeting or exceeding a certain threshold of } P\text{-instantiation meets or exceeds all lower thresholds of } P\text{-instantiation}\]

In symbols, the logical form in (34) goes through as a valid statement when $P$ is a gradable property (like, e.g., having three kids) and $x$ is an individual satisfying the property.

\[(34) \quad \forall x \ P(x) \rightarrow \neg P(x)\]

It is important to keep in mind that we are abstracting for the moment from implicature. Of course, the formula in (34) becomes contradictory at the very moment when we add the usual quantity implicature, i.e., add an “only” to the negated gradable predicate. If (34) goes through in ordered domains, then it is clear that (25), i.e., LC does not apply in ordered domains either. Bending this back to reasoning with the square of opposition, what this means is that in strictly ordered domains, unlike in weakly ordered ones, the O corner of the square is automatically given with the I corner. As de Morgan (1858, p. 121) pointed out regarding talk of extents:

There are three ways in which one extent (sic!) may be related to another [...] they are, complete inclusion, partial inclusion with partial exclusion, and complete exclusion. This trichotomy would have ruled the forms of logic, if human knowledge had been more definite. [...] As it is, we
know well the grounds on which predication is not a trichotomy, but two separate dichotomies. [...] Must be, may be, cannot be, are the great distinctions of ontology: necessity, contingency, impossibility. This was clearly seen by the logicians. But it was not so clearly seen that this mode of predication tallies, not with the four ordinary forms A, E, I, O, but with the three forms A, (OI), E. As in the following: – Every X is Y, which is the consequence of necessity; Some Xs are Ys and some are not, which is the consequence of contingency; and No X is Y, which is the consequence of impossibility.

Similarly aware of the potential confusion arising in the context of talk of extents (“continua”) was Leibniz, who wrote in a letter to de Volder around 1700 (translated from Latin):

But continuous quantity is something ideal, which pertains to possibles, and to actuals, insofar as they are possible. Indeed a continuum involves indeterminate parts, whereas, by contrast, there is nothing indefinite in actual entities, in which every division that can be made is made. Actual things are composed in the manner that a number is composed of unities, ideal things are composed in the manner that a number is composed of fractions. The parts are actual in the real whole, but not in the ideal. By confusing ideal things with real substances when we seek actual parts in the order of possibles and indeterminate parts in the aggregate of actual things, we entangle ourselves in the labyrinth of the continuum and in inexplicable contradictions.

The interactions between the (different kinds of) modalities and negation are notoriously complicated. We believe that there may be less systematicity here than many researchers would like to think; this is because like in ordered domains more generally, negation does not deliver the type of result that we are used to (namely, the complement of what is negated). Let us give just one example of the many idiosyncrasies typical of the modalities in interaction with negation, comparing English and German with respect to (the negation of) the expression of necessity.

(35) Otto muss das sagen.
    Otto must that say

(35) conveys that it is necessary that Otto say something particular as referred to by the demonstrative das. When we negate (35), we get (36).

(36) Otto muss das nicht sagen.
    Otto must that not say.
The interpretation of (36) in standard German is that it is not necessary for Otto to say *that*, i.e., it expresses possibility. This appears to be like it should be, following the laws of the quantifiers (what is not necessary is possible). However, in e.g. Westphalian, it is perfectly typical to interpret (36) such that it conveys ‘negative’ necessity, i.e., “necessarily not”, which appears to derive from necessity simply by ‘moving in’ the negation (illegally, from a logical perspective). English is like Westphalian, where “must not” expresses the same as “necessarily not”. The possibility reading associated with “muss nicht” in standard German cannot be expressed using just negation in English; (36) corresponds to (37) in standard English.

(37) Otto need not say that.

It appears quite hopeless to explain this type of variation in systematic logical terms; instead, historical accident leads to associating with the expression of modality in tandem with negation particular meanings but not others. The leeway follows from the structures being defective from an interpretive perspective, due to the strict ordering of the matter they talk about.

If O is entailed by I due to the ill working of negation in ordered domains, we can make do here following famous scholars with just a triangle as given I, O is given as well.

```
Every S is P
A  contradictory  E
contradictory

I
Some S is P
```

As as matter of course, it does not make sense at all to have the meaning represented in terms of O independently, or no more than it does to write down meanings that are weaker than what has already been asserted. By way of summing up as well as building a bridge to the analysis of comparatives, we take it that the peculiar workings of negation in ordered domains add to increasing systematic confusion as regards the rules that its use follows. When there is talk of matters ordered we see that the entailments go to the “smaller” or “lower” elements, while the implicatures amount to negating the “bigger” or “higher” elements, as the usual cancellation and suspension tests show (cf.
Levinson 1983, p. 115); in the following pairs of examples, the first sentence is an attempt to cancel or suspend an entailment, the second one is an attempt to cancel or suspend an implicature.

(38) a.  # Otto has three horses, in fact one.  
   b.  Otto has three horses, in fact ten.

(39) a.  # Otto has three horses, if not less.  
   b.  Otto has three horses, if not more.

(40) a.  #Otto weighs 100 kgs, in fact 90 kgs.  
   b.  Otto weighs 100 kgs, in fact 110 kgs.

(41) a.  #Otto weighs 100 kgs, if not more.  
   b.  Otto weighs 100 kgs, if not less.

It is anything but intuitive to tear apart entailments (going to smaller elements) and implicatures (negating bigger elements) in the case of (negated) scalar predicates; a quick demonstration that “weighing P” does entail “weighing less than P” but only implicates “not weighing more than P” can be made using the verum focus construction that “stresses the truth of what is said” (Höhle 1992), cf. (42) as opposed to (43).\footnote{Cf. for a recent overview and synthesis of verum phenomena Blühdorn/Lohnstein (2012).}

(42) Otto IST nicht 50 kg schwer. Er ist leichter.

(43) #Otto IST nicht 50 kg schwer. Er ist schwerer.

cf. above: (43) is possible only with a rise on “50”.

(44) Otto IST nicht so schwer wie Ede. Er ist leichter als Ede.

(45) #Otto IST nicht so schwer wie Ede. Er ist schwerer.

In sum, negating a scalar predicate does not yield complements at the interface to semantic interpretation but more inclusive sets. Therefore, the statement that “Everything P is not (=less) P” in the scalar domain has the same quality as (46) in the ordinary individual domain.

(46) $\forall x \, P(x) \rightarrow P(x) \lor Q(x)$

But (46) is tautologous, i.e., it could never be false (cf. section 2.2.2). Without further ado, negating a scalar predicate therefore does not add to informativity hence should never be motivated in the first place. However, as we argue, there is an escape from the tautologous quality of formulas of the form $p \rightarrow q$ where $q$ is entailed already by $p$ which consits in exhaustifying the weaker
meaning, which amounts to negating the stronger “original” meaning p. More specifically, we really get (47).

\[(47) \quad \text{Not } p \text{ but only } p \lor q\]

When “only” is added to the weaker meaning, then this yields a result that is incompatible with the stronger meaning which however appears to be asserted. Elsewhere, however, the operation makes perfect sense. Note, thus, that it serves to save violations of Hurford’s constraint, cf. (48).

\[(48) \quad \begin{align*}
    a. & \quad \# \text{John is a bachelor or unmarried.} \\
    b. & \quad \text{John is a bachelor or just / only unmarried.}
\end{align*}\]

We thus see the operation applying in certain patterns popularly used when assertions are to be made. We see it applying in hedges (cf. section 2.2), as well as in privative predicates like fake (cf. section 4.2.2). We argue in the next section that comparative structures generally are an instance of the operation, i.e., instances of repairs of Hurford’s constraint. In other words, we claim that “naked” comparative clauses are tautological but become informative via a repair mechanism that consists in exhaustifying the comparative clause, i.e., sticking in a silent operator that does what natural language expressions like only or just do.

### 3.2 Weak theories of comparatives

Comparatives are about difference eventually, which can be understood to be the absence of identity. Typically, comparatives involve adjectival predicates denoting properties. But we only just saw indications in the last section that it may be mistaken to extrapolate the concept of identity as we are used to it to the adjectival (as opposed to nominal domain) where, following Geach (1962), no criterion of identity is associated with the projecting material. If there is no criterion of identity, we are at a loss speaking of being the same, cf. again examples like (49), slightly modified from the last section.

\[(49) \quad \# \text{This is the same heavy as that.}\]

If identity is corrupted, we expect difference to be so, too. Negating (49) brings no amelioration, cf. (50).

\[(50) \quad \# \text{This is not the same heavy as that.}\]

We explore here in more detail the idea that it is the special behavior of negation in ordered domains particularly that gets us confused when we use comparative
constructions. That negation behaves particularly in comparative constructions becomes evident when we look at examples like (51), where the decreasing quantifier brings an extra negation into the comparative clause.

(51) (?) Otto is more beautiful than few others.

Contrary to what is sometimes claimed in the literature, (51) is not ungrammatical. It is just hard to interpret, so hard indeed that we do not see at first glance what it means – it turns out that (51) is an insult rather than a compliment as it may first seem, which we see when we transform it along the lines of “There are few people such that Otto is more beautiful than they are”, which amounts to something like “Many people are more beautiful than Otto”. As the negation has a different meaning when applied to ordered matter that amounts to “being less”, it effects that modulo other repair mechanisms, the comparative clause has a meaning originally that is weaker than (i.e., entailed by) the meaning of the matrix clause. To repeat, there appears to be a general ban on following up on something p that has been said with something q that is weaker in meaning than, i.e., entailed by, p. There is a definable class of structures though that provides an exception to this constraint, due, originally, to Hurford (1974) and qualified by Gazdar (1979, p. 81) as in (52).

(52) “S or S’” is infelicitous if S’ entails S, unless S’ contradicts S together with the implicatures of S.

We saw above that there appears to be a means of repairing structures that go against Hurford’s constraint; in particular, tautological structures (where the entailment relation between p and q goes both ways) can be saved by

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20 This presupposes the view that comparative clauses do feature negation, a view that we embrace. Cf. Ross (1967), Seuren (1973), Klein (1980), Schwarzschild (2008).

21 It would be interesting to collect erroneous uses of negation in the comparative/adjectival as compared to other (Boolean) domains; we would expect erroneous uses of negation to be more frequent (harder to detect, less offending) in the former than in the latter domain. An illustrative example that involves a gradable predicate and that when literally taken means the opposite of what the speaker obviously intended is given in (i).

(i) Was wir nicht hoffen, ist, dass diese neue Ebola-Epidemie nicht so dramatic wird wie die große Pest des 14. Jhdt.

22 Gazdar’s original and somewhat more cumbersome formulation is given in (i).

(i) The joining of two sentences by or is unacceptable if one entails the other but the entailed sentence does not potentially implicate the negation of the entailing sentence; otherwise the use of or is acceptable.
exhaustification, i.e., inserting an element that does what the form only does. We argue here that comparative structures are structures that routinely violate Hurford’s constraint in that the comparative clause is weaker in meaning than the matrix clause. Like with tautologies, this defect is repaired by exhaustification of the (meaning of the) comparative clause, i.e., inserting silent only. Comparatives are structures then that fall into the class defined by Gazdar: they violate Hurford’s constraint modulo the computation of implicatures.23 Regarding Hurford’s constraint, note that certain minimal changes to structures violating it yield perfectly acceptable sentences, compare (53) and (54).

(53)  a. #Otto is a bachelor or he is male or unmarried.
      b. #Otto is a bachelor and he is male and unmarried.

(54)  Otto is a bachelor (in so far) as he is male and unmarried.

Superficially, we could describe the difference between (53) and (54) as a switch from “ordinary individual language” to “comparative language”, i.e., exchanging a conjunction with an element known from comparative (more specifically: equative) structures, namely, the element as. Similarly in German, we find the pattern in (55) that illustrates the same thing.

(55)  a. #Otto ist ein Junggeselle und/oder er ist männlich und/oder unverheiratet.
      Otto is a bachelor or he is male or unmarried
      b. #Otto ist ein Junggeselle so er männlich und unverheiratet ist.
         Otto is a bachelor so he male and unmarried is

The switch to comparative – more generally: scalar – talk saves violations of HC as in scalar talk, the well-known quantity implicatures particularly naturally embed or get hard-wired, rendering structures informative that are redundant modulo the addition of the implicatures. As a second theory-independent piece of evidence for the analysis proposed here, note that it appears to be impossible to have only overtly in comparative structures, cf. (56).

23 This perspective offers a solution to an old-standing crosslinguistic puzzle pertaining to comparatives, namely, that the most common strategy of coding superlatives appears to have contradictory semantics (Uttan 1972, p. 123; Bobaljik 2012, chapter 3.2.3). Using the comparative morpheme and universally quantifying over the standard of comparison, a sentence like Otto is the best looks like in (i).

(i) Otto is better than everybody.

As everybody covers as well Otto, (i) entails the sentence

(ii) Otto is better than Otto.

We have it that (ii) ends up contradictory only after the calculation of implicatures.
While not perfect, having *only* in equatives appears much better, cf. (57).

(57) Otto ist so schwer wie (sonst) nur Ede.
   Otto is as heavy as (otherwise) only Ede

A plausible explanation for this pattern is that comparatives – unlike equatives – already feature silent *only*. Having it overtly will then either violate economy (as the cost of spelling it out is not justified) or a restriction against two *only*s applying to the same part of structure. Indeed it turns out that in equatives, the contribution that *only* makes to truth conditions is present as a conversational implicature which, as is well known, can but need not be made explicit, while in comparative structures it is truly part of the truth conditions. Put differently, what is known as the “nonvacuity principle”, an implicature associated with adjectives that they partition the domain non-trivially (cf. sections 2.2.1, 3.1.1) becomes part of the expressed meaning in comparatives. We can think of part of the relation between equatives and comparatives then as a mechanism that turns an (conversational) implicature into an entailment.

Section 3.2.1 develops the idea that there are two distinguished semantic levels to comparative structures, namely, a **quantificational** level where talk is of what are called thresholds (alternatively: standards), and a **predicational** level where talk is of individuals that are ascribed properties as in any other run-of-the-mill sentence. We propose that repair by inserting *only* may happen at either level; put differently, the defect of being tautological is neither tolerated at the quantificational level nor at the predicational level. The idea that comparatives are best analyzed in terms of quantification over thresholds (Lewis 1972) as opposed to an analysis in terms of the comparison of definite degrees (Creswell 1976) will be briefly discussed here as well. Section 3.2.2 discusses the relation between the positive/equative, the comparative and the excessive on the basis of the semantics developed so far, concretizing how the meaning of the respective structures comes about compositionally. Following earlier proposals (Ross 1969, Seuren 1973, Klein 1980 and more recently Schwarzschild 2008), comparatives are analyzed as equatives with a negation sign added to the comparative clause which leads to a strictly asymmetric interpretation. An original proposal consists in the claim that excessives, i.e., structures of the type *x is too A(to V)* are comparatives that have been illegally reflexivized. The modal interpretation of excessives is the reflex of a repair of the contradictory hence intolerable outcome of this illegal reflexivization.\footnote{To repeat, we see special meanings arising through illegal reflexivization elsewhere, e.g., in examples of the kind in (i) and (ii).}
3.2.1 Two ways of comparatives

An initially nearby question regarding comparatives is what they actually talk about. As pointed out by McCawley (1981, p. 185),

[t]he meaning of a comparative construction [...] involves not merely the individuals that are mentioned [...] and the predicates represented by the verbs and adjectives [...] but also ‘quantities’ and/or ‘extents’.

The last-mentioned individuals have given rise to much discussion, and, as we argue, much actual confusion in the minds of speakers and hence use of linguistic structures expressing comparison. Looking at the semantics literature, the standard answer to the question what comparatives talk about is that they talk about degrees, which they compare (Cresswell 1976, Stechow 1984). Alternatively, comparatives can be taken to talk about thresholds or standards (Lewis 1972, Klein 1980, Schwarzschild 2008). Very roughly, these two perspectives on comparatives can be illustrated as follows, using the example in (58), the meaning of which is schematically represented in (59).

(58) Otto is heavier than Ede.

\[
\begin{array}{c}
\text{O} \\
\text{E}
\end{array}
\]

Theories comparing degrees render (58) as something like (59), i.e., they relate definite (unique and presupposed) degrees.

(59) Otto’s weight is above Ede’s weight.

Threshold theories, also known as “A not A” theories of comparatives, on the other hand, say that the truth conditions of (58) should be rendered as in (60).

(60) There is a weight-threshold that Otto meets but not Ede.

\[\begin{array}{c}
\text{Otto} \\
\text{Ede}
\end{array}\]

(i) Otto kam zu sich. Otto came to REF. ‘Otto regained consciousness.’

(ii) Otto stand neben sich. Otto stood next to REF. ‘Otto was not himself.’

25 The threshold theory is the kind of theory that has developed out of Lewis (1972), on a suggestion by Kaplan, according to Lewis, and Klein (1981) as well as Seuren (1973) on the basis of a handout by Ross (1969). Technically and as far as the semantics is concerned, we follow Schwarzschild (2008).
For example, (58) would be true if Otto weighs (exactly) 100 kgs and Ede weighs (exactly) 70 kgs, as there are (indeed infinitely many) weight thresholds between 70kgs and 100 kgs that are met by Otto but not by Ede. The two theories are inter-translatable for the most part, i.e., each can be modeled in terms of the other. There are however some arguments in favor of the thresholds theories which we will briefly review here. As Schwarzschild (2008) points out, the most straightforward arguments have to do with the fact that as they compare definite degrees, the two degrees theories depend on there being uniquely existing degrees to start. But not all comparative structures appear to feature such uniquely existing degrees, cf. (61).

(61) The balloon is higher today than on any other day.

The problem with (61) is that there is no definite description interpretation of what would supposedly be the degree(s) that the comparative clause talks about, so it is hard to tell how the meaning of such examples could be represented. On the existential quantification over thresholds analysis, writing the truth conditions is no problem, cf. the paraphrase in (62).

(62) There is a height that the balloon reaches today and there is no other day such that the balloon reaches that height.

Similarly, equative sentences like (63) are acceptable, but it is hard to see what the definite degree of weight that *keiner* ‘nobody’ has would or could be.

(63) Otto ist so groß wie keiner.
Otto is as tall as noone.

On other occasions, two degrees theories would have to invent definite degrees. This would be the case for humdrum positives which according to the two degrees theories compare a linguistically coded weight to a contextually given (“standard”) one, cf. (64).

(64) Otto is heavy
≈Otto’s weight is above the contextually given standard weight.

It seems unintuitive that the positive should be as complex semantically as the comparative, given its simpler form (cf. Klein 1980, section 3.2.2). As pointed out by Klein (1991), quantification over thresholds enables us to use very well known means to analyze comparative structures, specifically, the square of opposition as featuring slots for “subject” and “predicate” properties for the representation of the relations between the quantifiers and the negation sign. Before we turn to Klein’s somewhat involved original example, note that comparative structures do appear to involve two slots, cf. (65).
(65)  a.  Ede is (as) heavy as Trude.
    b.  *Ede is as heavy as Trude for a horse.
    c.  *Ede is heavier than Trude for a horse.

As (65) exemplifies, there is room for two properties (of thresholds) in comparative structures, but not, e.g., three. Surface appearance suggests that the comparative clause or a comparison class indicating expression fill the same “predicate” slot, squaring with their syntactic embeddedness. Let us look in some more detail at how comparative structures translate under the threshold approach to prepare for the review of a point made by Klein (1991) that is truly astonishing against the background of the square of opposition.

Quantifying over thresholds, the meaning of the equative turns out to correspond to the A corner of the square of opposition, cf. (66), where the variable “s” stands for a threshold.\(^{26}\)

\[(66) \quad \text{Otto is as heavy as Ede} = \forall s \ [\text{heavy} (\text{Ede}, s) \to \text{heavy} (\text{Otto}, s)]\]

(66) says that all standards that Ede reaches are reached by Otto as well. Otto may reach standards that Ede does not meet, i.e., instantiate the property more than Ede.\(^{27}\) The comparative matches the O corner of the square, cf. (67).

\(^{26}\) For ease of exposition, we write the threshold argument into the formula directly and not on the interpretation function as would actually be more accurate.

\(^{27}\) Cf. Schwarzschild (2008); to give just one test, (i) shows that the meaning of ‘equality’ that is strongly felt with comparative structures is an implicature arising from exhaustive interpretation (i.e., an “exactly” reading) generally associated with scalar predication. Cf. as well the last section.

(i)  a.  Otto is as heavy as Ede, in fact heavier.
    b.  #Otto is as heavy as Ede, in fact less heavy.
Ede is heavier than Otto = \exists s [\text{heavy (Ede, s)} \land \neg \text{heavy (Otto, s)}]

Some standard that Ede reaches is not reached by Otto

(67)

Fuelling the view that language and logic have a lot to do with each other, (67) is truth-conditionally equivalent to the negation of (66), given in (68).

(68) Otto is not as heavy as Ede = \neg \forall s [\text{heavy (Ede, s)} \rightarrow \text{heavy (Otto, s)}]

Not all standards that Ede reaches are reached by Otto

The relation between the equative and the comparative thus appears to correspond to what is known as a law of quantifier negation, viz. exchanging a universal quantifier with an existential quantifier and “embedding” the negation to the predicate property. As is well known, comparative clauses do exhibit properties suggesting that they are monotone decreasing, viz. negated structures.\textsuperscript{28} Klein (1991, p. 685) comments on this remarkable pattern as follows:

An attractive feature of this [= the thresholds] approach is that (67) [= the comparative] is equivalent to the negation of (66) [= the equative], namely (68).

This is too beautiful to be an accident. At second sight, things look somewhat less beautiful but no less non-accidental. To note, and as was discussed above in section 2.1.2, it is questionable whether the O corner of the square is as logical as the other corners; further, it appears that the grammatical functions in the comparative construction are reversed when compared to the grammatical functions in the equative construction; what is the matrix comparandum (‘subject’) in the equative becomes the embedded comparandum in the comparative and vice versa. Given that the O corner of the square has the property of symmetry, it is more than unclear how this fits the idea that the step from the equative to the comparative corresponds to the application of the laws of quantifier negation.\textsuperscript{29} Finally, and importantly for us, while comparative structures do behave like they were negated from a more syntactic perspective, this

\textsuperscript{28} Evidence that German als does incorporate negation comes from certain excessive structures taking comparative clauses as well, somewhat irregularly. Thus, the sentences in (i) and (ii) are largely equivalent in meaning, where (i) features a (regular) finals clause with a negation which is missing in the comparative clause in (ii).

(i) Ede ist zu schwer, so dass er nicht Jockey werden kann.
Ede is too heavy such that he not Jockey become can

(ii) Ede ist zu schwer, als dass er Jockey werden kann/Könnte.
Ede is too heavy than that he Jockey become can/could

The pattern further supports a close vicinity of the comparative morpheme and the excessive form zu; cf. Bresnan (1973) regarding English too and -er.

\textsuperscript{29} Indeed without the switch of grammatical functions, the comparative entails the equative as it excludes the identity case.
is much less clear from a semantic perspective. In particular, negative polarity items are licensed in comparative clauses which however show properties of monotone increasingness, cf. the data in (69-a) vs. (69-b).

(69)  
   a. Otto is heavier than anyone.
   b. Otto is heavier than Ede, hence he is heavier than Ede or Ubu.

To give an intermediate summary, it looks like natural language comparative structures mimick the laws of quantifier negation in that the transformation of equative structures into comparative structures looks just like the law that says “If not everybody, then someone not”, but in doing so it does get lost somewhat, or go astray. The reason we propose lies in the non-standard workings of negation in ordered domains, as we discussed earlier. Let us look then at the predicational side of the comparative coin.

To repeat, we take it that talk about thresholds or degrees is not all there is to comparative structures; they talk as well about individuals to which they ascribe properties or that are “collected” by these properties. E.g., the possibility of conjoining an absolute predicate with the comparative of a gradable adjective as in (70) suggests that as far as the grammar is concerned, both types of expressions correspond semantically to sets, i.e., comparatives correspond among other to regular predicational structures.

(70) Martha is better qualified and a woman.

From the perspective of predication, when you say that Otto is heavier than Ede then you say that there is a set A of individuals that meet or exceed a certain threshold and that Otto is in that set and that Ede is not in that set. Now the set that distinguishes Otto is properly included in any set containing both Otto and Ede, which will be defined by a lesser instantiation of the property in question. To the extent that Otto and Ede are comparable at all, i.e., live on the same scale of property instantiation, there are infinitely many thresholds that are met (or exceeded) by both Otto and Ede, i.e., that define sets containing both Otto and Ede. The point is that due to what things are like in the real world, comparatives always guarantee for thresholds that are lower than the one that is talked about and that sets apart the comparanda and that will be met by the individual instantiating the property to the lesser degree, to the extent that the individuals are comparable to start. More technically, comparative structures furnish free variables the restrictions of which fall under the O-corner

31 This is because it is hard to see how the structure could be interpreted on the usual assumption that the conjunction is interpreted in terms of set intersection.
32 Different thresholds may come to define the same sets, but in general the sets will get smaller (more exclusive) the “higher” the threshold that defines the set.
of the square of opposition. There will always be infinitely many thresholds (defining sets corresponding to properties) that are met by the individual that does not meet the threshold that is actually talked about. In other words, and due to general requirements of grammar presumably – something like the ban on vacuous quantification taken to the realm of predication – we are sure to be allowed to infer that there is a threshold lower than that talked about in a comparative structure that is met by the ‘lesser’ individual, even if this is actually not asserted but corresponds to a non-logical inference due to the structure of the world. The contrast between the comparative in (71-a) that does and the equative in (71-b) that does not furnish an unbound variable is a reflex of this in that the introduction of new thresholds (hence new information) via the comparative does allow for infinite recursion, unlike the equative.

(71) a. Otto climbed higher and higher (and higher and higher...).
    b. Otto climbed high (and high).

(72) gives a paraphrase of our paradigm example of a comparative of inequality, where what comes behind the comma corresponds to the nonlogical inference.

(72) Otto is heavier than Ede

There is a threshold that Otto meets and that Ede does not meet, and there is a (lower) threshold that Ede meets (as well as Otto).

It is safe therefore to shift to the comparative domain: We can be sure of there being infinitely many threshold variables available over which we can quantify, and the same may go for (‘earlier’) temporal variables and (‘worse’) world variables. Figure 3.1 visualizes the pertaining inclusion relation.

The higher the threshold (the bigger the extent) that is quantified over, the smaller the set of individuals that meets or exceeds it will generally be. Like
in the case of numerals – actually, any scalar predication – instantiating P to a certain degree means instantiating it at least to that degree, but maybe as well to a higher degree. E.g., restricting our domain of individuals to what is there on our planet, there are zillions of individuals weighing – at least – one kilogram, including our planet. But there is only one individual weighing at least 5.9736 x 10^24 kg, namely the planet itself.

At the non-logical but grammatically required predication level then, comparatives are structures that violate Hurford’s constraint in its original version. However, this gets repaired automatically via exhaustification, an operation that is known to be very strong in scalar predication. We thus propose that the reason that comparatives are so mysterious is that due to the matter they are concerned with – namely, gradable properties – they cannot at all get interpreted straightforwardly but are meaningful only “around the corner” by means of a repair mechanism that has its roots in pragmatics. This is why they appear so difficult to learn and also why comparatives are not universal, as we might expect if they were indeed logical.

We saw that adopting the thresholds analysis, there are very good reasons to assume that the comparative derives from the equative in the following fashion: Equatives are formally trivial structures as they arrive at the interface (on their “first reading”) that are automatically strengthened (by inserting only at the level of embedded meaning). The comparative negates the embedded meaning, yielding a form that would be contradictory when interpreted in terms of weakly ordered ordinary individuals. In ordered domains it is differently problematic, as here, what is in the set of things meeting the stronger condition is also in the set meeting the weaker condition, while the opposite need not be true (but, indeed, may be true).

More concisely, recall that Diff is satisfied when S and P intersect and S and ¬P intersect at the same time. S is “being on the scale in question” (responsible for commensurability). P is the instantiation ascribed to the matrix. Due to monotonicity of degrees, ¬P gives you a bigger set of individuals, i.e., it is a case of weakening. As you can be sure that there is always a lower threshold that is passed by the individuals that you are talking about anyway, moving to the comparative domain is a safe bet. As is well-known, the “than” clause takes the place of the standard (“incorporates” into the predicate), cf.

(73) a. Otto ist (so) groß wie ein Riese / größer als ein Riese.
   Otto is (as) tall as a giant / taller than a giant
b. Otto ist riesengroß (wie ein Elefant).
   Otto is great/big (like an elephant)
c. *Otto ist riesengrößer als ein Elefant.
   Otto is great/bigger than an elephant
The “than” clause is thus like a presupposition (what you can take for granted: the standard). We see it “overwrite” the assertion in (74), which we are forced to interpret such that it does not talk about an individual that we point at while uttering the sentence.

(74) Otto ist größer.

Otto is taller

This is different in (75) where, as we argue, the difference requirement is there only as an implicature hence may be cancelled.

(75) Otto ist (so) groß.

Otto is (so) tall

Arguably, we put our finger here on the border between implicature and presupposition; what is an implicature in the positive or equative (namely, the principle of non-vacuity of Kamp/Partee 1995, cf. section 3.1.1) becomes a presupposition in the comparative that may ‘overwrite’ what appears to be asserted.\(^{33}\) This is because due to “monotonicity of degrees” (cf. Gajewski 2009), something that has the property of weighing say 100 kgs automatically has the property of weighing less than 100kgs.\(^{34}\) Thus, (75) is true in case the something occurring twice in the structure ends up referring to one and the same individual. When we put in only, things look radically different, cf. (76).

(76) Something is so heavy and something is only less than so heavy.

For (76), it is excluded that the same individual is talked about in the matrix and the comparative clause as this would yield a contradiction. An individual different from the one talked about in the matrix is required now to satisfy the embedded (comparative clause) predication as weighing only so-and-so much is strictly incompatible with weighing more than so-and-so much, while “naked” weighing so-and-so much is not, cf. again the pattern in (77), varying slightly the pattern discussed toward the end of the last section.

(77) a. Otto weighs 100 kgs, in fact more.

b. #Otto weighs only 100 kgs, in fact more.

\(^{33}\) Quite arguably, we see this difference in minimal pairs showing that extraction (in this case, relativization) is better from the comparative clauses in equatives than it is from comparative clauses in comparatives, cf. (i) (Benjamin Shaer p.c.)

(i) a. ?This is the guy who Otto is heavier than.

b. This is the guy who Otto is as tall as.

\(^{34}\) Gajewski defines monotonicity of gradable adjectives as in (i).

(i) gradable adjective P is monotonic iff P(d’)(x) = 1 and d’<d, then P(d’)(x) = 1
The central idea regarding the relation between the equative and the comparative is this: what is an implicature in the case of the equative (namely, identical property instantiation due to exhaustive interpretation) becomes part of truth conditional content in the comparative.

### 3.2.2 Positive, comparative, excessive

In this section, we relate to one another what are commonly called positive, comparative and excessive structures. In doing so, we flesh out the idea that at the level of literal meaning, run-of-the-mill comparative structures are trivial, and only become meaningful after the calculation of implicatures; very briefly, the interface reacts to the triviality of comparative structures like it does more generally in the case of structures that violate Hurford’s constraint, namely, by inserting (silent) *only*. Both positive/equative and comparative structures involve inserting an operator akin to *only*, albeit at different levels. For excessives, we argue a different repair mechanism is at work that consists in “pushing” an offending variable that originally ranges over ordinary individuals to a different domain, namely, that of phenomenal individuals.

Let us remind ourselves of the two levels at which we take comparatives to be interpreted, the level of threshold structure and the level of predication structure, respectively.

(78) Otto is heavier than Ede.

From the degrees perspective, (78) appears to say that the degree to which Otto instantiates the weight property is “above” the degree to which Ede instantiates the weight property. From the perspective of predication, (78) says that Otto has the property of having a certain weight, and that Ede has the property of having a certain weight that is lower than the weight that Otto has. Speakers of English have certain alternative expressions at their disposal which are very close in meaning to (78), cf. (79-a) and (79-b).

(79) a. Otto is as heavy as Ede.
    b. Ede is not as heavy as Otto

It turns out that the equative structure in (79-a) is entailed by the comparative in (78). More generally, the comparative means the same as the equative *modulo* the identity case (the case where Otto and Ede have the same weight). The same entailment relation obtains between the negated equative in (79-b) and (79-a). A plausible analysis of comparative structures should capture this closeness in meaning and try to make sense of it. Furthermore, we have that (80-a) does not entail (80-b), while (80-c) does entail (80-b).
(80)  a. Otto is as heavy as Ede.
    b. Otto is heavy.
    c. Otto is as heavy as something that is heavy (for something of the Otto-kind).

Starting with the relation between the positive and the equative, we see that equatives can be regarded as positives that make the standard of comparison explicit in pairs like (81) from German with its rich word building component; extending the evidence for two slots in comparatives that we encountered in the last section, we see that what the comparative as clause achieves can be achieved as well lexically, in this case by incorporating a noun that provides the standard of comparison; expressing the comparison class explicitly leads to ungrammaticality now, cf. (81-b).

(81)  a. Eva ist dürr wie ein Model.
      Eva is thin like a model
    b. Eva ist modeldürr (*wie ein Gespenst).
      Eva is model.thin (like a ghost)

It appears that adding the particle so to an adjective does not lead to different truth conditions, but to felt intensification (cf. below footnote 36).

(82)  Eva ist so dürr.
      Eva is so thin.

There is good reason then to analyze the positive and equative along parallel lines. Leaving the comparative phrase unexpressed is a typical case of backgrounding material not adding to informativity. Spelling out the comparative clause is not forbidden simply because if it is spelled out, an implicature can be calculated that makes the addition of the comparative non-trivial; obviously the implicature cannot be computed if what is coded in the comparative clause remains unsaid.35

35 This raises the question about the distinction between “intersective” vs. “subsective” adjectives, the reality of which is not universally accepted. E.g., the sentence in (i) does not seem to entail that Ede is heavy per se, but only when compared to jockeys.

(i)  Ede is a heavy Jockey

(i) is really ambiguous. Under the “positives are equatives” approach, the two meanings can be attributed to a difference in the elided material, where (ii-a) gives us the “subsective” meaning and (ii-b) the “intersective” meaning.

(ii)  a. Ede is a Jockey and as heavy as sth that is jockey-heavy. ‘subsective’
    b. Ede is a Jockey and as heavy as sth that is heavy. ‘intersective’

A further potential problem, the problem of infinite regress, disappears if we assume that it is two slots always that provide the backbone of comparative structures; cf. the last as well as the next chapter.
A deeper as well as more sophisticated argument for looking at the positive and equative as essentially the same thing (modulo implicatures, cf. above) lies in a famous puzzle from the realm of quantification over ordinary and phenomenal individuals respectively. To repeat, we argue that the positive comprises the hidden structure given in brackets in (83).

(83) Otto is (as) heavy (as something that is heavy, for his kind).

Here “heavy,0,” stands for being in the extension of “heavy” under a certain standard, say, the heavyweight standard. In this way, predicates may “inherit” a standard from material that is actually not articulated, as is of course generally the case with implicatures and also presuppositions. In this way, we can understand how expressions that belong to argument structure proper may be associated with different standards of comparison (Kennedy’s puzzle).

(84) Everyone in my family is tall.

In a situation where my family consists of a father, a mother and a baby, (84) may convey that the father is heavy for a grown-up man, the mother is heavy for a grown-up woman, and the baby is heavy for a baby, i.e., the judges (or standards of comparison) may vary with the individuals that are quantified over by the NP everyone. Building on earlier proposals (cf. Bartsch/Vennemann 1972), Kennedy (2007) proposes that gradable predicates can be type-shifted from “simple” properties of type \(<e,t>\) to more complex properties of type \(<<e,t>,<e,t>>\). He gives the rule in (85) (Kennedy 2007, p. 16).

\[\text{(i) Everyone in my family is so tall.}\]

(i) asserts that everyone in the speaker’s family has the same certain weight. An additional, empathic reading that requires stress on so asserts that everyone in the speaker’s family instantiates height to an extraordinary degree, with possibly different absolute values. The particle so appears to fix the value of the property instantiation beyond matters quantificational, as we would expect from a pronoun-like element that is evaluated with respect to context, i.e., “after” ordinary quantification. In support, speakers of some dialects of German would use a structure like in (ii) to assert that the individuals in question are equal in height, i.e., (ii) is an alternative in these dialects to the more standard structure in (iii) (this seems to work as well with the distributive quantifier \(jeder\) ‘every’, triggering singular agreement, although it sounds a bit awkward to me (?\(Jeder\ ist\ genauso\ groß,\ cf.\ ?!\(Jeder\ ist\ gleich\ groß\)).

(85) Building on earlier proposals (cf. Bartsch/Vennemann 1972), Kennedy (2007) proposes that gradable predicates can be type-shifted from “simple” properties of type \(<e,t>\) to more complex properties of type \(<<e,t>,<e,t>>\).

\[\text{(ii) Alle sind genauso groß.}\]

(ii) Arabic, exact, so tall

\[\text{All are exactly, so tall}\]

\[\text{(iii) Alle sind gleich groß.}\]

(iii) Arabic, equal, so tall

\[\text{All are equally tall.}\]

\[36\text{ Pointing to the pronominal character of so, the covariation of standards and individuals quantified over seems to disappear in (i) under its most natural reading.}\]

\[\text{(i) Everyone in my family is so tall.}\]

(i) asserts that everyone in the speaker’s family has the same certain weight. An additional, empathic reading that requires stress on so asserts that everyone in the speaker’s family instantiates height to an extraordinary degree, with possibly different absolute values. The particle so appears to fix the value of the property instantiation beyond matters quantificational, as we would expect from a pronoun-like element that is evaluated with respect to context, i.e., “after” ordinary quantification. In support, speakers of some dialects of German would use a structure like in (ii) to assert that the individuals in question are equal in height, i.e., (ii) is an alternative in these dialects to the more standard structure in (iii) (this seems to work as well with the distributive quantifier \(jeder\) ‘every’, triggering singular agreement, although it sounds a bit awkward to me (?\(Jeder\ ist\ genauso\ groß,\ cf.\ ?!\(Jeder\ ist\ gleich\ groß\)).

\[\text{(ii) Alle sind genauso groß.}\]

(ii) Arabic, exact, so tall

\[\text{All are exactly, so tall}\]

\[\text{(iii) Alle sind gleich groß.}\]

(iii) Arabic, equal, so tall

\[\text{All are equally tall.}\]
For any gradable A, there is an A' such that $[[A']] = \lambda x: f(x).[[A]](x)$, where f is a function from individuals to truth values.

Kennedy’s function is context-sensitive: It is accessed for each individual looked at and restricts the domain such that it contains only elements that are relevant for determining the standard of comparison. This gives us something to bind (the domain restriction) in the structure below, so we can model the judge variation with other scope-bearing elements. The price to pay lies in switching back and forth from computing “ordinary” (syntactic, i.e., LF) and contextual (non-syntactic, i.e., SEM) meaning in evaluating a syntactic structure.

Alternatively, what we have in the positive is binding the variable that takes the value of the embedded subject in the equative by the matrix subject. Evidence for variable binding and operator movement comes from cross-over and island effects (Ross 1967), as well as antecedent contained deletion structures (Sag 1976; Larson/May 1990) as well as the availability of stylistic inversion (cf. Klein 1991), like in WH movement contexts.

Treating thresholds as existentially quantified variables, it is well known since Russell (1905) that the quantifier in the comparative takes scope very freely, in particular, it can scope out of sentences and over propositional attitudes.

(i) I thought your Yacht is bigger than it is.

To account for the possibility of interpreting (i) as noncontradictory, a story is needed about how the comparative clause part of the structure (i.e., the decreasing set) can get past the attitude, crossing a sentential barrier.

(ii) a. Your yacht is d-long and I thought: your Yacht is d+-long. noncontradictory

b. I thought: your yacht is d-long and your yacht is d+-long. contradictory

The free scopal possibilities of the comparative clause are reminiscent of those of existential quantifiers (cf. Reinhart 1997; Ruys 1993) – cf., e.g., (iii), which can convey that there is a man of whom the speaker thought that Sue is meeting him.

(iii) I thought that Sue is meeting a man.

We follow the tradition of analyzing comparative constructions that makes use of existential quantification over just one variable, as well as negation (Lewis 1972, Seuren 1973, Ross 1967, Klein 1980, Schwarzschild 2008). Neglecting detail again, this line of analysis is given in (iv).

(iv) Sue is taller than Tom

\[ \exists d \text{TALL}(\text{Sue},d) \land \neg \text{TALL}(\text{Tom},d). \]

In (iv), d corresponds just to a point on a scale. (iv) says that there is a height (say 1.80m) that Sue has but that Tom does not have. Looking at Russell’s sentence again, we can easily get around the contradiction by giving the existential quantifier and comparative clause material wide scope with respect to the attitude while giving the matrix narrow scope with respect to the attitude, cf. (v).
There is a threshold that Otto meets or exceeds and Ede as well.

As Schwarzschild points out, though, (86) is quasi-trivial. To the extent that the subjects of the matrix and the embedded sentence do instantiate the property in question at all, there will always be thresholds “shared” by them that can be existentially quantified over; indeed there will be infinitely many of them. Instead, Schwarzschild (2008, p. 7) explains that (cf. as well Klein 1991, pp. 683f),

A is as heavy as B is.

can be paraphrased as any of the three alternatives in (88).

a. There is a threshold according to which A is tall and that threshold is the highest threshold that B meets or exceeds.
b. There is a threshold to which A is tall and that threshold is the threshold that B meets.
c. There is a threshold according to which A is tall and that threshold is B’s height.

The point of all these paraphrases is to make sure that the threshold talked about is the highest or maximal one, i.e., that there is no higher threshold that falls under both restrictions. Writing $\theta$ for threshold, Schwarzschild goes on to the formalization in (89).

$$\exists \theta \text{tall}(a, \theta) \land (\text{MAX}_\theta \text{tall}(b, \theta))$$

In (89), the MAX operator does what only does: it excludes alternatives, where alternatives are all the higher values. In prose, we have (90) for (89), where (90-a) captures the level of thresholds and (90-b) the level of ordinary individuals (predication).

a. There is a tall-threshold $\theta$ that a meets or exceeds and that b meets or exceeds and there is no higher tall-threshold that b meets or exceeds.
b. a is at least so$_\theta$.tall and b is at most so$_\theta$.tall.

