The Classic Account of Context Dependence

Author's (rough) translation of:
Zimmermann, Thomas Ede:
'Kontextabhängigkeit'. In: A. v. Stechow & D.
Wunderlich (eds.), Semantik/Semantics.
Berlin/New York 1991. 156–229.

Preface to the English translation

This is a rough translation of a handbook article originally published in 1991. There are two reasons I decided to translate it: the main motivation came from numerous requests I received from colleagues who do not speak enough German to read the original article and asked whether it had been translated in the meantime. The other reason is that references to the article in the literature are sometimes inaccurate; my hunch is that this too is due to the limited currency of my native tongue among semanticists. One particularly intriguing instance is the observation that simultaneous quantification over *de se* and *de re* readings is possible. Whether or not it is, the topic is not even mentioned in my paper, as far as I can see: I checked and rechecked it, translating it being one of the opportunities, and I even looked into a slightly longer predecessor (Zimmermann 1988), but without success. So whatever the source of the observation that I have been credited with is, it is not this article. On the other hand there are a number of remarks and observations which as far as I can tell, do derive from this text for which the literature sometimes has and sometimes has not given credit so that I think it should be made more accessible if only just for the record (and, of course, for generations to come). This includes hypothesis (L) on the characters of lexical expressions (Section 1.3), the discussion of the shaky status of variable binding in Kaplan's theory (Section 4.1) as well as the somewhat technical considerations on compositionality (and monsters, to be sure) found in Section 1.4; I also suspect that this article is among the earliest source to emphasise the crucial rôle Stalnakerian diagonals play for Kaplan's theory of context dependence and its ramifications. These and more instances of what can actually be found in the article are now made available to the non-German speaking public.

A word on the translation as such. It is rough for lack of a better command of the English language and for obvious financial reasons – decent translations don't grow on trees. In some cases I diverged from the original formulation for various reasons and without warning. This includes cases of obvious error which, had I spotted them at the time, I would certainly have corrected (or so I think). I still tried to be true to the original text as much as this made sense to me. In particular, the stylistic awkwardness and pompositiy can already be found in the original. More importantly, German remains the object language; all examples are followed by English translations marked by '[≈ ...]' and occasionally a footnote explaining some peculiarities of the original that the English version does not share. Switching to congenial English examples would have meant a much more thorough revision of the original paper. I hope readers can live with this; and they are invited to find similar examples in their own favourite language.

This brings me to the translation of the terminology used in this paper. Although the literature covered in this handbook article is mostly written in English, the terminology used in it is far form homogeneous. In any case, when writing the German text, I had to make up most of the terms for myself, and I am no longer sure how they were supposed to relate to the English terms. Here is a case in point: the fundamental distinction between context and index when pertaining to specific situations rather than n-tuples had been: *Äußerungssituation* [≈ *utterance situation*] vs. *Auswertungssituation* [≈ *evaluation situation*]. The former is, I believe, I more or less standard, but the latter sounds somewhat cumbersome to my non-native ears; I decided to translate it by *point of evaluati-*

on. Another example is the German adjective *einschlägig*, which would normally translate as *pertinent*, but which in the text is used for a general concept that is now standardly called *salience* and was thus translated accordingly.

The original text is full of allusions to German politics and popular culture in the 1980s (when it was written) and also to my personal situation at the time. Even then most of the innuendos may not have been transparent to anyone with a background only slightly diverting from my own. Rather than adapting the examples, I chose to keep them, translating them mostly in a literal fashion.

Why had the paper been written in German in the first place? Two reasons: laziness and trust. Like all prospective contributors to the handbook, I had been given the choice of writing it in English or in German, with the understanding that it would be professionally translated into the respective other language anyway. Unfortunately, the handbook was under contract with a publisher that went bankrupt at a time when all the articles had been written, and so the editors had to find another publisher for the whole bundle – which was before the translation had even been begun. De Gruyter were nice enough to take on the (linguistically) mixed bag of essays but made it clear that they would keep it as is: German articles in German, English ones in English. Had I foreseen this development, I think I would have written the article in English in the first place.

Since the paper is part of a handbook it contains quite a lot of crossreferences to other articles in the same handbook. I integrated them in the reference list at the end, which also contains those references to the more recent literature from the footnotes, none of which appeared in the original; rather, they were all added as commentaries on the translation. By the way, the original article did not come with a bibliography but only listed the literature quoted by author's name and year of publication, leaving bibliographic information to the cumulated list of reference at the very end of the handbook – obviously not a good decision.

This article was published 25 years ago. Much has been written on the subject in the meantime (including another handbook article by myself: Zimmermann 2012) and many of the speculations on what I thought of as open problems or ongoing developments at the time proved to be shortsighted in hindsight, while others evolved into ongoing debates. To set the record straight one could comment on almost each and every sentence in this article; for obvious reasons I refrained from that but still included the odd footnote with corrections or hints at later developments.

Let me finally encourage anyone who reads this and finds fault with the translation, the footnotes, or the content, to get in touch with me via email at tezimmer@uni-frankfurt.de and frankly express their criticism.

Frankfurt, September 2016 Thomas Ede Zimmermann

On the 2019 version
I am indebted to Ramona Hiller for typesetting the current version, which differs from the one uploaded 3 years ago in several respects. No substantial changes were made, but quite a few typos and translation blunders have been corrected, a few references have been added or updated, etc.

Frankfurt, July 2019 Thomas Ede Zimmermann

Instead of treating them under the label of **context dependence**, the semantic phenomena discussed in this article could also be subsumed under the concepts of *deixis* or **direct reference**. In any case, we are dealing with a certain kind of situation dependence of linguistic meaning. However, a better understanding of this situation dependence requires a general theoretic framework for the description of the relation between language and the world. Such a framework will be supplied by the *general theory of reference* exposed in Part 1; this theory also constitutes the **classic account of context dependence**. Other frameworks, most of which are closely related to the classic account, will be briefly introduced in the subsequent part. Only after that, in Part 3, a general survey of the phenomena will be given, which is primarily aimed at demonstrating the width and flexibility of the classic account and its variants. Its limits are the object of Part 4.

1 The Classic Account

The classic account of context dependence, which serves as our starting point, can only be fully grasped on the basis of a certain picture of the relation between language and the world. A coarse sketch of this picture forms the beginning of the following account, in which the very notion of 'context' will not appear: in our preferred terminology it is only part of a variation of the classic framework, to be discussed in Section 2.1.

1.1 Extension and Intension

In using linguistic expressions, speakers often refer to persons or objects. If, e.g., Erwin utters the sentence:

(1)   Ich bin Vertreter.
        [≈ *I am a salesman.*]

he uses the subject *ich* [≈ *I*] to refer to himself, i.e. Erwin. In this situation, Erwin is the referent of the word *ich* [≈ *I*], or its extension. One may also define an extension for the noun *Vertreter* [≈ *salesman*], though not in quite a straightforward way. If Erwin's claim is true, one might suppose that this noun refers to Erwin, just like the subject does. However, what should the word *salesman* refer to if Erwin is wrong? One possible answer is that, in some indefinite way, it refers to any salesman whatsoever or – which amounts to the same thing – to the totality of all salesmen. According to this view, which we will adopt here, the extension of the noun *Vertreter* [≈ *salesman*] is the set of salesmen, and hence something abstract. This view also allows for a definition of the extension of this use of the copula *bin* [≈ *am*]: Erwin claims that he is an element of the extension of *Vertreter* [≈ *salesman*] so that the extension of the copula may be construed as the set-theoretic relation of element-hood.

In a similar vein, one may now try to find extensions for arbitrary uses of linguistic expressions. Sentences turn out to present a notorious difficulty. At first glance, they seem to lack any intuitively given referents. However, a line of reasoning inspired by predicate logic reveals that, by using a certain detour, one may obtain extensions of sentences after all. For consider sentence schemata such as:

(2) x liebt y.
        [$\approx$ x *loves* y].

– or, using logical notation, (open) formulae like:

(2′)   LOVE (x, y)

The obvious move is to define the extension of (2) and (2′) as the set of all ordered pairs that satisfy sentence (2) or formula (2′), i.e. those pairs $\langle a, b \rangle$ for which it holds that a loves b. Naturally, when more than two variables are present, one gets sets of triples, quadruples, etc. as extensions. In general, then, the extension of a formula φ with n free variables is the set of all ntuples $\langle a_1, ..., a_n \rangle$ that satisfy φ. Now, since the only 0-tuple happens to be the empty set, $\emptyset$, a formula without free variables can only have the singleton $\emptyset$ as its extension – if φ is true – or the empty set $\emptyset$ (for false φ). Declarative sentences of natural language correspond to closed formulae inasmuch they obviously do not contain any free variables. Hence the set-theoretic objects $\{\emptyset\}$ and $\emptyset$ are prime candidates for being extensions of sentences: $\{\emptyset\}$ is the common extension of true statements, whereas the false ones all have $\emptyset$ as their extension. These two abstract objects are known as the two truth values. Moreover, in set theory (and in what follows) they are identified with the numbers $0 (= \emptyset)$ and $1 (= \{\emptyset\})$.

The particular choice of extensions introduced so far immediately leads to an interesting consequence concerning simple sentences like (1): their extensions can be determined from the extensions of their parts. They thus conform to a:

> *Naive Principle of Compositionality*
> The extension of a complex expression is determined by the extensions of its parts and the way in which they are combined.

However, this principle for combining extensions does not extend to arbitrary sentences. Typical counter-examples include sentences with embedded *that*-clauses:

(3)   Monika vermutet, dass Erwin Vertreter ist.
        [$\approx$ *Monika suspects that Erwin is a salesman.*]

From the Naive Principle of Compositionality and the assumption that the extension of the clause *Erwin Vertreter ist* [$\approx$ *Erwin is a salesman*] is its truth value, it follows immediately that the latter may be replaced by any German (subordinate) sentence with the same truth value, without thereby affecting the truth value of the overall statement (3). This, however, is of course absurd.

To avoid the difficulties arising in connection with (3), either the Naive Principle of Compositionality or the assumption that the extensions of sentences are truth values, must be given up. We will only entertain the first alternative here. (See Article 6 [= Barwise 1991] for the second option.) A minimally weaker version of the Naive Principle of Compositionality has it that problem cases such as embedded clauses, are in need of 'vicarious extensions': the truth value of (3) does not depend on the truth value of the embedded clause but on the proposition it expresses (its content), and so the latter may play the role of a vicarious extension in the compositional account of the extension of (3). The usual term

for 'vicarious extensions' is **intensions**. Hence propositions are sentence intensions. The improved version of the Naive Principle of Compositionality then reads:

> *Fregean Principle of Compositionality*
> The extension of a complex expression is determined by the
> extensions or intensions of its parts and the way in which they
> are combined.