Connecting back to section 2.2, we see happen what happens in case of tautologies more generally: there is an implicature to the effect that stronger meanings don’t apply – what only does. In prose, the truth conditions that we eventually get for the comparative at the level of threshold structure are as in (91).

$$\exists d \neg \text{LONG(your Yacht},d) \land \text{I thought: LONG(your Yacht},d)$$
There is a threshold that Otto meets or exceeds and that Ede meets and there is no higher threshold that Ede meets.

It is straightforward to analyze the ‘equative’ forms as or so and their kin as functions from properties to properties; they are thus of type \(<e,t>,<e,t>>\). From a syntactic perspective, as and so act as “degree modifier” proforms, i.e., they are like pronouns ranging over properties. Abstracting from detail, the structural skeleton of an equative comparative structure can be put down then as in (92), a structure between coordination and embedding as has similarly been proposed by Ross (1967) and Seuren (1973).

In support of this type assignment, note that while so is functionally very flexible, it appears to select for complements in the nominal domain that are of basic type \(<e,t>>\) (common nouns), but note of type e or maybe e,t, t cf. (i).

(i) a. Otto hat so einen Künstler (wie Picasso) getroffen.
   Otto has so an artist (like Picasso) met

b. *Otto hat so den Künstler getroffen.
   Otto has so the artist met

c. *Otto hat so jeden Künstler getroffen.
   Otto has so every artist met

In typological support of this analysis, Stassen (2001, p. 997) points out that as and so show properties that are highly reminiscent of relative pronouns, which frequently double as interrogative elements:

Equative sentences in SAE [= Standard Average European] tend to show a double marking [...]. In the typical case, the two markers are related, in that the marker on the predicate is the demonstrative form, and the marker on the standard NP the relative/interrogative form, of the same lexical stem.

Regarding the status of equatives as essentially coordinate vs. embedding structures, we need not take a clear stand but subscribe to the view that grammaticalization proceeds from a “primitive” stage where sentences that may contain various anaphoric or cataphoric devices relating them to each other semantically are syntactically juxtaposed for them to be reanalyzed later in terms of structures where one sentence takes a function within the other and the conjoining sign is reinterpreted as a subjunctor that signals the change in levels. Cf. Lehmann (1995, p. 1205). There are indeed indications that from a syntactic point of view, comparatives in Germanic are coordinations rather than embeddings: for one, we observe two nominatives, i.e., “subject” case markings in comparative structures rather than the transitive configuration typical of embedding structures with two NPs. Second, and as already remarked, the comparative clause forms no syntactic constituent but behaves much like a sentence introduced by a conjunction (like und or aber in German in that it is not topicalizable even if the comparative clause has a consecutive interpretation, cf. (i-b).

(i) a. Otto ist zu schwer, als dass er Jockey sein könnte.
   Otto is too heavy than that he jockey could be.

b. *Als dass er Jockey sein könnte ist Otto zu schwer.

We may note as well that in English, comparative clauses exhibit inversion, a phenomenon typical of root (i.e., in this context, coordinated main) clauses, cf. (ii).
The tree in (92) is a coordination structure; crosslinguistically, this is the type of structure most frequently associated with the linguistic expression of comparison (cf. Klein 1991, Stassen 2001). We observe properties typical of coordination structures in Germanic as well, e.g., gapping as generally thought to be licensed in coordination is highly typical of comparative structures.

Turning to the comparative construction of inequality proper, let us return to the fact noted in the last section that as in the case of the equative, it is possible to leave the comparative phrase unexpressed, compare (93) and (94).

(93) Otto ist schwer.
    Otto is heavy.

(94) Otto ist schwerer.
    Otto is heavier.

There is a notable difference though between the elliptical equative and comparative: someone may perfectly utter (93) pointing at the individual by the name of Otto, but the same appears to be impossible with (94); unless quite special discourse circumstances are met, the individual pointed at when the elliptical comparative structure is uttered cannot be identical to the referent of

(ii) a. Otto ate more crisps than Ede did.
    b. Otto ate more crisps than did Ede.

On the other hand, English comparatives allow stranding of the comparative complementizer in colloquial speech, reminiscent of preposition stranding, cf. (iii).

(iii) Who is Otto taller than?

Like preposition stranding, the German analogue of (iii) is ungrammatical, cf. (iv).

(iv) *Wer ist Otto größer als?
    who is Otto taller than?
the comparative structure’s subject.\textsuperscript{41} We propose that this contrast reflects one of the basic differences between positive/equative and comparative structures that provides as well a reasonable story as to how comparatives might ‘develop’ from adjectives. To note, positive/equative structures – indeed any use of an adjective – carries an implicature that both the positive and the negative extension of the adjective be nonempty; put differently, adjectives may be used only if they partition the domain of individuals in a nontrivial way. This is called the ‘principle of non-vacuity’ by Kamp/Partee (1995, p. 161), repeated in (95) (cf. Klein 1980, p. 23; Kennedy 2007, p. 18).

\textbf{(95)} Non-vacuity principle (NVP):
In any given context, try to interpret any predicate so that both its positive and negative extension are non-empty.

If a speaker uses a certain expression, he better do so in a way that adds to informativity; it will increase by use of a set-denoting expression only if there are individuals in the domain that are in the set and if there are also individuals in the domain that are not. In case of comparatives, what is given in (95) crosses the border to ‘what is said’ by being turned into a presupposition. Put differently, that there be an individual not falling under the literally expressed predicate becomes a presupposition in the case of comparatives that takes precedence over what is literally expressed. We see a parallel effect in examples like (96), uttered by the female killer in F. von Schirach’s story “Der Schlüssel” (‘the key’) (2010, p. 150), or in the classic (97).

(96) Ich gehe jetzt, du siehst mich nie wieder, und Du hast mich nie gesehen.
I leave now you see me never again and you have me never seen.
‘I’m leaving now, you’ll never see me again and you’ve never seen me.

(97) Diese Zeilen wurden nie geschrieben.
these lines were never written.

Presuppositions are backgrounded material, so the case of comparatives is parallel to that of positives/equatives. It is clear then why the comparative does not entail the positive (equative) form: the comparative ‘embeds’ the standard of comparison, which is just a lesser instantiation of the property in question than that in the matrix but has no independent value. The equative does not ‘lower the bets’ in any way like the comparative but relies on there being

\textsuperscript{41} This difference was pointed out to me by Alexis Dimitriadis (p.c.). In the immediate utterance context, an individual has to be prominent that is different from the one referred to by the elliptical comparative’s subject expression.
something instantiating the property in question independently.\textsuperscript{42} It is for this reason that we regularly interpret a comparative form like “ältere Dame” in (98) to carry a weaker meaning (i.e., be less old actually) than a corresponding positive form like “alte Dame” in (99) (cf. Becker (2005)).

(98) Otto traf eine ältere Dame.
   Otto met an older lady.

(99) Otto traf eine alte Dame.
   Otto met an old lady.

We follow here the tradition that analyzes the comparative as an equative with a negated comparative phrase.\textsuperscript{43} Accordingly, negative polarity items are licensed in comparative phrases.

(100) Otto is heavier than anyone.

As was noted above, the comparative clause also exhibits properties of monotone increasingness, as suggested by the inference pattern in (101).

(101) $X$ is P-er than $Y$ \rightarrow $X$ is P-er than $Y$ or $Z$

We can understand this apparently paradoxical behavior if we acknowledge the different interpretation of negation in ordered domains: negation does not lead to complement sets in ordered domains but to more inclusive sets; to repeat, in ordered domains the statement in (102) goes through as valid.

(102) $\forall x \ P(x) \rightarrow \neg P(x)$

The effect of negation in ordered domains is therefore one of weakening. To repeat, we suggest a comparative construction reaches the interface as in (103) at the level of predication structure.

\textsuperscript{42} Note in this context that (i), featuring the ‘phase quantifier’ still does seem to entail that Otto is heavy in absolute terms (cf. Löbner 1989).

(i) Otto is still heavier than Ede.

We would try to make sense of this in terms of the presupposition-triggering quality of the phase quantifier that requires there to be something that instantiates the property in absolute terms. The comparative would then identify this predication with the one furnishing the lower threshold.

\textsuperscript{43} Felix (2;9) produced the example in (i), suggesting that there is a lot to the view that the German comparative element als ‘than’ is essentially wie ‘as’ under negation (cf. as well the record in Grimm’s Wörterbuch).

(i) Ich bin noch nicht so müde als Mama.
   I am still not as tired as mama.
   ‘I’m not as tired as mama yet.’
Wrenches and nails

(103) Something is so and so. P and something is less than so and so. P.

(103) should constitute a violation of Hurford’s constraint, but comparative structures feel perfectly natural once they have been acquired; we propose that this is because they come with a generalized implicature that has an exhaustifying effect and turns (103) into (104) without us consciously noticing.

(104) Something is so and so. P and something is only less than so and so. P.

While it is perfectly possible to quantify over one and the same individual in (103) due to (102), this is no longer possible in (104). Having the two somethings refer to the same individual in (104) leads to a contradiction. In this way, comparatives dodge Hurford’s constraint modulo the calculation of implicatures and end up strictly requiring there to be two disinguished individuals.

In sum, we propose comparatives of inequality are tautologous at the level of predication modulo exhaustification. It is therefore forbidden to overtly exhaustify in comparative clauses but not in equatives:

(105) *Otto ist schwerer als (sonst) nur Maria.

Otto is heavier than (else) only Mary.

(106) Otto ist so schwer wie (sonst) nur Maria.

Otto is as heavy as (else) only Mary.

Given that silent exhaustification is possible, overt exhaustification is unnecessary hence forbidden. Alternatively, and depending on one’s stand regarding silent structure, the slot for exhaustification could already be taken by a silent element. Note that the element typically introducing comparative clauses doubles as what is tellingly called a ‘subsumptive conjunction’ or ‘subsumptive particle’ in more traditional grammar writing (e.g., Zifonun/Hoffmann/Strecker 1997; Stassen 2001), cf. examples like (107) or (108).

Language acquisition data would seem to be a promising place to look for possibly transparent reflexes of the analysis proposed here. E.g., Felix (3;4) produced the example in (i) asked to explain what he meant when he said that the author of these lines was an “alter junger Vater” (an ‘old young father’), suggesting that in his ontology, being old indeed entails being young as our approach would have it.

(i) Ich bin nur jung und Du bist alt und jung.

I am only young and you are old and young.

Implicatures of exhaustification are particularly strong in ordered domains, so much so that it has been proposed that the basic meaning is not as logic would have it, i.e., not corresponding to the ‘at least’ interpretation but actually to the ‘exactly’ interpretation. Cf. for recent discussion and references Spector (2013).

Stassen (2001, p. 997) writes that “[I]n role phrases [= subsumptive conjunction phrases] in SAE the same marker tends to be used that is employed for the marking of the standard NP in equative and/or simulative constructions.”
(107) Als Wissenschaftler muss ich widersprechen.
    As scientist I must contradict.
    ‘As a scientist, I have to contradict.’

(108) Ich kenne ihn als einen guten Wissenschaftler.
    I know him as a good scientist.

Part of the meaning of these constructions is that the NP referent (the subject in (107) and the object in (108)) are in the set denoted by the complement of the subsumptive particle, as in comparatives of inequality ‘before’ the calculation of the implicature of exhaustification. Remember that equatives are tautologous modulo exhaustification at both the levels of thresholds and predication. In comparatives in contrast, no exhaustification is needed at the level of thresholds to arrive at the correct meaning, given in (109).

(109) There is a threshold that something meets or exceeds and that someone does not meet or exceed.

The verdict on decreasing NPs follows as well. Consider (110).

(110) #Otto is more beautiful than few others

(110) merely requires there to be few individuals that are only in a more inclusive set than the one including Otto but not in this latter set. Goodwill on the part of the speaker is needed to take it that there is actually a witness for few others.\footnote{Regarding interpretation of decreasing DPs, Barwise/Cooper (1980, p. 192) give the definition in (i) which they comment on from a processing perspective.} If there is no witness for the quantifier, as in the case of negative quantifiers like nothing or noone, incommensurability results and the structure becomes ungrammatical, as illustrated in the example in (111).

(111) *Otto is more beautiful than noone.

(111) simply furnishes no threshold defining a set in which individuals other than Otto could only be. Violating the hard-wired presupposition associated with a quantifier in this way is tantamount to the speaker saying nothing at all.

\footnote{Let \( w \) range over witness sets for the quantifier \( D(A) \) living on \( A \).}

\begin{enumerate}
\item If \( D(A) \) is monotone increasing then for any \( X \),
    \[ X \in D(A) \text{ iff } \exists w \subseteq X \]
\item If \( F(A) \) is monotone decreasing then for any \( X \),
    \[ X \in D(A) \text{ iff } \exists w \left( X \cap A \right) \subseteq w \]
\end{enumerate}

We predict that response latencies for verification tasks involving decreasing quantifiers would be somewhat greater than for increasing quantifiers, and that for the non-monotone it would be still greater. These predictions are based on the complexity of the checking procedure we have suggested above.
with comparatives, it is therefore plain nonsense. Interestingly, and as is predicted on our analysis, equative structures involving negative quantifiers are felt to be much better, if strange.

(112) Otto is as beautiful as noone.

(112) merely cancels the implicature of non-vacuity, which is felt to be odd but does not lead to ungrammaticality. If comparatives involve weakening 'before' the calculation of implicatures, we can understand the common and unproblematic 'mistake' of having double comparative marking. Citing from the Yale grammatical diversity project description on double comparatives:48

The use of more than one morpheme to express the comparative or superlative is widespread across varieties of English, and is attested in other languages as well. It is attested as far back as Old English [...], and remains a property of many dialects across the globe [...].

As noted by Corver (2005), there are a number of examples from Shakespeare of double comparatives and superlatives:

(113) a. The Duke of Milan, and his more braver daughter could control thee. (Shakespeare, Tempest.)
    b. This was the most unkindest cut of all (Shakespeare, Julius Caesar iii, ii, 185)

Nevins (2012, p. 92) cites Radford (1977) for the observation that double comparatives do not license an extra 'layer' of semantic comparison, even if a compositional analysis would seem to allow it:

(114) a. *John is more more intelligent than Bill than you are.
    b. *John is more taller than Bill than you are.

That is, double comparatives do not seem to license extra semantic operators. We can understand this now as adding a comparative morpheme corresponds to saying that there is a more inclusive set that contains the matrix subject NP – a triviality before the calculation of implicatures. Adding comparative morphemes on top of each other will remain harmless until implicatures are computed (after completion of the comparative phrase, by hypothesis).

Prefinally, a basic puzzle with comparatives is that the comparative clause appears to be selected by the comparative suffix but never seems to form a constituent with it. Semantically, it appears to much higher in the clause, which has necessitated artificial technicalities and stipulations. From a syntax-/semantics perspective respecting basic assumptions of compositionality, the

core problem consists in the relation between the comparative morpheme /er/ and the comparative clause: To account for the interdependence between the two elements, we want to say that /er/ selects the comparative clause and builds a constituent with it that is embedded in the matrix predication. At surface, however, /er/ shows up on the adjective of the main predication while its supposed complement appears extraposed to the main predication. The trees in (115) represent the generally assumed LF and surface structure respectively for a sentence like *Sue is taller than Tom*.

\[(115)\]
\[
\begin{align*}
\text{IP} & \quad \text{IP} \\
\text{NP} & \quad \text{CP} \\
\text{Sue} & \quad \text{than Tom (is tall)} \\
\text{I} & \quad \text{A} \\
\text{is} & \quad \text{is tall-er} \\
\text{AP} & \\
\text{DP} & \\
\text{D} & \\
\text{er} &
\end{align*}
\]

In Bresnan’s derivation of an ordinary comparative structure, then, at least movement of the /er/ morpheme to the matrix predicate as well as movement of the comparative clause are involved.\(^{49}\) According to the analysis developed here, /er/ means just \textit{Diff} and that is all.\(^{50}\) In ordered domains, the right hand side is trivially satisfied \textit{modulo} the calculation of implicature and therefore backgrounded; in the ordinary individual domain it is like an implicature

\(^{49}\) Bresnan (1973, p. 275) asserts that

[t]he comparative clause construction in English is almost notorious for its syntactic complexity. Exhibiting a variety of grammatical processes – recursion, deletions, permutations, and suppletions – it is a fecund source of ambiguities and puzzles.

\(^{50}\) Since the work of Bresnan (1973), it has become standard to treat the comparative morpheme /er/ as a quantifier. In prose, “A is P-er than B” means that the extent representing A’s instantiation of the property P properly includes the extent representing B’s instantiation of the property P. The representations as generalized quantifiers (= functions from pairs of sets to truth values) in (ii) and (iii) bring out the close vicinity of /er/ and /every*. The /er/ meaning is modelled on Heim’s 2001 formalization in (i).

\[(i)\]
\[
/er/\text{comp} = \lambda d [\text{than } y \text{ is P to } d] \subset \lambda d [x \text{ is P to } d]
\]

Heim (2001)

To compare, we have the following relation between /er/ and /every*:

\[(i)\]
\[
/er/\text{comp} = \lambda d [\text{than } y \text{ is P to } d] \subset \lambda d [x \text{ is P to } d]
\]
and in the ordered domain it is like a presupposition that can be satisfied or accommodated in different ways. Importantly, however, there is no need for it to form a constituent with the material – if any – that satisfies it, i.e., /er/ and the comparative phrase may be as far apart as they wish. /er/ does require there to be an individual that is only in the larger set (i.e., not in the set defined by the matrix), but it does so by triggering a presupposition that is then satisfied by the comparative clause (or by the discourse context). There needn’t be and there actually isn’t a local syntactic relation between it and the comparative clause. The wide scope properties follow from the presuppositional status of the comparative clause.

Given that the O meaning as associated with the comparative suffix need not be satisfied locally syntactically, there is little if any reason why one shouldn’t assume the simplest syntactic analysis available for comparatives of inequality that looks as in (116) and is just the structure of the equative with the comparative suffix and negation of the comparative clause.

\[
(116)
\]

\[
\begin{array}{c}
\text{S} \\

\text{NP} \\
\text{Otto} \\

\text{AP} \\
\text{A} \\
\text{er heavy} \\
\text{S} \\
\text{NP} \\
\text{(something} \\
\text{AP} \\
\text{¬as} \\
\text{A} \\
\text{heavy})
\end{array}
\]

(ii) \[\llbracket \text{er} \rrbracket = \{<P,Q> \mid Q \subseteq P\}\]

(iii) \[\llbracket \text{every} \rrbracket = \{<P,Q> \mid P \subseteq Q\}\]

N.B. that /er/ is not the same as every – for one thing, /er/ talks about extents and every talks about individuals (hence proper inclusion (asymmetry) in (ii) and improper inclusion (possible symmetry) in (iii)). For another /er/ turns out to be the mirror image of every as respects the relation between the sets: in the /er/ case, the first (matrix) set includes the second (than-clause) set. In the case of every, the second (VP) set includes first (NP) set. Indeed we find that while every is left-decreasing and right-increasing, /er/ is left (matrix) increasing and right (than-clause) decreasing. The decreasing sets are both “presuppositional”, i.e., we presuppose the existence of something in the NP set in the case of every, while in the case of /er/ we presuppose the existence of something falling under the than-clause set. This presupposition has the form of the O (cf. below).
There is no mystery as concerns the origin of the /er/ suffix either. It is quite simply a plural suffix gone astray. Some languages (Standard Average European) have discovered the trick of it, some languages haven’t.

Let us now turn to the excessive structure. To recapitulate, we argued that in comparatives, an entailed meaning having its origin in an implicature associated with the equative structure is negated. We get something like the form in (117).

(117) The matrix is P and something is ¬P

Nothing forbids identifying whatever “something” quantifies over with the matrix, and it appears to be the cheapest hence preferred option. Applied to strictly ordered sets of individuals (in the thresholds approach), (117) is quasi-tautological – which is why we are allowed and prefer to not mention at all the form that corresponds to the comparative clause. Therefore, (117) is amended by inserting (silent) only, yielding (118).

(118) The matrix is P and something is only less than P

(119) is the form of the comparative, and now we cannot allow to identify whatever “something” talks about with the matrix, cf. (119).

(119) Otto is heavier than himself.

(119) comes out contradictory under our analysis. Specifically, it translates into a semantics according to which there is a threshold that Otto meets and that he also does not meet. Interestingly, it appears that to the extent that examples like (119) are interpretable at all, they involve quantification over distinct phenomenal individuals of the temporal kind, as in (120).

(120) Otto is bigger/stronger than himself again.

We would expect the repair not to involve the manipulation of thresholds as at the stage where the contradiction arises, there is quantification over thresholds already (cf. below for some evidence that thresholds are more locally available than temporal indices). Note as well that according to the analysis proposed here, reflexivization must be happening after exhaustification, supporting the conclusion that exhaustification originating from Q-implicature may embed; cf. section 2.2. In sum, we propose that we do say what is conveyed by examples like (119), but we do not say it in the form given in (119). We say it with the form in (121).

(121) Otto is too heavy.

Stassen (2001, p. 995) asserts: “Especially in the case of comparative affixes the etymological origin is largely unknown.”
The idea is, then, that excessives are “shortened” reflexivized comparatives. This yields impossible semantics. Therefore, something special may happen, namely, the embedded form is interpreted in terms of a fresh phenomenal variable. There is now good, i.e., syntactic reason to think that excessives do what other lexical predicates do, namely, so-called taste predicates, as well as privative predicates, which are the topic of section 4.2.2 which relates the structure in (121) to a structure that has been much discussed and is similar to (121) not only superficially, the tough-construction which is productive exactly with excessivized predicates, cf. (122) and (123).

(122) Otto is too heavy to carry.

(123) Otto is easy/good to carry.

Predicates like “good” or “bad” are not understood very well, and they have this in common with other raising predicates (seem, be likely to). We can understand them better looking at excessives, which figure in these constructions (cf. “John is good to see” and “John is too good to (be) fire(d)”). We propose the excessive is a reflexivized comparative. It is like saying “Otto is heavier than himself” which we saw above is forbidden and leads not only to the introduction of a new threshold argument but to the introduction of a new world argument, cf. again the hierarchy from section 2 above, which we repeat in (124) for convenience.

(124) \( \text{th} \sim w \sim t \)

\( w \sim \text{th} \)

\( w \sim t \)

We see in Kennedy’s example (84) from above that thresholds may vary within single worlds to the extent that they are associated with different individuals. With regard to one and the same individual and property, thresholds may not vary unless different worlds are talked about as well.

(125) \( \text{Otto ist mir größer als Ede.} \)

\( \text{Otto is me-DAT taller than Ede.} \)

While all speakers appear to accept (126).

(126) \( \text{Otto ist mir zu groß.} \)

\( \text{Otto is me-DAT too tall.} \)

‘Ethical’ datives want to bind phenomenal variables, and it appears that they like best worlds, then times, then thresholds. In (125), there is a threshold,

52 The distribution is shared except in the case of anders, cf. section 4.2.1.
Weak theories of comparatives

In (126), there is a world to bind. Cf. section 4.3.2 below on ethical datives. In comparatives, a new threshold variable gets introduced in tandem with a new individual. In excessives, there is only one individual. But it is impossible that there is one individual which passes a certain threshold with regard to a certain property and which at the same time only passes a lower threshold.

(127)  # There is one threshold where \( P(x,t) \) and there is one threshold where \( \neg P(x,t) \)

Varying patterns used by Kratzer (1995) to demonstrate the difference between predicates furnishing spatiotemporal arguments (stage level predicates) and predicates not doing so, we observe similar effects with respect to modal verbs proper which are analyzed in formal semantics treatments as quantifiers over possible worlds.

(128)  *Das Haus kann groß.
      the house can big.
      ‘The house may be big.’

(129)  Das Haus kann größer.
      the house can bigger.
      ‘The house may be bigger.’

(130)  *Das Haus darf nicht groß.
      the house may not big.

(131)  Das Haus darf nicht größer.
      the house may not bigger.

(132)  Das Haus darf nicht zu groß.
      the house may not too big.

In the positive, the modal does not appear to have anything to bind. In (131) and (132), there does seem to be something to bind for the modal – this is the extra threshold, giving rise in this case (as there is a unique referent and property) to a new world as well.\(^{53}\) We argue below in section 4.3.2 that what we observe with respect to the excessive analogously happens in personal predicates. We expect that excessives as well are good in middles. Note that excessive predicates productively occur in tough-constructions.

---

\(^{53}\) Cf. similarly the following examples.

(i)  *Das Haus wurde immer groß.
      the house got always big

(ii)  Das Haus wurde immer größer.
      the house got always bigger
      ‘The house got bigger and bigger.’
Among the grammatical routines that figure prominently in natural language is reflexivization, which identifies the roles of a relation as expressed by a verb. /er/ expresses a relation, and we would like to advance the hypothesis in (133).

(133) /tsu/ is reflexivized /er/

If we reflexivize /er/, however, we arrive at a logical problem, as the comparative expresses a necessarily asymmetric relation (entailing irreflexivity). It appears no matter how we formulate the reflexivization operation (e.g., we could feed the same individual into different operators or give a lexical rule binding the places in the relation to a single operator), a reflexivized comparative will end up somewhat nonsensical. E.g., a sentence like (134) will mean the same thing as a sentence like (135).

(134) Ede is too heavy.
(135) Ede is heavier than Ede (himself).

We would like to say that Ede is identical to himself, which is the same as saying that Ede has all the properties that he has. This is known as the principle of identity (Leibniz 1696):

\[ \forall P \ (P(x) \equiv P(y) \rightarrow x = y) \]

If \( x \) and \( y \) have all the same properties, then they are identical.

When we say (135), however, we say that Ede has a property that he does not have (there is a threshold that he meets/exceeds and that he does not meet/exceed),\(^{54}\) i.e., we get the LF representation in (137) for our example.

\[ \text{Ede is too heavy.} \]
\[ \text{as}.P(\text{Ede}) \land \neg \text{as}.P(\text{Ede}). \]

As it stands, (137) is only contradictory at a symbolic level. When the predication involves gradable properties, then (137) is actually tautological, as it says that Ede has a certain weight and that he also has a smaller weight (as negation means “less” in the domain of gradable properties).

Importantly, (137) does become contradictory when only is inserted before reflexivization applies. Exhaustification must be a very early, i.e., grammaticalized process then. Cf. section 2.2.1. To repeat, an individual will always have all weights that are smaller than his actual weight. We can say excessives are contradictions at LF but tautologies in actual use, i.e., at SEM. Although

\[^{54}\text{We see here again how identity and contradiction are connected, and interdefinable (cf. again Leibniz 1696): For something to differ from itself, it has to have a property it does not have. But this is a contradiction.}\]
there may be nothing wrong in principle with producing tautologies in use (and there certainly isn’t in derivations), the form in (137) smells bad. Namely, it smells like a violation of what is known as Hurford’s constraint, given in (138).

(138) * “S or S’” if S’ is entailed by S

That is, we are not allowed to say things like “Otto is a bachelor or unmarried”, as being a bachelor entails being unmarried, and analogously for “Otto is a bachelor and unmarried” as well as “Otto weighs 80 kilos and he weighs 70 kilos”. What do we do with such structures? We would like to propose that what we do is “split” the LF and interpret its parts with respect to different coordinates, bringing us back to the role of contexts and indices. We may regard both contexts and indices as lists pairing numbers with objects, where an object may as well be a set or a function from a set into a set, like a degree modifier. Assuming that thresholds are usually fixed contextually, the form in (137) is really the form in (139), where the subscript “c” stands for the context.

(139) as.P_c(Ed) ∧ ¬as.P_c(Ed)

At the step to semantic interpretation, the grammar evaluates the result of applying “big as” to the property with respect to the context (the actual world as compatible with the utterance context, in the simplest case), and it evaluates the result of applying “small as” to its property with respect to an index, that is, with respect to a world that may as well be incompatible with the context. This is indicated in the LF, which is still an LF, in (140).

(140) as.P_i(Ed) ∧ ¬as.P_c(Ed)

We see two reasons why it should be this way (and not, say, the other way around). For one, consider a sentence as in (141), assuming that the infinitive acts as the degree modifier (i.e., as) here.

(141) Ede is too heavy (to be a Jockey).

We usually interpret such sentences as meaning that the subject does not have the property coded in the infinitive in the actual but perhaps in a possible world. E.g., assume Ede weighs 80kgs in our world, where jockeys may only weigh 70kgs (70kgs being now our threshold). Ede weighs as well less than 70kgs, trivially, and as coded by “small as”, but as cannot assert this if he weighs in fact more. So it is not asserted in fact but in possibility. In the case at hand, the negative meaning Diff-O is pushed to the infinitival clause: the negation is prefixed to the predicate projecting the infinitival structure, while the variable predicated over remains an ordinary individual. (142) gives a simplified representation.
Wrenches and nails

\[(142)\quad \text{Otto.is.so.heavy} \land \neg \text{Otto.is.so.heavy} \land \diamond \text{Otto.is.jockey} \implies \\
\text{Otto.is.so.heavy} \land \neg \text{Otto.is.jockey} \land \diamond \text{Otto.is.jockey}\]

In effect, the O part of DIFF DIFF-O is pushed here to a coargument or copredicate, something that we will encounter again in the case of dative as well as existential constructions where the dislocated meaning is not, loosely speaking, pushed up but rather pushed sideways (cf. sections 4.3.1 and 4.3.2). There appears to be some leeway though as to how precisely the variables occurring in the formula are assigned values, which appears to be a matter of both the syntactic context as well as the discourse context, cf. for discussion section 4.2.1. The second reason is conceptual: It is safe to say that something that is in fact the case (namely, Ede weighing less than 70kgs) is also possibly the case. The syntax of excessives can be represented as in (143).

\[(143)\quad \text{S} \rightarrow \text{NP} \rightarrow \text{AP} \rightarrow \text{Ede} \rightarrow \text{D} \rightarrow \text{A} \rightarrow /\text{tsu/ heavy}\]

We submit the grammar produces an impossible world by reflexivizing an asymmetric relation. The modal interpretation is a reflex of ‘pushing’ an offending variable to the phenomenal domain. In the literature, we find two recent alternative proposals, one by Meier (2003) and one by Schwarzschild (2008), who builds on an earlier proposal by Nelson (1980). Meier (2003, pp. 92, 79) proposes that excessive too corresponds to a function from a world to a function from a world into a function from a proposition into a truth value (the purpose clause) into a function from a function from a degree to a truth value (the main clause); type-theoretically, this corresponds to (144).

Evidence that the purpose clause belongs to the same relevant syntactic domain comes from relativization such as in (i) (English) or (ii) (German), which involves extraction of the relative pronoun (where pied-p piping the infinitive yields a much better result in German) out of the purpose clause and into the matrix.

(i) Strike had invited her to come with him to meet Jonah Agyeman, whom she had done so much to find.
   (Robert Galbraith: “The cuckoo’s calling”, p. 544)

(ii) Otto traf Maria, die zu finden er so viel unternommen hatte.
    Otto met Mary who to find he so much undertaken had

We may note as well that the choice of controller that is important for such cases is generally acknowledged in standard generative theories to be at least in part pragmatically determined. Cf. however the approach of Farkas (1988).
Transitivity vs. inclusion semantics

(144) \[ [[\text{too}]] = f : D_{s,<s,<p,t>,<d,p>,t>} \]
For all \( w \in W, Q \in D_{s,<p,t>}, P \in D_{d,p} : \)
\[ f(w)(Q)(P) = 1 \text{ iff } \]
\[ \text{MAX}(\lambda e.P(e)(w)) > \text{MAX}(\lambda e^*Q(w)(P(e^*))) \]
where \( \text{MAX}(E) = \{ e \in E \land \forall e' \in E \rightarrow e > e' \land e = e' \} \)

The maximal [extent] \( e \) such that John is \( e \)-stubborn is greater than the maximal \( e^* \) such that, if John is \( e^* \)-stubborn, he can change his mind.

Using extent jargon (145-a) can be paraphrased as (145-b).

(145) a. Bertha is too old to drive a car
b. The maximal [extent] \( e \) such that Bertha is \( e \)-old is greater than the maximal \( e^* \) such that, if Bertha is \( e^* \)-old, she can drive a car in the view of the law.

Schwarzschild (2008, p. 18) proposes that excessive too corresponds to a BE-CAUSE operator that introduces a causal relation between the propositions expressed in the main clause (reason) and in the purpose clause (consequence); an accessibility relation between worlds captures the modal meaning.

(146) \[ [[((\text{too}_{ACC,a},\theta,w) \phi) \psi]]^g = 1 \iff \]
\[ \exists \theta' \text{ BECAUSE } (g(a)) (\lambda w' [\phi][w'/w',\theta'/\theta]) (\lambda w' \neg \exists w'' (g(ACC))(w'')(w') \land [[\psi][g(w'/w'')]]) \]

There is some stubbornness threshold \( \theta \): John meets or exceeds it and because of that he cannot change his mind.

Interestingly, both times, excessives involve two meanings that would contradict each other in a single context (John’s stubbornness cannot be above and below the threshold in question at the same time); this is the core of the analysis proposed here. The question where the other ingredients come from remains an open one. The reader may contemplate for herself how plausible these meaning assignments are, i.e., how learnable they might be or how so rich and so specialized a meaning could get to be associated with so little sound. We discuss excessives in the context of tough-constructions in section 4.2.1.

3.3 Transitivity vs. inclusion semantics

Transitivity can be said to be something like a grammatical Edelgaszustand. We see an effort to be transitive on the side of grammar – presumably, because transitive structures are the structures that can be manipulated best – and many a structure where grammar goes for a transitive structure at the cost of having a “funny” subject – among these are inchoatives and middles, to be discussed in section 4.1.2, but also existential constructions (section 4.3.1).
More generally, it is the subject position that can be manipulated rather than the object position, as evidenced by raising or passive, up to the “worst case” of leaving the subject unexpressed altogether, as is the case in infinitives.

In order for the subject position to be manipulable, it needs to be identifiable to start. We review evidence that the subject is positively defined, but not the object. The properties regulating what becomes subject (cf. Keenan 1976) are A(gentivity), T(opicality) and R(eferentiality)), but there are no properties regulating what becomes object. In essence, then, objects are just non-subjects.\(^{57}\) As another central instantiation of DIFF and its interpretation, we thus have an argument-structural version of the second condition, given in (147) and discussed in more detail in section 3.3.1 in particular.

\[(147)\]

**Second Condition**

The argument that is interpreted as the second member (= object) of a transitive relation lacks certain semantic properties that the argument that is interpreted as the first member of the relation (= subject) has.

(147) is an upside-down formulation of the O meaning as “lacking a property the subject has” (cf. (36) in 2.1.2). In a more general perspective, transitive relations or “relational ties” in Strawson’s terms require type-homogeneity and reference-heterogeneity while predication relations or “non-relational ties” in Strawson’s words require type-heterogeneity and reference-homogeneity.

Non-relational ties [...] demand of the terms they bind a degree of type-heterogeneity greater than that which [ordinary] relations will generally suffer. (Strawson 1959, p. 167 fn 1)

At the level of types, relational ties demand type-homogeneity (although there are exceptions, like, arguably, verbs relating “ordinary” individuals and propositions). At the level of reference, non-relational ties overlap – the classic interpretation of predication is that the predicate “collects” or “subsumes” the subject, or, in set terminology, that the subject is an element of the set denoted by the predicate. Transforming Strawson’s dictum toward our purposes, we may formulate (148).

\[(148)\]

[Ordinary] Relational (“transitive”) ties demand of the terms they bind a degree of reference-heterogeneity that non-relational (“predicational”) ties will not suffer.

Conflicts arise when the expressions that find themselves in a relational tie entertain a relation of overlap or improper distinctness at the referential level.

\(^{57}\) Incidentally, this recalls Burzio’s famous generalization that states that “objective” case assignment is contingent on having an agent, where agents must become subject.
This relation can take different shapes. We use the sign "\( \sqsubseteq \)" (and "\( \sqsubset \)" respectively if the relation is proper) and indicate the prototypical domains in which the variables of different variants live on the right hand side.

\[
(149) \quad x \sqsubseteq y \text{ iff def} \\
\qquad a. \text{ x is a subset of y } \quad x, y \text{ ordinary individuals} \\
\qquad b. \text{ x is part of y } \quad x, y \text{ phenomenal individuals} \\
\qquad c. \text{ x instantiates y } \quad x \text{ ordinary, y kind individual}
\]

Concerning the relation "\( \sqsubseteq \)" there will be more or less clear cases, and cases where we might not be able to tell at all whether it holds or not. For example, it is clear that the relation holds between the sets \{Otto, Anna\} and the set \{Otto, Anna, Ede\} (case (149-a)); similarly, it appears clear that, e.g., the location of the IDS is contained in the location of Mannheim, even if we are not able to give the exact coordinates of the two spatiotemporal regions. Regarding other cases, things are less obvious; e.g., we may wonder whether kinds are contained or included in their instances, or whether the relation goes the other way around actually. We take it that nevertheless, \( \sqsubseteq \) is a useful working tool that can be refined and calibrated in the usual way, namely, according to its coherence vis-a-vis the breadth of data that it captures. In this, the relation is similar to other notions that prove useful even if they are not fully defined. E.g., Keenan (1976) uses the relation \textit{more basic than} to talk about relations between sentences, admitting that we cannot always tell whether a sentence A is more basic than a sentence B. Like \textit{more basic than}, \( \sqsubseteq \) is a semantic notion; in the general case, it will hold that if the meaning of an element B depends on the meaning of an element A, then the form of B will similarly depend on the form of A; in the simplest case, B will be an elaboration of A, formally. Regarding again kinds and their instantiations, this leads us to assume that to the extent that kinds are most often designated by bare singulars while expression of kind instantiations usually involves more material (like classifiers or quantifiers and the like),

like \textit{more basic than}, \( \sqsubseteq \) is transitive, i.e., if \( A \sqsubseteq B \) and \( B \sqsubseteq C \), then \( A \sqsubseteq C \); furthermore, \( \sqsubseteq \) is partial for most domains, although there are important and systematic exceptions. Most importantly, degrees of instantiation that regard one and the same property are assumed here to be totally ordered; more formally, intervals that live on the same scale always relate by \( \sqsubseteq \) which, due to the strict ordering of the domain, behaves here like an asymmetric relation (i.e., if \( xRy \), then not \( yRx \); cf. the discussion of comparatives in the last section).

\[^{58}\text{Cf. for discussion section 2.1.1.}\]
The central empirical case discussed in this section is that of constructions with directional complements, from which we move to genitives. We argue following Gehrke (2008) that directional complement constructions have transitive syntax, requiring that the second condition be obeyed. However, the semantics relates the theme argument and a location, saying that the location includes the theme referent (as the result of the coded event having occurred). Consequently, directional complement constructions ‘do it the wrong way around’ in that the location argument is more specific (or less general) than the theme argument that is the sole candidate for the grammatical subject for independent grammatical reasons (namely, because it can receive nominative case).

### 3.3.1 The second condition

Across languages, we find designated constructions or ways of realizing a particular grammatical relation, that between the subject and the direct object. Assuming that grammars observe economy of expression and regarding the morphosyntax, there are two logical options: the subject or the object of a transitive structure could be morphosyntactically marked. We find both options realized: In nominative–accusative languages, it is the object that is marked by means of accusative case, while the subject bears the “null case” nominative. Conversely, in ergative-absolutive languages, the subject in a transitive structure bears marked ergative case while the object receives the unmarked absolutive case. From the perspective of the mapping from semantics to syntax, it is ergative-absolutive languages that behave according to broadly assumed iconicity principles in that semantically, it is clearly the first or subject argument in a transitive structure that is distinguished: it takes something to become subject, and the argument not displaying that property or set of properties is realized as the object. Looking at transitive relations only, there is no need at all to say anything positive about objects, as objects are sufficiently defined as the arguments that are not subjects. This is the view of traditional grammar (cf. Burkard 2003), and the most influential approaches to the linking of argument structure to syntactic functions rely on defining properties that make argument expressions qualify as first arguments in “proto”-relations decomposing transitive lexical predicates into sets of simpler and supposedly universally valid relational schemata (such as CONTROL, CAUSE or MOVE, cf. Dowty 1991 for English or Primus 1999 for German). The second condition, repeated in (150), captures the designation of the subject relative to the object.

(150) Second Condition
The argument that is interpreted as the second member (= object) of a transitive relation lacks certain semantic properties that the argument that is interpreted as the first member of the relation (= subject) has.
The main generalizations behind the second condition are the following:

(151) More deeply embedded structures express weaker meanings.

(152) There is talk of objects only where there is talk of subjects.

(153) Subjects bear unmarked nominative case. German

(154) Objects bear marked accusative case. German

The second condition centrally talks about objects, and deliberately so. The object slot is where structures are extended, adding locally interpretable semantics to the predicate. The object is defined negatively with respect to the subject, and we observe that the meaning component that is displaced or expatriately interpreted when it proves to be locally problematic is negative in this fashion, namely, it corresponds to the requirement expressed in the O corner of the traditional square of opposition that there is an argument that lacks a certain property (or properties) that the other argument has. Somewhat indirectly, we observe that on the illegal use of the means to mark transitivity (and similarly plurality), it is the ‘negative’ characterization that is merely “left over” so to speak for non-subjects that is ‘passed on’ to the next syntactic-semantic derivational cycle. As we explained in section 2.1.2, the “second” meaning is independently easily available as a (generalized) conversational implicature in cases of existential quantification (i.e., eventually, the expression of Difference as entering the meaning of plurality): regarding transitivity, the “second” meaning is nothing else but what is captured in essentially pragmatics-inspired principles like Farmer/Harnish’s (1987, p. 557) “Disjoint Reference Presumption” (DRP), holding that “the arguments of a predicate are intended to be disjoint, unless marked otherwise” or the binding-theoretic Principle B, leading to the referentially disjoining interpretation of the second argument in the absence of reflexive marking (Reinhart/Reuland 1993).

Relations are beautiful creatures in your semantics language, as they open up the opportunity to use one just one expression and have it do the job of two individual expressions at once. As Quine (1960, p. 257) puts it:

The demands of further uses in mathematics of the notion of ordered pair are similar; in every case the very point of the ordered pair is its role of object– of a single object doing the work of two.

The meaning of a relation corresponds to a subset of the Cartesian product of the domain, i.e., a subset of all pairs of individuals. As is well known, relations can be defined as properties, known as “Schönfinkelization” or “Currying” (cf. Heim/Kratzer 1998, pp. 29f). However, this does not mean that relations are in any sense the same as properties; instead, it becomes particularly obvious under this technique that relations are more complex than (simple) properties: while
the latter correspond to just functions from individuals into truth values, the former correspond to functions from individuals into functions from individuals into truth values, i.e., functions have to be allowed as function values. The view that relations are fundamentally more complex than properties comes out clearly as well in the following characterization of ordered pairs by Peirce (Collected Papers vol.2, §316), cited in Quine (1960, pp. 257f):

The Dyad is a mental Diagram consisting of two images of two objects, one existentially connected with one member of the pair, the other with the other; the one having attached to it, as representing it, a symbol whose meaning is “First”, and the other a Symbol whose meaning is “Second”.

Boole suggests that relations can be defined as combinations between the identity sign and a property (1854 [1958, p. 35]), giving (155) to illustrate:

For as those [descriptive = Class I] signs are used to express quality or circumstance of every kind, they may be employed to express the active or passive relation of the subject of the verb, considered with reference either to past, to present, or to future time.

\begin{enumerate}
  \item Caesar conquered the Gauls.
  \item Caesar is he who conquered the Gauls.
\end{enumerate}

According to Boole, (155-a) and (155-b) have the same meaning. What is needed though is reference to either the “active” or the “passive” role that is coded, i.e., the essentially relational quality (which is independently associable with the identity sign, cf. section 3.1.2) is reintroduced through the back door, so to speak. The view that one vs. two place functions are fundamentally different from properties can also be found in Frege (1891 [1994, pp. 38f]).

It is thus important to realize that while there is no problem in principle of going from a relation to a property, it is not guaranteed to be possible to go from a property to a relation without introducing the relational property through the back door (like Boole). To see this, consider first Kuratowski’s famous definition of ordered pairs in terms of sets of sets that is given in (156).

\begin{equation}
\langle a, b \rangle =_{def} \{\{a\}, \{a, b\}\}
\end{equation}

In (156), as under the “Schönfinkelized” definition of relations, ordered pairs are sets of sets: There is a “first” (or “old”) set \{a\}, and a “second” (or “new”) set \{a,b\} that is defined by containing next to all members of the first set an additional element. To say that something is the first element of an ordered pair then is to say that this something is contained in all the sets of the set of
sets that define the ordered pair. To say that something is the second element of an ordered pair is to say that the set defining the second element contains an element that is not in the set defining the first element:

(157) First element \(=_{df}\) what is contained in all sets of the set of sets defining an ordered pair.

(158) Second element \(=_{df}\) what contains something that is not contained in all sets defining an ordered pair.

Put differently, to say that \(a\) is the second element of an ordered pair is to say that there is a set in the set of sets that contains \(a\) and that for any two sets in the set of sets to be different, one of the two sets does not contain \(a\), as in the definition in (159).

\[
\begin{align*}
(159) & \quad a. \quad \forall A \in p \ x \in A \quad & \text{1}^{st} \text{ element} \\
& \quad b. \quad \exists A \in p \ x \in A \land \forall A_1,A_2 \in p \ A_1 \neq A_2 \rightarrow x \notin A_1 \lor x \notin A_2 \quad & \text{2}^{nd} \text{ element}
\end{align*}
\]

It comes out nicely under this definition that if there are no different sets to begin with, then (159-b) will be trivially true — since \(A_1 \neq A_2\) is false, the definition in (159-b) will capture the pair \(<x,x>\). Therefore, the “reflexive” ordered pairs count as ordered pairs as well, which is as it should be, as ordered pairs with identical arguments are a subset of all possible ordered pairs. The set of sets \({\{a\},\{a\}}\) thus counts as an ordered pair as well.

In sum, we can talk about relations as well as properties with (degenerate) relations. We cannot talk about relations with just properties, unless we allow going to higher types. From the point of view of parsimony, then, we could (and therefore should) drop simple properties from our semantics language, while we couldn’t drop relations. Simple and elegant formalizations of relations that can be used as well for counting and other interests rely on the idea that first and second elements can be differentiated if the second (or first) element satisfies some property that the other element of the pair does not satisfy.\(^{59}\)

\(^{59}\) Some authors go so far as to say that there may be no truly simple properties in the semantics at all. If so, one place predicates can be easily substituted for by two-place predicates the restrictions of one of the arguments of which are just weaker than those of the first argument. In a similar vein, Russell (1940, p. 35) states for \(b\)ona\) \(fide\) predicates like “being yellow” the following:

When a child learns the meaning of the word “yellow”, there is first an object (or rather a set of objects) which is yellow by definition, and then a perception that other objects are similar in colour. Thus when we say to a child “this is yellow”, what (with luck) we convey to him is: “this resembles in colour the object which is yellow by definition”. Thus classificatory propositions, or such as assign predicates, would seem to be really propositions asserting similarity. If so, the simplest propositions are relational.
Relations are indispensable also for another reason in that they furnish something that properties could never furnish, namely, order. Properties (one place predicates) cannot induce order as all individuals in the extension of one place properties are on a par with respect to each other. One place predicates (simple sets or functions from individuals to truth values) trivially induce symmetry between the arguments to which they apply. Two place predicates (relations (ordered pairs) or functions from pairs of individuals to truth values) on the other hand have the capacity to induce asymmetry between the individuals to which they apply. The logical properties of symmetry and asymmetry respectively are given in (160-a) and (160-b).

\begin{align}
\text{(160) a. } & xRy \supset yRx & \text{symmetric} \\
\text{b. } & xRy \supset \neg(yRx) & \text{asymmetric}
\end{align}

There are, of course, expressions denoting relations that are neither born symmetric or asymmetric, and this appears to be the largest class. The relation of brotherhood is an example: If A is the brother of B, then B could but needn’t be the brother of A (B be A’s sister). If A loves B, then B could but needn’t love A. Following tradition, we call such predicates non-symmetric (cf. Russell (1940, p. 35). The notions of symmetry versus asymmetry turn out to be very important for the explanation of transitivity phenomena. Some examples of natural language predicates that are traditionally classified as symmetric, asymmetric and non-symmetric respectively are given in (161).

\begin{align}
\text{(161) a. } & \text{resemble, be next/similar/identical to} & \text{symmetric} \\
\text{b. } & \text{follow, be to the right of, be greater than} & \text{asymmetric} \\
\text{c. } & \text{love, see, kick} & \text{non-symmetric}
\end{align}

The basic test for symmetry vs. asymmetry lies in exchanging the places of the arguments of the relation: If this can be done without change in meaning (i.e., truth conditions), we are dealing with symmetric predicates. If exchanging argument places leads to incompatibility, we are dealing with asymmetric predicates. We will discuss more sophisticated and finer-grained tests in the context of reflexivization and reciprocalization in the next section.

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60 This holds as well under the Russelian conception (cf. the last footnote), as resemblance is a relational concept that has the property of being symmetric, cf. immediately below.

61 In a grammatical dimension, the notion of symmetry is discussed in König and Kokutani (2006). Dimitriadis (2008) argues that the availability of the so-called discontinuous reciprocal construction depends on a predicate’s potential to be interpreted as irreducibly symmetric, defined in terms of “identical participation [of the two arguments] in any event described by its predicate”. For a lucid discussion of symmetry and other logical properties of functions as related to one another cf. Reichenbach (1947, pp. 118ff).
We should note that relations are prone to be asymmetric at some level. If they were not, it would make little sense to use a relation in the first place (the exception being the identity relation, cf. section 3.1.2). Kratzer (1995, p. 156) argues that even resemble is asymmetric; in a situation where grandmother is already dead while Aunt Theresa is still alive, exchanging the place of the arguments alters the truth conditions as indicated in (162).

\[(162)\]
\[
\begin{align*}
\text{a. Aunt Theresa resembled my grandmother.} & \quad \text{false/p-failure} \\
\text{b. My grandmother resembled Aunt Theresa.} & \quad \text{true} \\
\text{c. Aunt Theresa resembles my grandmother.} & \quad \text{true} \\
\text{d. My grandmother resembles Aunt Theresa.} & \quad \text{false/p-failure}
\end{align*}
\]

Turning to the notion of transitivity now, we find that there are at least three traditional interpretations to the adjective transitive. One of them expresses a property of relations. This is the logical sense that has the advantage of being clearly defined, cf. (163).

\[(163)\] \[x R y \land y R z \rightarrow x R z\] transitivity

Then there are the grammatical senses: transitivity may refer to a particular relation between ordinary individuals ("natural transitivity") as well as, at least traditionally, to a particular relation between phenomenal individuals ("temporal transitivity" or change of state). Both times, relations are expressed, namely, a relation between an agent and a patient in the ordinary individual case and a relation between a pre- and a post state in the phenomenal individual case, i.e., a set of times where p and a set of times where \(\neg p\) hold.

Looking at relational natural language expressions, we can distinguish two types of relation-expressing terms according to what they talk about.

\[(164)\]
\[
\begin{align*}
\text{a. x controls/steers y} & \quad \text{ordinary} \\
\text{b. x follows/includes y} & \quad \text{phenomenal}
\end{align*}
\]

(164-a) speaks about agents. (164-b) speaks about nonanimate objects as well as locations or certain properties. Again, this is at least what the observation of natural language expression suggests. The point is that some of the matter that we talk about in the (164-b) way is already ordered. This means that whenever we look at two elements, they stand in an inclusion relation, such that one of the two will have a property that the other one does not have, but not the

---

62 Arguably, the asymmetry here lies not in the lexical meaning of resemble but in the predication structure; roughly, tense appears to apply to the subject in (i) and not to the object. Moltmann (1991) notes in support of the opacity of the dative argument position that it does not support anaphora, cf. (i).

\[(i)\] Bill resembles a horse. \(\#\) Mary resembles it, too.
other way around. Syntax knows nothing about this, hence nothing prevents the execution of operations that turn out to be in conflict with such domain properties; it is only at the interface to semantic interpretation where something has to happen in order to render the structure interpretable. We may do things that we know from speaking about matter of the kind that we use (164-a) to talk about with structures that we use to talk about matter ordered. One such thing is reflexivization. The strict ordering of phenomenal matter forbids reflexivization though. A contradiction results, and this is generally considered bad news in the semantics community. However, it may also be good news. Namely, under certain circumstances, we may do something extraordinary with part of the meaning that leads to the contradiction, namely, push it aside. There appears to be a strong trend toward pushing things up, so to speak, and we see this in illegal pluralization of mass nouns or illegal reflexivization in inchoatives or middles, as well as in directional complement constructions. But there appear to be as well cases where the offensive meaning is pushed down, i.e., handed from an expression that we would expect to talk about phenomenal matter to an expression that we would expect to be talking about ordinary matter. We see this in existential sentences as well as in dative constructions and arguably genitive constructions as well.

As for relations between thematic agents and patients, it seems true that across languages, a special structure can be identified that is there especially to code this transitive predicate-argument structure (Walter Bisang p.c.). Many languages do it in a special syntactic configuration that is reflected in a particular case marking, namely, e.g., nominative-and-accusative marking. As it does not matter in principle whether you mark the first or the second element in a relation, we find nominative-accusative languages next to ergative-absolutive languages, instantiating the basic logical options respectively.

Decisive for the possibility of manipulating structures are certain properties of the structure that forms the input to the manipulating operation (or transformation). Concerning transitive structures, it appears that universally, the object (accusative/absolutive) argument forms a constituent with the verb that excludes the subject (nominative) argument, as in (165).

\[ (165) \]

Robustly across languages, it appears to hold that if there is anything available that looks like an agent, it has to be realized as the first argument, i.e., as the
grammatical subject. Only if this is not the case is there more variation – e.g., we find argument alternations in particular with psych-verbs where the subject/object opposition is not so clear (the stimulus is often inanimate but has causal force, while the experiencer is generally animate but has no causal force nor control).

(166) a. Otto worries about the exam.
   b. The exam worries Otto.

Related to the robustness of the generalization that a prototypical agent will be made subject is the fact that starting from a transitive structure, many an interesting structure with interesting interpretations can be derived. All languages have a ‘standard’ way of expressing agent-patient structures, and one can go to quite a few structures from there (passive, reflexive) that can be thought of as shortcuts to special meanings (Brandt/Garcia 2010). It has been argued that all verbal structures rely on a structure like in (165) above. Next to “ordinary” transitives, we have unergatives according to this view that are really nouns incorporated into verbalizing categories or light verbs, as in the structure in (167):

(167) Anna danced
    cf. Anna did a dance

\[
\begin{array}{c}
V' \\
  | \\
  V \\
  | \\
  e_{do} \quad N \\
  \mid \\
  dance
\end{array} \quad \begin{array}{c}
V' \\
  | \\
  V \\
  | \\
  N \\
  | \\
  V \\
  | \\
  N \\
  | \\
  e_{do} \quad t_{dance}
\end{array}
\]

Against the ubiquitous transitive scheme, unaccusatives are really only half structures, as they only talk about the second element. But what is a second element without a first element?

Alternatively, the slot for the external argument (the “first” slot in nominative-accusative languages) may be filled differently. In German, filling both slots with

\[\text{Hale/Keyser (1993) demonstrate how restricting the incorporation operation along the}
\text{lines of Baker (1988) can account for why certain unergatives cannot and do not exist.}
\text{Baker’s definition of Incorporation is given in (i).}

(i) Incorporation (Baker 1988)
   A head \(\alpha\) may incorporate into the first c-commanding head \(\beta\) and thereby
   assume the grammatical category of \(\beta\).\]
ordinary individuals leads to the standard NOM-ACC structure. But there is as well a different structure, given in (168).

(168)  

\[ \text{VP} \]
\[ \text{Theme} \quad \text{V} \]
\[ \text{V} \quad \text{LOC} \]

(168) ends up as the nominative-only structure, i.e., the case indicating “second” does not surface and the semantically second (theme) argument surfaces as the grammatical subject (NP with “first” or null case). The grammar may as well put something in subject position that does not need case (it has case by itself, e.g., from a prepositional element that it carries along and that we can also see). Now the only NP in need of case will get the null case.

(169) a. Down the hill rolled the carriage.

b. On the table stood a candle.

Broadly speaking, things that are independently case-licensed are happy in the position that is usually taken by the agent in the ordinary constellation. An influential analysis from the literature has it, e.g., that we may have either a bona-fide agent in vP or a spatiotemporal individual which regularly does not find linguistic expression (Kratzer 1995, Diesing 1992), cf. (170).

(170)  

\[ \text{vP} \]
\[ \text{NP/e} \quad \text{VP} \]
\[ \text{NP} \quad \text{V} \]

While there is nothing wrong with having an event (rather: non-agent) argument in the type of structure in (170) by itself, the interface may complain if it cannot find in the semantics two distinguished individuals in the face of a transitive structure. As the case may be, (170) may come to meet too poor a semantics or it may even code impossible semantics, e.g., if it happens to be reflexivized and associated with strictly ordered matter at the same time (cf. section 4.1). Due to the traditional belief in syntactic-semantic ‘perfectionism’, presumably, the option of deriving and using structures that are not immediately interpretable has been disregarded.

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64 Unless Loc is realized by a directional prepositional phrase with an accusative NP complement, cf. section 3.3.2.

65 Cf. the quote from Kaplan in footnote 36 in section 2.2.2.
According to Hopper/Thompson (1980), constructions can be more or less transitive as the result of meeting transitive ideals at various levels (or not). (171) gives a table with H&T’s “high transitivity” and “low transitivity” features.

(171)  

<table>
<thead>
<tr>
<th>Feature</th>
<th>HIGH</th>
<th>LOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Participants</td>
<td>A(x) &amp; O(y)</td>
<td>1 participant</td>
</tr>
<tr>
<td>B. Kinesis</td>
<td>action</td>
<td>non-action</td>
</tr>
<tr>
<td>C. Aspect</td>
<td>telic</td>
<td>atelic</td>
</tr>
<tr>
<td>D. Punctuality</td>
<td>punctual</td>
<td>non-punctual</td>
</tr>
<tr>
<td>E. Volitionality</td>
<td>+</td>
<td>–</td>
</tr>
<tr>
<td>F. Affirmation</td>
<td>+</td>
<td>–</td>
</tr>
<tr>
<td>G. Mode</td>
<td>realis</td>
<td>irrealis</td>
</tr>
<tr>
<td>H. Agency</td>
<td>x highly potent</td>
<td>x lowly potent</td>
</tr>
<tr>
<td>I. O-Affectedness</td>
<td>y totally affected</td>
<td>y not affected</td>
</tr>
<tr>
<td>J. O-Individuation</td>
<td>y highly individ.</td>
<td>y non-individ.</td>
</tr>
</tbody>
</table>

On the basis of the features in (171), Hopper/Thompson propose the “Transitivity Hypothesis” in (172).

(172)  

**Transitivity Hypothesis:**

If two clauses (a) and (b) in a language differ in that (a) is higher in Transitivity according to any of the features [in (2)], then, if a concomitant grammatical or semantic difference appears elsewhere in the clause, that difference will also show (a) to be higher in Transitivity. (Hopper/Thompson 1980, pp. 254f, their (9))

They further comment on the hypothesis as follows:

The Transitivity Hypothesis also predicts that the opposite type of correlation will not be found, where a high-Transitivity feature systematically co-varies with a low-Transitivity feature in the same clause. (p. 255)

The strict harmony between “high” and “low” features suggested by Hopper/Thompson makes the wrong predictions. There are infinitely many cases between what might be called “perfectly highly transitive” and “absolutely low transitive” constructions. The proposal is problematic also for a different reason, namely, that there is no independently testable grammatical characterization of high and low transitivity – the features given are all semantic and we are not told how to test them. What one would like to have is a link between high or low transitivity to morphological markedness, as has been proposed early on by Tsunoda (1985); most scholars today would agree that “highly transitive” constructions are coded with nominative–accusative structures as opposed to e.g. nominative-dative structures that signal “low transitivity”.
Assuming the features could be defined in a way that leads to predictions, there is no explanation for why the features should co-vary at all. Covariation means “A goes with B”, and we usually think that A goes with B because A and B “fit” in some sense, e.g., in that there is something like an entailment relation between them. This appears to be the case more or less for certain pairs of features, such as telicity and affectedness of O (cf. Tenny 1994). However, other features appear to be neither intuitively nor empirically related, like, e.g., agentivity and affectedness of O, or volitionality and reals. But there are different possibilities; e.g., there might be something like a “critical mass” of covarying features that lead to a certain marking, allowing thus for mixed cases – clearly what would need to be made clear would be which features contribute to this critical mass in which way. Another option to be fleshed out is that the relation between certain features may as well be of an “antidote” nature, i.e., failing to supply with a certain feature might have to be compensated for by supplying with a certain other feature. Let us look at the features A and C of Hopper/Thompson from this perspective. Often, these go together – what Vendler (1957) called “accomplishment” verbs are often enough two place as well as “telic” (in the testable sense of not being homogeneous, cf. ibid. or Dowty 1979, chapter 2). But there are prominent classes supplying clearly with A but actually forbidding C, namely, what Vendler called stative verbs; to these belong *love* or *know* and there is no way to make them “telic” in any defined sense.\(^66\) While the opposite case does not seem to exist (i.e., there appear to be no one place predicates that could not be made “atelic”), what are called “unaccusative” verbs appear to be clearly one place in not projecting an A but are most generally telic. When these verbs combine with directional PPs they seem to be necessarily “telic”, understood to conform with the tests for accomplishments or achievements given in Vendler (1957) or Dowty (1979).\(^67\)

- S = “being an argument” / having a theta role
- A = “having agent properties”
- P = objects are negatively defined – they are ¬A, but this doesn’t tell us what properties they have actually.

\(^66\) Other factors than the lexical semantics of verbs enter into making them “telic” (accomplishment/achievement) or “atelic” (activity/state). Cf. Verkuyl (1972) and Krifka (1989) and much work since for attempts to spell out what this means.

\(^67\) Cf. Dowty (1979, chapter 2) for concise presentation and discussion. E.g., it is odd to assert the occurrence of a change of state in the past and at the same time assert that it is still going on in the present, unlike with states or processes, cf. (i-a) vs. (i-b).

(i) a. The ball rolled into the yard # and it is still rolling into the yard.
   b. The ball rolled and it is still rolling.
Let us look at some proposals how agent and patient are defined from a semantic perspective, starting with Langacker (1991, pp. 283, 285):

The archetypal **agent** is a person who volitionally initiates physical activity resulting, through physical contact, in the transfer of energy to an external object. Its polar opposite is an archetypal **patient**, an inanimate object that absorbs the energy transmitted via externally initiated physical contact and thereby undergoes an internal change of state.

The patient (object or second) argument is negatively defined in Langacker’s description in contrast to the agent (subject or first) argument. A strikingly similar view has been explicitly argued more recently by Primus (1999), and it appears to find empirical support from neurolinguistic experimental work. E.g., nonprototypical agents appear to produce extra processing costs only when the patient argument has already been processed, suggesting that the grammar cares only about what is integrated as a subject. Also, processing difficulties encountered when the two arguments of a relation are both “patient-like” in the sense of e.g. Dowty or Comrie differ qualitatively from those where they are both agent-like, cf. Schlesewsky et al. (2010). Finally, there appears to be a “subject preference” parsing strategy that lets hearers interpret unmarked initial arguments as subjects, while forcing interpretation of initial arguments as objects leads to processing difficulties (cf. Bickel et al. 2009).

If we look more closely at Dowty’s (1991) influential proposal regarding the definition of proto-theta-roles as sets of entailments, we see that the patient argument is negatively defined here as well, cf. the characterization of proto-roles in (173) and (174) (from Dowty 1991, p. 572). The agent argument on the other hand is clearly positively defined.

---

68 Whether or not there are negative properties is an interesting question. It often appears that we are more disturbed by there being the “wrong” properties than by the absence of the “right” properties (e.g., when it comes to aesthetic judgments). There is neurophysiological evidence from some areas of biology that “belonging” may not be about having the right properties but about not having the wrong properties. E.g., belonging to a particular bee population is a matter of featuring a certain mix of 20-30 basic odors; however, bees that lack certain ingredients to the defining odor will be admitted to the stock as long as they have no “positively wrong” odor. Cf. Galicia (2014).

69 Cf. as well Keenan’s (1976) list of subject properties or Primus’ (1999) development of Dowty’s approach for German. On Primus’ execution, transitive predicates are decomposed into semantically basic, hierarchically ordered relations like Control, Cause or Move. The first argument of a transitive predicate is then defined as the first argument argument in the more basic relations, starting with the most prominent relation Control.
Contributing properties for the Agent Proto-Role:

a. volitional involvement in the event or state
b. sentience (or perception)
c. causing an event or change of state in another participant
d. movement (relative to the position of another participant)
e. exists independently of the event named by the verb

Contributing properties for the Patient Proto-Role:

a. undergoes change of state
b. incremental theme
c. causally affected by another participant
d. stationary relative to movement of another participant
e. does not exist independently of the event, or not at all

The term “object”, understood in a broad sense (covering grammatical function as well as the ‘patient’ theta role) is defined relative to that of “subject”: in dictionary entries, you find that an object is what is opposed to an acting or receiving subject in an eventuality. I.e., objects are the second elements in ordered pairs. This view of the core grammatical functions comes out most clearly in approaches to Proto-Argumenthood like that of Primus (1999), where the prototypically transitive relation is decomposed into more basic relations like \textit{Cause}, \textit{Control} or \textit{Move}; each time, the first argument of these relations is restricted, while what does not qualify as first argument takes the second position. Much in line with such more theoretical proposals, Comrie’s (1981) typologically inspired definition of “naturally” transitive constructions characterizes the object role as figuring lower on the scales of animacy and definiteness than the subject role, cf. (175).

(175) The most natural kind of transitive construction is one where the A is high in animacy and definiteness, and the P is lower in animacy and definiteness; and any deviation from this pattern leads to a more marked construction.

Comrie’s definition concerns the properties of animateness and definiteness, which to-day feature strongly in the literature on transitivity – it is these properties with respect to which agents (subjects) and patients (objects) should be asymmetrical.

3.3.2 Directional complements and Genitives

We are now exploring deeper parts of structure with a naturally more obstructed sight at matters. A robust generalization regarding structures with thematic direct objects and prepositional phrase complements in German is that
Transitivity vs. inclusion semantics

inasmuch as accusative case is assigned by the preposition, a change of state interpretation is associated with the construction that codes, intuitively speaking, directed motion.\textsuperscript{70} Thus, (176-a) means that the ball is rolling and that this rolling takes place in the garden. (176-b) in contrast means that the ball is rolling from some location outside the garden to a location within the garden.

\begin{align*}
(176) & \quad \text{a. Der Ball rollt in [dem Garten]}_{\text{DAT}}. \\
& \quad \text{the ball rolls in the garden} \\
& \quad \\
& \quad \text{b. Der Ball rollt in [den Garten]}_{\text{ACC}}. \\
& \quad \text{the ball rolls in the garden}
\end{align*}

We cannot make the verb responsible for the change of state interpretation, because the verb is the same in the stative example in (176-a) as in the change of state (“accomplishment” in Vendler’s terms) example in (176-b). We could not make the preposition responsible, since also the preposition is the same. Accordingly, projective analyses have to assume that the verb or preposition are ambiguous, with one variant carrying in some form or other the change of state meaning. At the same time, it has been recognized that what is special about structures as in (176-b) is the case configuration, namely, it exhibits the case assignment typical of \textit{bona fide} transitive constructions (Gehrke 2008).\textsuperscript{71}

Extending this line of thought, we argue that examples like (176-b) do count as transitive for grammatical purposes hence are subject to the “second condition”. The argument-structural version of the second condition is given in (177).

\begin{align*}
(177) & \quad \text{Second Condition} \\
& \quad \text{The argument that is interpreted as the second member (= object) of a transitive relation lacks certain semantic properties that the argument that is interpreted as the first member of the relation (= subject) has.}
\end{align*}

We propose in this section that constructions with directional complements in German have transitive syntax, signalling that \textit{Diff} must be interpreted. No sense can be made of \textit{Diff} however at the ordinary individual level (as one of the individuals is interpreted as its location (namely, the PP-contained individual) which includes, spatiotemporally speaking, the other (“subject”) individual. The second part of \textit{Diff} – i.e., the “object” meaning or O corner of the square – will then be satisfied at the phenomenal level, giving rise to the change of state meaning. Put differently, the claim is that directional

\textsuperscript{70} A curious exception is the preposition \textit{zu} that assigns dative case. If prepositional \textit{zu} codes a local contradiction, then going to the change of state interpretation via the transitive case morphology is not necessary, i.e., \textit{zu} does what the case morphology does in the regular cases.

\textsuperscript{71} Earlier analyses that combine case properties with a semantics very similar to the one of \textit{Diff} (namely, that of Löbner’s phase quantifiers) are Egg (1994) and Fong (1997), which we will discuss below in some detail.
PPs introduce fresh phenomenal variables “around the corner”, namely, as a compensation for being part of a construction that signals but does not realize difference between ordinary arguments. A superficially minimal pair that is highly suggestive in this respect is given in (178) and (179).

(178) Die Schuhe im Keller
    the shoes in the cellar

(179) Die Schuhe in den Keller.
    the shoes in the cellar.

(178) is not even a sentence. To become one, we need an element that carries the tense morphology. We interpret (179) though in propositional terms, and, in particular, in modal terms. (179) could mean that the shoes may go into the cellar or that the shoes must go into the cellar; in any event, a modal interpretation can only make sense if there is reference to a world or index that is not the one of the actual world in examples like (179). The index that is bound is brought by the PP location. A recent analysis of related facts is Berthele (2007), who argues against ellipsis and in favor of construction meaning analysis. Berthele concentrates on sentences of the kind in (180).

(180) Är isch ufe baum.
    he is onto the tree

For (180), it would seem plausible to argue that the participle is elided. However, the type of construction does not lead to a shift from present to perfect in a story, as it should if it were a participial construction. Berthele’s analysis

---

72 We see the role of the particle in data concerning root (deontic) vs. epistemic modality ambiguities as in (i) and (ii) that appear very pertinent. We see here that an imperfective complement leads to a deontic interpretation, while a perfective complement gives rise to an epistemic interpretation.

(i) Peter muss gehen.
    Peter must go.
    ‘Peter is obliged to go.’

(ii) Peter muss gegangen sein.
    Peter must gone be.
    ‘It must be the case that Peter is gone.’

73 In support, Berthele gives data like in (i) and (ii).

(i) *Är isch uf de baum gsi
    he is on the tree been

(ii) Är isch uf de baum gchlätteret gsi.
    he is on the tree climbed been

(i) should be just as grammatical as (ii) if it contained an empty participle.
Transitivity vs. inclusion semantics

involves a semantically primitive “movement” that is part of the constructional meaning; this is schematized in (181).

\[
\text{(181) } \quad \text{sem} \quad \text{movement} < \text{figure} \quad \text{path}(\text{+ ground}) > \\
\text{BE} \quad < \text{the “being” “predicative”} > \\
\text{syn} \quad \text{V} \quad \text{SUBJ} \quad \text{directional phrase}
\]

Kracht (2002) analyzes prepositions in terms of two layers “location” and “modalization”; the latter contributes “directionality”. We are reminded here again of a basic principle of common-sensical reasoning: two things cannot be in the same place at one time, nor can one thing be in different places at one time (cf. Leibniz’ dictum from section 2.3.1). A proposal concerning structures that contain directional complements that is more compositional than the constructionalist approach is that of Fong (1997). Building on Löhner’s (1989) original analysis of the temporal particles schon und noch, Fong proposes that directional locatives as headed by prepositions in German or as featuring elative or illative case in Finnish apply to ordered, i.e., directed structures instantiated by e.g. times or stages of events as well as by segments of objects or spatial traces of events (Fong 1997, p. 28). The truth of a structure containing a directional locative is evaluated with respect to an interval that contains a phase change from a property ¬p to a property p; in other words, the admissible intervals contain a generalized change of state. A sentence like Otto danced into the hall will be true only if it is evaluated with respect to a temporal interval that contains times where it is not true that Otto is in the hall in question (i.e., ¬p holds) as well as later times where it is true (i.e., p holds). Furthermore, the development must be monotone, i.e., it must not go back to the original state within the interval in question. Generalizing to nominal structures, a phrase like a bridge into San Francisco will be evaluated with respect to an interval consisting of segments of the bridge of which some are not in San Francisco (i.e., it is true of them that ¬p) but of which others are (i.e., p holds of them).

Fong’s analysis is crosslinguistically successful, even if it has been criticized by Kracht (2002) for not being general enough yet. Fong’s analysis is very close to what we are proposing here in that Fong does not say that the directional preposition itself carries the meaning of the change of state; rather, it is a condition of the structure that it is evaluated in that it contain such a change of state. Saying so is compatible with earlier proposals such as Givón (1972) or Dowty (1979) who have argued for e.g. changes of state that following observations of Kenny (1963) that these are only in part assertive (namely, as regards the “result state”) and in part presuppositional. Translating between

\[76\text{Cf. for the exact definition of admissible phases Fong (1997, pp.29ff) or the original work of Löhner (1989, p. 178).}\]
Fong’s analysis and these earlier proposals, changes of state are do not have the property of homogeneity (cf. section 2.3). They can only be evaluated given two timepoints between which they occur (cf. for the same intuition already Vendler 1957), as schematized in (182) and symbolized in (183).

\[
\exists t, t' \in 1h \neg \text{CLPSD(Peter)}(t) \land \text{CLPSD(Peter)}(t') \land t < t'
\]

We can observe that Peter was not collapsed at \( t \) is a presupposition applying the usual tests such as survival under negation. The question remains how directional locatives or prepositions would come to be associated with such admissible intervals, and we give an answer to this question: they project syntactically transitive structures which, however, do not meet what the interface wants to associate with these transitive structures, namely, a representation of two well-distinguished individuals, meaning, in the basic case, two spatiotemporally distinct objects. In the type of directional structure in question, the theme and the prepositional complement by no means are spatiotemporally distinct. On the contrary, the spatiotemporal location of the prepositional complement IS the spatiotemporal location of the theme in the result state of the event that is coded. Therefore, \text{DIFF} is not satisfied at the ordinary individual level and part of \text{DIFF}, namely, \text{DIFF-O}, is expatriately interpreted. Applying \( \neg p \) in an alternative, independently coded domain leads to the change of state meaning that we see systematically associated with verbal directional structures.

Having sketched our analysis of directional structures, let us review the evidence for their transitivity, taking (184) as an illustrative example.

\[
\text{The ball rolled into the yard.}
\]

The type of structure exemplified in (184) does not fit the agent-patient scheme. Yet, it exhibits the nominative–accusative case pattern typical of transitive structures as we can see in e.g. German, cf. (185).

\[
\text{Der Ball \quad rölle in den Garten.}
\]

\text{Gehrke (2008) argues for the claim that the configuration hosting the two arguments is completely parallel to a verbal nominative-accusative structure. Gehrke’s (ibid., p. 4) “Accusative Case Hypothesis” is given in (186).}

\[
\text{The Accusative Case Hypothesis:}
\]

\text{Accusative case inside German PPs is a structural case, licensed under the same conditions as accusative case on direct objects.}
Note that while directionality is signalled by accusative case in German, it is coded on the preposition into in English. The type of structure in (184) has special structural properties suggesting that the two argument expressions that it involves are both structurally licensed; in particular, there is evidence that the locative PP behaves like a structural subject in a range of respects. It has thus been pointed out by Bresnan that the directional prepositional phrase can undergo what is known as raising, that its extraction gives rise to that-trace effects, and that fronting it does not give rise to do-support. These three properties single out grammatical subjects as opposed to objects or adjuncts, i.e., any other grammatical function. This is illustrated in the following examples built on those of Bresnan (1994, pp. 95-97, 102).

(187)  
\begin{align*}
    a. & \text{[Into the yard] seems to have rolled the yellow ball.} & \text{PP}_\text{dir} \\
    b. & \text{Otto seems to have eaten the cake.} & \text{SU} \\
    c. & \text{*The cake seems Otto to have eaten.} & \text{OB} \\
    d. & \text{*Yesterday seems Otto to have eaten the cake.} & \text{ADJ}
\end{align*}

(188)  
\begin{align*}
    a. & \text{Into which yard do you believe (*that) the ball has rolled?} & \text{PP}_\text{dir} \\
    b. & \text{Who do you say (*that) has eaten the cake?} & \text{SU} \\
    c. & \text{What do you say (that) Otto has eaten?} & \text{OB} \\
    d. & \text{When do you say (that) Otto has eaten the cake?} & \text{ADJ}
\end{align*}

(189)  
\begin{align*}
    a. & \text{Into which yard rolled/*did roll the ball?} & \text{PP}_\text{dir} \\
    b. & \text{Who ate/*did eat the cake?} & \text{SU} \\
    c. & \text{What did Otto eat? / *What ate Otto? OB d. When did Otto eat the cake? / *When ate Otto the cake?} & \text{ADJ}
\end{align*}

In several Bantu languages, locative arguments may trigger subject-verb agreement, cf. the passive-like structure in (190-b) (from Keenan (1976, p. 330; cf. for fuller discussion of locative agreement in Bantu Ngonyani 1996.).

(190)  
\begin{align*}
    a. & \text{John a- nathamang -ir -a ku sukulu} & \\
       & \text{John he- ran -dir -indic to school} & \\
       & \text{“John ran to school.”} & \\
    b. & \text{ku sukulu ku- nathamang -idw -ir -a ko ndi John} & \\
       & \text{to school loc- ran -pass -dir -indic loc by John} & \\
       & \text{“School was run to by John.”}
\end{align*}

We claim that while constructions as in (184) as well as (185) count as transitive, they violate obviation, i.e., cannot be interpreted in terms of distinguished referents. In (185), this violation is compensated for by pushing the disjoint reference requirement to the level of temporal/aspectual structure; the effect is the change of state interpretation associated with structures as in (185).
According to Kracht (2002), directional PPs consist of what he calls a localizer and something giving orientation, called by him the modalizer. It is true that movement is a modal concept as something cannot be in different places at the same time, or at least this is how our conceptualization works in the face of quantum mechanics. To capture movement (as well as any other change), it is not sufficient to look at just one coordinate, but at least two coordinates are needed (be they times, spacetimes or worlds).

Important for the understanding of the nominal as well as the comparative group mentioned above and building a bridge to the pseudoreflexive cases are structures featuring directional locatives or infinitives. Let us start with the former, considering the example in (191).

(191) Otto tanzte in den Saal.
Otto danced into the hall.

Here it appears we have a relation between an “ordinary” argument – in this case, the agent – and the complement of the preposition, which appears in the accusative in German. But we also have a change of state interpretation, as in the inchoative case above, and unlike in (192).75

(192) Otto tanzte im Saal.
Otto danced in the hall.

Abstracting from detail, the logical form of the PP complex is rendered roughly as in (193) in many a treatment, i.e., the preposition is taken to denote a relation between an independently licensed argument expression and the complement of the preposition (cf., e.g., Kaufmann 1989, Wunderlich 1991).

(193) $\lambda y \lambda x \ldots \text{LOK} (z, \text{IN} (y))$

But this may as well be wrong. We may have an intransitive predication rather, i.e., being in y is a property ascribed to x. Or we may be talking about locations all along. Then typically one will be included in the other.

As we argued above, however, the basic property distinguishing individuals is that they will always be in different locations. \texttt{DIFF} as associated with the transitive structure cannot be interpreted. To get the change of state interpretation, something else is needed and employed in existing analyses, like a \texttt{BECOME} operator (taken to be supplied by the verb, cf. Dowty 1979, 75 To see this, note that the progressive of (191) entails (i), while the progressive realization of (192) entails (ii).

(i) Otto is dancing into the hall. $\rightarrow$ Otto has not danced into the hall (yet).

(ii) Otto is dancing in the hall. $\rightarrow$ Otto has danced in the hall.
chapter 2) or the claim that directional prepositions denote phase quantifiers (Fong 1997, cf. Löbner 1989). Under our proposal, the COS interpretation is really a compensation for an inappropriateness, namely, that a relational expression is used without there being two referents that are different in such a way that it would be sufficient to justify the use of a transitive structure in the syntax. Again, then, we have at the level of expression something that requires difference in the semantics/pragmatics, but the semantics/pragmatics is not such that it furnishes this difference (as, essentially, there is an inclusion relation between the arguments as in the spatiotemporal domain more generally).

This is completely general and productive. We expect there to be shortcuts developed then to achieve what directional complements, usually PPs, achieve. And this is what we find, cf. (194).

(194)  a. in Stücke reissen – auseinanderreissen – zerreissen
       into pieces tear – out.of.each.other.tear – apart.teat

       b. auf den Boden schmeissen – hinschmeissen
       onto the floor throw – down.throw

Now we see the transitive syntax more clearly as well. “Transitivizing” is one of the prominent functions of what appear to be the least understood prefixes to date, namely, (be), ver, zer and er respectively which we first mentioned presenting Kühnhold’s (1973, p. 342) results in section 2.3. To repeat, Kühnhold notes regarding what she calls er¹, the most frequent variant which according to her denotes a successful completion (“erfolgreicher Abschluss”) that the prefixed verb does not only code a change of state but that it is also transitive.

Die präfigierten Verben sind sämtlich trans.[itiv...]. In ca. 50 % der Fälle handelt es sich um eine Umwandlung eines Präp.obj. bzw. einer Präpositionalfügung in ein Akk.obj. [...].

The prefixed verbs are all transitive. In about 50 percent of the cases we are dealing with a transformation of a prepositional object or a prepositional construction into an accusative object.

In the case of Kühnhold’s er¹ then, at least, we appear to have a case that involves a notion of plural at (at least) two levels at the same time, namely, the aspectual/temporal as well as the ordinary individual level. The right generalization appears to be close to (195).76

76. The change of state interpretation associated with er- prefixed verbs is also noted by Fleischer et al. (1983, p. 271), who claim this to be the sole function of the prefix:

Das Präfix er- hat die Wortbildungsbedeutung ‘Perfektivierung besonders im Hinblick auf das durch den verbalen Prozeß erreichte Resultat’
(195) Generalization (German):

er- prefixed verbs denote a plural at the ordinary individual level or at the phenomenal individual level (or both).

Let us try to falsify (195) on the basis of Kühnholds (1973, p. 148) complete taxonomy of the different functions of verbal prefixal /er/, given in (196).

(196)  

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>er₁</td>
<td>etw. erarbeiten</td>
</tr>
<tr>
<td>er₂</td>
<td>erblinden, erfrischen</td>
</tr>
<tr>
<td>er₃</td>
<td>erdröhnen, erkennen</td>
</tr>
<tr>
<td>er₄</td>
<td>erfolgen, erdulden</td>
</tr>
<tr>
<td>er₅</td>
<td>erlöschen, erwürgen</td>
</tr>
<tr>
<td>er₆</td>
<td>ersprießen, erteilen</td>
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<tr>
<td>er₇</td>
<td>erwachsen, errichten</td>
</tr>
<tr>
<td>er₈</td>
<td>erschließen</td>
</tr>
<tr>
<td>er₉</td>
<td>ersetzen</td>
</tr>
<tr>
<td>er₁₀</td>
<td>sich ermahnen</td>
</tr>
</tbody>
</table>

We can see using the usual tests (cf. section 4.1.2) that except for the fourth group, the verbs resulting from er- prefixation are all clearly change of state. For example, the entirely productive group that forms verbs from adjectives (er- works, among other, as a function from a state to an achievement (in Vendler’s 1957 terms). Similarly for er-³ that according to Kühnhold codes a beginning (i.e., a change of state from “not p” to “p”) as well as for groups represented as er-⁵ to er-⁷, denoting according to Kühnhold completion, egression and upwards movement respectively. er-⁸ to er-¹⁰ are small with specialized but still change of state meanings (opening, substitution and result in Kühnhold’s terminology). We are left then with the group constituted by er-¹ which, according to Kühnhold, denotes intensification; these cases are not obviously change of state, nor are they all transitive. Let us look at this group more closely. Kühnhold (1973, p. 354) notes regarding this group that it falls into two subgroups, namely, the ‘intransitive’ one that makes up 15.6 % and the ‘transitive/reflexive one that makes up 84.4 %. The latter group is thus harmless for the generalization formulated in (195) as its instances are transitive (at the ordinary individual level). (197) gives the transitive cases, excluding lexically

---

the prefix er- has the word-building meaning ‘perfectivization, especially with regard to the result achieved through the verbal process’

We return to the function of er below in the context of the causative/inchoative alternation (section 4.1.2). The elements in the class of prefixes to which er belongs (namely, the prefixes be, ver, zerver and er) furnish the only cases in German where we see a prefix change lexical category. I.e., these prefixes appear to violate Williams’ 1981 Right Hand Head Rule that appears to work perfectly otherwise for German.
reflexive uses (cf. section 4.1 for a detailed discussion of reflexivization). 