If a syntactic construction (like the formation of sentences by combining subject and predicate) allows for determining the extension of an expression built according to it from the extensions of its parts, it is called **extensional**; all other constructions are **intensional**. Clausal embeddings as in (3), then, are intensional constructions. More intensional constructions are: direct object complementation of verbs like *suchen* [≈ *seek*] and *schulden* [≈ *owe*] as well as the modification by certain adjectives like *angeblich* [≈ *alleged*] or *vorsätzlich* [≈ *deliberate*]. It is a remarkable fact that most intensional constructions (and maybe even all of them) can be paraphrased in terms of clausal embeddings. Perhaps, then, propositions are the only intensions that are really needed.

But what are propositions? The above characterisation in terms of clausal or sentential content is rather vague. A traditional, though (as will be seen) insufficient, strategy of defining the notion of a proposition (and intension in general) equates content and information: according to it, the intension of an expression is the information needed to determine its extension. Since, in general, the extension of a linguistic expression depends on the circumstances of uttering it, the intension may be thought of as a procedure that leads from arbitrarily given circumstances to corresponding extensions – or, more abstractly and more general: as a function (quite in the mathematical sense) that can be applied to possible situations and whose values are always extensions. For instance, the intension of a noun like *spy* may be applied to the situation of West Germany in the early 1970s, yielding a set whose most prominent would probably be Günter Guillaume (but who knows?), whereas the value the same intension assigns to the fictional worlds created by Ian Fleming a set containing a character that used to be impersonated by Sean Connery, Roger Moore, and others: in either case, the value of the intension is the set of secret agents. In particular, then, the intension in this example is always the same mapping from situation to extension, even where the former is not part of our world and the latter is usually not fully known.

1.2   Intension and Character

Propositions, then, are characteristic functions, i.e. functions from situations to truth values, or (almost) equivalently: sets of situations – where a characteristic function is identified with the set of arguments to which it assigns 1 as its value. Accordingly, sentence (3) says that Monika stands in a certain relation V expressed by the verb *vermuten* [≈ *suspect*] to a certain set p, viz. the set of those situations in which Erwin is a salesman; and a rough account of the relation V would be: x stands in V to p if x has some suspicion which, is only correct in situations from p. Of course, the holding of the relation V in turn depends on the situation, so that the intension of the verb *suspect* turns out to be a function that assigns to situations relations between persons and

propositions. Under the (relatively harmless) assumption that the totality of suspicions that one person has again constitutes a suspicion of this person, we obtain the following (provisional) meaning rule:

(R*)   The intension of the verb *vermuten* [≈ *suspect*] is a function V which assigns to any situation s a binary relation V_s such that the following condition (*) holds for any individuals x and y:
(*) x stands in the relation V_s to y if p holds in any situation s' that is compatible with x's suspicions in s.

(R*) is a typical rule of interpretation for an intensional construction. When applied to sentences like (3), the variable 's' refers to the situation in which the expression in question is uttered and relative to which the extension is to be determined; 's'', on the other hand, refers to the situations that must be taken into account in determining the intension of one of the parts of the expression. In the following, this difference in the roles 's' and 's'' play will be captured by a handy terminological distinction: we will say that, in a (simple) application of (R*), 's' refers to an utterance situation, whereas 's'' stands for a point of evaluation.

(R*) is an instance of a rather popular analysis of attitude verbs like *suspect*. It is known that this analysis leads to difficulties, due to the inconsequent nature of propositional attitudes, and that these difficulties can be avoided by a more finely grained (but also more complicated) propositions.[1] (See Article 34 [= Bäuerle & Cresswell 1991] on this.) However, apart from a possible connection addressed in Section 4.2, this phenomenon is largely independent of matters of context dependence. We will thus continue to rely on (R*), under the tacit assumption that the problems to be discussed below also arise with logically structured propositions, and may then be solved in an analogous fashion.

Let us now apply (R*) to the following example:

(4)   Monika vermutet, dass ich in Radolfzell bin.
        [≈ *Monika suspects that I am in Radolfzell.*]

To see the problem (R*) poses for an analysis of (4) more clearly, we will look at a particular (somewhat weird) utterance situation s_0 of (4) the pre-history of which is as follows: Erwin is calling Monika from Schwäbisch-Hall to tell her that he is going to go to Radolfzell. However, while he is on his way, he changes his mind and instead steers for Konstanz, where they share an apartment and Monika is sitting in her study while her visiting parents are watching TV in the living room. The first thing on his arrival is that Erwin sees Monika's parents and utters (4). Though Monika does hear this utterance through a hole in the wall between living room and study, she takes it to be one of her father's (somewhat strange) remarks; for their voices are quite similar and after all, Monika takes Erwin to be in Radolfzell. So much for our account of the utterance situation s_0 of (4). Let us now try to employ (R*) to determine the truth value of (4) in s_0. In the case at hand, condition (*) boils down to the condition that the

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[1]Here and elsewhere the German original reads *einen logisch feineren [. . .] Propositions-begriff* [≈ *a logically more finely grained [. . .] concept of propositions*]; obviously the qualification *feineren* [≈ *more finely grained*] relates to the propositions according to these concepts and not to the concept itself. Rather than live with this bracketing paradox I decided to drop the reference to the concept whenever possible.

proposition expressed by (5) is true in any situation s' that is compatible with Monika's suspicions in s_0:

(5) Ich bin in Radolfzell.
  [$\approx$ *I am in Radolfzell.*]

Obviously, though, (5), is true in a situation s' just in case the person that is speaking in s' happens to be in Radolfzell (in s'). In order for (4) to be true in s_0 according to (R*), Monika's suspicions would thus have the utterer of (4) to be in Radolfzell. But, of course, this is absurd: Monika is in Konstanz, and she can hear that the speaker is next door. (R*) thus predicts (4) to be false in s_0, when Erwin is quite obviously right.

It is obvious what went wrong here: with his utterance of (4), Erwin does not claim that Monika suspects the person who is speaking next door to be in Radolfzell. Rather, the suspicion that Erwin is after relates to himself, the current speaker; it is thus a so-called *singular proposition*, a proposition, about a specific individual. The above definitions of intension and extension obviously do not account for this fact. They are in need of revision.

In principle, there are two obvious ways of escaping the difficulties arising in connection with (4): one may either (A) change the interpretation (R*) of the verb vermuten [$\approx$ *suspect*] by restricting clause (*) to such points of evaluation in which the same person is speaking as in the utterance situation; or (B) one gives up the presupposition that (5) expresses that the (changing) speaker is in Radolfzell and replace it by the assumption that (5) says that Erwin is in Radolfzell. We will investigate both possibilities in turns and come to the conclusion that (A) only poses new problems whereas (B) escapes them by leading to a novel notion of intension. However, it will later (in Section 2.1) turn out that, from a more abstract point of view, alternative (A) may be saved after all.

So let us first investigate alternative (A), which merely boils down to a refinement of rule (R*); clause (*) would have to be replaced by:

(+) x stands in the relation V_s to y if p holds in any situation s' that has the same speaker as s and is compatible with x's suspicions in s.

Of course, (+) is in need of further refinement: slight variations of example (5) would reveal that the points of evaluation s' would have to share more aspects with the utterance situation s – among other things: the addressee, the day of utterance, the place of action etc.; for you, today, here, etc. behave in analogy to I in the relevant respect. Let us call those **aspects** of the points of evaluation that must be taken over from the utterance situation as **fixed** [**in** (R$^+$)], whereas the other aspects are the ones **shiftable** [by (R$^+$)]. (It should be noted that aspects of situations correspond to certain of their properties: s and s' coincide in the aspect 'speaker' if s and s' share the property of having a certain person X speaking in them; more about this notion of aspect will be said in Section 2.1.) Revision (A) thus says that (R$^+$) fixes certain aspects of the utterance situation. Which aspects would that be? Example (4) suggests that the speaker would have to be one of them: according to (*), utterance situation and point of evaluation need to have the same speaker. However, this cannot be the whole story, as a little expansion of the above example shows. For Erwin may truthfully follow up his utterance of (4) by:

7

(6)   Monika vermutet, dass nicht ich spreche, sondern jemand anders.
        [≈ *Monika suspects that someone other than me is speaking.*]

However, according to (R^+) with (6) Erwin would basically say that there is
no situation that is compatible with Monika's suspicions and in which Erwin is
speaking: the proposition expressed by the embedded clause in (6) consists of
those situations s in which somebody is speaking, where this somebody is not
the speaker in s; since there obviously cannot be such situations, condition (+)
boils down to there not being any situation s' that is compatible with Monika's
suspicions and that shares speaker Erwin with s_0. However, in the situation
sketched, Monika may even be convinced that Erwin is speaking; in any case
this assumption does not contradict her suspicions about Erwin, so that the
described situations s' do exist. She just does not believe that Erwin is the
current speaker she is hearing, i.e. the one in s_0 – but she can imagine him
speaking in other situations. So (R^+) does not work either.

How about alternative (B), then? According to it, there is nothing wrong
with (R^*), and the mistake lies in the presupposition that the sentence (5)
embedded in (4) expresses the proposition that the (corresponding) speaker
is located in Radolfzell: if we instead assumed that the proposition expressed
by (5) consists of the situations in which Erwin is located in Radolfzell, then
(R^*) would have (4) express that in all situations compatible with Monika's
suspicions, Erwin is located in Radolfzell; and this is precisely how it is. However,
this solution depends on the *ad hoc* assumption that (5) says that Erwin is
in Radolfzell, which is obvious nonsense in the nearest situation s_1 in which
someone else than Erwin is speaking: the proposition expressed by (5) should
not be that Erwin but a certain person, who happens to be the speaker in s_1,
is in Radolfzell. But then (5) would have to express different propositions in s_0
and s_1, i.e. the intension of (5) would have to depend on the utterance situation.
Alternative (B) thus comes down to letting the intension of an expression vary
with the utterance situation – similarly to the extension: just like the truth
value of (5) may vary from situation to situation, so the sentence may express
this or that (singular) proposition, depending on who is using it.

In order to guarantee that the proposition expressed by (5) depends on the
utterance situation in the way desired, the above principles for determining
extension and intension must be refined. What is needed is a schema according
to which, in any utterance situation s, any sentence like (5) gets assigned an
intension typical of s; in other words: a definition of the functional dependence
of the intension on the (changing) utterance situation. We will, from now on,
refer to this dependent intension as the **character** of the linguistic expression
under scrutiny. Thus the character χ_5 of (5) is a function that assigns to any
utterance situation s the set of those situations s' such that the following holds:
in s', the speaker in s is located in Radolfzell.

To arrive at a systematic connection between the character χ_5 and the struc-
ture of (5), the distinction between utterance situation and point of evaluation
must already be made below the sentence level; for the extension of the sub-
ject I of (5) is determined in the utterance situation, whereas the extension of
the predicate (*bin in Radolfzell* [≈ *am in Radolfzell*]) depends on the point of
evaluation. This difference in impact between utterance situation and point of
evaluation is not due to the different roles of subject and predicate in general
but to the word *ich* [≈ *I*]. (This may, e.g., be seen from sentences with *mich*

[$\approx me$] in object position or proper names as subjects.) So if the extension e of the subject *ich* [$\approx I$] is to be determined, it must be known which situation s is the situation of utterance, whereas the point of evaluation does not play a role: e is the speaker in s. The character χ_{ich} of *ich* [$\approx I$] may then be construed as a function that always yields the speaker in s, for any situation of utterance s and point of evaluation s'. Like χ_5, χ_{ich} is a function that is applied to utterance situations and whose values are intensions, i.e. functions from points of evaluation to extensions. And so are characters in general. We thus obtain the following picture:

(K)   Character

                  $\downarrow$ utterance situation

           Intension

                  $\downarrow$ point of evaluation

           Extension
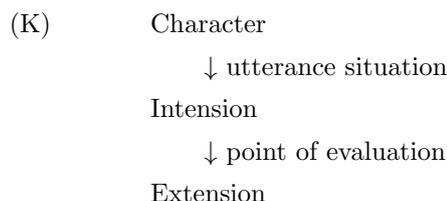
The arrows have to be read as indicating that the object at the origin uniquely determines the object at the goal. 'K' stands for David Kaplan's Klassical Kalifornian Kontext Theory.

Of course, (K) can only be applied where there is a meaningful distinction between utterance situations and points of evaluation, i.e. in intensional constructions. But then the schema easily carries over to extensional constructions: one only needs to think about what happens if, say, (5), with whose character χ_5 we are now more or less familiar, is asserted as such. To begin with, χ_5 may of course be directly applied to the utterance situation s; the result is the proposition $\chi_5(s)$ that (5) expresses and that consists of all situation in which the person who utters (5) in s, is in Radolfzell. What, then, is the extension, the truth value, of (5) in s? Schema (K) says that this question is answered by taking a point of evaluation into account; but none appears to be given. On the other hand, it is obvious that (5) is true in the utterance situation s just in case the person that utters (5) in s happens to be in Radolfzell in the situation s itself, i.e. if s itself belongs to $\chi_5(s)$. Hence, in this case, the proposition expressed by (5) in the situation of utterance must be evaluated with respect to the utterance situation itself. In order to make (K) universally applicable, one may thus agree that – as long as no other point of evaluation has been declared – the utterance situation will have to serve as a default value:

(D)   Outside intensional constructions, the utterance situation serves as point of evaluation.

(D) helps to bring out an interesting aspect of the difference between the two possibilities (A) and (B) of interpreting embedded *that*-clauses considered above. For according to (D), the outstanding feature of intensional constructions is that, on top of the utterance situation, further situations may have to be taken into account in determining extensions: the point of evaluation can be shifted from the origin. This is reminiscent of the shift of situational aspects according to the alternative (A) discarded above. According to (D), even entire situations are shifted (within intensional constructions). However, this does not lead to the difficulties encountered in connection with (6) because, with the distinction between utterance situations and points of evaluation, the origin of the shift

– the utterance situation – is always preserved: even if the main verb of (6), *vermutet* [≈ *suspects*], has the embedded clause evaluated in a variety of situations, its subject, *ich* [≈ *I*], can still depend on the utterance situation of the whole sentence.

Usually, (D) is only assumed to hold for the special case of a nonembedded declarative sentence φ; the more general version can then be deduced with some auxiliary assumptions. In any case, (D) provides a simple recipe for determining the extension (the truth value) v of φ in an utterance situation s_0: if one thinks of characters as tables displaying the extension for any combination of utterance situation and point of evaluation, then (D) says that, for extensional constructions (and particularly sentences in isolation), only the entries on the diagonal are of interest. This image of characters as tables should be kept in mind for what follows. In particular it will make clear that (D) reduces the two-dimensional concept of truth of the classic account (to be further elucidated in Section 2.3) to one dimension, thus making it comparable with the pre-theoretic concept of truth.

The distinction between utterance situation and point of evaluation marks a difference in the rôle situations may play when it comes to determining the extension of linguistic expressions. However, while obviously any conceivable situation may normally be used as a point of evaluation in a rule like (R*), only those situations in which an utterance takes place, are utterance situations: they only form a small part of the possible situations. Now, this observation is of some interest in that it shows that the above scheme (K) is by no means suited to determine the extensions of expressions at arbitrary pairs $\langle s, s' \rangle$ of situations, where s works as an utterance situations and s' as point of evaluation. (Such pairs will, from now on, be called **points of reference**.) If, e.g., no speaker (or utterer) is present in s, (K) cannot be applied at all. So character tables are not quadratic, and their diagonals only cut through the half occupied by the utterance situations:

(X)

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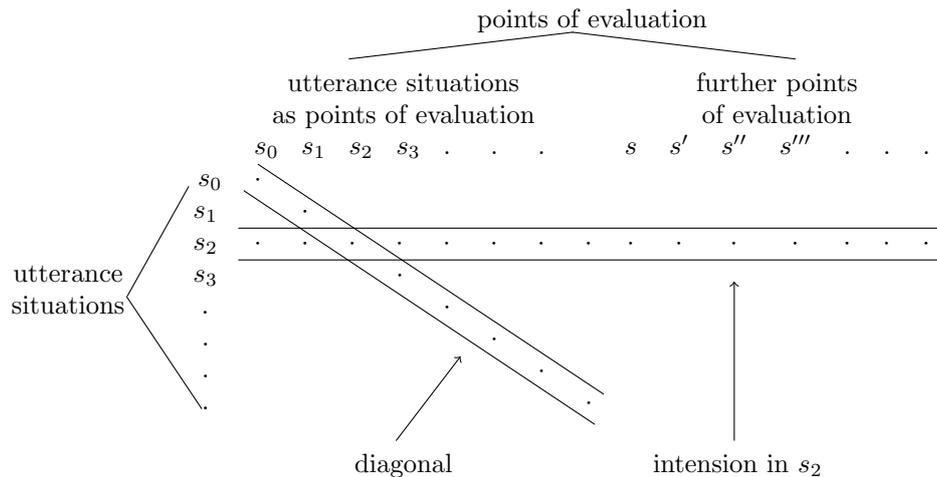
1.3   Kinds of Reference

According to (K), the extension of a linguistic expression α derives from its character χ_α, an utterance situation s_0, and a point of evaluation s. As the examples discussed so far already indicate, in some cases, knowing, apart from χ_α, one of the two situations already suffices to uniquely determine the extension $\chi_\alpha(s_0)(s)$. The pronoun *ich* [$\approx$ *I*] is a case in point, where: it is completely irrelevant what s is because $\chi_\alpha(s_0)(s)$ always coincides with the speaker in the (utterance) situation s_0; in a similar vein, the utterance situation plays no rôle when it comes to determining the extension of a noun like *salesman*. Thus emerges a natural classification of linguistic expressions according to their 'character traits':

> Definition:
> (a) A linguistic expression α **refers directly** if for any utterance situations s_0 and points of evaluation s and s', it holds that:
>
> $$\chi_\alpha(s_0)(s) = \chi_\alpha(s_0)(s').$$
>
> (b) An expression α **refers absolutely** if for any utterance situations s_0 and s_1 and any points of evaluation s, it holds that:
>
> $$\chi_\alpha(s_0)(s) = \chi_\alpha(s_1)(s).$$

Directly referential expressions, then, are those for which the point of evaluation in schema (K) may be skipped: they refer to the world directly, without mediation by a level of content or intension. Absolute expressions, on the other hand, are those that always express the same content on the level of intension, no matter on which occasion they are uttered. Since both concepts only concern the characters χ_α of expressions α, one may also apply them directly to χ_α, which is what we will occasionally do.

The above definitions do not exclude expressions α that refer both directly and absolutely. In this case, though, α needs to have a constant character table, displaying the same extension at all points of reference:

$$\chi_\alpha(s_0)(s) = \chi_\alpha(s_1)(s'), \text{ for any } s_0, s_1, s, \text{ and } s'.$$

Expressions that meet this tough condition are not all that frequent, but they do exist, at least according to semantic folklore : logical words like *und* [$\approx$ *and*], *oder* [$\approx$ *or*], *nicht* [$\approx$ *not*], *jedes* [$\approx$ *every*], etc. as well as tautological sentences (like *es regnet oder es regnet nicht* [$\approx$ *it is raining or it is not raining*]) are cases in point; proper names, too, are often analysed as absolute and direct, and we will adhere to this practice. To be sure, neither assumption is totally undisputed. (See Sections 4.4 and Article 16 [= Lerner & Zimmermann 1991], respectively.) It should be noted that Definition (a) only requires that the extension of the expression at hand does not depend on the point of evaluation, which does of course not imply that it does depend on the utterance situation. To obtain this consequence, one can extend (a) by the additional clause:

(a') For some utterance situations s_0 and s_1, it holds that:

$$\chi_\alpha(s_0) \neq \chi_\alpha(s_1).$$

Directly referential expressions α that also satisfy condition (a′) are called deictic. Words like *du* [$\approx$ *you*], *gestern* [$\approx$ *yesterday*], and *hier* [$\approx$ *here*] are typical cases in point.

The concepts definied in (a) and (b) are totally independent of each other. An expression can not only be deictic and meet both (a) and (b) or be directly referential without referring absolutely (like the deictic expressions). The opposite case it possible too, as can be seen from 'purely conceptual' words like *essen* [$\approx$ *eat*] or *Vertreter* [$\approx$ *salesman*]. And finally there is a whole range of expressions that refer neither directly nor absolutely. Simple sentences like (7) are cases in point:

(7)   Ich bin ein Berliner.
       [$\approx$ *I am a Berliner.*]

On the one hand, the truth value of (7) always depends on the point of evaluation. Thus the presumably most famous utterance of (7) was clearly false, for its speaker was from Brookline, Mass. It is still conceivable and thus true in some possible situation s, though, that John F. Kennedy had been born in Berlin. This proves that (7) is not directly referential, for $\chi_7(s_0)(s_0) \neq \chi_7(s_0)(s)$ if s_0 is the actual famous situation at Schöneberg City Hall and s is as described. On the other hand, of course, (7) is not an absolute expression. If, e.g., Arnim von Stechow utters sentence (7), he would thereby obviously express a different proposition than the US-president at the time; and if the utterance takes place in this world, it would even differ from its famous predecessor in its truth value.