(197) erdulden, erbringen, erfordern, erheizen, erleiden, ertragen, 
erdürfen, ergeben, erhärten, erheizen, ernähren, ertragen, 
nourish, render, necessitate, endurance, suffer, bear

This leaves us with the verbs that are listed in (198).

(198) erfolgen, erscheinen, ermahnen, sich erstrecken 
take.place, appear, reprimand, extend

The tests show that erfolgen and erscheinen are change of state. This goes as well for ermahnen, which, in addition, has two argument places, of which one is propositional, and could be counted as transitive after all. The last problematic case for the generalization in (195) is sich erstrecken, which, however, takes a prepositional complement and is lexically reflexive, which brings it into the realm of transitivity, cf. section 4.1.

In sum, the generalization in (195) appears to hold almost absolutely regarding Kühnhold’s corpus. Next to effecting a change of state (inchoative) reading when it applies to stative verbs, or – and this is productive (cf. Dowty 1979, chapter 2) – to adjectives, /er/ often applies to transitive verbs or leads to “transitivization”. This latter function is just a case of turning a property-denoting expression into a relation-denoting expression that will then, via the DRP, give rise to the demand of difference interpretation (i.e., distinguished referents in the semantic representation). Regarding the change of state interpretation, let us try to sketch how this might work, technically, by looking at an example derivation starting with the truth conditions in (199).

(199) \[[WACHT(x)]\] = 1 iff \(x \in WACHT \text{ at } t\)

(199) is going to be true if a time can be found where \(x\) is in the extension of WACH. If the sentence is in present tense, this is going to be speech time. Ignoring many complications, let us put this down as in (200).

(200) \[[ER-WACHT(x)]\] = 1 iff \(x \in WACHT \text{ at } t \land \exists x S(x) \land P(x) \land \exists x S(x) \land \neg P(x)\)

/er/ is going to be satisfied iff an individual can be found in the intersection of a set \(S\) and a set \(P\) and an individual can be found in the intersection of the

--

\(^{77}\) Most of the verbs in this group are also change of state, the exceptions being erfordern, ertragen, ernähren and sich erstrecken. The cases erheizen and erzeigen appear to be change of state but are at best peripheral in today’s German.
same set $S$ and the set given by $\neg P$ – in case of ordinary individuals, this is the complement of $P$. The system will try to satisfy /er/ in terms of spatiotemporal location, but this will fail, as in the case at hand, no relation can be construed between ordinary individuals in the semantics. As a handy representation, let us introduce the repair table format using the example under discussion.

\begin{tabular}{l|ccc}
 & interpreted & left & prob/rep \\
\hline
vP/VP & WACH(Otto) = I & O & $\xi$ SU > OB \\
CP/TP & $(\exists t) \neg WACH(Otto) = O$ & $+t$
\end{tabular}

In (201), /er/ calls upon DIFF, but the attempt of realizing it in the vP/VP derives a contradiction as there is only one ordinary individual here, namely, Otto. The interface leaves the right hand side of /er/, i.e., $O$, uninterpreted in this cycle, passing it to the next cycle, which talks about time. The leeway regarding where logical forms are eventually interpreted is restricted by more general properties of the derivation; we predict that logical forms that cannot be locally interpreted will be interpreted in terms of what is nearby or ‘close’ from a derivational perspective. Regarding times, there is always going to be a contextually given reference time, which we assume to be equal with speech time in the simplest case (or otherwise given by the story the sentence finds itself in). What we need to interpret is given again in (202).

(202) \[ \exists x \; S(x) \land \neg P(x) \]

Suppose EI can target different levels simultaneously, i.e., DIFF-O may ‘spill’ both to ordinary individual argument structure and phenomenal argument structure. Regarding the latter, let $S = \text{“I am a time”}$ and $P = \text{“I am the present time”}$. Then (202) says “I am a time and I am not the present but a past time”. At the ordinary individual level, what is coded is “x is awake”. Its negation is “it is not the case that x is awake” = “x is not awake” = “x is asleep”. Associating the positive and negative halves of DIFF at the different levels, we get the core meaning of inchoatives, namely, non-instantiation of a certain property at an earlier time (presupposition) and instantiation of that property at a later time (assertion). This is as well how the reference time is

---

78 Whether or not a relation can be established is in part a matter of convention. In e.g.
(i) rasen ‘speed’ is just as intransitive (unergative) as e.g. schlafen ‘sleep’. This may point to underlying transitivity, cf. section 3.3.

(i) Fahranfänger (18) rast 3 Freunde in den Tod.
Driving novice (18) speeds 3 friends into the dead.

We see here as well the transitivizing potential of directional prepositional phrases (“result”/“goal” phrases more generally, cf. Hoekstra (1988) and much work since).
Transitivity vs. inclusion semantics

moved: the original reference time gets to be associated with the negated property, the new reference time (that is handed to the discourse to follow) gets to be associated with the non-negated property (the “result state” of the change of state, cf. Givón 1972, Kenny 1963, von Wright 1965 and the discussion in Dowty 1979, chapter 2). Personal datives, discussed in section 4.3.2 present another case where Diff-O is distributed over different levels simultaneously.

**Verbal Genitive**

Genitive indicates deep embeddedness in German. Constructions featuring verbal genitive are parallel to Dir-PP cases in that there is a transitive relation that suffers from its arguments being intolerably close from the semantic perspective.\(^{79}\)

(203) Genitive Condition (Gallmann 1998):

A genitive phrase must have at least one head with a word-form positively specified for genitive.

(204) Der Fund *(schweren) Erdöls

the discovery (of heavy) mineral oil

Supporting earlier conclusions, the genitive condition may turn out to be an example of the more general condition that the expression of weaker meanings must be marked. Note in this regard that verbal genitives – more precisely, argument structures containing only a nominative and a genitive argument – are always interpreted in modal terms in today’s German, i.e., as involving reference to non-actual worlds.

In today’s German, there are 5 verbs taking two arguments of which one is marked nominative and one genitive.\(^{80}\)

---

\(^{79}\) Prepositional constructions and genitives behave similarly crosslinguistically with regard to relativization (e.g., Boef 2012). In German, genitives as well as PPs favor the overall rare w-pronominals; w- (vs. d-) pronominalization indicates the absence of a properly individuated antecedents, cf. Behaghel (1928, p. 726) or Brandt/Fuß (2017). Cases with PPs and genitives are given in (i), cases with accusative and nominative in (ii).

(i) a. Wir sind zufrieden mit dem, was/?*das Du tust.
we are satisfied with that what/that you do

b. Wir gedenken dessen, was/?*das er getan hat.
we think that-GEN what/that he done has

(ii) a. Ich sehe etwas was/das Du nicht siehst.
i see something what/that you not see

b. Etwas was/das Du getan hast ärgert mich.
something what/that you done have irritates me

\(^{80}\) This is excluding the case of *spotten* which is almost completely frozen in the construction *jeder Beschreibung spotten* ‘ridicule any description’. Building on Behaghel (1928) and Wilmanns (1897), Nishiwaki (2010, pp. 68ff) discusses “verbs of physical or mental movement towards a goal” that occurred with genitive NPs in older stages of German; the genitive disappeared and was replaced by accusative or a prepositional phrase:
These constructions all mean one thing, namely, that the subject referent does not have something that he should have, needs or wants to have – there is negation involved as well as modality. The following passage from Heidolph et al. (1981, p. 349) describes nicely the modal meaning component of German genitives (my translation):

It deserves mentioning, further, that the cited verbs and adjectives have a modal component. It is not just the non-occurrence or lack of a thing that is asserted. The lack or non-occurrence is presupposed as being counter to a norm or rule: *Das Kind bedarf der Pflege = ‘The kid should get care but does not get it’; therefore unacceptable: *Das Kind bedarf der Verwöhnung (‘the kid should be spoilt but is not spoilt’); *Das Kind entbehrt einen Diamantring (‘the kid should get a diamond ring but does not get it’); *Die Oper entbehrt des Beweises (‘the opera needs proof but does not have it’).

Interestingly, there are many more reflexive than ‘pure’ genitive verbs; (206) gives some examples:

sich annehmen, bedienen, befleissigen, bemächtigen, enthalten, (sich) attend.to, use, apply, usurp, abstain, entledigen, erfreuen, erinnern, erwehren, schuldig machen, get.rid.of, enjoy, remember, resist, guilty make, vergewissern, versichern ascertain, reassure

Verbs of wanting (translated into modern German):
(i) verfolgen, warten, bitten, flehen, verlangen, folgen, fragen, begehren pursue, wait, ask, beg, desire, follow, ask, crave

Verbs of sensation (translated into modern German):
(ii) empfinden, fühlen, hören, lauschen, schauen, sehen, beobachten sense, feel, hear, listen, view, see, observe

Sensation verbs with accusative express just sensation. Sensation verbs with genitive express directed sensation (listen to etc.).

This goes, by and large, also for adjectives selecting genitive in German, where the negative meaning component is somewhat harder to see or appears to be absent altogether:

bedürftig, (un)eingedenk, (un)fähig, geständig, gewiss, (un)kundig, mächtig, (un)schuldig, verdächtig, (un)würdig

potent, (not.)guilty, suspicious, (un)worthy
Arguably for reflexive genitive verbs, the reflexive element supports the re-dressed interpretation of genitive case in terms of possible worlds in that it indicates an underlying transitive relation that is however not interpreted in the usual fashion (i.e., in terms of well-distinguished individuals, cf. section 4.1).

Translating the modal meaning of the verbal genitive construction into our terms, the verbal genitive marking is the expression of DIFF; however, the argument on which it appears is already an object by way of structure, meaning that it lacks the positive (subject) properties from which objects are distinguished by means of negation (more specifically, predication of DIFF-O). Therefore, the DIFF-O is locally uninterpretable and pushed elsewhere; it appears it is pushed to the most general property of existence in the world being negotiated, which is the world of the subject referent as of general rule. In prose, and anticipating parts of the discussion of nominal genitives to follow, we get the following interpretive scheme for genitive constructions.

\[ x_{\text{NOM}} \text{ V } y_{\text{GEN}} \approx y \text{ belongs to } x \text{ and } y \text{ is not in } x's \text{ world} \]

In other words, verbal genitives are inherently contradictory structures according to our analysis. This may seem a curiosity, but then verbal genitives are rare curiosities as we noted. We will encounter much more productive cases of inherently contradictory constructions in the sections below though which might appear more affordable to the language user as the self-contradiction is not as deeply embedded as it is in the case of verbal genitives.\(^{82}\)

The modal function of the genitive is no quirk of today's German but appears to develop quite systematically historically in particular in the context of negation in largely unrelated languages. Lenz (1998, p. 8) writes:

> Although the old genitive/accusative opposition does not exist any more in today’s German, it is still of interest as it has parallels in its different functions in current languages like Basque and in the slavic and finno-ugric languages [...]. The question [...] is why in languages that have a genitive/accusative opposition, the genitive preferably occurs in contexts of negation, especially in negative-polar contexts, in contrast to accusative. This phenomenon that can be observed as well in the history of the German language since Gothic times and that has been described already by Behaghel 1923 has survived as a relict until today in the case of brauchen [‘need’], the genitive object of which is characterized by negative polarity in contrast to the accusative object [...]:

\(^{82}\) It can be shown for verbal genitives in “ditransitive” constructions that here, the genitive forms a constituent with the verb that excludes the object; in other words, verbal genitives are the most deeply embedded verbal arguments there are.
Nominal genitive. The nominal genitive construction expresses a relation; Heidolph et al. say that it codes “Zugehörigkeit” (‘Belongingness’) in German, which is a very general meaning indeed. Consider the example in (209).

(209) Ottos Pferd
Otto’s horse

Thinking about what readings are available, (209) could be talking about the horse that Otto is riding (sitting on top of), the horse that Otto has placed a bet on, the horse that Otto has dreamt about, the horse that Otto (the geneticist) designed, or the horse that somehow belongs to Otto (that he ‘possesses’), where this last meaning enjoys most popularity. Zimmermann (1995) has shown that the genitive relation in German is monstrous, meaning that it refers deictically and absolutely at the same time – tradition has it that expressions may chose either of these options, but not both at the same time; it generally holds that interpretation depends either on an index (absolute reference) or on the context of utterance (deictic reference), but not both. Before we discuss this irritating property in more detail and propose a solution as to how we can uphold the basic distinction with regard to particular expressions, let us look at the few generalizations that exist regarding the interpretation of genitive relations in German, considering both prenominal and postnominal genitives (cf. in particular Hartmann/Zimmermann 2003).

– In combination with relational nouns, the postverbal genitive must be interpreted as an object/patient.

(210) Die Explosion Hugos
the explosion Hugo-GEN

(211) a. Caesars Eroberung Roms
b. # Roms Eroberung Caesars

(212) a. Ottos Halstuch von sich
Otto’s bandana of/by REFL
b. Ottos Halstuch von Karl Lagerfeld
Otto’s bandana of/by Karl Lagerfeld
c. ??Karl Lagerfelds Halstuch von Otto
Karl Lagerfeld’s bandana of/by Otto
The prenominal genitive leads to a definite interpretation of the NP as a whole, unlike the postnominal genitive.

\[(213)\]  
\[
\begin{align*}
\text{a. Der Welt Pferderassen} \\
\text{the world’s horsekinds} \\
\text{‘the/all horsekinds of the world’}
\end{align*}
\]

\[
\begin{align*}
\text{b. Pferderassen der Welt} \\
\text{horsekinds of the world} \\
\text{‘(some) Horsekinds of the world’}
\end{align*}
\]

The relation between the prenominal genitive and the head noun has to hold ‘in the present’ (Asher 2007):

\[(214)\]  
\[
\begin{align*}
\text{Ottos Frau ging in Köln zur Uni.} \\
\text{Otto’s wife went in Cologne to uni} \\
\text{‘Otto’s wife went to University in Cologne’}
\end{align*}
\]

\[(215)\]  
\[
\begin{align*}
\text{Die Frau Ottos/von Otto ging in Köln zur Uni.} \\
\text{The wife Otto-GEN/of Otto went in Cologne to uni} \\
\end{align*}
\]

These properties remind us of the proposals discussed above concerning the definition of transitivity; the prenominal genitive appears to figure as the subject of the relation (it has definite reference, it is high on a scale of agentivity (exerts control, carries responsibility, provides a link to the utterance situation), while the postnominal genitive appears to figure as the object – it is interpreted as a theme/patient with relational nouns and it is low on relevant agentivity scales. (215) is well suited to illustrate the difference between context-dependence and index-dependence: As Asher (2007) observes, the woman in (214) is married to Otto in the utterance situation under the preferred interpretation, i.e., the relation is context-dependent. In contrast, (215) is true as long as the woman in question is married to Otto at the time where she went to the uni. As we said, it holds according to classical reference theory that\textsuperscript{83}

\[(215)\]  
\[
\begin{align*}
\text{Die Frau Ottos/von Otto ging in Köln zur Uni.} \\
\text{The wife Otto-GEN/of Otto went in Cologne to uni}
\end{align*}
\]

\textsuperscript{83} The formulation is from Zimmermann (1995), who credits Frege, Carnap and Kaplan for the generalization.
I, here, now ...

Denotative terms as in (217) in contrast depend entirely on the world or situation that is depicted in the sentence that contains them, i.e., they depend only on the interpretation index as far as their interpretation is concerned:

(217) house, friend ... (dependent only on depicted situation (index))

Zimmermann demonstrates the monstrosity of nominal genitives with (218).

(218) Der JSF vermutet, dass mein Halstuch aus Naturseide ist. 
The JSF reckons that my bandana of natural silk is 

\[ V_s(((\lambda x) \text{JSF}_s(x), [\lambda i(\text{AUS}_i((\lambda x) \text{HT}_i(x)&\text{Z}_i(i)(x,((\lambda y) \text{S}_i(y))))], \text{NS}_i)]) \]

The genitive relation \( Z \) is context-dependent: depending on what the speaker has in mind, it may express e.g. origin (the speaker designed the bandana) or ownership (the speaker owns the bandana) etc. The reference of the arguments of the genitive relation \( Z \) is index-dependent, however: E.g., for the Jungscharführer, there is only one bandana that belongs to the speaker due to the uniqueness coming with the possessor, and this bandana is of natural silk. In actual fact, it may well be true that the speaker possess many bandanas of which none need be of natural silk – (218) remains true regardless, showing that establishing the reference of the arguments of the relation hinges merely on the interpretation index. (219) isolates the relevant part of the statement with explicit indices for perspicuity (“\( c \)” stands for “context-dependence”, “\( i \)” for “index-dependence”)

(219) Mein Halstuch ist aus Naturseide 
\[ \lambda x \lambda i([\text{AUS}_i((\lambda x) \text{HT}_i(x)&\text{Z}_i(i)(x,((\lambda y) \text{S}_i(y))))], \text{NS}_i)] \]

Replacement of the first person pronoun by an arbitrary NP shows that the monstrous nature of the genitive relation is independent of the nature of the prenominal genitive NP. As both the nature of the relation and the referents hinge on the expression of the genitive relation, splitting the prenominal genitive into a nominal part and an abstract POSS-morpheme does not help either: the mode of reference stays mixed, i.e., it remains both context- and index-dependent. Zimmermann (1995) concludes eventually that the bifurcation between context- and index-dependent elements cannot be upheld:

Doch angesichts der Tatsache, dass mit Verletzungen von (L) auch in anderen Bereichen zu rechnen ist und keine unabhängige Rechtfertigung des Prinzips in Sicht ist, scheint es mir ratsam, den Hang lexikalischer Ausdrücke zu einer nicht gemischten Referenzweise als Kuriosum abzutun.
In light of the fact that violations of (L) are likely to be encountered in other domains and that no independent justification of the principle is in view, it seem advisable to me to dispose of the tendency of lexical expression not to refer in a mixed way as a curiosity. (ibid., p. 71)

On our proposal, there is a natural way around assuming mixed reference of the nominal genitive relation that squares as well with what we observed with regard to the verbal genitive which seems to express absence of the genitive complement in the subject-worlds, viz., a privative meaning. Specifically, we need not say that any of the ingredients to the nominal genitive construction is monstrous per se. The prenominal genitive is context-dependent as it should be given that the subject establishes a link to the utterance situation (“anchoring”, cf. Enç 1987, Brandt 2003). The postnominal genitive comes to carry DIFF-O that due to the configurationally determined object status of the postnominal genitive NP itself is interpreted expatriately as not being in the subject referent’s worlds. If the subject referent’s worlds are the contextual worlds (cf. the observations around (214) and (215) above), then the object’s worlds, i.e., the postnominal genitive NP referent’s worlds must be the indexical worlds – as interpretation is either contextual or indexical and tertium non datur.

In support of an analysis along these lines, note that there appears to be a restriction on non-referring expressions in postnominal genitive position, reminiscent of restrictions on negation embedded under negation as central to the analysis of comparatives (cf. section 3.2).

\[(220)\]
\[\begin{align*}
a. \text{ in Niemandes Hand} \\
\text{in nobody’s hand} \\
b. *?\text{in der Hand Niemandes} \\
\text{in the hand nobody’s} \\
c. ??\text{in der Hand von Niemand} \\
\text{in the hand of nobody}
\end{align*}\]

According to our analysis, (220-b) contains a meaning that corresponds to “nobody is not in the subject’s worlds”, which appears fairly uninterpretable. Note that the imperative to go beyond the worlds independently given in the linguistic context (and usually supplied by the subject NP) could give a rationale as well of the oft-observed unexpected wide scope effects associated with postnominal “genitive” complements, akin to so-called inverse linking constructions exemplified in (221) (cf. Hirschbühler 1982).

\[(221)\] A flag is hanging in front of every building. 'For every building there is a flag that is hanging in front of it.'
(222) is a particularly intuitive example of the postnominal NP escaping the scope of the adjective *gefälscht* and giving rise to a curious reading according to which the institutions did the faking.

\[
\text{gelalchte Papiere von Behörden}
\]

fake documents from institutions

‘documents from institutions that are fake’ (the fake documents are from real institutions).\(^{84}\)

By way of conclusion, let us suggest a rationale for the condition that genitive must be overtly marked (Gallmann 1998, cf. above (204)). According to our analysis, genitive marking is always expatriately interpreted, where Expatriate Interpretation is in terms of possible worlds. Interpreting Diff-O in terms of possible worlds means interpreting modally. But modal interpretations are weaker than non-modal interpretations. But weaker interpretations must be marked (cf. the discussion of plural marking above in section 2.3).

\(^{84}\) The example is from a radio show (*Einslive*). Note that *Behörden* is a Bare Plural, expected to take narrowest scope.
4. Bound to contradict

This chapter argues that the line of analysis developed so far derives the ‘hidden meaning’ associated with a range of constructions; so far, there is no analysis at hand that reduces these surprising meaning aspects to more basic operations or principles that are independently motivated. Large part of what is to follow is about arguing how composition could go wrong at deeper levels of structure where violations of the second condition furnish quantification at higher levels of structure, namely, in particular, existential (≈ particular) negative quantification over a phenomenal variable.

Quine said that to be is to be the value of a bound variable. As we want to talk about something, we need as well variables. The question is how they get introduced. Certain expressions “carry” them – it is custom just to assume that they accompany quantifying expressions together with denotatively restricting expressions. A type of variable that is interesting us here is the phenomenal individual variable (cf. section 3.1.1) which is just like an ordinary individual variable, only that the domain within which it is interpreted is structured differently; in particular, parts of these domains generally include each other rather than belonging to complementary sets. According to the standard practice, we would want to say with regard to phenomenal variables that (certain classes of) gradable adjectives or other expressions living on scales appear to carry phenomenal variables that are particularly well-suited for embedding, namely, they carry thresholds. Similarly, expressions that we are used to thinking of as quantifiers over times (always, never...), worlds (must, mayn’t) may be looked at as quantifiers that bind phenomenal variables. In this chapter, we first look at cases that involve the introduction of phenomenal variables by means of “hijacking” an ordinary individual variable (really: the ordinary variable is expatriately interpreted) as a means of circumventing a problem at the syntax-semantics interface that arises from “illegal reflexivization”.

Reflexivization can be understood to correspond to an operation that makes a relation symmetric.\(^1\) There are different ways to achieve this: we can identify the argument places or let the relation apply in both directions (which may make a difference depending on the matter that is negotiated, cf. section 2.3).

\(^1\) Symmetry may be more or less “perfect”, and this is reflected in reflexivization options or rather options of reciprocalization. E.g., the so-called discontinuous construction is only possible across languages if symmetry is perfect, i.e., holding at all relevant levels. Cf. sections 4.1.1 and 4.3.2 below.
There are relations that are born or created asymmetric, in particular, as bearing on the coding of comparison (section 3.2) or spatiotemporal relations (section 4.1.1). While reflexivization is ill-defined for such relations, the grammar still performs the operation in such domains, for the interface to ensuingly attempt to compensate for the wrongdoing (from the interpretive, i.e., semantic perspective), by expatriately interpreting, i.e., pushing the offensive O part of $\text{DIFF}$ elsewhere (and, preferably, into the phenomenal domain). For example, negating amounts to be the same as switching argument places, i.e., $\neg R_{x,y}$ is the same as $R_{y,x}$ in the case of asymmetric relations (taking them to be totally connecting). This fact plays an important role for the coding of reciprocal as opposed to reflexive meanings by means of weak elements (i.e., \text{/zich/}, cf. section 4.1.1). \text{/zich/} means no more than that the argument that is represented by it is included in (less specific than, more general than, part of) the other argument.\footnote{Cf. section 3.3 for discussion of different semantic dimensions as bearing on the determination of grammatical function.} Departing thus from the standard view that binding of \text{/zich/} establishes an identity relation in the reflexive construal, we submit that the meaning of reflexive \text{/zich/} is as in (1).\footnote{More formally, we have (i), where $R$, a relation entailed by the meaning of the lexical verb, captures that $x$ and $y$ coarguments:}

\begin{equation}
\begin{align*}
\lambda x \exists y R_{x,y} > & \wedge x \supseteq y \\
& \text{‘the } x \text{ such that there is a } y \text{ sich that } x \text{ is a(n improper) superset of } y
\end{align*}
\end{equation}

Section 4.2 discusses the infamous tough-constructions, and, in this context, infinitives. Loosely speaking, infinitives may serve to present something as an object that is related to a subject which is left unexpressed in the infinitival structure itself but must be independently accessible (by means of what is called “control”). Infinitives are very flexible as concerns their interpretation (cf. Rapp/Wöllstein 2013), and they are arguably poorer structurally than finite sentences (as they lack the temporal, modal and subject-related information that is given by finiteness and agreement); we argue infinitives are so flexible because like excessives, they denote straightforward contradictions.
Illegal reflexivization

hence always look for a place where the O meaning can be pushed. The “internalizing” property of infinitives is argued to be a consequence of this. Section 4.2.2 shows some of the breadth of phenomena involving contradiction and its compensation by presenting cases that involve the negation of entailed meanings. A striking case is that of so-called mis-constructions (Kunze 1997) which involve both a verbal prefix and reflexive morphology and very systematically encode a “wrong” meaning. At the pragmatic end, we discuss irony and related phenomena that are generally deemed rhetorical, moving on to recapitulate the case of excessives as a syntactic variant of the same phenomenon. We close with the case of so-called “prative” predicates like fake or false that appear to have the same underlying mechanism of negating an “asserted” meaning (provided by the head they modify) built into their lexical semantics.

Section 4.3 presents expletive there as well as dative arguments as expressions that act in essence as quantifiers that bind phenomenal variables; accordingly, we show that expatriate interpretation creates an environment where datives or expletives are licensed. We argue that in actual fact, both datives and existential there carry Diff which cannot however be interpreted in situ. The need to push the particular negative part of Diff to the theme argument accounts for certain phenomena that belong to the realm of definiteness effects: the theme expression must be capable of hosting the O meaning and therefore must not be already quantified.

4.1 Illegal reflexivization

The syntactic routine of reflexivization is generally taken to turn a relation into a particular kind of property semantically; as such, it indicates that the derivation must have started with a relation, entailing in the transitive case that Diff is coded as well. Reflexivization of a transitive relation appears to be a natural way of expressing properties; e.g., Felix (2:10) produced the example in (2) which is ungrammatical in adult speech for apparently shallow reasons; the example contains a directional PP that we argued above following Gehrke gives rise to a syntactically transitive configuration. Note as well that there is the perfectly grammatical analogue of (2) in (3) that does not appear to differ conceptually in essential ways from (2).

(2) Ich bin grad dabei um mich auf den Stuhl zu klettern.  
   I am just at.it to me onto the chair to climb.  
   ‘I’m busy climbing onto the chair.’

(3) Ich bin grad dabei mich auf den Stuhl zu setzen.  
   I am just at.it me onto the chair to seat.  
   ‘I’m busy taking a seat.’
As we discussed in section 3.3, the view that reflexivized relations express properties is perfectly compatible with their relational status; it appears most compatible with the traditional binding theoretic view to assume that technically, reflexivization relates the two positions of a relation in a certain fashion, namely, under the standard assumption, by identifying them; on the expressive side in German and many other languages, this is achieved by replacing the ‘bound’ argument slot by a special reflexive pronoun. Furthermore, there are two options a priori how one could go from a relation to a property via reflexivization: the object could be bound to the subject, or the subject could be bound the object.\footnote{The question whether reflexive structures are syntactically unaccusative or unergative is controversially discussed. Marantz (1984) and Pesetsky (1995) argue for the former, Reinhart/Siloni (2005) for the latter view.} The first option is well established: it is the object expression that is substituted for by the reflexive form, which can be shown as well to be poor contentwise, depending therefore on its antecedent to be associated with a referent. The second option – binding a subject to an object – does not seem to be instantiated superficially; it is however what we argue happens in inchoatives and middles (cf. for related considerations Haider 1985 and Schäfer 2013). We do need relations, but might be able to do without properties (cf. sections 2.3, 3.3). For the discussion to follow, the following points are central.

- The presence of *sich* indicates that the structure is relational. Under Reinhart’s more recent analyses (cf. Reinhart 2000, 2002), reflexivization turns a two place relation into a property by fusing the agent and theme argument slots. Alternatively, and more reminiscent of the binding theory as laid out in Reinhart (1976) or Chomsky (1981), we can say that reflexivization keeps the arity but adds a condition on the referential relation between the argument places.

- Under the mainstream account, it is assumed that the relation between the argument places is that of identity. We propose here that the relation in question is weaker, namely, the argument places get to stand in an inclusion relation as a result of reflexivization as defined in (4).

\[(4) \quad \lambda x \exists y R<x,y> \land (x \supseteq y \lor x \subseteq y)\]

- An important connection between negation and reflexivization comes out clearly in asymmetric (strictly ordered) domains: Negating the relation amounts to the same as switching the arguments, under the assumption that connectivity is total (i.e., for all x, y either xRy or yRx):

\[(5) \quad \text{The main dish is not following the dessert.} \quad \rightarrow \quad \text{the dessert is following the main dish.}\]
Let us look in some more detail at an illustrative example. A relational expression denotes a set of ordered pairs. E.g., (6) is true if and only if the pair \(<Otto, Anna>\) is in the extension of the relational predicate expression \(shave\).

(6) Otto rasiert Anna.
   Otto shaves Anna.
   ‘Otto is shaving Anna.’

Otto and Anna are distinguished individuals; among other, they are in different spatiotemporal locations. We may now reflexivize the predicate; as speakers of German, we do this using the reflexive anaphoric expression \(sich\), yielding (7).

(7) Otto rasiert sich.
   Otto shaves REFL.

According to common wisdom (Reinhart/Reuland 1993), reflexivization corresponds semantically to turning a relation (a function from a pair of individuals into a truth value) into a property (a function from an individual into a truth value), i.e., going from what is given in (8-a) to what is given in (8-b).

(8) a. \(\lambda y \lambda x \text{SHAVE}<x,y>\)
   b. \(\lambda x \text{SHAVE} <x,x>\)

(8) instantiates a case of strengthening: the reflexive meaning is more specific or exclusive than the original relational meaning in that the denotation of a reflexive structure is the pairs with identical members, which is a subset of the set of pairs that the original relation denotes. Doing things this way accords with the observation that there are languages without anaphors such as Loniu, where pronouns may be interpreted anaphorically as well, as well as with the observation that Principle B of the binding theory according to which pronouns must be free in their local domain is delayed in language acquisition.\(^5\) Thus, up to a certain age, children coinindex pronouns with subjects of the same sentence.

---

\(^5\) In Büring’s (2005, p. 43) formulation of principles A and B, we thus have (ii) in addition to the formalization of the reflexivizing operator (“self”) in (i) which by itself does not guarantee the complementary distribution observed between reflexives and pronouns.

(i) \(\text{SELF}\) is that function from relations to properties such that \(\text{SELF}(R) = \lambda x.R(x)(x)\) for all \(R \in D_{e,et}\)

(ii) a. No pronominal can be used where a reflexive would yield the same meaning.
   b. Unless a transitive verb \(V\) has a reflexive pronoun as its argument, interpret it as \(\lambda x.\lambda y.[[V]](x)(y) \land x \neq y\).

Principle B (and C) now become “elsewhere” conditions: If the more specific reflexivization rule cannot apply, the arguments of a transitive [sic!] predicate have to be interpreted as referring to different individuals. Thus, we get a directive that can be informally put as in (iii):

---
Bound to contradict

(9)  Peter, rasiert ihn₁.
    Peter shaves him

Only when they learn that there is a different construction that guarantees binding – in particular, the less elaborate as well as specific hence cheaper option given in (10) do they enforce principle B (or principle A, if you like).

(10) Peter, rasiert sich₁.
    Peter shaves REFL

The child starts with an all-purpose item that is just a naked variable. It may receive the same value as the last entertained variable of that type or it may receive a different value. The child learns that there is an element that has to be bound, namely, /zich/, i.e., the child learns principle A. The meanings this gives rise to are a subset of the meaning of the all purpose item. The meaning of the all purpose item now changes: it becomes the original meaning minus the /zich/ meaning, i.e., the child learns principle B. There are also languages that feature only pronouns and use them in contexts where languages that have anaphors would use these, such as Loniu (Hamel 1994, p. 54).

(11)  a. Suthu cathiti suthu.
       they.DU cut they.DU
       ‘They cut them.’

  b. Suthu cathiti suthu.
     they.DU cut they.DU
     ‘They cut themselves/each other.’

This is parallel to the distinction between plural and singular, where the latter instantiates the more specific meaning, cf. section 2.3 above.

(iii) Refer to something other than the other argument(s) of your predicate if you are not a reflexive pronoun.

As stated, the binding principles only talk about transitive predicates. Indeed structures that are commonly regarded as less transitive often ameliorate expected Principle B effects. The examples in (iv) and (vi) illustrate this for the experiencer or double object type os structures with dative arguments.

(iv)  Ad alcuni, piacciono/interessano solo loro, stessi.
      To some please/interest only they EMPH-selves.
      (Italian, Everaert 1990)

(v)   Mariu fannst hun vera gafuth.
      Mary-DAT thought she-NOM be gifted
      ‘Mary thought she (=Mary) was gifted.’

(vi)  Anna hat Otto, [ihn₁]f zugewiesen.
      Anna has Otto-DAT him assigned.

In dative constructions, assigning the arguments different indices fails as they are not distinguished in a way that meets the requirements of Transitivity. Cf. section 4.3.2.
4.1.1 Symmetrization out of order

The cases that we are looking at here can be characterized as involving illegal reflexivization, i.e., reflexivization leading to an uninterpretable semantics. To give an illustrative example, compare (12-a) to (12-b).

(12)  

a. Otto steht neben Ede.  
Otto stays next to Ede  

b. Otto steht neben sich.  
Otto stays next to REFLEX

While (12-a) expresses among other a spatial relation between the individuals Otto and Ede, (12-b) amounts to “Otto is out of his mind”. Arguably, this extraordinary meaning is the effect of expatriately interpreting part of the standard semantics associated with the expressions entering (12-b) and thus arriving at a requisite meaning “around the corner”, in a manner that serves expressive economy. The case in (12) belongs to an infinite class of cases where reflexivization goes astray due to properties of the domain; in particular, the property that we are interested in is that of asymmetry.

A related puzzle lies in the fact that reciprocal readings of /zich/ appear to be systematically excluded in certain domains, in particular, in prepositional phrases, cf. (13-a) and (13-b).

(13)  

a. Otto und Anna kratzen sich  
Otto and Anna scratched themselves/each other  

b. Otto und Anna standen neben sich  
*Otto and Anna stood next to each other

Gast/Haas (2008) note that /zich/ cannot be interpreted reciprocally in prepositional phrases. That it is the spatiotemporal semantics that is the problem is suggested by the fact that reciprocal readings of /zich/ are to some extent possible under prepositions, namely, when they do not carry more abstract meanings. The following examples in which the adverb gegenseitig ‘mutually’ makes it clear that a reciprocal reading of the construction is intended were retrieved from the German Reference Corpus (Deutsches Referenzkorpus) DeReKo hosted at the Leibniz-Institut für Deutsche Sprache by means of the COSMAS corpus search engine.

(14)  

[...] dank des Drucks, den die Länder am Euro-Tisch  
[...] thanks to the pressure that the countries at the euro-table  
gegenseitig auf sich ausüben.  
mutually on each other execute  
(Berliner Zeitung 20.01.2001, p.4)
That certain forms of symmetrization – in particular, reciprocalization – yield peculiar results when applied in ordered domains has been noted by Langendoen 1978, discussing so-called ‘linear’ readings as surfacing in (16).

(16) The plates are standing on top of each other.

On the classic understanding of reciprocity (cf. Dalrymple et al. 1994, 1998), for (16) to be true each plate that is being talked about should either be related to every other plate (strong reciprocity) or to some other plate (weak reciprocity). As is easily seen, neither strong nor weak reciprocity capture the meaning of (16) – e.g., there is no plate clearly on top of which the lowest plate is standing. As Langendoen (1978) noted, the reading of (16) is of the ‘linear’ type; this is schematized in (17) (Langendoen’s (30)).

(17) o–o–o–o

Langendoen notes that linear readings occur with particular relations, namely, relations having to do with location in time and space specifically.

We note that ERSs (Elementary Reciprocal Sentences) that can be used to make true assertions of the type (30) all involve spatial or temporal relations that order the elements of the set denoted by A in one of the ways listed in (37).

(37) a. from top to bottom
    b. from outside to inside
    c. from front to back
    d. from left to right or from right to left
    e. from earlier to later

Examples like (18), built on the example in (16), do fall under Langendoen’s scheme and satisfy as well weak reciprocity.

(18) They are standing next to each other.

Dalrymple et al. show that the linear reading – later called the Inclusive Alternative Ordering (IAO) – is equivalent to weak reciprocity if and only if the relation in question is symmetric, as is the case with the relation expressed
by *stand next to*. (19) and (20) give Dalrymple et al.’s definitions of weak reciprocity (their “one way weak reciprocity”) and IAO respectively.  

(19) One-way weak reciprocity:  
\[ \forall x \in A \exists y \in A (x \neq y \wedge R_{xy}) \]
*A are staring at each other*

(20) Inclusive Alternative Ordering (IAO):  
\[ \forall x \in A \exists y \in A (x \neq y \wedge (R_{xy} \vee R_{yx})) \]
*A are stacked atop each other*

Dalrymple et al. (1998, p. 175) explain concerning IAO: “Informally, IAO says that every member x of the set A participates with some other member in the relation R as the first or as the second argument, but not necessarily in both roles.” The point is that it can be argued that IAO is no reciprocal meaning at all but that it is really weak reciprocity “gone wrong” because of the structure of the domain. In this vein, Dalrympe et al. comment:

In fact, all examples in the literature we are aware of which have been proffered as attesting weak reciprocity have as their scope an inherently symmetric relation. When the scope of the relation R is symmetric, Inclusive Alternative Ordering is equivalent to Weak Reciprocity [as well as Symmetric Reciprocity]. (ibid., p. 176)

Beck (2001, pp. 128f) points out that uninterpretable reciprocals are common with relations that are asymmetric to different degrees.

I have found basically three types of asymmetric relations. The first type are comparisons (either verbal or with an explicit comparative). These are always unacceptable; in particular, the only reasonable reading IAO is unavailable ((201) and (202)).

(201)  
- a. # The two trees are taller than each other.  
- b. # The two sets outnumber each other.

(202)  
- a. # The skyscrapers are taller than each other for miles.  
- b. # These sets outnumber each other.

Dalrymple et al. argue against the very existence of weak reciprocity as assumed by many to be the basic reciprocal meaning. Weak reciprocity is given by Langendoen as in (i).

(i) Weak reciprocity (Langendoen 1978):  
\[ \forall x \in A \exists y, z \in A (x \neq y \wedge x \neq z \wedge R_{xy} \wedge R_{zx}) \]

According to Dalrymple et al., strong reciprocity is the basic meaning; interestingly, this entails that many if not most actual reciprocal interpretations result from pragmatically weakening a logically stronger reading.

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6 Dalrymple et al. argue against the very existence of weak reciprocity as assumed by many to be the basic reciprocal meaning. Weak reciprocity is given by Langendoen as in (i).
Bound to contradict

The second type is “normal” relations that are asymmetric by nature [...]. These tend to be unacceptable with small groups and get better with large groups ((203) and (204)). [...]

(203)  
  a. ??These three people inherited the shop from each other.  
  b. ??The three men buried each other on this hillside.  
  c. # My mother and I procreated each other.

(204)  
  a. The members of this family have inherited the shop from each other for generations.  
  b. The settlers have buried each other on this hillside for centuries.

On Dalrymple et al.’s analysis of IAO, there is a rather straightforward explanation why Beck’s examples cannot be interpreted. Namely, for IAO to be true, it has to hold among other things that (irrelevant parts neglected, compare to the more precise formula in (20) above).

(21)  
  \[ xRy \lor yRx \]

Taking it that “\lor” is interpreted inclusively, (21) is true in particular if both Rxy and Ryx. But this case is forbidden under asymmetry, which is defined as in (22) (repeated from above).

(22)  
  \[ xRy \rightarrow \neg(yRx) \]

In other words, assuming “\lor” to be inclusive as we do and assuming that Dalrymple et al.’s description of IAO is right, we arrive at a contradiction between the truth conditions of IAO and a property of the domain, namely, asymmetry. Before moving on, we might ask why reciprocals are out with some asymmetric relations but not others, cf. Beck’s taxonomy just given, in particular, cases like inherit or bury. It would seem that the place to look in light of the ameliorating effect of increasing the domain is the property of connectivity (cf. again the definitions of different orderings given in section 3.1.1 above). More specifically, under such an approach, relations that totally order the domain, yielding thus a completely connected domain, would yield irreparable results while relations that only partly order the domain would not. The bigger the domain, then, the more likely the possibility that elements are not connected to each other in which case the relation does not talk about them and no contradiction arises between IAO and the property of asymmetry.

It seems to be clear that reciprocal readings depend on properties of the domain and thus provide a strong case for weak semantics providing a wealth of different readings without extra assumptions. The table in (23) (taken from class...
notes by Yoad Winter) gives prototypical examples of English verbs and basic semantic properties of the relations they express together with the systematically arising readings that are associated with the reciprocal constructions built explicitly by means of the anaphoric element each other.

\[
\begin{array}{cccc}
\text{sym} & \text{asym} & \text{trans} & \text{RECIPE} \\
\text{know, see} & - & - & - & \text{SR} \\
\text{be equal to} & + & - & + & \text{SR} \\
\text{sit alongside} & + & - & - & \text{IR} \\
\text{stare at, kick} & - & - & - & \text{OWR} \\
\text{give measles to} & - & (+) & - & \text{IAR} \\
\text{stack atop} & - & (+) & - & \text{LIN} \\
\text{be contained in} & - & + & + & \text{LIN} \\
\end{array}
\]

Let us move on then to provide reasons why /sich/ cannot be interpreted reciprocally in spatiotemporal environments, while explicitly reciprocal expressions can be interpreted here, cf. (24).