It should be noted that (7) is a complex expression. Clear cases of words that satisfy neither (a) nor (b), are much harder to find. There are, however, certain uses of absolute words that come with a dependence of the extension on the utterance situation. One may, for example, omit the argument of a binary noun like *Bruder* [$\approx$ *brother*] or *Mutter* [$\approx$ *mother*] – one that refers to a relation or function – which must then be supplied by the utterance situation:

(8a)   Bevor er zum Familientreffen fuhr, rasierte sich Karl Marx. Nicht einmal die Brüder haben ihn daraufhin erkannt.
        [$\approx$ *Karl Marx shaved before he went to the family meeting. Not even the brothers recognised him then.*]

(b)   Vor der Schwarzwaldklinik wurde ein Säugling gefunden. Die Mutter ist nach wie vor unbekannt.
        [$\approx$ *An infant was found in front of the Black Forest Clinic. The mother is still unknown.*]

Given an utterance of (8a), one would, at least normally, understand *Brüder* [$\approx$ *brothers*] in the sense of *Brder von Karl Marx* [$\approx$ *brothers of Karl Marx*]; likewise, *Muttter* [$\approx$ *mother*] in (8b) naturally refers to the mother of the foundling previously mentioned. More precisely: in an utterance situation s_0, the proposition the second sentence in (8a) expresses, consists of the situations s (prior to s_0) in which the brothers of *the obvious person in* s_0 do not recognise the referent of [*him*] (i.e., Karl Marx); similarly, in an utterance situation s_1, the proposition the second sentence in (8b) expresses, consists of the situations s' in which the mother of *the relevant child in* s_1 is unknown.

In both cases, then, the missing argument must be gleaned *from the utterance situation*. For the time being, we will ignore the question of how precisely this is

done (but see Section 3.3) and only note that the missing arguments cannot and must not always be supplied by the utterance situation. For often the argument is indeterminate:

(9)   Vater werden ist nicht schwer.[2]
        [≈ *It is not hard to become a father.*]

Here *Vater* [≈ *father*] is used like *Vater von jemand* [≈ *father of someone*] or *Vater eines Kindes* [≈ *father of a child*], and precisely not in the sense of *Vater von x* [≈ *father of x*], where x is some person to be gleaned from the utterance situation. (Cf. Section 4.3 for more on sentences like (9).)

Inflected verb forms like *schläfst* [≈ $sleep_{2nd,sg,pres}$] present another case in which the extension of a single word depends both on the utterance situation and on the point of evaluation: unlike the absolute infinitive [*to*] *sleep*, the extension of the finite form depends on the time of utterance (and possibly on the speaker). But then this word can be regarded as the result of a syntactic rule of a morphological process and not as 'naked lexeme' – in grammatical terms: *schläfst* [≈ $sleep_{2nd,sg,pres}$] decomposes into V + INFL, were the latter is deictic but the former refers absolutely. In a similar vein, one can decompose the possessive pronoun *mein* [≈ *my*] into the deictic word *ich* [≈ *I*] and a possessive element (cf. Section 3.3 for this). We thus have reason to state the following hypothesis concerning the lexicon:

(L)   Lexical items are always deictic or absolute.

The extensions of certain adjectives are sometimes said to be doubly dependent on situations. The adjective in (9) is a case in point. In combination with a noun, its basic (positive) form refers to a set whose exact composition depends on a number of factors. Whether a given object lies in the set denoted by *schweres Textbuch* [≈ *difficult/heavy textbook*] among other things depends on the **dimension** the speaker refers to by *schwer* [≈ *difficult/heavy*] – the degree of readability or just the paper weight; and within the same dimension, there are different **standards**: the standards for readability shift with the readership the speaker has in mind, and different criteria of weight may take into account whether we are talking of chemistry textbooks or first grade primers. Both the underdetermined dimensions of some adjectives and the shifting standards of all gradable adjectives are sometimes said to depend on the utterance situation. It is, on the other hand, undisputed that the point of evaluation has a crucial part to play when it comes to determining the extension of an adjective: it supplies the relevant facts. Let us consider an example. With an utterance of (10), the speaker can ascribe to a group of students either a judgment on the weight of the book at hand or an opinion as to the intellectual demands it makes; but she cannot thereby express that said students take this book to be *schwer* in any sense – i.e., both heavy and difficult:

(10)   Die Studenten meinen, dass das Handbuch Semantik ein zu schweres
        Buch ist.
        [≈ *The students think that the Handbook of Semantics is too heavy/difficult
        a book.*]

---

[2]This is the very popular first line of a German poem by Wilhelm Busch (1832–1908), which continues: *Vater sein dagegen sehr* [≈ *but the harder is being a father*].

So the proposition that (10) states to be the object of an attitude (approximately) consists either of the points of evaluation at which the *Handbook of Semantics* weighs more than one can carry, or it is the set of situations in which the same book presents an inllectual challenge to its readership. Which proposition it is, obviously depends on which dimension the speaker refers to by *schweres* [≈ *heavy/difficult*]; and this again is at least influenced by the topic of the conversation and thus by the utterance situation. In a similar way, one may argue that the choice of the standard of comparison, too, is a matter of the utterance situation. But once dimension and standard have been fixed, the extension of *schwer* still depends on the point of evaluation: if a point s belongs to the set of situations in which the *Handbook of Semantics* exceeds Barwise (ed.)(1977) in weight (or some other accepted standard), depends on the facts in s and not on what is the case in the utterance situation. We would thus have to assume the following kind of semantic rule for *schwer*:

(R$_{schwer}$) Let s_0 be an utterance situation, s a point of evaluation, and X that dimension of comparison from the set {Weight, Difficulty, ... } that is most important in s_0. Then $\chi_{schwer}(s_0)(s)$ is a function that assigns to any set M those objects y for which the following holds:

> y is in M, and the X-value that y has in s is higher than the pertinent X-standard value in s_0.

(M is the extension of the head noun.) Adjectives like *schwer* thus seem to speak against Hypothesis (L) in two ways. However, things are not quite that simple. As we wil see in the next section, it is by no means always the utterance situation that contributes the underdetermined dimension. And as far as the standard is concerned, it is always invoked in determining the extension of the positive: a textbook is *schwer* (in whatever sense) if it is *schwerer* [≈ *more schwer*] (in the same sense) than the situationally given standard. Thus the positive of the adjective is obviously reduced to the comparative (or a basic lexeme with a comparative meaning that underlies all forms of comparison). And the comparative refers absolutely. The positive might thus also be the result of a morphological process und would thus fall outside (L)'s range of application. (See Articles 31 [= Hamann 1991] and 32 [= E. Klein 1991].)

The idea behind (L) is that the lexicon could be represented and interpreted simply and plausibly so that (L) holds; it is not claimed that (L) is a cogent principle without which no empirically correct account of German could manage. Moreover it should be noted that, by definition, (L) only concerns the determination of extensions[3] and does not capture any other semantic dimensions like style, presupposition, etc. Thus, e.g., it is clear that the extension of a pejoratively tainted word like *Köter* [≈ *cur*] only depends on the point of evaluation, whilst the derogative slant is contributed by the speaker as determined in the utterance situation, as a simple example makes clear:[4]

(11)   Hermann weiß, dass Hellas Hund gestorben ist.
         [≈ *Hermann knows that Hella's dog died.*]

---

[3] For reasons of accuracy, I decided to stick to the frequent *determination of extension* which corresponds to the (sightly less clumsy) German *Bestimmung der Extension* or *Extensionsbestimmung* for which I did not find a catchier term.

[4] Apart from the main verb, the translation follows Potts (2007: 171).

(11′)   Hermann weiß, dass Hellas Köter gestorben ist.
        [≈ *Hermann knows that Hella's damned dog died.*]

(11) and (11′) make the same claim about the carrier of the name *Hermann*, viz. that he stands in the relation expressed by the verb *wissen* [≈ *know*] to a certain proposition $p_\dagger$, which consists of the situations in which Hella's dog has died. The difference between the two variants merely consists in the fact that in the case of the latter, the speaker additionally indicates that he is not really fond of the animal in question. But this difference plays no rôle in determining the intension $p_\dagger$ of the embedded clause and thus neither for the character of the words occurring in it. *Hund* [≈ *dog*] and *Köter* [≈ *damned dog*] have the same character and both refer absolutely; they thus confirm Hypothesis (L). The slant thus obviously is part of a semantic dimension that is independent of character.

Hypothesis (L) says something about how the smallest linguistic carriers of meaning relate to the world. In the case of a deictic word the extension is directly determined by features (aspects) of the utterance situation. This is also so if the world enters an intensional construction: the contribution a deictic word makes to determining the intension of an expression in which it occurs does not go beyond its extension:

(12)   Caroline hätte fast übersehen, dass heute die Sonne scheint.
        [≈ *Caroline almost missed noticing that the sun is shining today.*]

By an utterance of this sentence on, say, December 26, 1953, it is said that Caroline stands in a certain relation (of 'almost missing to notice') to the set of situations p in which the sun is shining on December 26, 1953. The deictic word *heute* [≈ *today*] merely contributes in the day of utterance to the propostion p; thus p is a singular proposition about December 26, 1953. On the other hand, the verb *scheint* [≈ *is shining*], for example, also contributes a content, an intension, to both p and the whole sentence: the mere knowledge of the extension of *scheint* in the utterance situation does not suffice to determine p. The capability of directly slipping in extensions in the construction of intensions (like p) is the main semantic characteristic of deictic words and motivates the term 'direct reference'. It is even sometimes said that deictic words like *heute* [≈ *today*] see to it that, on account of its singularity, their referent is part of the proposition expressed. We will not use this parlance since it is hard to be made precise sense of; as a matter of fact, the very notion of a singular proposition is already delicate enough.

The contributions of deictic words to the content of expressions in which they occur thus merely consists in their referents. But then, of course, specifying its referent does not fully account for the meaning of a deictic word. For the extension varies from (utterance) situation to situation and it is precisely the way in which its extension varies that makes the character of such a word: in the case of direct reference the level of evaluation points may be safely skipped. Thus viewed, the character of a deictic word looks like a kind of miniature intension: a partial function from situations to extensions, but one that is only defined for utterance situations. The miniature intension thus obtained from the character χ_α of a directly referential α by skipping the redundant level of evaluation, will be called the **descriptive content** δ_α of α: for directly referential α, any utterance situation s_0 and points of evaluation s and s' we thus have:

$\delta_\alpha(s_0) = \chi_\alpha(s_0)(s) = \chi_\alpha(s_0)(s')$. As a rule, the descriptive content of a deictic expression more or less corresponds to the intension of some absolute expression. Thus the intension of *der Angesprochene* [$\approx$ *the addressee*] approximately equals the descriptive content of *du* [$\approx$ *you$_{sg}$*]: $\chi_{derAngesprochene}(s_0) \approx \delta_{you}$, for any utterance situation s_0. In such a case the absolute expression is called a **circumscription** of the corresponding deictic expression: thus *der Angesprochene* [$\approx$ *the addressee*] is a circumscription of *du* [$\approx$ *you$_{sg}$*]. It should be noted that deictic expressions and their circumscriptions never [!] have the same characters. The circumscription merely takes the variability of the deictic character to a conceptual level. Or, somewhat more prosaically: the dependence of the extension of a deictic expression on the utterance situation in the circumscription becomes a dependence on the point of evaluation.

The relation between deictic character and circumscription can be construed as the work of an operator that is invisible at the linguistic surface and that relates any situational dependence to the utterance situation. This operator carries the slightly awkward and hard to pronounce name *dthat* [phonetically: dðæt]. For utterance situations s_0 and points of evaluation s, the extension of an expression of the form $dthat(\alpha)$ is determined as follows: $\chi_{dthat}(\alpha)(s_0)(s) = \chi_\alpha(s_0)(s_0)$. To see how *dthat* works it is best to consider meta-linguistic accounts of the characters of absolute expressions: suppose, $\chi_{der\ Angesprochene}(s_0)(s)$ is the person addressed in s. Then *dthat(der Angesprochene)* comes out as the person addressed in s_0. The result of applying the *dthat*-operator can always be described as such a substitution of utterance situations for points of evaluation. More about this in Section 2.3.

1.4   Kinds of Combination

Schema (K) not only leads to a natural classification of linguistic expressions according to their referential properties. It can also be used to distinguish different types of syntactic constructions. For this it is useful to employ the conceptual apparatus of algebraic semantics (see also Article 7 [= von Stechow 1991]) and regard these constructions as operations on linguistic expressions or their underlying structures. Accordingly, e.g., there is an operation R in German that builds up a complex noun from a noun and a (congruent) relative clause: $R(Kind, das weint) = Kind, das weint$ [$\approx$ *child that is crying*], etc. In general a syntactic construction F takes a certain number n of expressions (or underlying structures) $\alpha_1 \ldots, \alpha_n$ as arguments and as a result again delivers an expression (or an underlying structure). In the context of compositional semantics as favoured here one assumes that the character of the result $F(\alpha_1 \ldots, \alpha_n)$ can be determined from the characters of the arguments by way of a **semantic operation** Σ_F that corresponds to the construction F. We thus have a:

> *General Principle of Compositionality*
> The character of a complex expressions emerges from the characters of its parts and the way in which they are combined.

In the case of relative clause attachment R the corresponding semantic operation is set intersection: $\Sigma_R(\chi_1, \chi_2)(s_0)(s) = \chi_1(s_0)(s) \cap \chi_2(s_0)(s)$, where it is taken for granted that both the extensions of both relative clauses and nouns are sets. R is thus extensional (in the sense of Section 1.1), since

at any point of reference it suffices to know the extensions of the two arguments in order to determine the extension of the result. Generally, an n-place syntactic construction F is **extensional** if extensionally equivalent expression parts always lead to extensionally equivalent overall expressions, i.e., if for all characters $\chi_1, \chi_1', \ldots, \chi_n, \chi_n'$ and points of reference $\langle s_0, s \rangle$ the following holds: $\chi_1(s_0)(s) = \chi_1'(s_0)(s), \ldots, \chi_n(s_0)(s) = \chi_n'(s_0)(s)$ implies $\Sigma_F(\chi_1, \ldots, \chi_n)(s_0)(s) = \Sigma_F(\chi_1', \ldots, \chi_n')(s_0)(s)$. According to this definition, of course, such a construction F is extensional just in case the corresponding semantic operation Σ_F always, i.e. at any point of reference $\langle s_0, s \rangle$, reduces to an operation $\Sigma_F^{s_0, s}$ on extensions in the sense that any characters $\chi_1, \ldots, \chi_n$ satisfy: $\Sigma_F(\chi_1, \ldots, \chi_n)(s_0)(s) = \Sigma_F^{s_0, s}(\chi_1(s_0)(s), \ldots, \chi_n(s_0)(s))$. In the case of relative clauses, $\Sigma_F^{s_0, s}$ is always set intersection, of course, and hence in particular does not depend on the point of reference. In that sense F is **canonically extensional**, and possibly every (actual) extensional construction is.[5]

As we have already seen from the example of clausal embedding under attitude verbs in Section 1.1, the Naive Principle of Compositionality is insufficient: not all actually occurring syntactic constructions are extensional. Sometimes the intensions of the expressions concerned must be known in order to determine the extension of the overall expression. But at least in the case of an intensional construction one does not have to know the full characters of the expression parts in order to determine the extension of the result. In general an n-place syntactic construction F is **intensional** if intensionally equivalent expression parts always lead to extensionally equivalent overall expressions, i.e., if for all characters $\chi_1, \chi_1', \ldots, \chi_n, \chi_n'$ and points of reference $\langle s_0, s \rangle$ the following holds: $\chi_1(s_0) = \chi_1'(s_0), \ldots, \chi_n(s_0) = \chi_n'(s_0)$ implies $\Sigma_F(\chi_1, \ldots, \chi_n)(s_0)(s) = \Sigma_F(\chi_1', \ldots, \chi_n')(s_0)(s)$. According to this definition, of course, such a construction F is intensional just in case the corresponding semantic operation Σ_F always, i.e. at any point of reference $\langle s_0, s \rangle$, reduces to an operation Σ^{s_0} on extensions in the sense that any characters $\chi_1, \ldots, \chi_n$ satisfy: $\Sigma_F(\chi_1, \ldots, \chi_n)(s_0)(s) = \Sigma^{s_0}(\chi_1(s_0), \ldots, \chi_n(s_0))$. In the case of the clausal embedding mentioned above, the semantic operation is always a certain kind of (intensional) functional application; the exact specification of this operation and its intensional counterpart is left to the reader.[6] The latter will also observe a certain canonicity, which however is not so easy to define as in the case of relative clause attachment. The reason for this is the difference in behaviour between the attitude verb and the embedded clause: while the latter contributes its whole intension, for the former only the extension matters. The construction is thus as it were, 'ex-intensional'. The notion of canonicity can be generalized to such mixed constructions if they can always be reduced to the same operation on extensions (of attitude verbs) and intensions (of sentences). And again, perhaps all mixed constructions (in this sense) satisfy this kind of canonicity.[7]

It is readily seen that any extensional construction is also intensional; the reverse is not true of course. But are there any constructions that are not even intensional? The definitions so far do not exclude this. Still the very idea of a non-intensional construction goes against the spirit of the theory expounded here, which is why semantic operations for which the extension of the result is

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[5] The topic is further elaborated in the first three sections of Zimmermann (2018).

[6] Cf. Heim & Kratzer (1998: 308), where the rule is called Intensional Functional Application.

[7] The topic is further elaborated in the first three sections of Zimmermann (2018).

not determined by the intensions of the arguments are called **monsters**. The classic account of context dependence suggests the following principle:

(M)   There are no monsters in natural language: syntactic constructions are always (at most) intensional.

(M) is but a reformulation of the Fregean Principle of Compositionality within the framework of schema (K) and a constraint on the General Principle of Compositionality. Given the considerations so far, (M) may be motivated along the following lines: a monster would have to take into accout the dependence of the extension on the utterance situation for at least one of its arguments; thereby the utterance situation gets hypothetically shifted and thus ultimately becomes a point of evaluation: the alleged monster turns out to be a misconstrued intensional construction. This argument, which may be further extended and made more precise (Article 7 [= von Stechow 1991]), almost appears to explain away any monsters by definition. That things do not stand quite as simple can be seen by way of an example. For this we return to the dimensionally underdetermined adjectives mentioned in the previous section. Even if the missing dimension can often be somehow reconstructed from the utterance situation, it may happen that none of the dimensions available for the adjective is particularly obvious in a given speech situation. To avoid misunderstanding in such a situation, the speaker needs to be clearer than the adjective in question would allow. He can then make use of a more explicit adjective: apart from *schwer* [≈ *heavy/difficult*], there is, e.g., the dimensionally determinate *schwierig* [≈ *difficult*] or the adjective *gewichtig* [≈ *heavy*] , which is somewhat obsolete (on the relevant reading). However, often there is also the possibility of making the missing dimension explicit by adding an adverb:

(13)   Der zeitlich kürzeste Weg nach Paris führt über Landau.
        [≈ *The temporally shortest way to Paris is via Landau.*]

If however the dimension underdetermined by *kurz* [≈ *short*] (duration, length) were to depend on the utterance situation, then the construction of modifying an adjective by an adverb (of dimension) applied in (13) would be a monster! For if, e.g., (13) is uttered in a situation s_0 in which length is more obvious than duration, then according to this analysis the naked adjective *kürzeste* [≈ *shortest*] relates to the scale of length in s_0; but in the complex adjectival phrase *zeitlich kürzeste* [≈ *temporally shortest*] length gets replaced by duration: in combination with a noun α, $\chi_{k\ddot{u}rzeste}(s_0)(s)$ denotes the set of those objects in the extension $\chi_\alpha(s_0)(s)$ of α that have the least value on the dimension determined by s_0, i.e., those of minimal length; $\chi_{zeitlich\ k\ddot{u}rzeste}(s_0)(s)$, on the other hand, delivers (in connection with α) the set of those objects in the extension $\chi_\alpha(s_0)(s)$ of α that have the least value on the dimension determined by the meaning of *zeitlich* [≈ *temporally*], i.e., those of minimal duration. The adverb *zeitlich* [≈ *temporally*] thus operates on the adjectival character in a way that – instead of the real extension at a given point of reference – the extension of the (embedded) adjective at another point of reference is determined, viz. at such a point whose utterance situation suggests the dimension of duration for the embedded adjective: for the point $\langle s_0, s \rangle$ the relevant combination Σ of $\chi_{zeitlich}$ and $\chi_{k\ddot{u}rzeste}$ thus delivers the extension $\chi_{k\ddot{u}rzeste}(s_1)(s)$, where s_1 is like s_0 – except that duration is the most pertinent dimension for *kurz* [≈ *short*] in s_1.