(24) a. Sie folgten einander (ins Zimmer).

   they followed each other (into the room)

b. *Sie folgten sich (ins Zimmer).

   they followed REFL (into the room)

To repeat, typologists do not hesitate to say that the ‘ambiguity’ between reflexives and reciprocals is a case of polysemy. This is because it is observed across languages. It makes no wonder then that we sometimes see the closeness (and confusion between) reflexive and reciprocal expressions also within one and the same language. E.g., the following examples from newspapers and the news are strictly speaking ungrammatical due to both sich and einander occurring in the same slot, but do not sound bad at all to the native speaker.

(25) Sie stehen sich einander ... unversöhnlich gegenüber.

   they stand REFL each other ... unforgiving opposite

(26) Man wünscht sich einander eine gute Nachbarschaft.

   one wished REFL each other a good neighborhood

   (Derwesten.de, 31.3.2012)

(27) Gespräche haben aber nur dann Aussicht auf Erfolg, wenn man

   talks have but only then prospect of success if one

   sich einander anerkennt, ...

   REFL each other acknowledges

   (Trierischer Volksfreund, 30.03.2012)
Bound to contradict

To the extent that a term may not be followed by a more general one (cf. 2.2), the examples suggest that *sich* is more general than *einander*. The order *sich* – *einander* is much more frequent than the order *einander* – *sich*; the latter order can be found as well though within nominal constructions.

(28) Da zwei einander sich widersprechende Sätze im Sinne des Nicht-Widerspruchsprinzips nicht zugleich wahr sein können, folgt daraus, daß entweder der eine oder der andere wahr ist; eine dritte Möglichkeit gibt es (in der Logik) nicht.

The data show that matters aren’t all that simple, even if it is hard to doubt that there is a systematic relation between the reflexive vs. reciprocal use of certain bindable expressions. Thus, from a typological perspective, Nedjalkov (2007, p. 17) writes:

> Reflexive-reciprocal polysemy, typical of reflexive (clitic) pronouns; inflectional forms called middle may be assigned here as well. The reciprocal meaning is semantically akin to the reflexive meaning as in both cases the same entity(-ies) (person(s)) behave both as agent and patient; [...] The crosslinguistically frequent reflexive-reciprocal polysemy would seem to be nothing than an accident if the respective interpretations were not logically related as well. We adopt Dalrymple et al.’s basic analysis according to which SR is the basic interpretation of reciprocal constructions, cf. (29).

(29) Strong reciprocity:
\[
\forall x, y \in A \ (x \neq y \rightarrow R_{xy})
\]

A hit each other

Dalrymple et al. give the following paraphrase of strong reciprocity:

> Informally, SR says that every member of A [...] is related directly by R [...] to every other member [...]. (ibid., p. 169)

Accordingly formulated, reflexivity is defined in (30).

(30) Reflexivity:
\[
\forall x \in A \ R_{xx}
\]

A are identical with themselves

\[
\forall x, y \in A \ (x = y \rightarrow R_{xy})
\]

A are identical to each other
Remember though that we take /zich/ to have a weaker meaning, repeated in the Dalrymple et al. notation in (31) (the subscript “w” signalling weakness).

(31) Reflexivity$_w$:
\[ \forall x, y \in A \ (x \subseteq y \lor y \subseteq x) \rightarrow R_{xy} \]

Taking difference to be the negation of identity, we get for SR (repeated in (32)) what is given in (33).

(32) Strong reciprocity (SR):
\[ \forall x, y \in A \ (x \neq y \rightarrow R_{xy}) \]

(33) SR$_W$:
\[ \forall x, y \in A \ (\neg(x \subseteq y \lor y \subseteq x) \rightarrow R_{xy}) \]

Note now that there is something seriously wrong with (33) as being derived from (31). Interpreting Nedjalkov’s point such that x and y are “the same” in being both agent and patient — and in being part of the same thing, namely, the set A — (33) amounts to the negation of a property, which means in strictly ordered domains that it is nothing but a weaker version of (31). But this would mean that starting from the reflexive meaning, the basic reciprocal meaning is derived by an operation of weakening. But this goes contra Dalrymple et al.’s basic assumption, namely, the SMH, given in (34).

(34) The Strongest Meaning Hypothesis:
“A reciprocal sentence is interpreted as expressing the logically strongest candidate truth conditions which are not contradicted by known properties of the relation expressed by the reciprocal scope when restricted to the group argument.”

Another way in which (33) is wrong is the following. As can be easily shown with the method of truth tables, it holds in propositional calculus that

(35) \[ \neg(p \lor q) \equiv \neg p \land \neg q \]

Now let \( p = x_{Ry} \) and \( q = y_{Rx} \). If \( R \) is strictly ordered, \( \neg(x_{Ry}) \) yields \( y_{Rx} \). As we do this on both sides of the negation, the end result is (36).

(36) \( x_{Ry} \land y_{Rx} \)

But (36) is impossible, as it is the negation of the definition of asymmetry as defining strictly ordered relations and added in (37-d) to the definition of asymmetric orderings.
(37) R is an ordering relation in the sense of < (short: R<) iff it is irreflexive (a), transitive (b) and connected (c):
   a. There is no x such that xRx  Irreflexivity
   b. For all x,y,z, if xRy and yRz then xRz  Transitivity
   c. For all x,y xRy or yRx  Connectivity
   d. xRy → ¬(yRx)  Asymmetry

(38) ∀x, y (x,y ∈ D< → x ⊂ y ∨ y ⊂ x) ordered domain

In sum, explanations of the facts given in the beginning of this section can be given on the basis of the meanings assumed here for the reflexive and reciprocal construction, once we acknowledge the fact that negation does not amount to complement formation in strictly ordered domains. There is no reflexivity in strictly ordered domains because strict orderings are incompatible with Reflexivity. A way out would seem to take the reciprocal interpretation of /zich/.

But this may go against the SMH. Or, taking it that the reciprocal meaning is derived from the reflexive one, applying the usual logical routines yields a result that contradicts asymmetry which is just what defines the relation that we are looking at.

In order for the last explanation to make sense, we would seem to be forced to say that reciprocal einander has a different semantics from ‘reciprocal’ sich. This is quite arguable given prima facie contrasts like in (39), variants of the corpus examples given above:

(39) a. Sie passen gegenseitig auf sich auf.
     They pay.attention mutually on REFL PRT.
   b. ??Sie passen gegenseitig auf einander auf.
     they pay.attention mutually on each.other PRT

It is maybe needless to say that the semantics proposed for SR_W is not at all like what is usually proposed in the literature. E.g., according to the influential analysis of Heim/Lasnik/May (1991), each other consists of two parts: the universal quantifier/distributor each and the contrast element other. At LF, the universal quantifier/distributor adjoins to a position c-commanding the antecedent expression:

(40) [CP [DP [DP the horses ] each_i ] [VP hate [t_i other_i]]]
     ‘The horses hate each other’

Arguably given surface appearances, sich may not have such a complex structure. The prediction is that certain scope ambiguities arising with einander do not arise with (reciprocally interpreted) sich. While I think this is arguable, I leave this matter for further research here.
The possible interpretations of German /zich/ provide a test for asymmetry, stated in the generalization in (41).

(41) /zich/ cannot be interpreted reciprocally in asymmetric relations

There is also a test for symmetry that involves /zich/, namely, the discontinuous reciprocal construction. Dimitriadis (2008) has shown that the discontinuous construction is only possible with predications that can be construed in a certain symmetrical sense, what he calls irreducible symmetry:

A predicate is irreducibly symmetric if (a) it expresses a binary relationship, but (b) its two arguments have necessarily identical participation in any event described by the predicate.

Thus, the following examples show that while the predicate *können* (‘kiss’) can be construed symmetrically, the predicate *vergöttern* (‘deify’) cannot.

(42) a. Johann und Maria küssen einander.
    John and Mary kissed each.other.
    Johann und Maria küsssten mit Maria.
    John kissed REFL with Mary
    ‘John and Mary kissed.’

(43) a. Johann und Maria vergötterten einander.
    John and Mary deified each.other.
    Johann vergötterte sich mit Maria.
    John deified REFL with Mary
    ‘John and Mary deified each.other.’

We predict, correctly, that the constructions we have been looking at here – comparatives in general, constructions with directional prepositional phrases as well as certain classes of lexical predicates cannot be construed with the discontinuous construction.

(44) *Johann is sich mit Maria größer
    Johann is REFL with Mary taller

(45) a. Otto und Maria folgen einander.
    Otto and Mary follow each.other.
    *Otto folgt sich mit Maria.
    Otto follows REFL with Mary.

(46) a. Otto tanzte sich mit Maria in den Saal
    Otto danced REFL with Mary into the hall
    (?)Otto und Maria tanzten einander in den Saal
    Otto and Mary danced each.other into the hall
Moreover, it turns out that there are beautiful generalizations in the realm of the discontinuous constructions that relate to case. Thus it is true that dative-selecting predicates never enter the discontinuous construction except (for some speakers) for the cases ähneln and gleichen (‘resemble’) that talk about similarity, an apparently symmetric concept.

(47) a. Otto und Maria ähneln sich.
Otto and Mary resemble REFL
b. *Otto ähnelt sich mit Maria.
Otto resembles REFL with Mary.

We will have opportunity to apply this test further below in section 4.3.2.

4.1.2 Inchoatives and Middles

We argued above that transitive relations as well as binding structures are both asymmetric. More specifically, we assume (cf. section 3.3) that it is the first argument in a transitive relation that must meet certain properties rather than the second argument. In the prototypical case, the agent is mapped onto first position, and the remaining argument is mapped onto second position whatever its properties. Let us put this down informally as in (48).

(48) In a transitive relation, the first argument (subject) has certain properties (“agentivity”) distinguishing it from the second argument (object).

Consider now binding relations and how they are asymmetric as well. The bound argument can have no properties that the binding argument does not have as well, but it is possible that the bound argument has fewer properties than its antecedent, just like /zich/ is poorer from the morphosyntactic feature perspective than its antecedent. Picking up the short discussion of mass nouns and kind interpretations above in section 2.3.2, we see that anaphors may have a more general meaning than their antecedents in examples like (49).

(49) a. At the post-WW III peace meeting, Martians presented themselves as almost extinct.

b. At the post-WW III peace meeting, some Martians presented themselves as almost extinct.
(Rooth 1985, from Krifka et al. 1995)

According to Rooth, themselves in (49-a) can be interpreted as a kind also if Martians receives an existential interpretation. Analogously in German, we can have structures as in (50) where /zich/ should have kind reference as it serves as the subject of the kind predicate.
(50) Auf der Konferenz der Tiere präsentierten die Wale sich als praktisch ausgestorben.

In a similar vein, Reuland (2011, p. 234) provides the following evidence to the effect that unlike the complex anaphor *sich zelf, /zich/ behaves not like an individual referring expression but has cumulative reference rather like a mass term (Reuland’s original numbering).

Suppose a group of soldiers has been given the assignment to hold a hill; subsequently the enemy attacks them. After the battle we can have a number of situations. For our purposes two are relevant: (i) the soldiers kept the hill, but at the cost of most of their lives; (ii) the soldiers lost the hill, they all stayed alive. In the first case one can properly say (82a), but not (82b). In the second case one can say either:

(82) a. De soldaten verdedigden zich met succes.
   the soldiers defended “them” successfully
   b. De soldaten verdedigden zichzelf met succes.
      the soldiers defended themselves successfully

What this shows is that *zichself has a distributive reading (each of the soldiers must have defended himself successfully), whereas *zich is collective.

We have that A) subjects are more specific than objects and that B) full NPs are at least as specific as anaphoric expressions bound by them. Now in ‘regular’ binding structures like (34-b) above, both conditions are met. We are thus used to thinking of “standard” reflexivization as binding the object expression to the subject expression. From a purely logical perspective, there is as well the option of binding the object to the subject. Inchoatives and middles get reflexivization wrong in this way, violating the condition that the object have no properties that the subject does not have as well, viz. the “second condition” (which is really one aspect of interpreting Difference, cf. section 3.3).

(51) Second Condition
The argument that is interpreted as the second member (= object) of a transitive relation lacks certain semantic properties that the argument that is interpreted as the first member of the relation (= subject) has.

Let us, as a starting point, sum up influential earlier analyses concerned with inchoative or middle structures in the table in (52), where “CM” stands for “construction meaning”, “IE” stands for “invisible element”, and “AM” stands...
Bound to contradict

for “ambiguity”; “Motto” is intended to indicate the mainstream analytical strategy regarding the construction; forms like “C89” are shorthands for particular proposals (in this case, Condoravdi’s 1989 middle analysis).\footnote{The shorthands translate as follows: C89 = Condoravdi 1989, CH89 = Chierchia 1989, D01 = Dowty 2001, KG08 = Koontz-Garboden 2009, L05 = Lekakou 2005, Sch13 = Schäfer 2013, St02 = Steinbach 2002.}

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|c|c|}
\hline
 & & & & \\
Inch & CM & IE & AM & Motto \\
\hline
Mid & CH89, KG08 & All (?) & Sch13 & V\textit{BECOME} \\
C89, D01, L05 & C89, L05, St02 & Sch13, St02 & P\textit{RONGEN} & \\
\hline
\end{tabular}
\end{table}

We will discuss particular insights of particular proposals in more detail in the appropriate context; the point here is to remind us what the analysis proposed here might be an alternative for. Regarding the change of state interpretation of the inchoative construction, then, the mainstream strategy is to postulate a silent verbal element that has the meaning of the English verb \textit{become} (cf. von Wright 1965, Dowty 1979). Regarding the modal (and generic) interpretation of middles, the mainstream strategy is to posit a silent pronoun that has the meaning of the English pronoun \textit{one}. Beyond positing construction semantics (as done to some extent by Condoravdi 1989 for middles), earlier analyses of inchoatives or middles mainly build on the idea that the meanings observed with these constructions stem from invisible counterparts of words that we believe to carry these meanings.\footnote{Condoravdi argues that middle constructions map in a particular way on special topic-focus structures, cf. Brandt (2009) for some discussion. Steinbach (2002) claims that inchoatives and middles feature a special reflexive pronoun that is not bound in any way (like the regular reflexive pronoun) but merely signals argument reduction. Steinbach’s proposal builds on the assumption of ambiguity, then.}

However, saying e.g. that a change of state meaning stems from invisible \textit{become} is like taking for granted what needs to be explained; also, it leaves the relation to middles mysterious that can be crosslinguistically observed – on the contrary, middles are characterized by stative (generic) temporal interpretations. To give some intuitive initial motivation for our claim that the change of state semantics can be traced to the reflexive morphology, note that the basic verbal constructs that code change of state in German prominently feature reflexive morphology (and, frequently in addition, the preposition/particule \textit{zu}, cf. section 3.3.2 for discussion).

Verbal constructs expressing ‘pure’ changes of state in German:
\textit{sich verändern, sich wandeln}

Adopting an earlier used metaphor, the problem with inchoatives and middles is an argument-structural version of the what falls under Hurford’s constraint:
Illegal reflexivization

There is a relation, but one of the argument places is more general than (entailed by) the other argument place. In ordinary reflexive structures this is the case as well, but crucially, the subject is more general than the object place. In inchoatives as well as middles, the object is more general than the subject place, and this is illegal, namely, it violates what we earlier called the “second condition”. Cf. Kemmer (1993) for the proposal that middles are the “middle ground” between transitive and intransitive structures for not furnishing distinguishable referents. This is really the argument structural variant of the “second condition”, repeated in (54).

(54) Second Condition
The argument that is interpreted as the second member (= object) of a transitive relation lacks certain semantic properties that the argument that is interpreted as the first member of the relation (= subject) has.

Due to the violation of (54), the “second” meaning cannot be realized with interpretation of the VP cycle. In inchoatives, it is pushed to the next cycle where aspect or tense are negotiated. The change of state interpretation is the consequence. In middles, the “second” meaning is interpreted at the threshold level, leading to comparative semantics. The difference in interpretation between inchoatives and middles is due to grammar operating opportunistically, i.e., using what is most easily available: in inchoatives, pushing Diff-O to the temporal level is the option that seems nearest by. In middles, Diff-O can be pushed to the threshold level as the adjective that is part and parcel of middles introduces thresholds into the semantics even before it comes to dealing with temporal structure. Thresholds are even locally available (cf. example (84) in section 3.2.2); however, comparing the actual object-NP referents to their kind (inserted as subject argument) leads to a contradiction that is repaired by modalization. A new problem arises due to the special, rigidly designating semantics of kinds; this problem is repaired by generalization.

Transitive predicates denote relations, and ordinary reflexivization as just discussed derives a property from a relation by binding the object to the subject but still representing two places of a relation. Now there is a different option, namely, binding the subject to the object. Abstracting from structural questions (cf. Schäfer 2013), we propose this is odd. Namely, while subjects are positively defined, i.e., there is a set of properties that makes you qualify as the subject or external argument (essentially: agentivity), there is no such set of properties that makes an expression qualify as object (cf. above). As the classical view has it, the object is what is opposed to the subject and it is thus only negatively defined. For this reason we propose it is illegal to bind a subject to an object. Still grammar does it, and it does it in constructions as in (55) and (56), usually called inchoative and middle respectively.
Bound to contradict

(55) Das Tor öffnet sich.
the door opens REFL.
‘The door opens.’ pseudoreflexive inchoative

(56) Die Trakehner reiten sich gut.
the trakehns ride REFL well.
‘One can ride the trakehns well.’ pseudoreflexive middle

We argue that the cases in (55) as well as (56) involve weakening, i.e., going from a more exclusive to a less exclusive meaning. This is because both (55) and (56) are actually uninterpretable under their first reading as they violate what one might call the subject–object binding condition, given in (57).

(57) In a binding structure derived from a transitive verb, the subject may bind the object but the object may not bind the subject.

Objects are defined negatively relative to subjects: subjects must have properties that objects do not have, but not the other way around (i.e., objects needn’t have properties that subjects do not have). On violation of (57), the difference requirement is pushed to the aspectual ((55) and to the comparative domain (more concretely: threshold domain, (56)). This is why structures like (55) are interpreted as changes of state, i.e., accomplishments or achievements in Vendler’s terms. Testing this for the example in (55), we see that the truth of the “Rheinische Verlaufsform” version of it that corresponds to the English progressive entails the falsity of its present perfect version, as is typical of changes of states (i.e., accomplishments or achievements).

(58) Die Tür ist sich am öffnen → Die Tür hat sich (noch) nicht geöffnet.
the door is REFL at.the opening → the door has REFL yet not opened

Let us now turn to reflexive inchoatives. We follow Chierchia’s (1989 [2004]) analysis,9 adopted later by Reinhart (2000, 2002) and Koontz-Garboden (2009) and others. Here is Chierchia’s own summary of his analysis.

(26) a. Gianni ha affondato la barca
   Gianni sank the boat

   b. La barca e’ affondata
      the boat sank [...] 

(27) a. the boat was sunk [PRO to collect the insurance]
   b. *the boat sank [PRO to collect the insurance] [...] 

The point is that, as often observed in alternations as those in (26), the transitive member of the pair tends systematically to be a causative. [...] What I would like to suggest is that the meaning of unaccusative affondare is a reflexive form of the causative [...] This means that I am essentially proposing to interpret the boat sank as the boat sank itself. Now, this is not quite right, of course. What we really want is to interpret the boat sank as: some property of the boat (or some state that the boat is in) causes it to go down. [...] for the boat to sink, it suffices that the boat has or comes to have a property that causes the sinking. [...] The upshot of this proposal, then, is that intransitive members of an unaccusative alternation are related to their transitive counterpart via an operation of reflexivization that has the following two characteristics: (a) the causing factor is understood statively, and (b) the reflexivization operation is an “internalizing” one. (Chierchia 89, pp. 18ff)

Chierchia allows as a possible interpretation of the subject argument a property or situation formed by an abstraction over the object argument; as we will see presently, this squares with the influential generalization that it is transitive predicates that do NOT enforce the standard agentive interpretation on the subject (“first”) argument but a more general causative one that take part in the causative-inchoative alternation crosslinguistically. We can test for this by trying whether an instrument or natural force makes for a good subject in the transitive construction. This is possible with the verb sink in English, cf. (59) that exhibits the alternation accordingly (cf. (60)).

(59) The cannonball/the storm/the pirates sank the boat
(60) a. John sank the boat.
   b. The boat sank.

The existence of this alternation suggests that there is a derivational relation between transitive and (illegally) reflexivized realizations of the relevant predicates. Note as well that semantically, causative constructions entail their inchoative counterparts: Whenever the causative construction is true, then so is the inchoative relation. Furthermore, the grammatical subject of inchoatives exhibits object properties.

The generalization as to which causatives specifically participate in the alternation is that only those causatives which, in Reinhart’s terms, allow an “unspecified cause” participate in it. In Reinhart’s version, the generalization is (cf. Smith 1970, Levin/Rappaport Hovav 1995):

(Only) verbs that allow an unspecified cause (a cause that is not an agent) in the transitive version have an inchoative variant.

Only verbs that allow a certain leeway as regards filling of the subject slot – e.g., with a property – thus allow the alternation. Schäfer (2009) gives the following examples from English:

(62) a. The baker/the knife cut the bread.
   b. *The lightning cut the clothesline.
   c. *The bread cut.

(63) a. The vandals/the rocks/the storm broke the window.
   b. The window broke.

(64) a. John/the hammer/the storm enlarged the hole in the roof.
   b. The hole in the roof enlarged.

(65) a. The terrorist assassinated/murdered the senator.
   b. *The explosion assassinated/murdered the senator.
   c. *The senator assassinated/murdered.

(66) a. John removed the sand from the rocks.
   b. *The wind/the water removed the sand from the rocks.
   c. *The sand removed (from the rocks).

Starting from exceptions to what has come to be called the UEAG (Underspecified External Argument Generalization) in German as well as other languages, Schäfer envisages two possible routes regarding how the empirical problems could be dealt with. He writes (ibid., p. 660):

The generalization exemplified in (62) to (66) is of astonishing crosslinguistic accurateness. However, it is not perfect. On the one hand, some languages have a very small class of alternating verbs that restrict their external argument to causers and exclude agents in contrast to the formulation of the generalization used by Reinhart (2000, 2002). German examples are anwehen (to drift/blow up to) or anschwemmen (to wash ashore), the former taking subjects like wind, the latter subjects like river.

Furthermore, some languages have a somewhat larger group of verbs that allow agents, instruments or causers as subject but, nevertheless, do not form anticausatives. English examples are kill or destroy. German has in addition the verb erschlagen (strike dead) and zerkleinern (to reduce to small pieces) (see Härtl (2003)). [...T]he question is why some languages are more flexible and allow the anticausative use of destroy, kill and also cut (e.g., Greek Hindi; see Alexiadou (to appear)). Again, two options are conceivable. Either such verbs do not mean the same in these two...
groups of languages (Davis and Demirdache 2000) or the more flexible group of languages has some morphosyntactic way to circumvent some restrictions that prohibit anticausative formation in the other class of languages (Alexiadou et al. 2006) and Alexiadou (to appear).

There is a third option that is the reversal of the second option mentioned by Schäfer: It could be that the generalization talks about verbal roots and that in the less flexible group, the exceptions are derived in such a way that it is the derivation that gives rise to the change of state (eventive/“telic”) meaning which appears to be a necessary condition for taking part in the alternation to start. German provides some evidence for this option: we will see shortly that the apparent exceptions are overwhelmingly prefixal and that it is plausible to assume that it is the prefix that makes the verbs in question denote a change of state. If the generalization applies before the prefixation, then the verbs in question will not fall under the generalization as they have the “wrong” aspectual structure. Let us formalize the generalization as in (67).

\[(67)\]
\[
p \quad V \text{ has a causative variant}
q \quad V \text{ has an inchoative variant}
r \quad V \text{ allows an unspecified cause}
\]

There is a strong (symmetric (plus “only”) and two weak (asymmetric, minus “only”) version (there are two minus versions).

\[(68)\]
\[
a. \quad (p \land q) \equiv r \quad \text{symmetric}
b. \quad (p \land q) \subset r \quad \text{asymmetric}
c. \quad (p \land q) \supset r \quad \text{asymmetric}
\]

(68-a) is the conjunction of (68-b) and (68-c). (68-b) says that if a verb allows an unspecified cause as subject in the transitive variant, then it has an inchoative realization as well. Conversely, (68-c) says that if a verb has an inchoative variant, then it allows an unspecified cause in the transitive variant. We see here the connection to the pronominal element that we are most centrally interested in here, namely, /zich/. /zich/ is the reflexivizer, i.e., a sign (German “Anzeichen”) that a property has been derived from a relation. We can see that the bulk of exceptions to the strong version of the generalization go against the generalization (b) generalization, i.e., zerstören (kill), etc. We can write this with the help of truth tables, as exemplified in (69) for the well-behaved cases (like break) and the ill-behaved ones, respectively (like kill) (but cf. Schäfer’s qualifications from above).
Bound to contradict

(69) formalizes the UEA (underspecified external argument hypothesis) in terms of a truth table and reads as follows starting with the first nonempty column: There is a causative variant \(V_{\text{caus}}\). There is an inchoative variant \(V_{\text{acaus}}\). If there is \(V_{\text{caus}}\) then there is \(V_{\text{acaus}}\) (= one half of UEAG). If there is \(V_{\text{acaus}}\) then there is \(V_{\text{caus}}\) (= other half of UEAG). There is \(V_{\text{caus}}\) if and only if there is \(V_{\text{acaus}}\) (= UEAG). The table in (70) gives some more English as well as representative German examples from the classes of verbs behaving the same with regard to the properties relevant here.

Verbs that behave like \textit{destroy} are a problem only for the strong generalization, while they are fully compatible with the other half of the UEAG. Note as well that the exceptions in German regularly feature a prefix of the class briefly discussed toward the end of section 3.3.2; there we noticed that these prefixes are in complementary distribution with directional PP complements which clearly lead to change of state interpretations; very likely, then, the prefixes have this function then as well. Here is a representative list of exceptions, i.e., verbs that do allow a non-agentive external causer argument in the transitive version yet do not project an intransitive “inchoative” structure (cf. the lists of Schäfer 2009 or Härtl 2003):

(71) erschlagen ‘strike dead’, zerstören ‘destroy’, zerkleinern ‘shred’, vernichten ‘defeat’, zerschneiden ‘cut into pieces’, zerlegen ‘disassemble’

Further examples with in part more complex prefixes are given in (72).

(72) abreifen ‘tear off’, ausfahren ‘arm out’, umkippen ‘tilt over’, umstürzen ‘topple over’, zusammenklappen ‘fold together’, zurückspulen ‘rewind’
It seems promising to further explore the possibility that regarding the German exceptions to the UEAG, it is regularly the prefix that leads to the needed change of state interpretation, i.e., that the roots of the verbs in (72) are not what the generalization is designed to capture in the first place. What remains of the verbs in (72) after subtraction of the prefix denotes a state, as the usual tests show. Note that it is perfectly conceivable that there are verbs that feature a prefix but denote a change of state interpretation independently; the verbs in the following list would belong to this class.

(73) zerreissen ‘tear apart’, erhöhen ‘heighten’, beruhigen ‘calm’, verbreiten ‘spread’

The verbs in (73) – except zerreissen – need reflexive morphology in the inchoative variant which as we argue is just another means to arrive at change of state interpretations. Deeper investigation discloses that in German, the verbs taking part in the causative-inchoative alternation are prefixed or take reflexive morphology in the inchoative variant or belong to the class given in (74).


What unites the verbs in (74) is that they are almost exceptionlessly about cooking, loosely speaking, denoting a change of aggregate which one could describe more abstractly as a change that is installed in the object (patient argument) as one of its essential properties. Putting all this together, we arrive at the following generalization for German:

(75) Verbs taking part in the causative-inchoative alternation in German take reflexive morphology in the inchoative variant or are prefixal or denote a change installed in an essential manner in the object undergoing the change.

In sum, it appears very much worthwhile to keep the strong generalization regarding the UEAG with the qualification that it applies to verbal roots, i.e., before derivative word building operations take place. As a corollary, we see that prefixation or reflexivization may be just different means in German to achieve the same thing, namely, a change of state interpretation.

Before we make a further empirical case for this on the basis of object experiencer verbs in German, let us see how the story so far fits in with what we know of pseudoreflexivemarking crosslinguistically. As Haspelmath (1993) has shown, one of the prominent functions, crosslinguistically, of reflexives (or other reflexive marking strategies) lies in compensating for a lack of “spontaneity”
that may otherwise be associated semantically with verbal roots: somewhat simplifying, Haspelmath has it that the reflexive morphology leads to an interpretation in terms of an external causer which in turn implies a change of state interpretation generally. In this sense, the reflexive morphology can be said to be in many cases a “trace” of a causer argument that has been removed from the structure. Haspelmath’s crosslinguistic spontaneity generalization says that (reflexive) marking is the more needed the less spontaneous the eventuality coded by the (verbal) exponent is, which could be interpreted for the German or Romance type as /zich/ taking the place of the usually needed causer/agent argument, i.e., what is represented as subject. In reversal, the claim is that the spontaneous (≈ self-motivated) changes of state are less marked.\textsuperscript{11} Of course, the possibility exists for languages to always inchoativize silently, like English; some languages never do it silently, like Serbo-Croatian. (76) gives Haspelmath’s (1993, p. 104) sample of some thirty investigated languages.

\begin{verbatim}(76) split 0.04 develop 0.33 melt 0.68 close 0.06 roll 0.35 learn/teach 0.68 break 0.07 spread 0.35 sink 0.70 open 0.10 begin 0.38 go/put out 0.71 gather 0.12 finish 0.38 wake up 0.75 change 0.12 fill 0.38 dry 0.77 connect 0.14 (be) destroy(ed) 0.39 freeze 0.86 rock 0.25 burn 0.42 boil 0.96 improve 0.26 dissolve 0.42 die/kill 1.00 rise/raise 0.27 turn 0.48 lose/get lost 0.28 stop 0.62\end{verbatim}

According to Haspelmath, then, constructions as in (77) crosslinguistically tend to be interpreted in terms of “inchoativity” (or “spontaneity”), i.e., a change of state more than their brothers doing without a reflexive marker.\textsuperscript{12}

\begin{verbatim}(77) X splits +REFL change of state\end{verbatim}

\begin{verbatim}(78) X boils -REFL state (homogeneous)\end{verbatim}

In constructions like (77), the reflexive marker is eventually interpreted as the logical subject expression. Independent evidence comes from constructions fea-

\textsuperscript{11} It is interesting to note that the exponents of the least-marked concepts (freeze, boil, etc.) appear to code changes in aggregate, which appears to be an interesting way of its own of losing one’s identity.

\textsuperscript{12} While we are happy to accept that this is a tendency rather than an absolute generalization, it has been explicitly claimed for Italian that inchoatives featuring reflexive morphology code changes of states always unlike inchoatives without reflexive morphology. Cf. Cennamo (2012), Folli (2002).
turing dative arguments. Regularly, these appear to be interpreted as causers in inchoative structures without reflexive marking; in inchoative structures with reflexive markers, however, interpretation as the causer appears much harder if not at all impossible (Härtl 2003). This follows if the reflexive marker takes the causer role, forcing a dative to be interpreted in different terms (typically, as a benefactive or malefactive). Cf. (79) and (80).

(79) Der Ballon ist ihm geplatzt.
     the balloon is him$_{DAT}$ burst
     ‘He caused the balloon to burst.’

(80) Die Tür hat sich ihm geöffnet.
     the door has REFLEX him$_{DAT}$ opened.
     ‘The door opened for him.’

Section 4.3.2 further discusses inchoatives and dative arguments. Summing up for now, /zich/ marks that there is a relation in the semantics somewhere (namely, it forms the input to the reflexivization function), and the relation requires difference by virtue of the Different Referents Presumption (DRP). Difference – more precisely, the O part of DIFF, DIFF-O – is expatriately interpreted. In a table, we can present this as in (81) where the first column represents the derivational cycle, the second column represents what is interpreted, the third column represents what is not interpreted and the fourth column represents the reason why this is not interpreted and/or the move the system makes in order to render the structure interpretable (like, e.g., introducing a new temporal variable as in the example at hand).

(81) Repair table: die Tür öffnet sich

<table>
<thead>
<tr>
<th>Cycle</th>
<th>Interpreted</th>
<th>Left</th>
<th>Prob/Rep</th>
</tr>
</thead>
<tbody>
<tr>
<td>vP/VP</td>
<td>offen(die.tür) = I</td>
<td>O</td>
<td>$\notin$ SU &gt; OB</td>
</tr>
<tr>
<td>CP/TP</td>
<td>$(\exists t) \neg$offen.die.tür(t) = O</td>
<td>$+t$</td>
<td></td>
</tr>
</tbody>
</table>

Before we move on to middles, let us discuss the case of object-experiencer verbs which alternate in a fashion almost completely analogous to causative-inchoative verbs as we see the functional parallel between prefixes and reflexive marking most clearly here (cf. Alexiadou/Iordachioiu 2014). An example of the alternation is given in (82).

(82) a. Das Wetter ärgert Maria.
     the weather annoys Mary

b. Maria ärgert sich über das Wetter.
   Mary annoys REFLEX about the weather
(82-a) exemplifies a transitive structure with an external argument underspecified in the sense of the UEAG (Underspecified External Argument Hypothesis, cf. above); note the talk of “stimulus” arguments in the realm of psych predicates more generally. (82-b) is the corresponding pseudoreflexive structure where superficially, the internal argument has “moved” to external position under reflexivization. That the external argument is a deep object is suggested by the fact that only the adjectival passive variant that clearly identifies the internal argument (cf. e.g. Grewendorf 1989) “inherits” the argument realizational pattern, i.e., the prepositional realization:

(83)  Die über das Wetter verärgerte Maria
      the about the weather PREF. annoyed Mary

Furthermore, the adjectival passive variant must feature the prefix, i.e., (84) is impossible although no prefix is needed in the transitive realization, cf. (82).

(84)  *Die über das Wetter geärgerte Mary
      the about the weather annoyed Mary

More verbs behaving in this way are given in (85).

(85)  (ver-)ängstigen ‘scare’, (er-)freuen ‘rejoice’, (be-)sorgen ‘worry’, (ver-)
stören ‘disturb’, (ent-)täuschen ‘disappoint’, (ver-)wundern ‘amaze’

The pattern in (86) captures this behavior of object experiencer verbs in German (STIM and EXP stand for the stimulus and experiencer roles respectively, V for the category verb, PREF for prefix and PREP for preposition):

(86)  a.  STIM Vs EXP  transitive
     b.  EXP Vs REFL PREP STIM  pseudoreflexive
     c.  EXP is PREP STIM PREF. Ved  adjectival passive

In analogy to the causative-inchoative alternation, “pseudoreflexive” marking appears needed in what corresponds to the inchoative realization of the object experiencer construction. Addition of a prefix is odd here if not ungrammatical. In the adjectival passive realization where reflexive marking is impossible, the prefix becomes obligatory, i.e., (87-a) and (87-b) are impossible.

13 Prefix and reflexive morphology may cooccur if the verb is born with a prefix, as is the case with the verbs in (i).


Of the verbs listed in (85), sorgen and wundern allow cooccurrence of the prefix and the reflexive morphology.
This pattern is predicted if pseudoreflexive marking and prefixation fulfill one and the same function in this domain, namely, they furnish a change of state interpretation. In fact, we seem to see more systematic behavior in the psychological domain with respect to the distribution of reflexive or prefixal marking than in the physical domain, i.e., with respect to the supposedly “original” causative-inchoative alternation. Inasmuch as the experiencer alternation does build on patterns that developed in the realm of the causative-inchoative alternation but took the original meaning to more remote domains where the marking may prove to be largely dysfunctional, we have another case here where we see the original pattern survive better in the domain where it does not really make sense anymore, or at least not the “original” sense, cf. section 2.3. (102). In general, the less reality impinges, the more the system can afford to stay neatly organized (be more systematic in the more abstract psychological domain than in the domain where it arguably evolved. A paradigm example where we see marking survive where it cannot be interpreted is plural marking in the case of dative, cf section 4.3.2. Cf. as well the earlier discussion of plural marking and exaptation in section 2.3, in particular the remarks around (102).

Turning now to middles, let us start by noting what appears to be a basic condition on middle formation, namely, the requirement that the input be transitive (cf. section 3.3). In Fagan’s (1992, p. 97) words,14

> The restrictions on Middle Formation in French appear to involve the notion of transitivity. Verbs that are high in transitivity with respect to the parameters of participants and agency can generally undergo Middle Formation without difficulty; those that are low in transitivity cannot. Verbs that are high in transitivity except for the parameter of agency are fine in middles if they are also punctual or volitional.

In many ways, the middle construction is like the inchoative construction that was just discussed and that is morphosyntactically reflexive like the middle. From the interpretive perspective, middles are very close to tough-constructions, to be discussed further below in section 4.2.1. Remember that regarding inchoatives, the core idea here is that there is something wrong, so to speak, with the causer, such that the condition on reference-heterogeneity introduced in section 2.1.2 and repeated in (88) is violated.15

---

14 Fagan’s notion of transitivity is essentially that of Hopper/Thompson (1980) discussed above in section 3.3.1 above.

15 Remember that what appears to be the right generalization about the causative-inchoative alternation hinges on the subject/external argument being more inclusive from a conceptual point of view than the archetypal agent.
(88) [Ordinary] Relational (“transitive”) ties demand of the terms they bind a degree of reference-heterogeneity that non-relational (“predicational”) ties will not suffer.

In inchoatives though, as we said, the property that is made responsible for the action may “come from the outside”. But in middles, it is always an essential property, a property from the inside (intension). Because of this, presumably, these are felt to be timeless.\footnote{Cf. Lekakou (2007).} Therefore, we cannot shift to the temporal domain. Therefore, we shift to the threshold domain, and this brings with it as well an other time/world index.

Inchoatives and Middles are very close: both times, we have a logical object functioning as the syntactic subject, i.e., they are both passive-like structures. There is no other expression – like, e.g., a locative – that could take the subject slot, however. Often enough, it is hard to tell apart inchoatives and middles, if it is possible at all. Consider (89).

(89) a. The suitcase easily opens up (*with the key).
   b. The suitcase opens up easily (with the key).

The example in (89-a) has an inchoative, agentless interpretation, while the causative/agentive interpretation typical of middles is associated with the structure in (89-b). We argued along the lines of Chierchia that in inchoatives, a property derived from the (grammatical subject) NP fills the logical argument position, hence we have something like

\[(90) \text{A property of (the situation) the boat (was in) caused the boat to sink.}\]

According to our proposal, this is illegal: the subject here has nothing that the object doesn’t have. Therefore, we get the COS interpretation: Diff-O is pushed to the aspectual/temporal domain. However, there may also be some leeway as the property may come as well from the outside, i.e., be “accidental” to some extent.

Regarding middles, it looks like the property is more restricted. E.g., it has been observed by various scholars that some notion of responsibility is involved in licensing the construction. Thus, van Oosten (1977) has noted that middles can only be formed from constructions where the object is “responsible” for the action (cf. as well Fagan 1992, p. 76); this is exemplified in (91).

(91) a. *This applesauce will eat rapidly
   b. Keep these pills away from the baby. They’re powerful, but they eat like they were candy.
Illegal reflexivization

In (91-b), a property of the pills is “responsible” for their being eaten. This property is just “being the kind of pill that tastes good”.\footnote{This property is important for the differentiation between middle and tough-constructions (cf. section 4.2.1). While the (grammatical) middle subject is interpreted as responsible, the subject of tough-construction needn’t be. Other differences appear to have their source here as well (cf. Ackema/Schoorlemmer 2006): while middles are in complementary distribution with dative arguments, this is not the case for tough-constructions. We argue that in tough-constructions, the index is free to be bound by a dative argument. In middles, the index must be bound by the grammatical subject; hence the intuition of a “responsibility” interpretation.}

The bare plural (kind) meaning of the logical object is raised to subject position in middles, so to speak. This does not happen in the inchoative variant where the property (¬q) projects itself. In German, such movement is not directly visible due to the left branching structure of German. However, the element /zich/ does not appear to be in the VP, as data involving placement with respect to adverbs and particles suggest, cf. (92). (93) shows that /zich/ may occupy a VP position in German in principle.

(92) a. Zum Glück reiten sich die Trakehner ja gut.
   to.the luck ride REFL the trakehns yes well

b. *Zum Glück reiten ja sich die Trakehner gut.
   to.the luck ride yes REFL the trakehns well

c. *Zum Glück reiten die Trakehner ja sich gut.
   to.the luck ride the trakehns yes REFL well

(93) Zum Glück hat Otto ja sich und Maria rasiert.
   to.the luck has Otto ja REFL and Maria shaved

Data concerning the absence of Principle C effects in middles as in (94) support the idea that the phrase introducing the comparison class is interpreted above the base position of the grammatical subject at LF at the latest:

(94) a. *Er, überholte den Bruder von Texas,
   he overtold the brother of Texas

b. Er, reitet sich wie der Bruder von Texas
   he rides REFL like the brother of Texas

Alternatively, we could assume rightward movement of the adverb; recall that extrapolation of the comparative phrase is a hallmark of the standard comparative analysis. E.g., von Stechows (1984) analysis uses raising of the comparative phrase in order to get the scopal relations right; Bhatt/Pancheva (2004) argue for “late merger” of the comparative phrase. (95) on the next page gives the structures for English Inchoatives and Middles respectively.
In any event, we observe an adjacency requirement between the verb and adjective in middles, indicating their structural hence interpretive closeness. To repeat, we propose that middles are really hidden comparative constructions that compare objects (kinds and their instances) with regard to a complex property that is built on the basis of the adjective and the verb. Compare the informal paraphrase of the example under discussion in (96).

18 Conditions on complex property formation might explain other restrictions on middle formation, such as the exclusion of certain predicates or the choice of adverb. Regarding the former, the verb has to be gradable in order to be able to fuse with the adjective (cf. Kennedy/McNally 2002); regarding the latter, the adverb has to express a dimension of ‘personal’ judgment. Thus, verbs like recognize, hate or see will be out in middles as they do not provide the necessary scalar structure, while adjectives like impossible or fast do not provide the personal judging dimension. Cf. sections 4.2.1 as well as 4.3.2 for further discussion next to the examples in (i) and (ii) comparing to the tough-construction that appears to be structurally as well as semantically close.

(i) a. Otto is easy to recognize.
   b. *Otto recognizes easily.

(ii) a. The book is impossible to read.

Complex predicate formation appears to provide a promising basis as well to explain at least certain differences between languages; for example, middles are possible in French with sensation verbs in French as opposed to German or English.