This definition of s_1 might be a bit unclear and could be formulated in a more satisfactory way within a certain variant of the theory under scrutiny (to be discussed in Section 2.1). But however s_1 is determined: it is a situation that differs from s_0, and it is this shifting of the utterance situation that makes Σ a monster.

The example just discussed is a representative of a type of monstrous constructions that have been proposed in the literature. We will meet further possible monsters as we go along. And we will also be concerned with the question whether at least some of them can be avoided, and if so, how. In Section 2.1 already will we encounter a way of escaping the monster Σ just described by a theoretical dodge.

2 Variations and Alternatives

The classic account is not uncontested. Many of its achievements can be reached just as well or even better within other theoretical frameworks whose conceptual underpinnings may be related to the classic ones, but which still open new perspectives. The following synopsis is meant to provide readers with a cursory view of the most important possible deviations from the classic perspective. For reasons of space, this account is less detailed than Part 1 though; at times it is little more than a rough sketch. For deeper insights the reader is referred to the literature cited in Section 5.2.

2.1 Parameterisation

The examples presented so far indicate that the rôle of the utterance situation s_0 in the determination of extensions (by the character) is in each case confined to contributing certain aspects: for *ich* [$\approx$ *I*] one needs the producer of the utterance made in s_0, *gestern* [$\approx$ *yesterday*] refers to the day before the day of s_0, *hier* [$\approx$ here] refers to the place at which it occurs, etc. But what are aspects of (utterance) situations in general? It seems that this question may be answered in different, equivalent ways. We will construe **situational aspects** as values of certain functions that assign something to (specific) situations; the functions themselves will be called **situational parameters**. Thus the *place parameter* is taken to be a function that assigns to each situation its place; given any s, the *previous day parameter* yields the day before the day of s; the *speaker parameter* is a partial function that is only defined for utterance situations where it does the obvious, etc.; and being the values of the corresponding parameters the speaker, previous day, and place of an (utterance) situation s_0 are thus aspects of s_0. According to this definition any situation obviously possesses a host of outlandish and uninteresting aspects only some of which are relevant for determining extensions – which ones will concern us in Part 3. In what follows we will pretend as if the list of relevant parameters was well-known; at times the parameters themselves will even be identified with their position on this list: so if the speaker parameter happens to be the first one on the list, we will refer to it as *Parameter 1*, etc.

Those situational aspects that are used in determining the intension and extension as the contribution of the utterance situation (in a given language) are called *contextual*; we will also apply this term to the corresponding situa-

tional parameters. Thus if in Schema (K) the utterance situation is replaced by its contextual aspects as a whole, the core of the classic account would not be affected. Characters could even be construed as functions that assign intensions to lists (i.e., n-tuples or sequences) c of contextual aspects. Such c are usually called **contexts**. Hence any utterance situation corresponds to precisely one **context determined by** it, but in principle one and the same context can correspond to a host of utterance situations – exactly how many obviously depending on the number and nature of the contextual aspects: if the speaker were the only contextual parameter, contexts would basically consist of persons and all utterances by Ronald Reagan would take place in the same context, thus conceived. The fact that determination is not a one-one relation shows that the notion of context just defined does not always match the intuitive one – as would that of an utterance situation – but it is this notion of context that has become customary in current logical semantics.

Just as the utterance situation can be reduced to its contextual aspects, the point of evaluation can in principle be cut down to size and thus be construed as a list of situational aspects (relevant to determining the extensions of linguistic expressions). The point of evaluation thus becomes an **index**. In analogy to what has been said before it is again true that in general a point of evaluation s corresponds to several indices, and that the question of how many they are again depends on which situational parameters and aspects are **index parameters**. The general theory of reference does remains silent about this: an index may equally well consist of just a single aspect (a possible world, say) as it may consist of a host of aspects, which in their sum uniquely determine the point of evaluation. (Of course, it is not the *number* of the aspects that is crucial for this possibility of unique determination; it is, however, questionable if and when such rather special aspects will ever be needed.) In the following it will be taken for granted, though, that index parameters automatically count as contextual. This assumption both makes sense in theory and is justified empirically. Concerning the theoretical sense, some hints will be given in the following paragraph as well as in Section 2.3; the empirical justification is deferred to Section 3.1. Contextual parameters and aspects that are not at the same time index parameters are called **purely contextual**. Purely contextual aspects are typically such that their very existence is tied to the fact that an utterance is taking place in the situation at hand. Once again the prime example is the speaker.

Just as the utterance situation in (K) may be replaced by the context it determines, the rôle of the point of evaluation can naturally be played by the corresponding index; following this lead, intensions would then have to be construed as functions from indices, rather than situations (as points of evaluation), to extensions. However, this substitution is not quite as inconsequential to the classic account as the transition from utterance situations to contexts. For not all contextual parameters also appear in the index, whereupon the latter is always less specific. So while sometimes the point of evaluation is itself an utterance situation (as explicitly indicated in the schema (X) in Section 1), a match between context and index is ruled out in principle. In particular, there is no diagonal *stricto sensu* in the context-index variant of the classic account. On the other hand, still under the assumption that index aspects are always contextual, any context c corresponds a unique index $i(c)$ deriving from dropping the purely contextual aspects. This correspondence can be used as a diagonal substitute in a reformulation of principle (D): rather than the point $\langle s_0, s_0 \rangle$, the default value

for the evaluation in s_0, then, is $\langle c(s_0), i(s_0) \rangle$, where $c(s_0)$ is the context thus determined by s_0. However, not all functions of the diagonal can be simulated in this theoretical variant; this will be shown in Section 2.3.

Of course, the substitution of the point of evaluation by indices could still be achieved while still having intensions depend on the utterance situation, whereby no essential change ensues vis-à-vis the context-index-variant. As one reason for keeping the specific utterance situations one may adduce the observation that the totality of contextual parameters is principally open and thus cannot be accounted for by listing. Whether this is actually so, ultimately depends on the parameterisation of the utterance situation, which can be chosen freely; more will be said about this in Part 3.

The introduction of contexts and indices can also be used as a starting point for a true extension of the framework introduced in Section 1. For according to the above definitions, contexts and indices are lists of situational aspects. So far we have been assuming that the individual aspects of a context or index are in tune in that they are always aspects of the very same situation (of utterance or evaluation); however, apart from such **harmonious** contexts and indices one could, in principle, also take into account lists of aspects that do not determine any possible situation. That this does make sense can be gleaned from examples like (14), with which the classic account has its problems:

(14)   Vor hundert Billionen Jahren hat es hier geregnet.
         [$\approx$ *A hundred trillion years ago it was raining here.*]

To see where the difficulty lies, we may consider an actual utterance situation s_0 of (14), which took place at some moment in the past. Then (14) is certainly false – specifically in view of the age of our universe. However, what does the classic account say about this? To begin with, according to (D), the point of evaluation must be put equal to s_0. The prepositional phrase *vor hundert Billionen Jahren* [$\approx$ *a hundred trillion years ago*], which embeds the rest of the sentence, then obviously sees to it that the evaluation be restricted to situations whose time lies 10_{14} years in the past. Since, however, the sentence does not say anything about any other world etc., the remaining aspects of s_0 would thus have to be kept. Given this, the interpretation of the construction '*n years ago* + Φ' according to the classic account would have to make the whole expression true if the proposition expressed by Φ delivers the truth value 1 for those points of evaluation whose time is located n years in the past but otherwise agree with s_0. Since there is no such situation in the case of the s_0 at hand, the sentence comes out false – as desired. Unfortunately however, (15) would not fare better in the same situation:

(15)   Vor einer Billiarde Jahre hat es hier nicht geregnet.
         [$\approx$ *A quadrillion years ago it was not raining here.*]

For (at least according to the received physical view) there was no situation that actually happened at the time referred to in (15); in particular, then, there was no such rain-less situation. According to this classic analysis, then, (15) would be false. It would appear that this certainly unwelcome consequence can only be avoided by the assumption that the negation in (15) takes the entire remainder of the sentence in its scope – which seems hard to motivate independently.

If instead the meaning rule for '*vor n Jahren* + Φ' [$\approx$ '*n years ago* + Φ']

shifted the temporal aspect independently of the rest of the point of evaluation, the result would be an index that does not correspond to any real or fictional situation – because under the world aspect it would yield our blunt reality, but at the same time be located before Big Bang; but the truth conditions of (14) and (15) could be correctly captured this way: since said index does not correspond to any situation, one may assume that it did not rain at it, whereby – unlike (14) – (15) would become true. It is easy to verify that the scope ot the negation is irrelevant for this analysis; the utterance under scrutiny would be evaluated as true in any case. This obviously speaks in favour of extending the concept of an index to lists of possibly disharmonious index aspects.

The above argument is not fully conclusive.[8] We only indicated that a certain application of the classic account to examples like (14) and (15) leads to difficulties. It is, of course, conceivable that these difficulties could in principle be resolved by recourse to different levels of semantics (like, e.g., the layer of presuppositions) or other semantic rules within the framework of the classic account. We will, however, leave this open.

Of course, example (15) is rather *recherché*, but it does offer a handle on the basic idea behind disharmonious lists of aspects. A slightly more realistic, while at the same time less transparent, application of the same technique can solve the conflict about the status of dimensional adjectives (or the syntactic construction introducing them) that was indicated at the end of Part 1. One only needs to declare the relevant dimension a separate index parameter to be shifted by the pertinent adverbs (but not by clause-embedding verbs). The shift then often results in an index that does not determine precisely one situation (but usually more than one), which makes the question of determining this situation pointless. This solution of the problem of dimensional adverbs is not the only way of expelling the monsters of Section 1.4; an alternative will come into view by an adaptation of descriptive techniques to be discussed in Section 3.3.

Incidentally, the substitution of points of evaluation by disharmonious indices also allows for an interpretation of intensional constructions according to alternative (A) in Section 1.2, i.e. by shifting individual aspects, without hitting on the difficulties encountered there: the point is that the result of shifting is not necessarily (determined by) a situation (of evaluation). However, here and in general it holds that disharmonious indices should only be invoked in cases of emergency when no other method of description works. For they may all too easily lead to a treatment of any conflict with the ban on monsters by an increasing number of independently varying index aspects. The result would be an anecdotal and unlimited list of accidentally determined situation parameters – in place of the clear classic division into utterance situations and points of evaluation. At the same time the distinction between index and context (or , as the case may be, between index and utterance situation) would be blurred or at least become gradual: obviously an aspect like the most pertinent dimension is almost contextual in that the constructions that shift it are quite rare and far-fetched, and it may be only a mater of time until a shifting construction is found for any given contextual aspect. We will therefore strive to do without disharmonious indices and instead keep to the limits of the classic account of Part 1 (or one of its variants indicated at the beginning of the present section). We will return to the fundamental question of the consequences of this strategy

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[8]See Köpping (2019: ch. 2) for a more thorough criticism.

at the end of the chapter (in Section 4.3).