(iii) a. La tour Eiffel se voit de loin.
     the tower Eiffel SE sees from far
     b. *The Eiffel tower sees from far

A route to explore here is Talmy’s (1985) original distinction between path-incorporating (Romance) vs. manner-incorporating verbal roots (Germanic); thus, the path-incorporating quality of Romance may make fusion of the verb and PP in French possible, while it is forbidden in manner-incorporating Germanic.
(96) Regarding ease of opening, the suitcase is better than its kind.

The central question here is where the modal and generic interpretation comes from. We argue it stems from middles being actually comparative structures (cf. above section 3.2). So this time we push O not to a time but to a threshold, like we saw already in section 3.1.2 above, cf. again the example in (97) that is interpreted in terms of comparison.

(97) Kind ist nicht Kind.
child is not child
‘Children are different from each other.’

Dowty (2001) hints at the possibility of analyzing middles as comparatives:

The Middle Verb Construction compares one object (implicitly) to other objects indirectly: via comparing the action performed on the first object, to the same action performed on the other objects: the actions are compared with respect to ease, difficulty, time needed, etc. in performing them.

He goes on to develop the idea that it is an inherent property of the object how well or badly it fares in the comparison:

Because the comparison is between generic actions on specific objects, the only factors that determine whether a middle sentence is true are properties inherent in the object acted on.

It is well known that middles are interpreted in modal terms, cf. (98).

(98) The trakehns ride well, but they are not well ridden.

Sentence (98) is not contradictory, as it should be if it made reference to actual situations only. Ordinary reflexives lead neither to a change of state nor to a modal interpretation, cf. (99) and (100).

(99) Otto ist sich am kratzen. → Otto hat sich gekratzt.
Otto is REFL at scratching Otto has REFL scratched

(100) ❌ Otto kratzt sich, aber er kratzt nicht.
Otto scratches REFL but he scratches not

When illegal reflexivization occurs, the interface grants a new threshold variable as the syntax has built something that has contradictory semantics. As we saw, an “easy” way to a new variable is using a comparative construction as it says that the comparative object does not meet a threshold that the matrix subject meets or exceeds. For the two to be comparable (i.e., belong to S), there has to
be a threshold that is met or exceeded by the comparative object – this is what we called a quasi-free variable. The tabular representation in (101) illustrates the vicinity to the inchoative derivation proposed in the last section.

(101) Repair table: *Die Tür öffnet sich leicht*

<table>
<thead>
<tr>
<th>interpreted</th>
<th>left</th>
<th>prob/rep</th>
</tr>
</thead>
<tbody>
<tr>
<td>vP/VP</td>
<td><em>leicht.offen(die.tür,th)</em> = I</td>
<td>O</td>
</tr>
<tr>
<td>CP/TP</td>
<td>$\exists th \neg<em>leicht.offen(TÜR,th)</em> = O</td>
<td>+th, $\uparrow$LC</td>
</tr>
</tbody>
</table>

What is missing in (101) is an explanation of the generic interpretation of middles. An intuitive explanation could have it that it is an effect of the construction of the standard of comparison to the extent that one accepts the analysis of middles as comparatives.\(^{19}\) We would like to propose that the generic interpretation is the repair of a problem caused by the earlier repair, i.e., EI to a possible world. The last line in (101) transports that the instances of the kind talked about differ from the kind in that they better exemplify the property in question. But it holds that (cf. (149) in section 3.3)\(^{20}\)

(102) Kind-instance \(\subseteq\) Kind

Given (102), middles pitch the instances that they talk about into an identity crisis: Given that the instances belong to the kind, they must have all the properties that define the kind (as the sum total of all instances). But this is what middles deny.\(^{21}\) Therefore, binding of the possible world variable in middles is not existential but quasi-universal (or existential and exhaustive, yielding the same effect). This overcomes the trans-world identity crisis as, as Peirce reminds us, LEM does not hold for the general.

\(^{19}\) The ‘standard’ analysis inserts an invisible operator or pronoun that is interpreted as ‘man’ (‘generic you’). Cf. Lekakou (2005) and references therein.

\(^{20}\) In line with Carlson (1978), we assume that kinds include their instances: If something realizes (or is an instantiation of) a kind, then it falls under the property corresponding to that kind (cf. section 2.3.2 for discussion). This is captured in Carlson’s definition of the “realization relation” \(R\) in (i).

\(\forall P \forall x \Box [R(k(P),x) \equiv P(x)]\)

E.g., if Bronco is a horse, then he is included in the horse-kind (which we take to correspond to the sum total of everything falling under [[horse]]).

\(^{21}\) Plausibly, mastering different types of contradictions and strategies to resolve them happens late in acquisition. Very pertinent to the semantic difficulties connected to kinds, e.g., Felix (3;8) produced the sentence in (i) that the average grown-up would reject on semantic grounds.

(i) *Die Suppe ist ohne Fleisch, aber aus Fleisch gemacht. The soup is without meat but from meat made*'

‘The soup has no pieces of meat in it but is made of meat.’
illegal reflexivization

[...], the individual is determinate in regard to every possibility, or quality, either as possessing it or as not possessing it. This is the principle of excluded middle, which does not hold for anything general, because the general is partially indeterminate [...] (C.S. Peirce, PPM 1.434, ca. 1896)

On the empirical side, the quasi-generic quantification binding otherwise free (and to be eventually existentially closed) variables may provide an explanation of the fact that purpose clauses are out in middles, as opposed to e.g. tough-constructions that are otherwise very close in meaning, cf. (103-a) vs. (103-b).

(103)  
  a. *The horse rides well (in order) to escape.
  b. The horse is good to ride (in order) to escape.

On the assumption that existential quantification of the world variable associated with purpose clauses is a must, the generic binding associated with middles contradicts the necessarily possibility-modal interpretation of purpose clauses, which rules them out in these contexts.

Prefinally, the generic quantification applying in reaction to a violation of LEM in middles provides an explanation for their intransparency for cyclic embedding (cf. Ackema/Schoorlemmer 2006), which, again, stands in sharp contrast to the transparency of tough-constructions, cf. the pairs in (104) and (105).

(104)  
  a. *Such a film easily makes a complete mess of.
  b. Such a film is easy to make a complete mess of.

(105)  
  a. This book is hard to get her to avoid reading.
  b. *This book easily gets her to avoid reading.

As can be witnessed more generally, domains of universal quantification (including, adopting the Russelian analysis, definiteness) are opaque to extraction, while domains of existential quantification are not, as exemplified for nominals in object function in (106).

(106)  
  a. About what have you read a book by Chomsky?
  b. About what have you read books by Chomsky?
  c. *About what have you read every book by Chomsky?
  d. *About what have you read the book by Chomsky?

Further empirical evidence for the analysis of the generic interpretation as a result of a repair consisting in quasi-universal quantification over a variable that would otherwise be existentially closed at the end of the day comes from datives, which are the subject of section 4.3.2. Our discussion of the causative-inchoative alternation supports the analysis: Allowing leeway for the subject is

---

22 Cf. section 4.2.1 for pertinent discussion.
what opens the possibility of putting something here that is funny: a property or kind (that will have no properties that the referents of the logical object do not have as well). The kind is put in a relation with the instantiations of the kind. The relation is CAUSE or ‘responsibility’ in the inchoative interpretation and it is “being better/worse” in V-ing in the middle interpretation.

4.2 Infinite mis-construction

According to the view developed here and preferably from an acquisition perspective, grammatical items contribute unique logical forms; still, and depending on their linguistic context, they deliver meanings that vary considerably from a purely intuitive semantic perspective.

The last section has dealt with “illegal reflexivization” of a particular kind; inchoatives and middles look superficially like reflexive structures that are derived from transitive structures; this is true, but the particular kind of reflexivization, or, more generally put, symmetrization – namely, essentially, binding the subject to the object – goes against the general condition that objects may be more general (less specific) than subjects, but not the other way around (viz., the “second condition”).

In section 3.3.2 above, we argued that a similar violation and repair occurs in structures with directional complements in that the the prepositional phrase is more specific (hence subject-eligible) than the actual grammatical subject; we posited that the change of state semantics observed with this type of construction results from pushing the O meaning to the domain of times, i.e., setting x to times and P to the proposition coded in the verbal projection (pace Givón’s 1972 analysis of changes of states). We argued in section 2.3.1 as well 3.3.2 that verbal prefixes like er- and its variants ver and zer in German similarly lead to a change of state interpretation by virtue of coding Diff on a category that is associated with times, namely, on the verb. A construction occurring productively in German that combines features of both ‘verbal’ marking of Diff as well as illegal reflexivization has been called the mis- construction by Kunze (1997), illustrated in (107).

(107) Otto vertut sich.
    Otto ver does REFL
    ‘Otto is wrong/erring.’

The construction features both a verbal prefix ver as well as a reflexive pronoun, and it systematically means that the subject referent Vs in a ‘wrong’ manner or achieves a ‘wrong’ result V-ing. Kunze (1997) offers the scheme in (108) and the list of examples in (109) (slightly extended) for the mis- construction.
The construction thus combines two features that have figured prominently here, namely, prefixation as well as reflexivization. Interestingly, the verbs participating in the construction are (by and large) verbs allowing object drop, which is severely restricted in German. Assuming that the object argument is incorporated (cf. Hale/Keyser 1993, van Geenhoven 1998), its slot is no longer available for manipulation. At the same time, we have both the verbal prefix _ver_ as well as reflexive morphology calling upon the Second Condition, i.e., interpretation of the O meaning. We can derive the meaning coded by _mis_-constructions using a combination of features of our earlier analyses quite straightforwardly now. Namely, the verbal prefix leads to a change of state interpretation by means of temporal interpretation of the O meaning carried by _ver_. As this option has now been made use of, it is no longer available in order to get rid of the O meaning carried by the reflexive morphology. Similarly to what happens in excessives, we can say that it is moved to a result or purpose slot associated with the verb, as sketched in the repair table in (110).

(110) Repair table: _Otto vertut sich_

<table>
<thead>
<tr>
<th>vP/VP</th>
<th>interpreted</th>
<th>left</th>
<th>prob/rep</th>
</tr>
</thead>
<tbody>
<tr>
<td>¬∃x DO(Otto, x) &amp; SU &gt; OB</td>
<td>O,PUR</td>
<td>¬OK(PUR_DO) = O</td>
<td>O ~ PUR</td>
</tr>
</tbody>
</table>

The negative meaning thus ends up on the purpose (manner, result) slot due to _ver_ having used up the option of repair in terms of a change of state interpretation. Note in support that pertinent examples that lack the “wrong” interpretation appear to be reciprocal (versus strictly anaphoric):

(111) verlieben ‘fall in love’, verloben ‘become engaged’, versammeln ‘gather’, verbünden ‘confederate’, verabreden ‘make an appointment’
Reciprocalization differs from reflexivization semantically: Reflexivization symmetrizes a relation by identifying the first and second argument. Reciprocalization in contrast can be described as a process that sums the arguments’ referents and then mutually quantifying over the parts which, importantly, do not overlap but are complementary to each other instead (cf. the discussion in the last section), i.e., asymmetric at the level of quantification such that no problems due to illegal symmetrization could arise. The few remaining counterexamples to the generalization that we found are given in (112).

(112) sich einer Sache vergewissern ‘make sure’, sich einer Sache verschreiben ‘dedicate oneself’

Both examples lack the ‘wrong’ interpretation; note the verbs assign marked genitive or dative to their NP complements (cf. section 4.3), which as we discussed regularly trigger modal interpretations as well (cf. section 3.3.2).

In the remainder of this section we look at more instances of structures that do not superficially look like reflexives but which as we argue nevertheless involve symmetrization; we have already discussed a central case, namely, so-called excessive constructions as featuring the “degree particle” too (cf. section 3.2). The idea is that excessives are comparative hence symmetric structures that have been reflexivized, illegally, producing thus a local short circuit. As we discussed, reflexivization can be semantically executed by means of having the relation both ways, i.e., we reflexivize the relation \( x \) \( R \) \( y \) and get (113).

(113) \( x \ R \ y \land y \ R \ x \)

In asymmetric domains, however, changing GFs amounts to the same as negating the relation. To repeat, the negated equative structure has the same truth conditions as the comparative with switched grammatical functions, cf. (114).

(114) Otto is not as heavy as Ede = Ede is heavier than Otto

Negating the right hand side again yields (115), which is compatible with both (116-a) and (116-b).

(115) Ede is not heavier than Otto.

(116) a. Ede is as heavy as Otto
    b. Otto is heavier than Ede

What we have done in effect is apply negation twice to the basic equative structure. However, this has lead for one to a meaning that is equivalent to the original meaning under the “exactly” reading, i.e., after the computation of implicatures (compare (116-a) to Otto is as heavy as Ede), and, for another,
to a meaning that entails the original non-negated reading (compare (116-b) to
*Otto is as heavy as Ede*) and is equivalent, *modulo* subtraction of the “exactly”
reading, to (115). In other words, we got almost back to where we started.
This is like the Litotes effect: Negating A once yielding B and having both A
and B after computation of implicatures is a contradiction. Negating B again
almost but not quite leads back to A.

The paradigm example of reflexivization “gone wrong” is /tsu/ that marks a
short circuit, namely, an asymmetric relation that is reflexivized. Remember
that in asymmetric domains, switching argument places (i.e., reflexivization) is
the same as negating, as (117) holds in totally ordered (connected) domains.

(117)  $\neg x \ R \ y \equiv y \ R \ x$

We developed the idea that /tsu/ is reflexivized /er/ above in the context of
comparatives (section 3.2). It makes a lot of sense to pursue the idea that
‘infinitival’ /tsu/ is nothing else, only it does not apply to gradable properties
but to times, which are just as asymmetrically ordered. The semantic indeter-
minacy of infinitives regarding their temporal (or modal) interpretation as well
as their logical subject is a consequence.

4.2.1 *Tough(er) infinitives*

*Tough*-infinitival structures combine prominent features of some of the central
cases investigated here in that they appear to share the semantics with mid-
dles and the syntax with excessives. The basic property of infinitives is that by
themselves, they do not code complete thoughts as correspondig to sentences;
in particular, they do not express the basic subject-predicate structure of sen-
tences in lacking overt grammatical subjects. (118) illustrates the oft-noted
near-synonymy between the middle construction and the *tough*-construction.

(118)  

a. The horse rides easily.

b. The horse is easy to ride.

In middles like in *tough*-constructions it is the gradable adjective that furnishes
the ordering. In middles the problem is that the logical subject is more general
than the logical object. The problem is by now familiar: there is one argument
that appears to receive two semantic roles with requirements that get into
conflict when there is only one argumental referent availabe in the semantics (as
opposed to two referents with essentially arbitrary properties). In particular,
it gets a “subject role” and an “object role”, cf. (119).

(119)  

a. Otto is easy to please.

b. Otto is too fast to catch.
In the examples in (119), Otto has the properties expressed in the infinitive, and he is also the object (patient) of the infinitival verb. We have seen above that it is the object meaning – the O corner or particular negative of the square of opposition – that cannot be interpreted locally. In tough-constructions, it is again as if the uninterpreted object meaning of the excessive is pushed to the embedded verb and interpreted with respect to it. This is a case of sideways pushing, as in the case of personal datives or existential constructions below in section 4.3. Again we see the internalizing effect, i.e., interpretation as an object as a reaction to the object meaning not being interpretable in the cycle where it is originally coded.

We argue that too is an illegally reflexivized comparative; let us now consider how, analogously, infinitival to can be taken to signal an illegally reflexivized “later than” relation. Both times what you get is a new coordinate – in the case of infinitives, a free temporal index that is free to be bound by existential quantification (irrealis interpretation, cf. below) or by an appropriate selecting verb (as in the case of, e.g., manage. In other words, the interpretive freedom (or context-dependence) of infinitives is a result not of their original underspecification but instead of freeing or excorporating an indexical variable in reaction to a contradiction arising from reflexivizing an asymmetric relation.23 In this connection, Haspelmath (1989, pp. 289, 301) makes an interesting proposal:

I claim that it is no coincidence that the infinitive is marked by an element that is synonymous with the allative preposition to (German zu), and that there is a close connection between the modal meaning of the infinitive and the allative meaning of the preposition to/zu.

The infinitive marker starts out as a purpose marker which also often goes back to a direction marker, and finally it is used to mark grammatical clausal arguments (i.e., complement clauses) in general.

We observe that infinitival /tsu/ is sometimes inserted wrongly and feel it is there out of politeness, i.e., serves as a weakening element. Consider, e.g., the

23 This is perfectly compatible with the view that infinitives end up denoting properties (e.g., Williams 1980), albeit with different options as regards binding indexical variables, cf., e.g., the parallel between (i) and (ii).

(i) Poverty is no shame.

(ii) To be poor is no shame.

We would expect though that not all languages develop a routine of reflexivizing asymmetric relations so as to free up indexical variables; in the comparative domain in particular, designated elements coding excess appear to be absent in Russian (but cf. for some discussion of the “short form” section 4.3.2) as well as Persian. Yet another option would consist in developing the routine as well as marking it but then avoiding it beyond the literal register, as appears to be the case in Hungarian (Marcus Kracht p.c.).
example in (120) from a letter by the “Verwertungsgesellschaft Wort” (‘Collecting Society Word’) that stands in for the copyrights of authors in Germany.

(120) Sollten Sie über keinen Internetzugang zu verfügen, dürfen wir Sie bitten, das beigefügte Formular auszufüllen und per Fax oder Post an uns zurückzurichten. ‘If you should not have internet access, we would like to ask you to fill in the attached form and give it back to us.’

(VG Wort on the transmission of authors’ rights, August 2009)

To repeat, infinitives are rather free as concerns their interpretation; it is the syntactic as well as pragmatic context that appears to determine good part of their meaning. Let us just give some examples illustrating the variance of infinitival interpretation regarding tense, mood and the value of the subject slot of the infinitive, also known as control. In (121-a), the infinitive receives a factive interpretation, i.e., the proposition that it expresses must be true for the whole sentence to be true. In (121-b), in contrast, this need not be the case at all. We can observe that for the most part, infinitives receive such an interpretation of possibility that is usually loosely called ‘modal’. We will focus on the modality typical of infinitives in a moment.

(121) a. Otto managed to come. factivity
    b. Otto tried to come. possibility

The examples in (121) feature ‘subject control’, i.e., the logical subject of the infinitive that remains unexpressed is identified with the subject of the matrix verb. This is different in the object control structure in (122) where the infinitival subject is controlled by the matrix object.

(122) Otto begged Mary to leave him alone.

However, if we passivize the infinitive, it appears that the matrix subject takes over again, cf. (123).

(123) Otto begged Mary to be left alone.

Quite generally, object control becomes ‘arbitrary control’ as soon as there is no matrix object, i.e., the nonlinguistic context will decide what is to be interpreted as the logical subject of the infinitive.

(124) Otto begged to be left alone.
Example (125) from Jackendoff (1972) is a special type of relative construction (cf. section 4.2.1), ambiguous between a subject and an object reading.

(125) The pig is too fat to eat.

Infinitely many more examples could be construed to show the interpretive variability of infinitives, regarding, in particular, the question of how the infinitival subject gets its semantic value. It is interesting to note that infinitives can be used as relative clauses as in (125) or in the examples in (126).

(126) a. He is the man to do the job.
    b. He needs something to eat.

The relative clause use shows that infinitives are ‘open’ structures, i.e., they feature a variable that can be bound from the outside. It appears though that which variable in particular can be bound varies with the construction as well as with the extralinguistic context. In other words, it appears as if the infinitive has a variable that is ‘left dangling’ so to speak and whose value will be determined depending on the particular context. This is expected under our analysis that says that infinitival (as well as excessive) to signals a short circuit, namely, the simultaneous assertion of ‘p’ and ‘¬p’. The interface solves the problem by ‘freeing’ one occurrence of the variable in the structure and binding it in a different manner. We submit that the interpretive variance observed with infinitives that has the air of arbitrariness is a reflex of just this. Infinitives give rise to a local interpretive problem that is solved in a nonlocal fashion by interpreting part of the problematic structure with respect to the nonlocal context.

Let us look a bit more closely at an infamous issue in the context of infinitives, namely, their oft-noted ‘modal’ interpretation. The following examples are from Holl (2006); it is hard to see for many of these examples where the modality should come from if not from what Holl (2010) calls the “modal-passive affix zu”.

(127) Still, im Dickicht versteckt und aus der Ferne kaum zu Quietly, in the thicket hidden and from the far hardly to bemerken (*seiend), schoss der Fotograf *being), took the photographer placidly seine seelenruhig seine notice *being), took the photographer placidly his Bilder pictures.
Often, we observe ambiguity between a universal (necessity / ‘must’) and an existential (possibility / ‘can’) interpretation, cf. (128) or (129).

(128) Wir haben noch diese drei Stück Sahnetorte zu essen.
We have yet these three pieces of cream.cake to eat
(A) We still have these three pieces of cream.cake that can be eaten.
(B) We still have these three pieces of cream.cake that must be eaten.
(C) We must still eat these three pieces of cream.cake.

As we would expect if the modal force is underspecified in Germanic (cf. FN 24), the context decides whether a necessity or a possibility interpretation is favorable, cf. as well (129) and (130), taken from Holl 2006.

(129) Ich suche einen Koffer zum Ziehen.
I look for a suitcase to pull
A I’m looking for a suitcase that can be pulled. preferred
B I’m looking for a suitcase that must be pulled.

(130) Man gab uns erst mal Formulare zum Ausfüllen.
One gave us first of all forms to the filling in
A They gave us forms that we had to fill in. preferred
B They gave us forms that we were allowed to fill in.

We argue that hidden modality is regularly an effect of giving an interpretation to a string that codes a contradiction. To repeat, Peirce (MS 678, p.34, 1910) had it that

[...] that which characterizes and defines an assertion of possibility is its emancipation from the Principle of Contradiction.

We expect then to find possibility readings of modality regularly rather than necessity interpretations, to the extent that we associate the former with existential and the latter with universal quantification (cf. above footnote 24).

The truth conditions of the modalities of necessity and possibility respectively are standardly written as in (i) and (ii) in formal semantics treatments that allow quantification over possible worlds.

(i) \[[\text{must}]] = \forall w_1, w_2 \ p(w_1) \land w_1 > w_2 \rightarrow p(w_2)

(ii) \[[\text{can}]] = \exists w_1, w_2 \ p(w_1) \land \neg p(w_2)

Rullmann/Matthewson/Davis (2009, p. 251) write:

To put it briefly, English modal auxiliaries lexically specify quantificational force (universal versus existential) but leave the modal base unspecified, whereas St’át’imcets modal enclitics do the reverse [...]
Only existential quantification appears to provide a way around LC, repeated in (131) for convenience.

(131) Law of Contradiction

\[ \neg(p \land \neg p) \]

Not both P and not-p

Peirce was careful to formulate LC in terms of subject-predicate (individual-property) terms (cf. Lane 2001 and sections 2.1 and 3.1.2):

(132) Principle of Contradiction

Material mode: For any property and for any definite subject, it is not the case both that the subject possesses that property and that the subject does not possess that property.

Formal mode: For any pair of contradictory predicates “P” and “not-P” and for any definite subject-term “S”, “S is P” and “S is not-P” are not both true.

(133) a. #Pete is tall and Pete is not tall.
   b. #Everyone is tall and everyone is not tall.

Note the “definite Subject” in Peirce’s formulation – importantly, LC does not apply to the vague, i.e., when we existentially quantify (indefiniteness):

(134) Someone is tall and someone is not tall.

(135) Pete can be tall and Pete can be not tall.

It may be argued that possibility (ability) interpretations are the basic case, and that necessity interpretations are a marked option; let us look at imperatives that appear to constitute a strong case for hard-wired necessity interpretations pace a repair analysis, given that they lack constitutive properties of full sentences, in particular, finiteness marking and, accordingly, overtly expressed subjects. According to Kaufmann’s (2012) analysis, necessity interpretations of imperatives are captured by existential quantification over worlds together with exhaustivity, achieved by a silent operator which yields the effect of universal quantification through the back door. The possibility of expressing allowance by means of imperatives suggests that a necessity interpretation is by no means hard-wired, cf. (136) featuring the particle rühig (cf. Grosz 2011).

Similarly, Holl (2010) argues that apparently universal modal readings of certain infinitival structures are really the result of existential quantification together with an operation of exhaustification of the modal base.
Infinite mis-construction

(136) Geh ruhig in die Stadt.
go calm into the city

Ruhig in (136) cancels the necessity interpretation, as should be impossible if it belonged to the asserted meaning. Similarly, phrases like for example cancel the alleged default interpretation of imperatives in terms of necessity. Interestingly and tellingly, an alternative way of expressing (136) is (137).

(137) Geh nur in die Stadt.
go only into the city

In (137), we see our old acquaintance only in the context of possibility modality. Let us compare the approach followed here to prominent accounts of hidden modality from the more recent literature.

The kind of reasoning performed by the lexicalist generativist is that whenever there is a certain meaning, there is as well a lexical element that gives rise to this meaning. According to traditional analyses of modal readings that are not transparently marked, there is an empty element that is like overt modal elements, only it has no phonological form. This amounts to writing a symbol in the semantics language that is not traceable in the syntax language. Bhatt (2006) is a typical example, his line of reasoning is given in (138).

(138) a. Infinitival subject relatives like (He was the last one to arrive) are often nonmodal. Infinitival subject relatives lack a CP projection.
b. Infinitival nonsubject relatives like (this is the party to visit) as well as WH infinitivals like (We) know who to invite are always modal. Infinitival nonsubject relatives are CPs.
c. \( \Rightarrow \) A [+WH] complementizer is the source of modality in infinitival questions.

At rock bottom, the modality thus becomes a constructional property (as C is the head of the clause). Independently of the question what the explanatory force of postulating a silent head doing the required semantics work might be, there are serious problems with Bhatt’s approach. To note, the meaning variability observed with hidden modality does not arise in this form with overt

\[\text{ExH}(\phi) = \lambda b.\lambda p[\phi(b)(p) \land \forall q \in \phi(b)[q \in \phi(p)]]\]

In (i), the variables b, p and q range over propositions, i.e., sets of worlds. \( \phi(b)(p) \) says that the worlds making up the modal base (b) and the worlds described by the imperative intersect; the part after “\( \land \)” says that all worlds in q that are in b are also in p, i.e., there is no world that is in b (the modal base) that is not in q as well, i.e., all the worlds in the modal base are in the proposition associated with the imperative.

\[\text{Kaufmann’s (2012, p. 185) formalization of necessity modality in imperatives is given in (i), (taken from Gärtner 2014, p. 87).}\]
modal elements (i.e., there are no overt elements giving rise to the same meaning) as would seem to be predicted if there were silent cousins of modal expressions. Further, the type of language variation observed with silent modality is unexpected (cf. Reis 2003). E.g., in German, root infinitives are always modal, although it would seem hard to argue that they feature a WH operator.

A different route to the often modal semantics of infinitives is taken by Reis (2003), who relies more on the potential of contextual, i.e., pragmatic accommodation processes or other processes of ‘enrichment’ with information that is not coded or marked in the usual ways. There clearly are regularly embedded infinitives that are not modal, hence Reis concludes that there is nothing in the structure of infinitives themselves that is responsible for the modal meaning. Briefly looking at our proposal, the modal meaning does come from the infinitive (namely, zu/to), but it is because the feature in question cannot be interpreted locally that the modal meaning arises in the first place (in that it is the result of expatriate interpretation of PN coming from excessive too). Regarding root infinitives, Reis proposes that there is a pragmatic strategy to fill in something that is not structurally encoded, in this case, hooking to a possible world (cf. section 4.3.1 below and Brandt 2001).

(139) Wohin gehen?
where.to go?

(140) Einmal spielen wie Brendel.
Once play like Brendel

Reis’ (2003) analysis can be roughly summarized as in (141).

(141) a. The propositional content of any sentence must be referentially anchored.
b. Nonembedded infinitives lack the means to achieve anchoring to context (no finiteness, no subject – cf. again Brandt 2001)
c. The ‘minimal’ anchoring strategy lies in relating the propositional content to the set of possible worlds, hence modality.

More explicitly, (141-c) amounts to existentially binding the world variable associated with the proposition, which is just what the ◦-symbol stands for, namely, possibility (cf. as well footnote 24). Binding the world variable not to the actual world follows from the assumption that free variables are eventually bound deictically, i.e., in the case of world variables, to the world corresponding to the utterance situation. On such accounts, infinitives, as well as, e.g., irrealis morphology or participles as occurring in complex tenses somehow code
that this default valuation strategy is not available.\textsuperscript{27} Reis’ proposal predicts the amazing interpretive variability that we observe with regard to the interpretation of infinitives – this variability is a consequence now of the context filling in the material that is missing in the structure but is needed to arrive at a fully-fledged interpretation. That anchoring to possible worlds – rather than to the actual world – corresponds to the minimal anchoring strategy would appear to be just a stipulation, although it is also what we observe with respect to middles. Note though that in the case of excessives, the PN meaning appears to be put to the actual world rather than to a different possible world, according to our analysis, cf. the repair table repeated in (142).

(142) repair table: \textit{Otto is too heavy (to be a jockey)}

<table>
<thead>
<tr>
<th>vP/VP</th>
<th>\exists th \fake{\textit{SCHWER(Otto, th)}}</th>
<th>O, PUR</th>
<th>\text{prob/rep.}</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP/TP</td>
<td>\neg \fake{\textit{Jockey(Otto) = O}}</td>
<td>\text{P} \rightarrow \text{PUR}</td>
<td></td>
</tr>
</tbody>
</table>

\textsuperscript{27} Regarding participles, it is interesting that in e.g. French or Icelandic, certain constructions featuring a dative experiencer argument appear to be much more acceptable in perfect tenses than in simple tenses, cf. (i) and (ii) from Schütze (1997, p. 109).

(i) a. Marie a semblé à Jean être fatiguée
   Marie has seemed to Jean be tired
   ‘Marie seemed to Jean to be tired’

b. ?? Marie semble à Jean être fatiguée
   ‘Marie seems to Jean be tired’

(ii) a. Mér hefur alltaf virði honum hafa verið seldar þessar bækur
   me-DAT has often seemed him-DAT have been sold these books
   at far-too high a-price

b. ??? Mér vírðast honum hafa verið seldar þessar bækur á alltof
   me-DAT seemed him-DAT have been sold these books at far-too
   high a-price

According to the influential Reichenbachian analysis, perfect forms rely on there being two separate temporal indices available, in particular, an index that does not overlap with the one associated with the utterance situation (speech time). In a more recent formulation of Musan,

Any perfect construction as a whole denotes a post-state of a truth interval of the embedded VP’ (Musan 2001, p. 5)

In other words, there is existential binding of an index that is different from the one that would be the result of “default” deictic value assignment applying to all variables not earlier bound. In contrast, middle constructions rarely occur in perfect tenses or receive a special interpretation if they do (cf. Brandt 2009). This is expected in middles quasi-universal quantification applies so as to repair a violation of LEM as argued in section 4.1, on the assumption that this quasi-universal quantification captures all variables not otherwise bound (cf. Lewis’ 1975 unselective binding approach to adverbs).
Quite possibly, anchoring will be to or by means of what would seem to be nearby on the respective occasion, and this may vary, although the system appears to be restricted in certain yet to be explored ways. We appear to observe restrictions of particular kinds, e.g., that certain semantically interpretable material is “used up”, i.e., may be used only once, e.g., like a variable that cannot be bound twice (cf. the discussion of definiteness effects below in section 4.3.1).

A range of other facts hitherto unaccounted for falls in place. For example, unlike ‘pure’ infinitives, infinitives with *zu* do not appear in the Prefield of certain structures that are generally interpreted in a generic fashion.

(143)  a. Reisen bildet.  
        travelling educates
    b. Zu reisen bildet.  
        to travel educates

Assuming that the prefield is associated with a topic (including, possibly, contrastive topic) interpretation as a general rule and that this corresponds to some form of universal quantification of all free variables at the level of LF, (143) comes out meaning something like (144) in terms of unselective binding.

(144) All travelling cases are education cases
     ‘Whenever you travel, you educate yourself.’

Now, as we argue, infinitival structures are contradictory as of nature, which is the reason why they are interpreted in a modal fashion: it is interpreting a problematic occurrence of a variable as a possible world that is behind their modality. The modal nature is most obvious in cases where *zu* infinitives do occur in the prefield. Apparently they must be modal here.

(145) Zu bedenken ist, dass ...
     to consider is that ...
     ‘It must/should be considered ...’

Universally quantifying over all variables occurring free is no option for infinitives as it does not provide a way out of their contradictory nature. Only existential quantification is an option, but this is not available in topic position (but further below, namely, in the VP, roughly, which is the traditional domain of existential closure and which is as well where we find *zu* infinitives as opposed to pure infinitives which are forbidden here.

(146) a. Reisen gefällt Otto.  
        travelling appeals to Otto
    b. Zu reisen gefällt Otto.  
        to travel appeals to Otto
Infinite mis-construction

(147) a. Otto gefällt zu reisen.
   Otto appeals to it to travel

b. *Otto gefällt (es) zu reisen.
   Otto appeals to (it) travel

Having a zu-infinitival structure in the prefield amounts to (148-a), while what is needed – and available in the middle field only in the general case – is given in (148-b), where p represents the propositional content associated with the infinitival structure.

(148) a. For all possible values of variables x occurring free in p, p(x), and for all possible values of variables x occurring free in p, ¬p(x)

b. For some possible values of variables x occurring free in p, p(x), and for some possible values of variables x occurring free in p, ¬p(x)

In support of this analysis, note that zu infinitives in the prefield get better when material is added that furnishes quantification in terms of the I and O corner of the square. The same material makes ‘pure’ infinitives much worse; ‘pure’ infinitives require material that allows for generic or universal quantification. The data in (149) illustrate the point.

(149) a. Hunde (zu) streicheln ist gefährlich.
   dogs (to) stroke is dangerous.

b. Diesen Hund *(zu) streicheln ist gefährlich.
   this dog (to) stroke is dangerous.

Let us turn back to tough-constructions. When we ask how the property that we are looking at is built, we look at tough-constructions as they appear to provide a window into the formation of this very property, which, to give away a longer story, is “being good/bad as an object of a certain action”. The interesting thing that we see in so-called tough-constructions is that the matrix subject appears to be ascribed a property in which it figures itself – preferably, as an object. So this seems to be an allowed option of self-reference. As we argued, we see it as well in middles – there, essentially, what is being compared is thresholds of being good or bad regarding participation as an object (patient) in certain actions (cf. above section 4.1.2).

The basic question is whether we can derive the properties of tough-constructions from the syntax or whether we have to account for the them by lexical means. If the analysis here is on the right track, the properties we are interested in could not be lexical as tough-constructions are perfectly productive, namely, occurring with excessive predicates which we analyzed as reflexivized comparatives, cf. section 3.2.2. In support of the likely syntactic source of the particular
meaning associated with tough-constructions, we observe regularly applying transformations in this domain (examples from Chomsky 1980, p. 309).

(150) The violin is good to play (on).
      It is a good violin to play on.
(151) This is an easy violin on which to play sonatas

According to Chomsky’s approach, tough-constructions are not compositional in any simple transparent sense, the basic idea being that the infinitive denotes a property that is put together with the tough-predicate further up in the structure. On this basis, interpretive differences like between (152-a) and (152-b) from Chomsky (1980, pp. 204f) can be accounted for.

(152)  a. John is too clever [PRO to expect us to catch]
       b. John is too clever [PRO to expect us to catch Bill]

Chomsky’s idea regarding the contrast is that PRO must refer arbitrarily in (152-a) because it would otherwise bind the trace of the matrix subject and thus violate Principle C of the binding theory. Regarding (152-b), where PRO is controlled by the nominal John, Chomsky writes:

The question does not arise in case (45ii) [= (152-b)]. Therefore it may receive the (highly preferred) control reading.

It looks as if the grammar tries to use what is available as an antecedent, but that it cannot, and that only therefore it introduces a different individual (arb) (cf. the Principle “Don’t overlook anaphoric possibilities” (Williams 1997)). This is essentially like pushing something somewhere else, i.e., the kind of repair that we seem to be concerned with. Chomsky comments that:

An approach to this complex of problems that might be explored is one based on the assumption that the adjective-complement phrase [...] is subject to reanalysis, with easy-to-please (etc.) taken as a complex adjective. [...]

(19) John is [AP [A easy to please] t_i]

Compare “how easy to please” is John. The trace t_i, no longer A’-bound, is not a variable but rather an anaphor after reanalysis; it also lacks case. If it is coindexed with John, as is an option under the free indexing convention, the sentence is grammatical. We now assume that there is no rule of control relating John and PRO in COMP [...] rather, there is an antecedent-anaphor relation relating John and t_i. [...] Since the trace in
Infinite mis-construction

(19) is in a $\Theta$-position, we may assume that it transmits its $\Theta$-role to its antecedent in the usual way. Therefore, we need no longer assume that the matrix subject position is a $\Theta$-position. Correspondingly, there is no need for a dual lexical representation. Adjectives of the easy-category never assign a $\Theta$-role to their matrix subject when they have clausal complements; the matrix subject assumes the $\Theta$-role of its coindexed trace, exactly as in the case of movement. (Chomsky 1981, p. 312)

When compared to middle constructions, however, we see that tough-constructions allow much more leeway as concerns the predicates occurring in them; to the extent that one wants to put explanatory burden on conditions on complex predicate formation as appears sensible, this indicates that adjective and verb are not fused in tough-constructions as they are fused in middles, or at least not in the same way, cf., e.g., the examples in (153) and (154).

(153)  a. Otto is easy to recognize.
       b. *Otto recognizes easily.

(154)  a. The book is impossible to read.
       b. The book reads impossibly.

Further, ‘infinitival’ /tsu/ appears to belong to inflection; there is functional material then between what fuses according to Chomsky’s proposal, indicating that there is some structural distance at least between the adjective and verb; again, this appears to be different in middles where material between adjective and verb is generally disallowed, cf. (155).

(155)   The horses ride (*sometimes/always/indeed) easily.

When we look at the predicates that license the kind of tough transformation just described, it seems at first sight that they form a small class consisting of be likely, be fun and be good. In fact, however, the class is infinite, namely, the excessive construction discussed in section 3.2.2 productively gives rise to the tough transformation. The examples in (156) from Jackendoff (1972, p. 227) may serve to illustrate.

(156)  a. This pig is old enough/too young for Harry to kill.
       b. This pig is old enough/too young to climb the fence.
       c. This pig is too fat/fat enough to eat.

The lexically simple predicates occurring in the tough-construction all belong to a class that has recently drawn much attention, namely, the so-called “predicates of personal taste”. The next section discusses how excessive constructions can enlighten us about their underlying structure.
232 Bound to contradict

By way of summary, let us put down the news about /tsu/ in terms of its properties as they surface in tough-constructions as something like an extreme case. To note, we observe over and over that superficially different constructions containing /tsu/ – in particular, infinitives and excessives – are quite generally characterized by two properties, namely: 28

- a modal interpretation (infinitival, comparative /tsu/)
- an ‘internalizing’ effect, i.e., blocking of the realization of the external argument

As to the first point, our analysis supports the idea that the modal interpretation often associated with constructions is the effect of some kind of repair (cf. Reis’ analysis). However, we argue that existential quantification over worlds is not merely the default ‘minimal’ strategy but really the only option as only existential interpretation provides a way out of LC as arising from illegally reflexivizing asymmetric relations as structuring the comparative as well as the temporal domain. The consequence is that apparent universal (necessity) interpretations are the effect of exhaustification. The idea that infinitives carry a free variable that must be bound by non-standard means leaves room for cases where we observe no modality, e.g., in embedded infinitives that are interpreted factively, as in (157).

(157) Otto managed to come (→ Otto came)

As is standardly assumed, the ‘factive’ or, more generally, realis interpretation of infinitives under certain selectors is very probably a case of lexical material ‘overwriting’ more general routines that cover the elsewhere cases.

Turning to the ‘internalizing’ property, it is remarkable, first, that we observe it in /tsu/ constructions just as much as in the illegal reflexivization structures that are instantiated in inchoatives and middles (section 4.1.2). Our analysis predicts “object meanings” to surface in unexpected (as they are unmarked) places as it is DIFF that is coded in the construction but cannot be interpreted in situ in full, such that DIFF-O is pushed elsewhere by Expatriate Interpretation. To repeat in prose, DIFF-O can be paraphrased as in (158) (cf. in particular section 3.3.1.

(158) DIFF-O = lacking a property that the subject has

It should be clear that DIFF-O cannot be accommodated if there is no appropriate subject (to validates the I meaning) with respect to which it can defined

28 A work that makes /tsu/ responsible for the modal interpretation of certain infinitives is Holl (2010).
be defined only. However, while it appears to be the overwhelmingly applying option to interpret the missing argument as an object in *tough*-constructions, it is not the only option; e.g., (159-b) gives Jackendoff’s example of an ambiguous *tough*-construction next to a ‘standard’ *tough*-construction in (159-a) that assigns an internal role to the matrix subject.

(159)  
  a. The pig is too fat to keep at home.  
  b. The pig is too fat to eat.

In the ‘standard’ *tough*-construction in (159-a), the matrix subject is assigned the embedded predicate’s internal role. In (159-b), it appears to be possible as well to assign the embedded predicate’s external role. We may ask why assignment of the internal role is strong preference in *tough*-constructions, but not absolute. In accordance with what we argued above, we tentatively offer the following reasons: If something cannot be both subject (agent) and object (patient) at the same time, it is safer to drop the subject (agent) role as it is more specific than the object role (namely, it is the role that is positively defined) as well as independently recoverable given the prominence of agency. We saw again and again above that it is regularly the object meaning – O that is – that is “left over” and expatriately interpreted: The same ‘internalizing’ property that we see in *tough*-constructions is associated of course with inchoative and middle constructions that were argued to be cases of illegal reflexivization like the /tsu/ cases discussed in section 4.1. There is, generally speaking, much more syntactic flexibility as concerns expressing the external role, witness the pro-drop property or even passive. Not least, the object is marked in nominative-accusative languages hence there is a sign – accusative marking – here that calls for interpretation, unlike with nominative that is just the unmarked “null” case. Pushing the external role up may be a way of dodging the classic theta-theoretic problem associated with the construction, namely, that one argument expression appears to be assigned two different roles from two different sources – it appears that it is predicates allowing for object drop like *eat* where we see the extraordinary external reading emerge. Alternatively, we may be dealing with a different structure of course with just a ‘regular’ purpose clause with its PRO subject being bound by the matrix subject. Further research will have to show in how far the suggestions made here square with Haider’s worthy insight that (infinitival) /tsu/ blocks the external role, i.e., cuts off whatever would have become subject if /tsu/ were not there.

We argued specifically for comparative constructions that the predication associated with the ‘object’ role (embedded standard of comparison) is weaker than that associated with the ‘subject’ (matrix) role. For this reason, we argued, the ‘object’ predication is turned presupposition. An additional reason for manipulating the subject rather than the object role may then consist in the circumstance that it is generally more feasible to manipulate assertive rather than presuppositional material.
4.2.2 Embedding irony

Irony involves a kind of contradiction between what is said (semantics) and what is actually the case in the utterance situation (pragmatics) and is thus clearly located at the pragmatics-interface. The incompatibility of what is literally coded with what is (known) to be the case leads the addressee to manipulate the literally coded meaning, in particular, weaken it, be it in terms of negating the whole proposition or just certain parts of it (cf. below). We are trying to make a case here that what happens in irony happens as well at embedded levels of structure, i.e., in the compositional process proper. In this section, we discuss further cases that corroborate the view that much like there appears to be a quasi-automatic and silent interface mechanism that achieves what the natural language expression only achieves (in terms of strengthening), there is also a quasi-automatic interface mechanism that achieves pretty much the opposite of what the natural language expression only achieves, namely, the weakening mechanism described here takes what is asserted and negates it and asserts instead a meaning that is represented as a consequence of the one that appears to be actually coded, i.e., an entailed (weaker) meaning. To exemplify, it turns an utterance like that in (160-a) into what we have in (160-b).

(160)  a. It’s superbly hot.
        b. It’s not superbly hot, but quite hot.

We see this transformation take place in cases of hyperbole, where it is obvious from the context that the utterance is too strong when literally interpreted, quite simply because the literal interpretation contradicts what can be observed or is known in the utterance situation. Similarly, weakening is licensed in reaction to a violation of LC – not between the literal meaning and the context, but rather between literal meanings that are simultaneously coded. As we will see, weakening is generally marked in addition, namely, in our cases, there is morphology in the structure that is not interpreted in place – generally, with respect to what are commonly called “ordinary individuals” – but with respect to structural elements in the linguistic context, in particular, with respect to structure that is concerned with coding indexical information. As a matter of course, the literal meanings of utterances are strengthened for them to be interesting or even usable. The news is there is also systematic weakening, to the disadvantage of what is actually asserted.

Spotorno et al. 2012 have found that understanding irony is effortful. In particular, there arise P 600 (“late positivity”) effects in the comprehension of irony that indicate reanalysis. Schumacher et al. (2018) find the same effect in the comprehension of privative predicates such as fake as well as so-called animal-for-statue alternations that enforce weakening of the meanings of the
combined material to the avoidance of contradiction, e.g., the requirement that what falls under \textit{dove} be alive for the example in (161).

(161) wooden dove

Asking what the process we are trying to describe is akin to, we could say that it resembles embedded irony. We should note then, first of all, that irony does embed indeed, as in, e.g., the indirect quotation in (162), which clearly conveys that Otto’s original speech act was intended ironically.

(162) Otto \textit{sagte das sei eine schöne Bescherung gewesen}. Otto said that were a nice mess been

In irony, contradiction is at the same time most hidden and most obvious. While we feel at a loss largely describing how it is marked, it is obvious in the case of irony for the hearer that what is said by the speaker contradicts in some way or other what is the context of the utterance that is made. It is clear why it is so hard to pin down the markedness of irony (cf. below): it is a matter of being in conflict with the extralinguistic context, which couldn’t be part of the expression as a matter of logic (it is the nature of strengthening not to be marked, cf. above section 2.2). Irony shows that we make use of contradiction between what is said and what is contextually given. What we argue here is that we can as well embed it, i.e., make use of the option of producing a contradiction already before we start looking at the context (cf. above/below: times, worlds, thresholds are context-affine). A case where we see it clearly is privative predicates, to be discussed presently.

Irony is a way to get a message across in particularly difficult contexts, namely, in contexts where speaking plainly (i.e., obeying in particular quality maxims like “be perspicuous” or “be truthful”) is dangerous. If these techniques exist, why should they not make it into the grammar at more hidden levels?

But let us ask what it means for there to be embedded irony, starting with the question of how irony should be defined to start. The putatively classical – i.e., Grice-inspired – view is that Irony is something like negation of the literal statement.\textsuperscript{30} What does Grice say? He seems to be saying in 1975 (page 53f) that irony is the negation of what is actually said.

A must be trying to get across some other proposition than the one he purports to be putting forward. This must be some obviously related proposition; the most obviously related proposition is the contradictory of the one he purports to be putting forward.

\textsuperscript{30} This seems to have been the original concept; with Cicero, apparently, the idea emerged that irony needn’t consist in understanding the opposite of what is said but just “something else”, cf. Lapp (1997).
But this is too strong and too weak at the same time, as Grice as well realizes, adding later (1989, pp. 53f) that

I cannot say something ironically unless what I say is intended to reflect a hostile or derogatory judgment or a feeling such as indignation or content.

and concerning markedness, Grice (1989b, pp. 53f) says

It was suggested to me that what should have been mentioned in my account was, first, a familiarity with the practice of using a sentence, which would standardly mean that \( p \), in order to convey that not-\( p \) (a familiarity which might be connected with a natural tendency in us to use sentences in this way), and, second, an ironical tone in which such utterances are made, and which (perhaps) conventionally signifies that they are to be taken in reverse. [...] I am also doubtful whether the suggested vehicle of signification, the ironical tone, exists as a specific tone; [...] what qualifies such a tone as ironical is that it appears, on this and other occasions, when an ironical remark is made.

The ironic tone may turn out to be indistinguishable from other prosodic features, as, e.g., the main accent of the clauses. Consider the pair in (163).

\[(163)\]
\[\text{a. } \text{Das ist ein schönes Geschenk.} \]
\[\text{b. } \text{Das ist ein SCHÖnes Geschenk.} \]

‘That’s a beautiful present.’

(163-b) is much more easily interpreted ironically than (163-a), if (163-a), which has just the default accent, can be interpreted ironically at all. In (163-a), the accent is shifted to the adjective. Assuming, as is standard, that the accent on \( \text{scho"enes} \) evokes alternatives to the adjective, it appears that a particularly obvious alternative to the accented expression is its negation, or, rather, its polar opposite, i.e., \( \text{häsßlich} \) ‘ugly’.

Or take the example in (164), which transports that the addressee is actually not an excellence and that the speaker is not her subject, by way of cumbersome expression that is likely to be interpreted as an exaggeration or ironically (cf. section 2.2 on the relation between exaggeration and irony).

\[(164) \quad \text{Would your generous majesty please forgive a humble subject to express his unworthy opinion?} \]

To sum, we find basically two things in irony: negation, and pretense that is used to avoid face threat. Speakers may use quality violations to get their message across if the qualitatively better utterance would have been what Brown
and Levinson (1987) call a face threat. Saying it plainly would be against the social code. So we could say that sometimes, being truthful is in conflict with prudence, and then irony provides a way out.

To repeat, Grice says that irony is marked, albeit in a truly circular fashion: there is an ironical tone associated with the ironically made utterance that is defined by being used when an ironical statement is made (ibid.). Hence, it appears that anything might be turned ironic. But this is not the case. There has to exist the possibility of being false. Therefore, e.g., irony appears impossible within the complements of factive verbs; Cutler (1974, p. 117) illustrates with the example in (165).

(165) #Bill regrets that Austin is a swinging town.

Similarly, it is hard to use a tautological statement ironically:

(166) It is like it is.

\[ \neg \text{It is not like it is.} \]

\[ \neg \text{It is like it is not.} \]

Now note the contrast between the examples featuring verum focus in (167) and (168), suggesting that verum focus is disallowed in tautological structures.

(167) #Es IST wie es ist.

\[ \text{it IS like it is} \]

(168) Es IST nicht wie es ist.

\[ \text{it IS NOT like it is} \]

The rationale is that one may not stress what is obvious or can be derived – another instance of Hurford’s constraint. Note that in contrast to tautology, verum focus appears to ameliorate contradictions. As a corollary, utterances with verum focus appear to be very hard to interpret ironically. This is because verum focus stresses truthfulness.

(169) Otto IST ein Linguist.

(170) Otto IST aber auch ein Linguist.

To sum, two things appear to play a decisive role regarding irony: negation, and some notion of praise or blame. We may think of irony as partial negation (Preuschat 2007). It need not be the whole proposition that is negated. Instead, negation can affect only part of “what is said”, in particular, something that is entailed or presupposed by what is said. What is negated may thus appear to belong to different levels. Let us look at an example that can only be interpreted ironically and sketch how we derive the implicature carried by it.
Bound to contradict

(171) Sie sind zu gnädig
you are too merciful.

The addressee knows that she is not a ruler or king, or manages to figure out that this is what the speaker is trying to convey to her uttering (171). Also, it could appear impossible for anybody, including rulers and kings, to be too merciful. Irony is thus the negation of certain parts of the literal meaning—something that is entailed or presupposed by the actually made utterance, were it uttered in what Frege called “gerade Rede” (i.e., speech with full commitment to the truth of what one says). Accordingly, it appears to help for ironic interpretations to arise to have alternatives, e.g., oppositions or scales that can easily be identified (Lapp 1997, p. 36). In this regard, irony is like the better understood Q(uality)-implicature. Our point here is that Quality-based implicatures may embed as well.

Weakening as a result of violations of quality maximes takes us a long way as regards the understanding of standard cases of metaphor. About metaphor, Grice says the following (1975, p. 53):

Examples like You are the cream in my coffee characteristically involve categorial falsity, so the contradictory of what the speaker has made as it to say will, strictly speaking, be a truism; so it cannot be that that such a speaker is trying to get across.

Grice’s idea here seems to be that since there is no logically related proposition (e.g., the wide scope negation of the literally coded one) that makes sense in being informative, you go an to access the entailments, i.e., supersets of your expressions so as to broaden the interpretive possibilities or allow more options of interpretation. Similarly in meiosis or hyperbole, discussed above in section 2.2. (172) is an example of understatement.

(172) He was a little intoxicated.

Using (172), the speaker asserts a weaker meaning that the hearer is prone to strengthen, presumably, by looking at it as the negation of what is actually intended. Since we are moving about in a scalar domain here, the resulting meaning is basically “more than this P” (cf. section 2.2). Politeness more generally appears to work this way, of course, leaving it to the addressee to strengthen the case that the speaker has understated. In the scalar domain, this amounts to taking away the negation, which as we discussed leads to a “lesser” meaning here, such that subtracting it leads to a stronger meaning. To note, adding another negation does not cancel out an other negation but leads to the Litotes effect.

(173) He is not unsmart ≈ He is pretty smart.
(173) is quite polite, as the speaker is now being superbly vague and leaving the hearer vast interpretive options. One could maybe say that being polite means leaving open more, or opening choices for the hearer. Therefore, questions are more polite than imperatives – they leave more choice. Therefore, being polite is saying something weak: it includes more options. A core feature of politeness thus lies in not determining too much for the hearer. In a similar vein, Bolinger (1972, p. 116) states the following.

In examples like

(i) I was not unaware of the problem
   It was a not unkindly meant remark

the denial of the negative leaves the entire positive range open to whatever degree is appropriate. The litotes, in fact, calls attention to this gradient – the hearer is invited to consider the degree to which the facts point.

Or, in Horn’s (1989, p. 555) formulation:

Bolinger points out that ‘...the denial of the negative leaves the entire positive range open to whatever degree is appropriate’, the context narrowing down the intended range actually intended by the speaker.

The cases just discussed all involve gradable predicates; we expect the resulting meanings to be weaker (as negation means “less” here), and it appears to be many a speakers intuition that (174-a) is weaker than (174-b).

(174) a. Otto is not unsmart
    b. Otto is smart.

On the other hand, and taking a more technical perspective, none of (174) appears to really entail the other. Arguably, this is an effect of the tradeoff between explicitness and brevity discussed in section 2.2 – to repeat, we generally expect elaborateness to be paired with exclusivity, i.e., strength, and brevity to be paired with inclusiveness, i.e., weakness. In (174-a), the elaborateness of the utterance pulls in the opposite direction of the literal semantics, namely it invites the hearer to look for a plus in informativity compared with the unmarked form in (174-b). Crucially for the Litotes effect, negation does not yield complements with gradable predicates (that give rise to strict orderings, cf. section 3.1.2), but rather means “less”. We see the difference between weak (ordinary individual) and strict (phenomenal individual) orderings with respect to the interpretation of negation again in (175) and (176).
Bound to contradict

(175)  
a. Otto is alive  \[\text{Otto} \in \text{ALIVE}\]
b. Otto is not alive  \[\text{Otto} \notin \text{ALIVE}\]
c. Otto is alive = Otto is not not-alive = Otto is not dead

(176)  
a. Otto is heavy  \[\text{OW} \supset \text{HW}\]
b. Otto is not heavy  \[\text{HW} \supset \text{OW}\]
c. Otto is not un-heavy = Otto is quite/rather/pretty heavy

To repeat, an absolute predicate like in (175) will generally partition the domain, i.e., an individual will either be in P or not. There is no other option, as the union of a set denoted by P and its complement denoted by \(\neg P\) will cover the whole of the domain. In contrast, a predicate that behaves along the lines of (176) does not partition the domain. Quite to the contrary, we argued that (before any pragmatics-inspired mechanisms apply) what is in P is just as well in \(\neg P\) in the case of gradable predicates (cf. again sections 3.1.2 as well as 3.2).

Now (175) and (176) are about one place predication, i.e., simple property ascription. If we look at relations, quite the opposite of what we just saw is the case. Namely, in the ordinary individual case, if \(xRy\) it is completely open whether \(yRx\) or not. In the case of strict orders in contrast, asymmetry holds, i.e., the formula in (177) is true (cf. above section 3.1.1).

(177)  \[xRy \rightarrow \neg(yRx)\]

To the extent that the ordering is total, (177) amounts to LEM for relations, i.e., (178), familiar from the definition of strict orderings (cf. section 3.1.1).

(178)  \[\forall x, y \ xRy \text{ or } yRx \text{ but not both}\]

In other words, LEM generally holds in the scalar hence comparative domain where negation behaves funny in taking “illogical” narrow scope. LEM is given again in (179) in its standard version and in (180) in Peirce’s formulation.

(179)  Law of Excluded Middle (LEM)  
Every instance of “p or not-p” is true  
\[p \lor \neg p\]  
Either p or not-p

(180)  Principle of Excluded Middle:  
Material mode: For any property and for any individual, either that individual possesses that property or that individual does not possess that property  
Formal mode: For any pair of contradictory predicates “P” and “not-P” and for any (non-general) subject-term “S”, either “S is P” or “S is not-P” is true.
We observe that negation can be moved around in other domains than the scalar one. In particular, the phenomenon that has come to be known as Negative Raising (NR) exhibits unexpected semantic scope of negation.

(181) John believes Sam had some of the cookies.
\[ \neg \text{John believes Sam didn’t have all of the cookies.} \]

The problem here is that negation is too low, leading to a stronger interpretation than would be expected given the surface structure. The phenomenon is restricted to particular predicates like believe, think, suppose or imagine, while predicates like e.g. know or regret do not exhibit it, cf. (182) and (183).

(182) John knows Sam had some of the cookies.
\[ \neg \text{John knows Sam didn’t have all of the cookies.} \]

Know, claim or regret are non-NEG-raisers:

(183) John regrets Sam had some of the cookies.
\[ \neg \text{John regrets Sam didn’t have all of the cookies.} \]

According to the mainstream analysis, NR takes off as a pragmatic routine that may get conventionalized in certain cases. We argue that EI is similarly rooted in pragmatics; however, what is expatriately interpreted is brought into the structure by grammatical elements, EI effecting that Diff-O ends up higher in the structure than would be expected (cf. section 3.1.1). In section 3.2 we argued that the formula in (184) amounts to a tautology when interpreted in strictly ordered domains.

(184) \[ \forall x \ P(x) \rightarrow \neg P(x) \]

The relational version of negative raising is (185).

(185) \[ \neg \forall x \ P(x) \rightarrow Q(x) \rightarrow \forall x \ P(x) \rightarrow \neg Q(x) \]

(185) is just our analysis of comparative formation. Incidentally, it corresponds to a classic example that is the opposite of negative raising in giving a syntactically narrow scope negation semantically wide scope, cf. (186).

(186) All that glitters ain’t gold

Felix 5;6 appears to use the same pattern when he says (187).

(187) Auf jeden Fall nicht.
\[ \text{in any case not.} \]
The target utterance is (188), where we see the sign carrying the negation occur at a different position in the structure, arguably at a more embedded position.

(188) Auf keinen Fall.

Plausibly, NR comes at a cost, in terms of cognitive effort.\textsuperscript{31} Bartsch’ (1973) seminal analysis explains NR on the basis of the reasoning scheme in (189).

(189) \( p \lor q \)
\[ \neg p \]
\[ q \]

For the first line to be true, \( p \) or \( q \) or both have to be true. If one of \( p \) or \( q \) is false, then the other must be true. It is the scheme in (189) that according to Bartsch (1973) gives us the clue as to how negative raising interpretations come about, i.e., how we can go from (190) to (191).

(190) A doesn’t believe that \( p \)

(191) A believes that not \( p \)

A crucial assumption for deriving (191) from (190) is that regarding the truth of the embedded sentence, \textit{tertium non datur}, i.e., we can assume (192).

\[
A \quad \text{A glaubt dass } p, \text{ oder } A \text{ glaubt dass nicht } p. \quad \text{cf. LEM}
\]

Bartsch gives a proof that under \( A \), (191) is derived from (190). The proof has an interesting and problematic property (apart from ‘existential’ and ‘universal instantiation’): It goes to a contradiction that is “repaired” by replacing an assumption by its opposite, as in a reductio ad absurdum proof: Under the assumption that ‘a believes that \( p \)’, derive a contradiction. Therefore, ‘a believes that not \( p \)’ must be true. The proof goes like this:

\[
\begin{align*}
A & \quad \text{A doesn’t believe that } p & \exists w (w \in B_A \land \neg (\text{‘}p\text{’} \in w)) \\
\exists! & \quad \text{A believes that not} \ p \ \text{in} \ w_1 & \text{existential instantiation} \\
A^* & \quad \text{A believes that} \ p & \forall w (w \in B_a \supset \text{‘}p\text{’} \in w) \\
\forall! & \quad \text{A believes that} \ p \ \text{in} \ w_1 & \text{universal instantiation} \\
\# & \quad \neg (\text{‘}p\text{’} \in w_1 \land \neg (\text{‘}p\text{’} \text{in} \ w_1)) \\
\end{align*}
\]

Therefore: the opposite [sic!] of \( A^* = A \) believes that not ‘\( p \)’

\textsuperscript{31} Before it may get completely conventionalized, this is. But so may the process of EI, or certain instantiations of it, which appears to be becoming an empirical question, at least to some extent (cf. Schumacher et al. 2018).
We can reach the conclusion only if LEM holds with regard to the predication, but not otherwise. Above we saw that part of the cases here discussed similarly depend on the applicability of LEM as entrained by talk of matters that are strictly ordered (cf. section 3.2). However, Horn (1989, p. 322) concludes his discussion of NR by noting that NR is subject to considerable variation.

Given the extent of the intra- and cross-linguistic variation on the membership of the set of NR predicates, we must apparently conclude with Epstein (1976:160) that even if the NRP is pragmatically motivated, the process within a given language ‘may be conventionalized, so that its end results are automatic’.

Still, Horn proposes a classification of Neg-Raising predicates along the following semantic classes (ibid., p. 323):

(192) a. OPINION: think, believe, suppose, imagine, expect, reckon, feel, (%guess, %anticipate)
   b. PERCEPTION: seem, appear, look like, sound like, feel like
   c. PROBABILITY: be probable, be likely, figure to
   d. INTENTION/VOLITION: want, intend, choose, plan
   e. JUDGMENT/(WEAK) OBLIGATION: be supposed to, ought, should, be desirable, advise, suggest.

Horn (ibid., p. 345) further comments that

[...] whether a predicate within the appropriate class does in fact trigger the NR understanding depends on whether this implicature has been short-circuited into a usage convention.

When we look at Horn’s classification, we observe that the contexts described invite application of the law of the excluded middle (LEM). We expect this to be so because in LEM-contexts only, the reductio proof is really as good as a real proof. So there are at least two ways of arriving at new variables really: For one, there is Peirce’s law, which is equivalent to LEM. For another, there is the option of deriving a contradiction, which under LEM appears to be as good as deriving any (other) proposition. For both Peirce’s law and deriving something from contradictions, then, LEM is crucial.\(^{32}\) In sum, Neg-raising

\(^{32}\) Anticipating, the contribution by so-called “personal” or “free” dative arguments has been analyzed as implicature (Horn 2013, Gutzman 2007) and that we can observe an interaction between dative licensing and negation. As is well known, (conversational) implicature disappears in negative or downward entailing contexts as its strengthening effect is lost here (cf. above section 2.2). The examples in (i) from Reinhart (2006) illustrate the loss of implicature in negative (downward entailing) contexts.
Bound to contradict

is a conventionalized reductio proof. We expect it to conventionalize in LEM contexts, but not elsewhere.\[^{33}\]

At rock bottom, then, NR gets to be associated with certain lexical elements by convention. Do we find that the mechanism of pushing D─O by means of Expatriate Interpretation may similarly be lexicalized, as we might expect? In what follows, we submit that this lexical (as opposed to grammatical) conventionalization is what we see in the case of so-called privative predicates (*false*, *fake*) as well as in so-called predicates of personal taste (*nice*, *tasty*).

As noted above (section 2.2), interpreting constructions that feature privative predicates involves going beyond – more specifically, to the complement of – what is literally coded in the structure; whatever is denoted by (193) is outside of the denotation of the head noun, contrary to most basic assumptions regarding compositionality, in particular, the head principle and conservativity (somewhat more broadly understood as not going beyond what falls under the restrictions of natural language expressions, cf. again section 2.2).

(193) (This is) a false senator.

Regarding predicates of personal taste, it is not immediately obvious that interpreting these involves weakening in this sense. What is clear though is that PTs are particularly volatile as regards their interpretation, i.e., they react with context very heavily. E.g., a speaker uttering (194) does not appear to be contradicting himself although this would be expected on the basis of pure form, cf. (194-a) and (194-b).

(194) a. Es schmeckt mir nicht, aber nicht, weil es nicht
tastes me.DAT not, but not because it not
schmeckt.
tastes.
‘I don’t find it tasty, but not because it is not tasty.’
b. #Es ist nicht dunkel, aber nicht, weil es nicht dunkel wäre.
It is not dark, but not because it is not dark is
‘It is not dark, but not because it is not dark.’

Thus, predicates of personal taste often appear to have a modal interpretation,\[^{34}\] consider as well English (195).

(i) a. Anyone who has six children is entitled to child support.
b. If you have three dollars, you can go to the zoo today.

\[^{33}\] We would expect, accordingly, that Dative constructions are more easily available in LEM contexts, cf. section 4.3.2.

\[^{34}\] I.e., interpreting them involves making reference to situations that are not the “actual” situation. Cf. below section 3.3.
The pudding is tasty, but I’m not enjoying it.

If it is possible for the meaning of PTs to vary even if the subject referent is kept constant, we are not surprised to see the meaning may be different for different subjects; in particular, PTs give rise to what has come to be called “faultless disagreement” (FD), exemplified in (196).

A and B disagree, but we feel they may both be right—so the disagreement is “faultless”. This is disturbing, as it contradicts our intuition that at a certain place at a certain time, i.e., on a certain occasion, either p (“this is tasty”) or ¬p (“this is disgusting”) should hold, but not both. This is of course the law of contradiction LC, cf. section 3.1.2.

Kennedy (2009) notes that what singles PTs out is that FD survives with them if they are used in the comparative construction. Thus compare (197) to (198).

We will see that in tandem with other tests, Kennedy’s criterion leads us to acknowledge that there is in fact an infinite set of predicates that exhibit PPT behavior. To this set belong so-called “privative predicates” like fake, former or alleged, as well as actually any adjectivally used participle form of a verb expressing a change of aggregate (melted, destroyed). Most crucially, the

Privative predicates have the disturbing property of asserting of the individuals falling under the nominal that they apply are not in the extension of these very nominals: a fake senator is not a senator, and if I say “That senator is false” then I am saying that the person in question is not a senator for real. Privative predicates ruin a neat classification of adjectives along the intersective vs. subsective dimension as they are neither. The hierarchy of adjective meanings in (i) is taken from class notes from Romero (2008).
excessive forms of run-of-the-mill adjectives turn out to pattern with PTs as well. Excessives have the advantage of making visible some, if little, syntax, and they can therefore serve as a window into the workings of PTs.

According to the currently predominant line of reasoning, there is a judge involved in A’s and B’s statements that is essentially on a par with the world or time indices common in model-theoretic semantics (cf. section 3.2.2). The judge is of course our threshold. Turning to the property of FD survival in the comparative construction, it appears impossible at first sight to test it for excessive predicates as the comparative and excessive forms usually exclude each other. There is, however, the case of German anders ("different") that allows the combination of both constructions in one sentence. Basically, the adjective anders shows the distributional properties of bona fide comparative forms while it lacks comparative morphology. We observe FD in the case of anders; note, then, that FD associated with excessive structures survives in the comparative construction, cf. (199).

(199)  A: Aga ist zu anders als die anderen Kinder.  
       Aga is too different than the other children  

       B: Nein, Aga ist nicht zu anders als die anderen Kinder.  
       No, Aga is not too different than the other children  

We want to explain why faultless disagreement survives in the comparative, i.e., Kennedy’s observation. Why would it survive? This is because comparing is adding a negation to the P meaning. But regarding the predicates that give rise to FD, we argue they already have a negation added to the P meaning. Stacking another negation on top makes no difference – having the comparative is building in a negative meaning – with the interpretation of Diff-O amounting to “something doesn’t pass the threshold” – that is there already, so this is just tautologous. The natural question to ask is how the structure can integrate the negative embedded meaning. But in fact, positives naturally

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Partee (2010) argues regarding privative adjectives that they come with a coercive instruction to interpret the noun they modify in a looser fashion than usual, in essence, an option that appears feasible in principle in light of the fact that oftentimes, the information that something is not “real” can be inferred from the context. Morzicky (2014, chapter 2) gives the example in (ii) to illustrate the naturalness of this kind of talk in appropriate contexts, commenting that “one wouldn’t be inclined to say something like (ii-Morzicky’s (38)) to a child”.

(ii) Stop pointing your fake gun at your sister’s face, and take your fake dinosaur out of her nose. Put away your fake truck, too.

Incidentally, this is a typically structuralist argument that comparative and excessive morphology compete for the same job in the derivation (cf. Bresnan 1973 and below). Much useful information on anders can be found in Grimm’s Wörterbuch.
Infinite mis-construction

entrain the relevant position, to the extent that standards of comparison and comparison classes are just entailed meanings. In other words, the structure in (200) The burger is tasty.

naturally extends to the structure in (201), i.e., a standard of comparison can be freely added in principle. If personal predicates are reflexivized comparatives, then this entails that (202) something that is tasty, is ¬tasty, i.e., there should be a threshold where both the thing in question meets and does not meet a certain threshold (but only some lower threshold). But this is impossible. Therefore, the semantics is “split” and turned into (203) Something is tasty, and only.less.tasty = tasty, elsewhere.

This appears to be the opposite of what happens in the comparative usually. Here, something is not embedded but kept to be interpreted with respect to what will be computed later. In personal predicates as much as in excessives, we propose what happens is reflexivization of the comparative structure with ensuing Expatriate Interpretation of Diff-O in terms of indexical structure. In comparatives, there are infinitely many thresholds that come for free, cf. section 3.2. But comparatives do not infinitely embed.

(204) *Otto is heavier than Max than Ede.

Possibly, examples like (204) cross the line as regards threshold handling capacities, or the required repair cannot apply too deep (e.g., there is no throwing in of only below another only (that has been thrown in in reaction to a too-weak (tautological) meaning, cf. section 2)).

There is an independent argument that predicates of taste and excessive predicates are “the same” at an interesting level of abstraction, building on observations made with regard to personal predicates by Sæbo (2009). Sæbo discusses the fact that certain attitude verbs like find or consider select for predicates that appear to be judge dependent, cf. (205-a) and (205-b).

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37 Current experimental work with Petra B. Schumacher suggests that the extension becomes costly as soon as there is a problem the solution of which depends on it.

38 Alternatively, a second negation is thrown in, but to no avail (the new threshold was indefinite, and now it stays indefinite, and maybe it doesn’t even vary perceivably.)

39 Thanks to Klaus von Heusinger (p.c.) for raising the issue, by asking how the comparative structure building process would ever halt.
Bound to contradict

(205)  a. Otto finds the pudding tasty.
    b. # Otto finds the pudding liquid.

If *find* binds judge arguments, then we can understand why constructions featuring it become odd when we add a judge expression, cf. (206).

(206)  # Otto finds the pudding tasty to him.

If predicates like *find* act as binders of judges, then valuing the judge independently lets them end up binding vacuously, which is illegal.

Turning to excessives, note that “ordinary” predicates that are usually bad as complements of *find* are fine if they appear in the excessive form, cf. (207).

(207)  a. #Otto finds the soup liquid.
    b. Otto finds the soup too liquid.

Using an argument identified by Sæbø to suggest that judges have a connection to “local” (i.e., LF-contained) argument structure, note that coordinating ordinarily vague predicates with PTs is odd, whereas coordinating an ordinarily vague predicate in its excessive form with a PPT yields a good result.

(208)  a. #Otto finds the soup tasty and/but liquid.
    b. Otto finds the soup tasty but too liquid.

Note next that in German, the excessive form of virtually any adjective licenses what is traditionally called an “ethical” or “iudicantis” dative argument (cf. Brandt 2003, Hole 2008), cf. (209).

(209) Die Suppe ist dem Otto *(zu) heiss.
    the soup is the Otto-DAT too hot

Similarly to what Sæbø proposed for *find*, it makes a lot of sense to say that “ethical” or “iudicantis” datives act as binders of judges, consider the following completely general pattern:

(210)  a. Otto findet die Suppe zu heiss.
    Otto finds the soup too hot

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In essence, the argument is that the judge argument of the PPT may not be bound locally because then *find* wouldn’t have anything to bind. If the judge argument is not bound locally, however, there is a type mismatch between PPTs and ordinary predicates due to the judge arguments that the former do but the latter do not feature. That judges may be locally bound is suggested as well by examples like (i) where the possessor that is part of the NP hosting the taste predicate is interpreted as the judge:

(i) Here is your tasty burger.
    ‘Here is the burger that you find tasty.’
Mostly up, or sideways

b. Die Suppe ist dem Otto zu heiss.
   The soup is the Otto-DAT too hot
   ‘The soup is too hot for Otto.’

   Ede finds the soup the Otto-DAT too hot
   ‘Ede finds that the soup is too hot for Otto.’

Extending the above reasoning, *find and the “ethical” dative in (210-c) compete for the same job, namely, binding the judge. By logic, however, the judge variable can only be bound once (“vacuous quantification” is disallowed).

In sum, excessives and privative predicates or predicates of personal taste have peculiar properties because their derivation involves Expatriate Interpretation of DIFF-O. They are so volatile – i.e., context-dependent – as regards their interpretation because deriving their meaning involves going to a contradiction and, in reaction, excorporating a variable that is ensuingly interpreted in terms of something else that is present in the linguistic context.

4.3 Mostly up, or sideways

We have so far been concerned with constructions having to do with the coding of difference (DIFF) and in particular with the interpretation of expressions coding difference “going wrong”, i.e., used dysfunctionally, but with an ‘upwards’ direction into the next higher derivational cycle. According with what we sketched abstractly in the beginning of this chapter and looking from the syntax, we can identify two groups of cases at superficial glance:

1. Cases involving the use of relational lexical expressions signalling distinguished referents
2. Cases involving the use of functional expressions signalling distinguished referents

We expect there to be mixed cases where we have to do with relational expressions as well as with functional morphology that call for DIFFERENCE – we have already seen such cases in section 3.3.2 where we discussed genitives as well as in section 4.2.2: the mis- construction involves both a verbal prefix and reflexive morphology that cannot be interpreted locally. We argue here that existential there-sentences, as well as structures involving dative or genitive-marked arguments similarly involve Expatriate Interpretation of DIFFERENCE coding morphemes. In contrast to the cases discussed so far, the direction in which expatriate interpretation happens here is sideways or downwards in structural terms. More specifically, we argue for the following:
In *There*-existential sentences (ESs), there is Diff-erence-indicating mor-phology on a temporal category (cf. Freeze 1992). We expect interpre-tation in terms of different times; however, building on the analysis of Brandt (2000), interpreting Diff in the temporal domain is not an option in *there*-sentences because in these structures, reference time is identified with speech time. Therefore, the O part of Diff is pushed to the theme NP which can only accommodate the O meaning if it is existentially quantified (as $A_1^1 O$). This accounts for so-called definiteness effects.

Regarding experiencer and double object dative arguments in German(ic), Brandt (2003, 2006) argued that they relate to sublocations that are encoded deeper in the structure and that their presence is furthermore conditioned by a bifurcation of truth intervals (viz. a phenomenal plural). Regarding the ‘personal dative’ (PD) construction in English, we propose that relevant dative arguments carry Diff which however cannot be interpreted with respect to them. Expatriate Interpretation of Diff-O targets the theme coargument, leading to the requirement that it be existentially quantified (like in ES). At the same time, expatriate interpretation of Diff-O may target indexical structure and thus lead to the “success” interpretation (Oehrle 1976) often observed in these structures.

Uniting both classes of cases, existential *there* as well as certain dative arguments are licensed in environments only that allow for the Difference interpretation to be accommodated elsewhere, i.e., that provide for a variable not yet bound. On the surface, both *there* and (certain) dative arguments look much like quantifiers. According to Milsark’s (1977) classical analysis, existential *there* is essentially the expression of an existential quantifier. The idea that productively occurring dative arguments depend on there being something to bind is also defended in Hole (2008). In structures such as (211), the dative ‘binds’ the additional threshold variable that is the result of the repair of the illegally reflexivized comparative, i.e., excessive structure.

(211) Der Otto ist der Anna *(zu) schwer.
the Otto is the Anna-DAT too heavy
‘Anna finds Otto too heavy.’

In the PD construction, next to the change of state interpretation, Diff-O “spills over” to the theme argument, which must therefore not be strongly quantified (as “some x are not P” contradicts “all x are P”).

41 The abnormality lies in the lack of individuation which has its roots in the part-whole structure of the spatiotemporal domain, a consequence being the inability to pluralize. We can directly observe this “defectiveness” of location denoting expressions in e.g. Bantu languages, where all but the locative noun classes have singular as well as plural paradigms, or in the behaviour of mass denoting expressions (cf. above section 2.3.2).
Mostly up, or sideways

(212) Anna drank her a/*every beer.

This “definiteness effect” is just what existential constructions are famous for.

(213) There is a/*every beer.

This analysis makes sense of Milsark’s (1977) idea that there is expresses an existential quantifier and needs to bind something. Furthermore, it derives the two licensing conditions for productively occurring dative arguments argued for in Brandt (2003, 2006) from a single source, namely, expatriate interpretation of the O part of Diff. Expatriate Interpretation depends on marking – it is really interpreting (part of) the meaning of a certain grammatical marker \textit{ex situ}. ESs are obviously marked, namely, they contain (the analogue of) the element \textit{there}. Dative belongs to the marked cases in German together with the genitive. Marking tells us something. In the case of existential there- sentences or certain dative (or genitive) constructions, it tells us that interpreting the structure involves Expatriate Interpretation.

4.3.1 Existential sentences

Following the path paved by Freeze 1992, we have argued earlier that existential sentences express Diff morphologically on a temporal category that cannot be interpreted with respect to them, however, since ST is essentially set to be included in RT (Brandt 2000). Therefore, a different variable has to be there to be bound. Incidentally, definiteness effects appear to be ameliorated much as soon as comparative morphology appears as well, cf. (214).

(214) a. *There are tomatoes big on the moon.
   b. There are tomatoes bigger than pumpkins on the moon.

We have argued above that in comparatives, i.e., with respect to property instantiations, the O meaning may always be safely interpreted due to the fact that in the scalar domain, it amounts to meaning “less”. In the comparative domain, therefore, left-over logical forms coding the O meaning are not a problem, truth-conditionally. We will see readily that this is also a promising explanation for the fact that dative case marked arguments are licensed in change of state contexts OR in comparative (strictly ordered) contexts (cf. Brandt 2003, 2006) – like /er/, they have to find a variable and property with respect to

German accords to the Universal Case Hierarchy of Primus (1999), cf. (i).

(i) Universal Case Hierarchy:
    nominative/absolutive $>$ accusative/ergative $>$ dative $>$ other cases
which the O meaning can be interpreted, and such variables and properties are provided in the contexts in question.

Let us follow up then on the possibility that the unique feature of *there* sentences among the finite sentences is that the structure that could otherwise be used to accommodate or bind the freed variable is actually missing (C/T), as proposed in Brandt (2001, 2003, pp. 245ff). There is no other option therefore than interpreting Diff-O with respect to the theme argument. If this is so, then the theme cannot be quantified because A and O cannot hold with respect to one and the same restriction at the same time. Although the execution here is different in the details, it strongly supports the conclusion reached by Barwise/Cooper (1980, pp. 201f).

The traditional logical notions of validity and inference are a part of linguistics – a conclusion not likely to comfort many logicians or linguists.

As mentioned, Milsark (1977) argued that *there (be)* functions as an existential quantifier. The well-motivated assumption that indefinites provide a bindable variable but universal/‘strong’ NPs do not explains then why universally quantified NPs or NPs that are otherwise ‘closed off’ from a quantificational perspective like names are excluded in ESs, cf. (215-a) and (215-c) vs. (215-c).

As discussed by McNally (1998), names and definites NPs yield weaker definiteness effects than universally quantified NPs, with crosslinguistic variation; this may speak for treating them as existential expressions which are interpreted exhaustively, cf. Heim 1982). With respect to the present discussion, all that matters is that no distinguished other referent falling under the restriction in question is available, which is the case as well in the case of exhaustively in-

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On Barwise/Cooper’s (1980) account, strong NPs lead to ESs that are tautologous, while Weak NPs yield contingent sentences. “Weak” and “strong” can be interpreted in terms of the ‘intersection condition’, cf. (i).

\[(i) \quad Q S \text{ are } S \text{ that are } P.\]

If (i) is automatically true (tautologous), then Q is positive strong (*every*, *each*). If (i) is automatically false (contradictory), then Q is negative strong (*neither*). If (i) is sometimes true and sometimes false (contingent), then Q is weak (*some*, *many*). Barwise and Cooper take *there be* to mean “being in the domain”; in an ES, a strong NP like “every horse” will then lead to the (tautologous) meaning in (ii-a), a weak NP like “a horse” will lead to the (contingent) meaning in (ii-b).

\[(ii)\]

a. Every horse exists.

b. A horse exists.

As we have seen above (cf. in particular section 2.2.2), tautologies are by no means felt to be ungrammatical in the way that universal NPs in ESs are felt to be ungrammatical; this makes Barwise and Cooper’s proposal questionable, even if we agree on the more general conclusion given in the citation that is behind it.
terpreted (hence quasi-universal) existential quantification, cf. in particular section 2.2 for pertinent discussion.

(215) a. *There is every horse (in the garden). ‘strong’
   b. There is a horse (in the garden). ‘weak’
   c. ?There is Bronco/the horse (in the garden). ‘strong’

Regarding the phenomenon currently in focus and as expected, then, definites and names appear to give rise to essentially the same problem as universally quantified NPs. It is worth noting in this connection that like in the case of pluralization of mass nouns discussed above in section 2.3.2, we can observe a sortal effect in ESs, namely, even universally quantified NPs appear to be felicitous to the extent that they range over sorts or kinds, cf. (216).

(216) There was every *(type of) linguist at the party.

The reason why sortal NPs escape the definiteness restriction likely has to do with the need of an extension of the range of possible alternatives to the actually coded referent: Diff-O, can be pushed to other kinds of persons (e.g. philosophers, mathematicians), while universal quantification over a set of ordinary individuals leaves no alternatives with possibly different properties. Next to definiteness effects observed on associate NPs, ESs exhibit restrictions on the possible predicates that can occur in them. Kratzer (1988 [1995]) presents an interesting perspective on the predicate restriction by extending Milsark’s binding account to variables not stemming from NPs but rather from verb phrases or the sentence as a whole, namely, what are elsewhere called “events” (Davidson 1967). According to Kratzer’s proposal, Stage Level Predicates (SLP) that are felicitous in ESs feature a spatiotemporal argument that can be bound by there but Individual Level Predicates (ILP) that are odd in ESs do not feature such a spatiotemporal argument (cf. for the SLP/ILP distinction Carlson 1978).

(217) a. *There is a horse intelligent. *ILP
   b. There is a horse in the garden. SLP

Under a Russelian analysis, definite NPs as well as names correspond to structures involving universal quantification, cf. (i).

(i) Goethe/the guy wrote Faust
There is someone called Goethe or that I am pointing to who wrote Faust and everybody who wrote Faust is the same as the individual called Goethe or that I am pointing to.

44 Generally, it is assumed that those predications the truth of which hinges on time and location feature a spatiotemporal argument but predications that do not do not. Cf. Kratzer (1995) for independent tests showing the presence or absence of spatiotemporal arguments and discussion.
On Kratzer’s analysis as well, then, it is the failure of there to bind a variable that accounts for why certain predications cannot be construed as ESs.

The linguistic coding of temporal reference is a matter of context and anaphoricity, as was already clearly seen by Reichenbach (1947) – according to his most influential analysis, expressing the tenses involves relating reference time and event time to speech time, which by its very nature is deictically determined.

If reference time is included in speech time, then ESs belong to the class of so-called token-reflexive expressions. Reichenbach has it that token-reflexive words act in a pragmatic capacity (only):

\[\ldots\] there is a class of descriptions in which the individual referred to is the act of speaking. We have special words to indicate this reference; such words are \emph{I}, \emph{you}, \emph{here}, \emph{now}, \emph{this}. Of the same sort are the tenses of verbs, since they determine time by reference to the time when the words are uttered.