As far as contexts are concerned, the inclusion of disharmonious lists of aspects does not make sense – or at least in their case no argument along the above lines can be put forward, since contextual aspects are never shifted or modified. And the starting point invariably derives from the utterance situation; it is thus harmonious by its very nature. Together with the observations concerning (14) and (15), this line of reasoning may be used in favour of a theory of context based on utterance situations and partly disharmonious indices, in which thus the intension is established relative to a concrete situation, whereas the extension must be determined by an abstract feature bundle, the index. On the hand, in Section 2.3 we will come across some very elegant semantic-pragmatic techniques that require splitting the utterance situations into aspects.

Before we get to further alternatives to the classic account of context dependence, it ought to be pointed out that the problem just discussed is not the question of **disharmonic points of reference**, i.e., whether one sometimes needs to look at context-index combinations that do not correspond to a common situation; basically, this already happens in the classic account: most points of reference do not lie on the diagonal (of the character tables), but they are needed to determine the intension. The question brought up by (14) and (15) only makes sense if one is ready to leave the classic account and replaces situations by corresponding lists of aspects.

In the remainder of this chapter we will from time to time return to the division of situations into aspects whenever it seems appropriate for reasons of presentation. Unless indicated otherwise, we will then always assume a division of both utterance situations and points of evaluation. The resulting variant of the classic account will, from now on, be referred to as **parametrisation**.

2.2 Extensionalisation

The extensions of linguistic expressions depend on situations or situational parameters. In order to define the nature of this dependence in a given case, we have been referring to the situations in question by way of meta-linguistic variables: as a case in point, the character χ_{ich} of the personal pronoun *ich* $[\approx I]$ had been described as a function that assigns to any utterance situation s_0 and point of evaluation s the person speaking (or writing) in s_0. Determining the extension of *ich* thus requires the function χ_{ich}, which itself requires certain arguments to deliver a result. One may instead interpret the word *ich* itself as a name of the function χ_{ich}, whose arguments remain mute on the linguistic surface. Thus, instead of interpreting the word *ich* via its character, one would then assume an underlying **logical form** of the structure $EGO(x)(y)$, where EGO is a function symbol and the variables x and y refer to the utterance situation and the point of evaluation, respectively. It should be noted that this way the distinction between character, intension, and extension as distinct layers of semantic analysis becomes void: $EGO(x)(y)$ just names the extension of the word *ich* $[\approx I]$, whereas $EGO(x)$ and EGO are names of its intension and its character; the underlying logical form only has one layer of naming, the extension. The representation of situational dependence of the extension of natural language expressions by means of variables that are only visible in logical form, is therefore called **extensionalisation**.

The difference between classic character analysis (K) and in-depth interpretation in terms of extensionalisation is less pedantic than it may at first seem – as can be illustrated by a single word: instead of underlaying the pronoun *ich* [$\approx I$] a function *à la* (K), which then turns out to be idle, extensionalisation offers the possibility of just dropping this argument, thereby reducing the word meaning to a unary function. Quite generally, the very notion of direct reference, introduced in Section 1.3, may be represented in logical form by the absence of variables corresponding to the point of evaluation; and by the same token, absolute reference is marked by the absence of the utterance situation. The logical forms thus constructed thereby allow for a redundancy-free and transparent representation of the situation dependence of the extension of a natural language expression. In particular, this representation pays when it comes to complex expressions with mixed modes of reference (direct, absolute, etc.): the sentence *I am a salesman* would no longer be analysed as a combination of various characters that each depend on two arguments, but instead – ignoring tense – along the following lines:

(16) $\text{SALESMAN}(s)(\text{EGO}(s_0))$

Here, as in the previous text, 's' and 's_0' are variables standing for the point of evaluation and the utterance situation. The only thing that is new in the extensionalised representation (16) is that the notion of character has been eliminated and the different modes of reference of noun and pronoun are brought out by way of different variables. The adherence to previous notational conventions is meant to stress the fact that our meta-language used to formulate semantic rules refers to situations just as explicitly as the (extensionalised) logical forms.

(16) is not just a logical form but also a formula of logic – more precisely: a notational variant of a first-order formula. The variation merely consists in the presence of expressions that stand for functions whose values are themselves functions; in predicate logic one uses names of relations instead, which however boils down to the same thing. We will therefore identify (16) with the logically more familiar representation (16′):

(16′) $\text{SALESMAN}(s, \text{EGO}(s_0))$

Apart from the not too exciting reduction of the -artiy of characters of directly and absolutely referring expressions, extensionalisation also helps gaining further insights into the interaction of the central concepts of the classic account of contextdependence. More specifically, this concerns the distinction between utterance situation and point of reference as well the particularly pertinent principle (M) of freedom from monsters. As we have seen, intensional constructions stand out in that the extensions of the expressions partaking in them must be considered across different points of evaluation. In relation to the representation in terms of extensionalised logical forms this means precisely that such constructions abstract away from the specific assignment of the relevant variables, i.e. that these variables need to be bound. (**Abstraction** from the specific value is the most general form of **variable binding**.) Moreover, principle (M) says that utterance situations behave fundamentally different in this respect: according to it, there cannot be any constructions that demand a shift of the concretely given utterance situation. This difference in the rôle of utterance situation and point of evaluation postulated by (M) is captured by the following catchy slogan:

(EM)　　The utterance situation is a free parameter: logical form variables corresponding to it must not be bound.

It is its clarity that makes this reformulation of the Ban on Monsters particularly attractive – as well as the fact that it reduces the initially somewhat unfamiliar and abstract considerations from Section 1.4 to the good old distinction between free and bound variables. And the fact that (EM) presupposes representations in terms of extensionalised logical forms should not be overestimated: it is the behaviour of certain variables that matters for (EM), and if one wants to avoid the detour via logical forms, this behaviour may as well be studied in the meta-linguistic semantic rules.

The above formulation (EM) is couched in the classic frame (K). An analogous formulation may be found for the parameterisations discussed in Section 2.1, and particularly where disharmonious lists of aspects are employed. In all these cases different sorts of variables for contextual and index aspects must be introduced; and the principle (EM) must be adapted so as to mention contextual variables (instead of variables for the utterance situation).

It is common to interpret first-order formulae like (16') in a purely **formal** way, as statements about an arbitrary domain of individuals. As a result one obtains an **abstract theory of reference** in which the different types of situations (or aspects) merely play the rôle of underspecified individuals. Though, in such a theory, one usually distinguishes between different sorts of individuals (objects, situations, etc.), the assumptions made about them are kept to a minimum. As a result, all presuppositions crucial to logico-semantic analysis need to be made explicit. This can be seen as an advantage of the abstract point of view. One of its drawbacks is that it all too easily blurs the difference between situations and their aspects: after all, the values of the corresponding variables are arbitrary. This arbitrariness may even have the side-effect that principle (D), which is essential for the classic account, cannot be formulated without further ado; in order to do so, the very concept of a diagonal would have to be axiomatised first.

2.3　Two-dimensional Modal Logic

According to the account (X) in Section 1.2, characters can be construed as functions that assign all kinds of objects to points of reference, i.e., pairs $\langle s_0, s \rangle$ of utterance situations and points of evaluation. Temporarily ignoring the fact that not every situation (of evaluation) is also an utterance situation, denotations of linguistic expressions just appear to be doubly dependent on situations. This kind of double dependence of extensions can also be encountered in **two-dimensional modal logic** where, on the one hand, logical formulae are interpreted relatively to pairs of possible worlds and, on the other hand, certain modal operators quantify over these pairs of worlds. The classic account of context dependence may thus be though of a as an application of two-dimensional modal logic: the rôle of the worlds is played by situations and the modal operators are the clause-embedding intensional constructions whose point it is to abstract from the points of evaluation.

Among the most important operators investigated in two-dimensional modal logic are the so-called **diagonal operators** that shift the point of evaluation to the diagonal (the set of world pairs of the form $\langle w, w \rangle$): if one **diagonalises**

an expression α of two-dimensional modal logic – i.e., if one applies a diagonal operator to it – the extension of the resulting expression at a world pair $\langle w, w' \rangle$ is simply α's extension at the corresponding point on the diagonal. There are thus exactly two diagonal operators, one of which projects the evaluation point to $\langle w, w \rangle$, whereas the other one shifts it to $\langle w', w' \rangle$. Replacing worlds by situations (as points of evaluation), it turns out that we have already come across one of these two diagonal operators: it is the operator *dthat* introduced in Section 1.3, which allows to obtain a deictic character from a corresponding absolute circumscription. Using the diagram (X) for orientation, *dthat* comes out as a **horizontal diagonal operator**, since under *dthat*, the point of evaluation is moved to the diagonal in a horizontal direction. On the hand, we have not yet met the vertical counterpart to *dthat*. Small wonder: such an operator shifts the utterance situation and is thus a monster banned by (M). In Sections 2.5 and 4.2 the rôle this monster has to play within the logical analysis of language will be addressed. At this point we just note that a comparison between horizontal and vertical diagonalisation reveals the asymmetry between utterance situation and point of evaluation postulated by the classic account: only the latter can be shifted to the diagonal. In two-dimensional modal logic no such asymmetry is usually assumed; it is an additional feature that characterises this particular application.

The asymmetry between utterance situation and point of evaluation is not merely a consequence of the Ban on Monsters (M). It is independently justified by the fact that the character tables (X) are not quadratic, given that the utterance situations only make a part of all the situations that may serve as points of evaluation. In particular, the diagonal does not cross through the whole table; as a consequence there is, strictly speaking, not just one vertical diagonal operator, but a whole bunch of them, whereas there is only one horizontal one, viz. *dthat*: vertical diagonalisation only concerns the behaviour of an operator on the left side of (X), through which the diagonal runs; distinct vertical diagonal operators could differ in their behaviour on the right hand side.