The word \emph{I}, for instance, means the same as \emph{the person who utters this token}; \emph{now} means the same as \emph{the time at which this token is uttered} \[\ldots\].

We therefore need inquire only into the meaning of the phrase \emph{this token}.

(ibid., p. 284)

Token-reflexive symbols point to themselves in requiring for their interpretation certain information about the situation in which they are used. In ESs, the crucial token-reflexive element is \emph{there} which essentially takes the place of an otherwise expressed logical subject, which we assume with Musan (1995) has a prominent role in the anchoring of utterances to the context in regular subject-predicate structures as well. In ESs, there is no NP that functions as the logical and grammatical subject in TSs. Evidence that ESs correspond to “chopped off” regular predication structures comes from different sources, including the oddity of certain high adverbs (cf. (218)).

(218) a. ?*There fortunately came a horse.
   b. A horse fortunately came.

Furthermore, the case and agreement properties of ESs diverge from those of regular subject-predicate structures; for one thing, case on the NP appears to be accusative rather than nominative, cf. (219). For another, number agreement between the finite verb and the NP is disturbed, cf. (220).

(219) a. ?There was only me-ACC in the garden
   b. *There was only I-NOM in the garden

(220) There’s\textsubscript{s}\textsubscript{sg} horses\textsubscript{pl} all over the place.
Agreement is expected to be disturbed if *there* is in fact agreement with a location argument lower in the structure (Freeze 1992). Brandt’s (2001, 2003, pp. 245ff) claim that ESs belong to the class of token-reflexive expressions predicts that the interpretation of ESs is more directly dependent on speech time than that of other structures. In German this is not easy to see in root structures, but it shines through in embedded structures that ‘inherit’ speech time from their matrix structures. Unlike regular subject-predicate structures, ESs that are embedded are not ambiguous between a “simultaneous past” reading (the situation described in the embedded sentence holds simultaneously to the situation encoded in the matrix sentence) and a “distant past” reading (the situation described in the embedded sentence holds at a time prior to the time in which the situation described in the matrix sentence holds). (221-b) only furnishes the ‘simultaneous past’ reading as we expect if temporal reference cannot be independently established in ESs.

(221) a. Bill said that a hen was walking in the garden.
   b. Bill said that there was a hen walking in the garden.

In support of the temporal defectiveness of ESs, perfect tenses as requiring separation from the temporal anchor are odd compared to regular subject-predicate structures, cf. (222) (Karen Zagona p.c., cf. Brandt 2003, p. 247).

(222) a. Ede said that a hen had been walking in the garden.
   b. ??Ede said that there had been a hen walking in the garden.

Under the mainstream generative account, *there* is semantically empty. In contrast, we propose that its LF entails DIFF, repeated in (223).

(223) DIFF = λSλP∃x S(x) ∧ P(x) ∧ ∃x S(x) ∧ ¬P(x)

Although the meaning of DIFF is very general, it can fail to be realized with respect to the denotation of the term that it is attached to if that term does not furnish distinguished individuals (e.g., sections 2.3.2, 3.2.2). This is also the case with DIFF carried by *there*, as speech time and reference time are not properly distinguished here. As in the cases discussed earlier, the consequence is that DIFF-O, the O-meaning part of DIFF as carried by *there*, is interpreted expatriately; more precisely, it is “pushed down” to the theme argument.

---

46 Existential sentences are often taken to be the closest natural language analogue to existential quantification. Remember that DIFF corresponds to the I and O of the traditional square of opposition, i.e., it is in essence existential quantification together with the pragmatically rooted inference that the stronger universally quantified alternative does not yield the right truth conditions (hence there must be x that are not P).
256  Bound to contradict

(224)  **Expatriate Interpretation (EI)**
Morphosyntactic feature [f] on expression α cannot be interpreted in terms of the corresponding semantic feature [F] with respect to the meaning of α. Part of [F] is interpreted with respect to the meaning of an element in α’s linguistic context.

As we suggested, the peculiar structural defectiveness of ESs excludes the otherwise nearby solution of accommodating the left over Diff-O higher up in the structure; if syntactic and interpretive cycles work in parallel and if interpreted material is inaccessible for further manipulation, then there and the theme/patient NP should actually belong to the same syntactic domain, i.e., EI is ‘sideways’ rather than downwards – as it would seem when we look only at c-command relations. We will not go deeper into the matter here; in the arguably parallel case of EI in the context of (personal) dative arguments to be discussed in the next section, it appears relatively clear that EI is sideways, namely, to the c-commanded theme/patient coargument of the personal dative.

### 4.3.2 (Personal) Datives

The table in (225) gives the inflectional paradigms of Sternefeld’s (2008) 10 most important nominal categories in German, leaving out for formatting reasons the class exemplified by *Mutter* (‘mother’), marked -n in dative plural.

<table>
<thead>
<tr>
<th></th>
<th>Every S is P</th>
<th>Contrary</th>
<th>No S is P</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>subaltern</td>
<td>contrary</td>
<td>subaltern</td>
</tr>
<tr>
<td>I</td>
<td></td>
<td></td>
<td>O</td>
</tr>
<tr>
<td></td>
<td>some S is P</td>
<td></td>
<td>not all S are P</td>
</tr>
<tr>
<td></td>
<td>some S is not P</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Mostly up, or sideways

We see that dative case must as a rule marked in the plural always, unlike all other cases.47 Within nominal phrases, inflection on the nominal head is the inflection that is “deepest down” and least visible. When we can inflect the nominal head, then we can generally also inflect other elements higher up—adjectives and/or D elements. When we look at the paradigms here, we find the exponents in (226) and (227).

(226) 3rd person singular and plural pronouns

<table>
<thead>
<tr>
<th></th>
<th>Masc_{sg}</th>
<th>Neut_{sg}</th>
<th>Fem_{sg}</th>
<th>Plural</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOM</td>
<td>er</td>
<td>es</td>
<td>sie</td>
<td>sie</td>
</tr>
<tr>
<td>ACC</td>
<td>ihn</td>
<td>es</td>
<td>sie</td>
<td>sie</td>
</tr>
<tr>
<td>DAT</td>
<td>ihm</td>
<td>ihm</td>
<td>ihr</td>
<td>ihnen</td>
</tr>
<tr>
<td>GEN</td>
<td>seiner</td>
<td>seiner</td>
<td>ihrer</td>
<td>ihrer</td>
</tr>
</tbody>
</table>

(227) 3rd person singular pronominal inflection

<table>
<thead>
<tr>
<th></th>
<th>Masc_{sg}</th>
<th>Neut_{sg}</th>
<th>Fem_{sg}</th>
<th>Plural</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOM</td>
<td>der</td>
<td>das</td>
<td>die</td>
<td>die</td>
</tr>
<tr>
<td>ACC</td>
<td>den</td>
<td>das</td>
<td>die</td>
<td>die</td>
</tr>
<tr>
<td>DAT</td>
<td>dem</td>
<td>dem</td>
<td>der</td>
<td>den</td>
</tr>
<tr>
<td>GEN</td>
<td>des</td>
<td>des</td>
<td>der</td>
<td>der</td>
</tr>
</tbody>
</table>

From the point of view of phonology, the /m/ most frequently occurring in the dative is a relatively heavy (sonorous) marker (like in particular ‘genitive’ /s/), while e.g./n/ or /r/ are relatively light. Wiese (1999) argues that phonological heaviness is iconic to specificity regarding feature content in the sense that a phonologically heavier exponent has a more specific feature content. Given that features are there to be interpreted, this implies that phonologically heavier markers are generally semantically more specific as well. On Wiese’s account of the German case system in terms of (under)specification, dative case is the most specified case in German.

Picking up the discussion of marking and (dys)functionality in section 2.3, we submit that (part of) the meaning that the features defining datives carry is \textit{Diff}, and that it is because \textit{Diff} cannot be interpreted on the dative-case marked argument that it must be marked.\footnote{Recall that we argue the same for the case of genitive case marking, which is subject to a visibility condition in German (Gallmann’s condition, cf. section 3.3.2.)} As we will shortly see, EI may have a double effect in the case of datives, namely, \textit{Diff-O} may be interpreted in phenomenal terms, effecting change of state or modal interpretations. At the same time, \textit{Diff-O} may be interpreted with respect to a co-argument of the dative, leading to definiteness effects as observed as well in ESs.

As we pointed out already at the end of section 3.2, some but not all speakers of German accept (228).\footnote{Felix (2;10) produced the sentence in (i), giving a reason why he wanted to receive the food from his mother and not his father.}

(228) \%Otto ist mir größer als Ede.
\hspace{1cm} Otto is me-DAT taller than Ede.

In contrast, all speakers appear to accept (229).

(229) Otto ist mir zu groß.
\hspace{1cm} Otto is me-DAT too tall.

These patterns with so-called judicantis datives nicely illustrate what appears to be the core problem of dative arguments regarding their syntax and semantics: very often, and particularly so in the case of so-called “free datives”, dative arguments appear to modify sentences (cf. Wegener 1985, pp. 54f, 1989; Gutzmann 2007) to which they should accordingly attach. However, we see at the same time that the licensing of datives hinges on the presence of certain grammatical elements, in particular, prepositions or degree morphemes like \textit{zu} (cf. Eisenberg 2013, p. 291). This dilemma can be solved with the means developed here: in examples like (228), there is a quasi-free variable in the comparative structure, while in (230) there is a truly free threshold or world structure. Like \textit{there}, what the dative does in these structures is bind the free phenomenal variable, which gives rise to the “personal” feel about the meaning of the construction. We see in examples like the following that just as excessive constructions that we argued are just as personal as predicates like “dear” or “feeling cold” that productively license dative arguments, the addition of a dative argument may lead to an excessive, i.e., personal, interpretation that is otherwise not observed, or at least not as prominently.
(230) a. Es ist kalt.
   it is cold
b. Mir ist kalt.
   me-DAT is cold
c. Mir ist zu kalt.
   me-DAT is too cold.

(230-a) is neutral as regards the question whether the temperature is agreeable or not, i.e., this personal aspect appears to be missing in the interpretation. In contrast, (230-b) very strongly suggests that the speaker does not find the temperature agreeable, i.e., (230-b) appears to mean essentially the same as the example in (230-c).50

The few adjectives that license dative arguments without /tsu/ (schematically, MeDAT is A “I feel A”) all have a personal feel to them that is associated with body parts, cf. the (near-exhaustive) list in (231).

(231) schlecht ‘sick’, kalt ‘cold’, warm ‘warm’, wohl (zumute) ‘well’

Adjectives occurring in the scheme $H_{NOM}$ is $me_{DAT} A$ (“it is A to me”) is more productive, cf. the list in (232) that is again near-exhaustive.


Next to the personal feel, we observe an adversary meaning in many of the cases; to note, malefactiveness appears to be one of the most regularly observed meaning aspects associated with “free” datives elsewhere. The following examples give some more suggestive illustration of the interdependence between a dative argument and a free phenomenal variable, which appears to be of the world-kind in (233) (viz. modality) and of the temporal/aspectual kind in (234), an example which corresponds to a change of state due to the direc-

50 The pattern in (230) was pointed out to me by Hagen Pitsch, who also informed me that Russian features patterns concerning ‘personal’ interpretations in the context of dative arguments that are highly reminiscent of the ones discussed here for German. In Russian, special “short forms” of adjectives give rise to ‘personal’ interpretations, and it is in the context of these short forms that dative arguments are licensed and interpreted as something like a ‘judge’. Cf. Isacenko (1962:149f) on short adjective forms and sections 3.2.2 as well as 4.2.1 on the notion of ‘judge’.
tional prepositional phrase in contrast to (235) that features just a (stative) location argument hence no free phenomenal variable (cf. section 3.3.2 above).

(233) Dank sei/*ist Dir.
Thank be/is you_{DAT}

(234) Die Vase fiel ihm auf [den Fuss]_{ACC}.
the vase fell him on the foot
‘The vase fell on his foot (to his misfortune).’

(235) *Die Vase fiel ihm [in der Garage]_{DAT}.
the vase fell him [in the garage]
‘The vase fell in the garage to his misfortune.’

To repeat, the dative argument appears to function like a quantifier, i.e., as an expression that needs to bind a variable in order to be licensed. In this, the dative argument is similar to e.g. a modal auxiliary that gives rise to parallel effects, compare the examples just given to the ones in (236) and (237).

(236) Der Besen (muss) in [die Garage]_{ACC}.
the broom (must) in the garage
‘The broom must go into the garage.’

(237) *Der Besen (muss) in [der Garage]_{DAT}
the broom (must) in the garage
‘The broom must be in the garage.’

If the job of the dative is binding a fresh phenomenal variable (cf. Horn’s “F-implicature”), then this is parallel to binding of a phenomenal variable by, e.g., a modal verb. If there is no variable to bind, the dative (or modal verb) is not licensed. The connection between dative licensing and purpose clauses as observed by Thompson/Longacre (1985, p. 186) is not surprising then:

[...] dative case marking may occur in various slots of purpose clauses, notably as the very member that lends the purposive interpretation in the first place.

Similarly Schmidtke-Bode (2010, p. 121):

Across the worlds languages, adverbial clauses of purpose provide an important constructional environment for the occurrence of benefactice and semantically related markers.

We see the reason now why dative arguments occur with infinitives or purpose clauses crosslinguistically: These constructions provide a variable for the dative

\[^{51}\text{Independently of the data discussed here, Wegener (1985) proposes an analysis of “personal” (ethical) datives as modal particles.}\]
argument to bind. By their nature, purposes cannot be bound to the actual world as would be the default, according to standard accounts, cf. section 4.2.1 above; as what is coded in the purpose clause may or may not become true, the alternative, existential binding strategy as resulting in a modal interpretation must apply unless they are bound differently – as they are, we submit, by a dative argument regularly if there is one present in the structure. The idea that dative arguments act as variable binders in certain structures is not all new. Brandt (2003, 2006) argued that double object and dative experiencer arguments bind location (or degree) variables lower in the structure. Krivokapić (2006) argued for structures in Serbocroatian that are analogous to the structure in (229) that the dative argument here binds the standard of comparison. Hole 2008 provides a detailed discussion of “binding” analyses of dative arguments, arguing for the “binding claims” in (238) (cf. ibid., p. 101).

(238) Binding claims about dative arguments

i The referent of a dative argument is mentioned at least twice in the linguistically relevant description of the situation it helps encode

ii The syntactic position of the dative argument is hierarchically higher than the syntactic position of the expression within which reference is made to the dative referent again

iii (i) and (ii) together lead to a great grammatical similarity between sentences with datives and sentences with reflexive constructions

iv In sentences in which no explicit pronoun refers to the dative referent another time, there is implicit reference to the dative argument referent by a relational expression like the friend (=‘his/her/...friend’) or to his support/benefit. The expression of purpose with to can again be implicit.

In a similar vein, Krifka 2001 formulates a condition on dative shift that says that Non-alternating prepositional object constructions have MANNER incorporated into V that says that the two events in the CAUSE relation are homomorphisms of each other, i.e., they express one complex event (that is conditioned by a continuous imparting of force).

(239) a. Pete yelled the message to Otto.
b. *Pete yelled Otto the message.

Here, each yelling part corresponds to a message-reception part. Dative-alternating predicates do not have this ‘event unifying’ homomorphism.
(240) a. Pete threw the ball to Otto.
b. Pete threw Otto the ball.

Here there is no mapping between throwing parts and ball-receiving parts. There is an independent throwing event and an independent receiving event.

(241) If \textsc{Manner} (V(e,e')), then for all x, x' \leq e and y,y' \leq e':
   a. If y \neq y', \textsc{Manner}(V(x,y), \textsc{Manner}(V(x', y'), then x \neq x'
b. If \textsc{Manner} (V(x,y), \textsc{Manner}(V(x', y'), then \textsc{Manner}(V)(x \oplus x', y \oplus y').

In the course of language development, licensing of a certain construction by a particular feature – e.g., datives and free phenomenal variables – may become introduction of the feature by the construction. E.g., in Slavic, datives occur in infinitival environments in particular (Moore/Perlmutter 2000). Similarly in the adjectival domain in Russian, there are particular “short forms” that have a “personal” interpretation and that appear to license datives. The forms are used as well to code excess like the /tsu/ comparatives in Germanic (cf. Isacenko 1962, pp. 149f); in case of dative presence, it is the dative argument’s referent who experiences the excess. Hagen Pitsch (p.c.) informs me that also in the absence of a dative argument expression, it is often clear from the context when a short form is used in Russian that it is the speaker who experiences a particular measure (or excess); similarly, certain constructions acquire a ‘judging’ interpretation that is not generally associated with them in case there is a dative argument present in the structure. For some German speakers but not others, it appears dative argument expressions are licensed in certain constructions that are not originally modal (or personal, for that matter) but get the kind of modal (or personal) flavor from the dative; typically, contrast or special focus marking accompany such cases, cf. (242).

(242) Du bist mir ??(aber) groß (geworden).
   you are me-DAT (but) tall (become).
   'You appear to have grown much to me.'

In this way, licensor and licensee are “two sides of the same coin”; we expect construction specific semantics to become lexicalized in certain cases (as, e.g., with dative-licensing adjectives like \textit{sympathisch}) or even become largely independent from each other with language use, as, apparently, for some speakers of German in the case of datives in the context of comparison (cf. above).

As a matter of course, not all datives are the same even in German.\textsuperscript{52} In support of the idea that datives may “start off” personal and then get conventionalized

\textsuperscript{52} Cf. Wegener (1989, pp. 70f) on “ethical” (“free”) vs. “lexical” (“argument”) datives.
Mostly up, or sideways  

in certain domains, we see personal dative arguments gain ground in English synchronically. Incidentally, personal datives have received much attention because the structures they are part of appear to resist a compositional analysis. We argue that there is EI here as well, only the uninterpretable ‘plural’ feature DIDD-O is not (only) pushed up but (as well) sideways, i.e., to the theme argument expression – in this, PDs are like existential constructions discussed in the foregoing section (cf. as well Brandt 2003).

We seem to be looking at “sideways pushing” as well in dialects of Spanish, discussed by Company (2001). When speakers of American or Catalan Spanish intend to express plurality of a dative occurring in a double object construction, they regularly ‘move’ the morphosyntactic [plural] feature that we argue to be uninterpretable on the dative to the accusative argument. The dative itself is altered into the reflexive form se that is unspecified for number. The following examples in context illustrate the pattern (from Company 2001, p. 14).

(243)  

a. Sé que es innecesario, porque así lo manda la ley, pero les ruego que voten con libertad, yo>DAT (I) beg that (you) vote with freedom, se los imploro.

b. ¿Se acuerdan del chiste que les conté anoche? You>DAT it>ACC (I) implore ‘I know it is unnecessary, but I beg you to vote freely, I implore it of you.’ [Mexican Spanish, La Jornada newspaper]

(244) He>i got him>i some candy. PD

(245) *He>i gave him>i a chocolate. “Goal”-Dative (=GD)
As noted by Webelhuth/Dannenberg (2006, p. 41), they must appear right-adjacent to the verb, cf. (246) vs. (247) (featuring again a regular dative).

(246)  
  a. What did they buy at Walmart?  
  b. He bought him a watch and she bought her a bracelet.  
  c. *Him he bought a watch and her she bought a bracelet.

(247)  
  a. What did you give them?  
  b. I gave him a watch and I gave her a bracelet  
  c. Him I gave a watch and her I gave a bracelet.

Third, the theme-argument in PDs must be existentially quantified, cf. (248).

(248) He loves him some / *these / *⊘ datives

Related, apparently, is the fact that PDs appear to resist negation, if this is not absolute. The table in (249) gives Horn’s (2013) Google results.

(249)  
<table>
<thead>
<tr>
<th>Expression</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>“I have me some”</td>
<td>22,600</td>
</tr>
<tr>
<td>“I have me a”</td>
<td>37,300</td>
</tr>
<tr>
<td>“I don’t have me a”</td>
<td>80</td>
</tr>
<tr>
<td>“I don’t have me any”</td>
<td>9</td>
</tr>
<tr>
<td>“I lack me any”</td>
<td>6</td>
</tr>
<tr>
<td>“I want me some (X)”</td>
<td>128,000</td>
</tr>
<tr>
<td>“I don’t want me any (X)”</td>
<td>3</td>
</tr>
<tr>
<td>“I like me some”</td>
<td>128,000</td>
</tr>
<tr>
<td>“I like me a”</td>
<td>17,000</td>
</tr>
<tr>
<td>“I don’t like me a”</td>
<td>6</td>
</tr>
<tr>
<td>“I don’t like me any”</td>
<td>1</td>
</tr>
<tr>
<td>“I dislike me some/any/a”</td>
<td>6</td>
</tr>
</tbody>
</table>

Fourth and finally, there is an intuition that PD constructions have a “telic” quality of some sort. This is worded differently from case to case, cf. the following citations.

The semantic purpose of the Southern DOC is to highlight the consequences of the subject’s involvement in the event or state denoted by the verb. (Webelhuth and Dannenberg 2006, p. 39)

They [Old/Middle English “Pleonastic Datives”] [...] serve semantically to heighten the involvement of its referent: e.g. the subject acted intentionally or was involved in the action in some way other than the role it has in virtue of being the subject argument. At times they suggest a telic interpretation. (Keenan 2003, §1.2)
What do non-argument PDs add if not a 2nd object or goal? \[\implies\] an F[rege]-implicature of subject intentionality/success/benefit/satisfaction. (Horn 2013, p. 163)

These quotes are highly reminiscent of course of Oehrle’s 1976 proposal that double object constructions carry a ‘success entailment’ that the IO referent end up ‘possessing’ the theme. It seems clear though that this is not an entailment really but rather an implicature, e.g., it is easily cancelled (cf. section 2.2.1).

(250) Otto sent Ede the letter (but it never got to him).

A recent analysis of PDs (“ethical datives”) in Horn’s terms that builds on Wegener’s analysis of “ethical” datives as modal particles is offered in Gutzmann (2007), summarized by himself as follows:

Following the theory of conventional implicatures developed by Christopher Potts (2005), an ethical dative can be analyzed as an expression of type \(<t^a, t^c>\) that yields a second proposition of type \(t^c\), which is independent from the proposition to which it is applied. This second proposition is defined by the conventionalized meaning of the ethical dative and expresses – though not propositionally articulated – that the speaker has some personal interest in the hearer’s execution of the action requested. (ibid., p. 1)

Although this may be felt to be intuitively correct, it is hard to see how it could explain the syntactic-semantic properties of the datives in question. Building a bridge to syntax (and semantics), we propose (251).

(251) Dative case-marking entails Diff that cannot be interpreted with respect to the dative argument’s referent and is therefore EIed.

Here is how (251) can explain the properties of PDs that were mentioned.

- Principle B effects:

  Diff as generally crucially involved in the establishing of reference is not interpreted with respect to the dative-case marked argument. If features bearing on the establishing of reference cannot be interpreted, reference will be disturbed. Principle B is about nonlocal coreference. If the features needed for establishing reference are actually not interpreted with respect to the dative, we expect Principle B to be disturbed.\(^{53}\)

\(^{53}\) We saw examples in section 4.1 above indicating that Principle B effects are ameliorated with dative antecedents more generally, cf. (repeated):
Bound to contradict

Definiteness effects:

The theme/patient coargument of the PD may not be definite or universally quantified because Diff-O cannot be interpreted with respect to it if it is, much like in the case of ESs.

Polarity effects:

Negative environments disturb PD licensing because the negativity interferes with the genuinely negative meaning Diff-O that is Eled; in particular, Diff-O is most likely an implicature originally, but negation cancels implicatures. Incongruencies between dative licensing and negation occur elsewhere; we have, e.g., patterns like in (252).

(252) a. Die Dummheit ist ihm eingeflüstert.
    the silly-idea is him\textsubscript{DAT} in-whispered
b. *Die Dummheit ist ihm noch uneingeflüstert.
    the silly-idea is him\textsubscript{DAT} still un-in-whispered

Crosslinguistically, dative marking surfaces systematically in infinitival contexts and specifically purpose clauses, negation appears to block dative licensing (Schmidtke-Bode 2010, pp. 121, 139):

Interestingly, there is a class of purpose clauses which is exempt from the previously mentioned tendencies. More precisely, we can observe the systematic absence of goal-encoding devices such as allatives and benefactives in negative purpose clauses (or ‘lest’ constructions). [...] When languages grammaticalize a construction specifically dedicated to the expression of negative purpose, it seems that neither allatives nor dative-benefactives have a chance to appear in such constructions.

(i) Ad alcuni piacciono/interessano solo loro, stessi.
    To some please/interest only they EMPH-selves.
   (Italian, Everaert 1990)

(ii) Mariù fannst hùn vera gáfuth.
    Mary-DAT thought she-NOM be gifted
   ‘Mary thought she (= Mary) was gifted.’

(iii) Anna hat Otto [ihn,\textsubscript{P}] zugewiesen.
    Anna has Otto-DAT him assigned.
   ‘Anna assigned Otto to himself.’
Mostly up, or sideways

– Success entailment:

The felt inference of success or change of state more generally is the result of Diff-O being interpreted in the temporal domain, much like in the case of inchoatives (cf. above section 4.1.2).

– Adjacency:

The dative must be adjacent to the verb because having the verb in the immediate syntactic context makes EI easier. The cliticization is like getting the offending feature to where it is actually interpreted, namely, in the phenomenal domain.

PDs show that Expatriate Interpretation may be both to an individual denoting expression (the theme) and a phenomenal denoting expression at the same time. And why not?! After all, “or” is inclusive in our definition of Eling, repeated from above (cf. (253)).

(253) Expatriate Interpretation (EI)

Morphosyntactic feature [f] on expression α cannot be interpreted in terms of the corresponding semantic feature [F] with respect to the meaning of α. Part of [F] is interpreted with respect to the meaning of an element in α’s linguistic context.

We observe in many a “lexical” dative construction weaker traits of this effect, suggesting that the personal construction provides a bridge for datives to make it into the grammar proper.

Toward closing this section – and the book – we relate back our dative analysis to our earlier proposals regarding infinitives, excessives and tough constructions as well as middles – remember that inchoatives, infinitives, excessives and tough-constructions were argued to furnish free variables, while middles were argued to bind them like datives (or find-predicates, cf. section 4.2.2). Datives are like quantifiers in that they depend on there being a variable to which Diff-O that cannot be interpreted with respect to them can be pushed. We predict datives to be good in the inchoative and infinitival contexts, as is borne out. But they are predicted to be out in the middle context as here, all variables are (quasi-) universally bound (cf. section 4.1 above) which is incompatible with Diff. This is what we find – while tough/purpose constructions peacefully coexist with, or rather, have licensing potential for dative arguments, dative and middle constructions appear to exclude each other crosslinguistically, as pointed out by Fagan (1992).

Regardless of the semantics of individual verbs, ditransitives simply do not make good middles. (Fagan 1992, p. 79)
Bound to contradict

Ackema/Schoorlemmer (2006) call the incongruity between dative licensing and middle formation the Anti-double object condition.

(254) Anti-double object condition:
Verbs in a double object construction do not undergo middle formation.

The following examples illustrate (254).

(255) ?*Die Geschichten erzählen sich Kindern leicht.
the stories tell REFL children easily

(256) *Money gives (to) victims of natural disasters easily. (Fagan 92, p. 79)

(257) *A cup of coffee offers (to) a guest easily. (ibid., p.79)

(258) a. *Small packages ship most customers easily.
b. ??Small packages ship most customers easily.

(259) *Children teach easily.
‘It is easy to teach children.’ (Marelj 2004, p. 168)

(260) *Students rent easily.
‘It is easy to rent to students.’ (Marelj 2004, p. 168)

We predict datives to discern middle and (reflexive) inchoative structures: Only the inchoative reading should survive under dative presence, given that there is no variable for the dative to bind in the middle construction (involving quasi-universal quantification as a means to escape LEM, cf. section 4.1).

(261) Das Pulver löst sich ihm leicht auf
the powder dissolves REFL him.DAT easily PRT
‘The powder easily dissolves on him.’
‘The powder dissolves easily on him.’

We propose personal datives are licensed as ‘binders’ of variables that are incorporated in reaction to a violation of LC. Oftentimes, LC is violated but it is a “don’t care” because it happens with respect to a domain that is asymmetric (cf. sections 2.2, 3.2, 4.1.1). Interestingly, verbal dative constructions in German forbid the discontinuous reciprocal construction (an observation due to Frans Plank (Alexis Dimitriadis p.c.)), with the possible exceptions of gleichen or ähneln (cf. 4.1.1) which appear to allow the discontinuous construction for some speakers. In closing this section, let us review two place predicates licensing dative arguments in German and briefly comment on how their properties might go against ‘perfect’ symmetrization as correlating with the possibility of the discontinuous construction (Dimitriadis 2008, cf. discussion in section 4.1.1). There are three classes of datives according to Blume (2000):
Verbs of Interaction:
trotzen ‘defy’, danken ‘thank’

There appears to be an asymmetry with respect to authority or responsibility
between the arguments of the verbal predicates in (262).

Verbs of Possession:
gehören ‘belong to’, gebühren ‘be due to’, sein ‘be’, zustehen ‘be entitled to’, obliegen ‘rest with’

If possession is really spatiotemporal inclusion, or follows the format prescribed
by it (cf. references and discussion in Brandt 2003), then the domains about
which the verbs in (263) speak are asymmetric.

Verbs of Experience:
gefallen ‘appeal to’, schmecken ‘taste’, widerstreben ‘be reluctant to’,
grauen ‘dread’, bekommen ‘agree with’

These could be argued to be extensions of the earlier listed classes, cf. as well
section 4.1.2 for relevant discussion of a possible extension of the causative-
inchoative pattern into the psychological domain. There are four categories ac-
cording to Mortelmanns, who applies syntactic criteria to establish the classes:

I transitive coding in English, passivizable:
antworten ‘answer’, applaudieren ‘applaud’, assistieren ‘assist’, danken
‘thank’, dienen ‘serve’, drohen ‘threaten’, ...

Again, we see a strong authoritative asymmetry between the argument places.
These verbs do not allow the discontinuous reciprocal construction, indicating
that they are inherently asymmetrical at some level.

II psychological – the dative argument corresponds to a nominative
subject in Dutch or English, not passivizable:
behagen ‘be to the liking’, bekommen ‘agree with’, belieben ‘please’,
leicht/schwer fallen ‘be easy/hard’, fehlen ‘lack’, gebühren ‘be due to’,
gefallen ‘appeal to’, ...

The verbs in (266) again disallow the discontinuous construction.

III resemblance – not passivizable:
gleichen, ähneln ‘be similar to’, ‘resemble’

Interestingly, we can observe some variation here as concerns the availability
of the discontinuous construction which some speakers find acceptable in par-
Folk reasoning would have it that A is similar to B if and only if B is similar to A. In fact, the relation expressed is asymmetrical at least in the referential dimension (Kratzer 1995), cf. section 3.2.

IV miscellaneous – prepositional construction in Dutch/English:
- gehören ‘belong to’
- gelten ‘be directed to’
- kondolieren ‘condole’
- lauschen ‘listen to’
- passieren ‘happen to’
- weichen ‘yield to’
- erliegen ‘succumb to’

The dative assigning verbs in (268) are also asymmetrical according to the test with the discontinuous construction (Dimitriadis 2008, cf. above section 4.1.1).
5. **Summary**

We have argued that natural language grammars – to note, the grammar of German – profit from semantically “pushing”, i.e., expatriately interpreting, parts of the meanings of grammatical formatives that have been locally nonsensically composed. Part of the profit lies in coding certain highly demanded meanings from the comparative, temporal/aspectual and modal domain (TAM) in particularly efficient ways: the material that codes these meanings by means of being (in part) expatriately interpreted is very general in meaning as well as formally “light”, namely, it stems from the small inventory of ever-used functional elements which have to do with the expression of difference (as implied, *ceteris paribus* when there is talk of relations or plurality).

Yet below this economic profit, the redressing of decomposed material provides an even more basic advantage that lies in rendering usable structure that would not be usable at all in relating sounds and meanings; in light of the massive gap as regards the diversity and complexity between the available expressive linguistic means on the one hand and reality and possibility on the other hand, rendering usable structural options otherwise unavailable in the compositional task constitutes a decisive advantage regarding the exploitation of the grammatical machinery as making infinite use of finite, and scarce hence precious means. The other major trick to overcome the basic expressive poverty of grammar lies in hugely underdetermining the interpretation eventually associated with linguistic expressions (viz. “vagueness”). We have argued that the functional elements that have been at the center of attention here carry meanings that are even more general than is already usually assumed; only together with the linguistic context does their semantic contribution become reasonably specific (viz. “combinatory interpretation”) hence usable in the compositional task of coding one’s meaning (cf. chapter 2).

We hope to have made plausible that the combination of certain functional expressions with certain lexical expressions in certain contexts may lead to conflicts with unconditionally applying principles at the morphology-syntax/semantics interface, e.g., the semantic demand to be non-contradictory (or, as the case may be, obey the law of excluded middle). Center stage took certain expressions having to do with the coding of *DIFF* (and, as comes with it, identity and negation, cf. section 3.1.2) the meaning of part of which (the right-hand part, i.e., the negative or object meaning) does not make sense, locally composed, but is automatically pushed to phenomenal domains that are intuitively
far apart semantically. According to our proposal, they have to make do with the same apparatus however that has developed, presumably, in the realm of ordinary individuals. These logical laws are useful in describing our thinking procedures and routines, but they only really work well with regard to the ordinary individuals. Nevertheless, grammar has no choice but to rely on the same machinery as being used for the coding of the structure of phenomenal individuals, as there is no other machinery. This gives rise to many a superfluous construction, semantically speaking (as enabling, in turn, production of many an impossible construction, semantically speaking). It is interesting to note that in the realm of comparative constructions especially, we observe a massive over-supply of expressions to code what appears to be one and the same meaning as well as flexibility of singular expressions to code what appear to be different meanings (e.g., the positive yielding superlative or excessive meanings depending on contextual factors). We argued that comparative constructions are genuinely corrupted, so to speak, by their quasi-tautological semantics, i.e. tautological semantics modulo exhaustification.

The contradictions here reported on are not recognizable as such on the surface, i.e., they cannot be read off the linguistic sign directly. A repair may cause new problems (syntax is blind before it comes to interpreting its structures). Repairs interact with each other in different ways. E.g., we have proposed among other that

- in the mis-construction, /ver/ and /zich/ have the same problem but solve it in different fashions.
- in the middle construction, dative arguments and /zich/ have the same problem but cannot solve it in different fashions.
- excessives (and other infinitives) help license dative arguments as datives need what the former have as a surplus, namely, a free variable.

Coding contradictory semantics at hidden levels is a perfectly seizeable strategy to arrive at interesting meanings in economically feasible ways. In the terminology here favorably used, the second condition as well as Hurford’s constraint present themselves as aspects of the interface conditions that rule the interpretation of DIFF(ERENCE). We can distinguish two kinds of interpretation, an “ordinary” interpretation in terms of grammatical function mapping from certain semantic relations (often involving causation, cf. section 3.3)):

(1) Second Condition:
- The subject must have a property P that the object lacks
- = The object lacks a property P that the subject has.
Inchoatives and middles and directional complement constructions violate the second condition as here the logical subject has no property that the logical object does not have as well – the object is illegally more exclusive than the subject. Next, in the realm of propositions (i.e., phenomenal individuals), we see \textit{Diff} take the shape that is captured by (something like) Hurford’s constraint. In the sentential domain though, we find the inverse from what we find in the argument structural domain: The embedded (\approx object) meaning has to have something that the unembedded meaning does not have.\footnote{The ‘matrix’ sentence will by all means express something that the embedded sentence does not express as well, in the most general case.} E.g., change of state verbs obey Hurford’s Constraint if the pre-state is presuppositional and only the result/end state is actually asserted, cf. Givón (1972).

\begin{enumerate}
\item[(2)] Hurford’s Constraint as propositional \textit{Diff}:
    \textit{The second (embedded) sentence codes a propositional meaning that the first sentence does not code.}
\end{enumerate}

The interpretation in (2) is the second condition “turned around” in that the embedded sentence must positively differ from the matrix sentence. The reader may try her intuitions with potentially relevant examples like (3-a) vs (3-b).

\begin{enumerate}
\item[(3)] a. Ich glaube, dass ich nicht glaube.
    i believe that i don’t believe
\item[(3)] b. Ich glaube nicht, dass ich glaube.
    i believe not that i believe
\end{enumerate}

To the extent that negative meanings are weaker than their positive counterparts – or treated so by the grammar (cf. sections 2 and 3.2), we would expect (3-b) to be better than (3-a), but intuitions become flurry quickly. The relevance of (2) has shown in the analysis of comparative structures, which have both sentential as well as argument-structural properties, projecting so to speak the transitive ideal into the domain of property instantiations. Comparatives violate (2), which is compensated for or repaired, quite generally (but maybe not in the case of superlatives, cf. footnote 23 in section 3.2) by inserting silent \textit{only}. This leads to a situation that contradicts the demands of reflexivization, which we suggest is nevertheless applied, and marked by the formative \textit{zu}.

Hurford’s constraint reverses the direction of the second condition as applying in the argument-structural domain. It is plausibly easy to turn relations around once one has gotten the hang of them (cf. section 3.3.1).

The table in (4) presents again the three grammatical formatives that have been centrally discussed here together with their here proposed meanings next to meanings or functions regularly assumed in the literature.
The treatment of comparative/excessive or infinitival zu along the lines of reflexivization makes some sense of the fact that we observe in inchoatives and middles and infinitival/excessive complements (tough-constructions) alike that the argument that is left is the “internal” one, i.e., the object (or patient/theme, in semantic role terms). It is the case that the subject cannot find expression as the structure violates the condition that subjects be less general (more specific) than objects (which, as part of the predicate, traditionally speaking, generally serve to “collect” the subject). Incidentally, it is typical of Romance languages to express certain meanings expressed with infinitives in Germanic with morphologically reflexive structures, cf., e.g., (5).

(5) a. zu verkaufen.
   to sell

   b. se REFLECT vende
     ‘for sale’

From a theoretical or grammaticological perspective, we argued that it holds more generally that

(6) DIFF that cannot be realized within one syntactic-semantic cycle may in part be handled in the next cycle.

Namely, DIFF-O will be realized in the next cycle (without there being a corresponding syntactic sign in the next cycle). For the large majority of cases discussed here, “connected cycle” can be taken to mean “next higher cycle” – this is what we expect to the extent that grammar is opportunistic and driven by economy; we have seen again and again that among different logically possible options, the one that appears to closest is chosen. The cases of existential or

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2 Thanks to Hardarik Blühdorn for pointing the analogy out to me. Similarly, it has been claimed that Romance se has an aspectually “perfectivizing” function that we see associated with German zu as well in constructions featuring directional complements, cf. section 3.3.2.
dative constructions suggest that the meaning component in question may also be pushed down (existential sentences) or sideways (dative constructions) – it would be expected given current generative theorizing that the most suspect option of ‘pushing down’ may not exist but that pushing upwards or ‘sideways’ (to a co-argument of the same predicational structure) are the only options, such that expatriate interpretation targets either the same computational cycle or the next cycle up. We argued that the meaning component Diff is introduced by functional elements as well as independently available as a generalized conversational implicature. Local realization of the meaning component – the O of the traditional square of opposition, i.e., \((S(x) \land \neg P(x))\) in the cases discussed – would contradict basic principles of argument linking (the “second” condition) or semantic interpretation (LC). To repeat and more technically, the mechanism that renders the “defect” or “illegal” structures eventually interpretable is that of Expatriate Interpretation, repeated in (7).

(7) **Expatriate Interpretation (EI)**
Morphosyntactic feature \([f]\) on expression \(\alpha\) cannot be interpreted in terms of the corresponding semantic feature \([F]\) with respect to the meaning of \(\alpha\). Part of \([F]\) is interpreted with respect to the meaning of an element in \(\alpha\)'s linguistic context.

Regarding the question how meanings are compositionally coded, the meaning that is brought about by EI is very close to the literal but contradictory meaning. It is only the O-meaning part of Diff, Diff-O, that is “semantically dislocated”, i.e., interpreted with respect to a predicate (P) and argument (x) that are available in the current or in the next higher syntactic cycle. From an intuitive semantic perspective, however, the meaning that is derived may appear to be quite distant from (what would be) the literal meaning in that there is typically a move from ordinary individuals to phenomenal individuals. In Existential Sentences though, EI targets the ordinary individual denoting theme argument, explaining definiteness effects (section 4.3.1). The cases of changes of state (inchoativity) as brought about by directional complements (sections 3.3.2, 4.1.2) and also personal datives (section 4.3.2) suggest that EI may also target both the domains of ordinary individuals and phenomenal individuals at the same time.
Abbreviations & symbols

© contradictory
≥ more general than
≈ leads to
Agent
Conversational Implicature
Change of State
Difference
Diff-O Something is not P
Directional Prepositional Phrase
Expatriate Interpretation
Existential Sentence
Experimenter
Faultless Disagreement
Huford’s Constraint
Inclusive Alternative Ordering
Inchoative Construction
Law of Contradiction
Law of Excluded Middle
Logical Form
Middle Construction
Negative Raising
Predicate of Personal Taste
Particle
Patient
Personal Dative
Prefix
Preposition
problem/repair
Purpose
Reflexive
Reference Time
Strongest Meaning Hypothesis
Strong Reciprocity
Stimulus
Speech Time
Subject outranks Object
Tense, Aspect, Modality
Underspecified External Argument Generalization
Weak Reciprocity
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Modern theoretical linguistics lives by the insight that the meanings of complex expressions derive from the meanings of their parts and the way these are composed. However, the currently dominating theories of the syntax-semantics interface hastily relegate important aspects of meaning which cannot readily be aligned with visible structure to empty projecting heads non-reductively (mainstream Generative Grammar) or to the syntactic construction holistically (Construction Grammar). This book develops an alternative, compositional analysis of the hidden aspectual-temporal, modal and comparative meanings of a range of productive constructions of which pseudoreflexive, excessive and directional complement constructions take center stage. Accordingly, a contradiction-inducing hence semantically problematic part of literally coded meaning is locally ignored and systematically realized „expatriately“ with respect to parts of structure that achieve the indexical anchoring of propositional contents in terms of times, worlds and standards of comparison, thus yielding the observed hidden meanings.