The analogy between two-dimensional modal logic and the theory of context dependence becomes more interesting once we turn from the classic version to the parameterisation from Section 2.1. Under the assumption (already made there) that index aspects are always a the same time contextual, a natural **splitting** $\langle i, i', c \rangle$ of the points of reference (as represented by lists of aspects) emerges: i lists all aspects $\langle i_1, \ldots, i_n \rangle$ determined by the point of evaluation; i' comprises the index aspects $\langle i'_1, \ldots, i'_n \rangle$ of the utterance situation; and c consists of its purely contextual aspects $\langle c_1, \ldots, c_m \rangle$. This splitting of the points of reference produces various diagonals and corresponding potential diagonal operators. To begin with, there is of course the *dthat*-operator, which applied at the split point $\langle i, i', c \rangle$ yields the extension at $\langle i', i', c \rangle$. Apart from that one may consider, for each index parameter j the corresponding **small diagonal** δ_j, which consists of the points (or lists) for which $i_j = i'_j$, i.e., in which point of evaluation and utterance situation agree with respect to aspect j. For each such small diagonal there are then corresponding operators that shift the evaluation from a given point $\langle i, i', c \rangle$ to the corresponding δ_j-point, either (in horizontal, licit direction) to $\langle \langle i_1, \ldots, i'_j, \ldots, i_n \rangle, i', c \rangle$, or (vertically and monstrously) to $\langle i, \langle i'_1, \ldots, i_j, \ldots, i'_n \rangle, c \rangle$. So while an application of *dthat* to a complex absolute expression like *at the place and at the time* boils down to *here and now*, a (small) local diagonalisation differentiates more finely between the links to the

utterance situation; the result would then be equivalent to *here and at the time*. A less artificial example is the horizontal shift of worlds, restricting *dthat* to the world parameter. Its effect on sentences roughly corresponds to a modification by the sentential adverb *actually*. It should be noted in passing that shifting by small diagonalisation generally leads to disharmonious lists of aspects.

The purely contextual aspects contained in c obviously lack any diagonalisation potential. It follows that, within the context-index variant of the classic account , deictic words cannot be obtained by horizontal diagonalisation of corresponding absolute circumscriptions, along the lines indicated at the end of Section 1.3. The underlying reason for this lies in the different degree of specification of context and index. Dropping purely contextual aspects may, e.g., merge two distinct contexts c and c' that differ with respect to their speakers: $\mathrm{Speaker}(c) \neq \mathrm{Speaker}(c')$, but $i(c) = i(c')$. The index $i(c)$ may thus correspond to some s that contains various utterances of different speakers. Due to this 'over-occupation' of the speaker-rôle there is no way back from $i(c)$ to the speaker of c: the evaluation of the circumscription *the speaker* does not have a definite result at $i(c)$. The classic account avoids this problem by also admitting the more local utterance situations c and c' as points of evaluation. Clearly, such non-accountability of some deictic expressions can only be avoided if context and index parameters coincide. This can be reached by brute force, declaring each contextual parameter an index parameter and replacing each split point of reference $\langle\langle i_1, \ldots, , i_n\rangle, \langle i'_1, \ldots, , i'_n\rangle, \langle c_1, \ldots, , c_m\rangle\rangle$ by the longer $\langle\langle i_1, \ldots, , i_n, c_1, \ldots, , c_m\rangle, \langle i'_1, \ldots, , i'_n, c_1, \ldots, , c_m\rangle, \emptyset\rangle$. ($\emptyset$ is the empty list.) This artificial over-expansion of indices and points of reference will be referred to as **quadrature**, since it makes the character table quadratic. We will return to it in Section 2.5.

Given the aspect-list point of view, along with large and small diagonalisations one may also define middle-sized operations that simultaneously shift some but not all aspects to the diagonal. In practice these rather clumsy operators can be avoided by combining several aspects into one.

The technique of extensionalisation sketched in Section 2.2 can also be applied to systems of two-dimensional modal logic. The result is a *two-sorted logic* whose expressions have the peculiar feature that only two particular variables of the 'situation' sort may occur freely in them. And the diagonal operators then come out as special **substitution operators**, viz. those that replace all free occurrences of a (particular) variable by occurrences of another variable. As a case in point, the horizontal diagonalisation by *dthat* corresponds to an operator $DTHAT$ which binds the situation variable s and combines with arbitrary expressions α; the extension of $(DTHAT\ s)\ \alpha$ then depends on the variable assignment g and is the same as that of α at the assignment g', which in turn is like g except that it assigns $g(s_0)$ as the value of the variable s. As a consequence $(DTHAT\ s)\ \alpha$ always has the same extension as the result $\alpha[s/s_0]$ of replacing all free occurrences of s in α by s_0. Given the aspect-list variant, $DTHAT$ performs a replacement of all index variables by their contextual counterparts: the world of evaluation becomes reality, the time is now, etc. By analogy one may expect that $\alpha[s_0/s]$ corresponds to vertical diagonalisation. However, this is only approximately so: after all, the original α may contain conditions that essentially require the variable s_0 to refer to an utterance situation – e.g., if α is about the speaker in s_0. When passing to $\alpha[s_0/s]$ these conditions no longer make sense for all assignments; $\alpha[s_0/s]$ thus only defines a partial function. However, any

expansion of that function to all points of evaluation is a diagonalisation in the sense of the above definition.

Extensionalisation reveals an elementary logical property that is common to all diagonalisations, whether large, small, or middle-sized: by abstracting from certain situational aspects they make the latter redundant. This means that an expression whose extension depends on a certain aspect, may lose this dependence by diagonalisation. In a way, we have already come across this effect: the principle (D) introduced in Section 1.2, which inserts the utterance situation as a point of evaluation, boils down to horizontal diagonalisation, an invisible *dthat* as it were, thus making the extension independent of the point of evaluation whereby the latter becomes dispensable for the notion of extension (and truth in particular). In Section 2.5 we will make use of this abstraction effect of vertical diagonalisation.

2.4 Token Analysis

In the version expounded in Part 1, the classic account rests on the assumption that the utterance situation clearly determines the extension of a deictic word like *you*. Quite often, however, this does not seem to be the case. As a case in point, let us look at a typical kindergarten argument between Alain and Fabian where the following allegations can be heard (absolutely) simultaneously:

(17)   Du hast mein schönes Haus kaputt gemacht.
        [≈ *You destroyed my beautiful house.*]

(18)   Du hast meinen Flitzer versteckt.
        [≈ *You hid my sports car.*]

Obviously, it makes no sense to claim of such a situation that it definitely determines a referent of the word *du* [≈ *you$_{sg}$*]: in Alain's utterance of (17) the form of address relates to Fabian, who in the same instant addresses his friend Alain by uttering the very same pronoun. But then the whole scene might not be an utterance situation after all, given that more than one utterance takes place in it and that we had (implicitly at least) been assuming that utterance situations are characterised by containing precisely one linguistic utterance. So maybe one can locate the two utterances of (17) and (18) in distinct **situation segments**: accordingly, Fabian's and Alain's utterances take place in different segments of the same situation; and the characters of the sentences uttered are functions defined on these segments. However, this strategy does not always work that smoothly. For example, the situation just described could be enriched by the clarifying appearence of kindergarten teacher Doris, who during her utterance of (19) first points to Fabian and then to Alain:

(19)   Während du das Haus wieder aufbaust, kannst du ja den Flitzer holen.
        [≈ *While you rebuild the house, you can fetch the toy car.*]

Here too, *du* [≈ *you$_{sg}$*] obviously has two extensions, viz. the same as in the above utterances of (17) and (18). If one took this as a reason for evaluating the two utterance parts at different situation segments a and a', one would need additional principles (somewhat alien to the classic account) for interpreting complex expressions. For whatever the relevant situation segment for the entire sentence (19) may be, it cannot coincide with both a and a'.

Examples like (17)–(19) suggest that the smallest interpretively relevant situation segments consist of utterances of single words; they may even be identified with such utterances of words. Yet what are utterances (of words)? An obvious and common answer to this question is: utterances consist of expressions and (utterance) situations. However, this concept of utterance is not very helpful here, because it is just not applicable in the cases at hand, where we had more than one utterance of du [$\approx you_{sg}$] per situation. An alternative emerges if we take linguistic expressions, which had so far worked as primitive units, to be (disjoint) classes of utterances – their **realisations** or **tokens**. As a consequence, the four appellations y_1–y_4 in the kindergarten scenario would all come out as realisations of the same word: $\{y_1, \ldots, y_4\} \subseteq du$ [$\approx you_{sg}$]. The different extensions could then be accounted for by having the character χ_{du} assign its own value to each of these four tokens. According to this approach, characters would be functions that assign an intension to each realisation (i.e., each element of) an expression.

All lexical meaning rules introduced so far can be slightly modified along these lines. Nothing much changes for absolute lexemes; the independence of the extension from the utterance situation is just replaced by an independence from the token. But even in the case of directly referential words this new approach does not present any difficulties. Thus, e.g., χ_{du} can be characterised as the producer of the token $i \in I$, $\chi_{heute}(y)(s)$ is the day on which the utterance $y(\in du)$ is made, etc. . . . where s is an arbitrary situation (of evaluation); nothing thus changes on the level of intension.

Since (according to this approach) semantic rules for deictic words relate to their realisations, these words are also known as **token-reflexive**. The said substitution of utterance situations by utterances thus boils down to an analysis of deixis as token-reflexivity – **token analysis** for short. That token analysis is not a trivial variation of the classic account becomes apparent by moving from lexical to complex expressions. As we have already seen in connection with (19), this requires an additional theoretical component, in order to connect different parts of utterances. Typically, in theories of this kind conceptual complexity and gain of insight are out of balance; we thus refrain from going into this part of token analysis.

It is apparent that in token analysis too, the extension always depends on certain properties or aspects of the token only. To account for this, one may follow the lead of Section 2.1 and define aspects of realisations and have characters operate on the corresponding lists of aspects; and again there is the possibility of expanding the theory by adding disharmonious lists of aspects. Also, the technique of extensionalisation described in Section 2.2 can be combined with token analysis. In this case, however, one needs a further sort of variables for the realisations of linguistic expressions, which may be taken as indication that the parallelism to the classic account is somewhat superficial after all. Whereas on the classic account the utterance situations are part of the totality of points of evaluation, token analysis demands two independent sorts of variables for realisations as situations. In particular, without further ado, considerations concerning the notion of a diagonal – and thus all those coming from two-dimensional logic – do not carry over; the same is true for the assumption made in Section 2.1, that index aspects are always automatically contextual at the same time. (We will point out a further substantial difference between the classic account and token analysis in Section 2.5.)

Given the theoretical complications brought in by token analysis and its deficits (including those to be demonstrated), the question arises whether the advantages of the classic account cannot be reconciled after all with some (not too complex or artificial) solution of the problems addressed in connection with (17)–(19). This is indeed so. For the classic account can be construed as a special case of a suitably formulated version of token analysis. To begin with, token analysis is too fine for the majority of examples discussed so far in that they do not necessitate any differentiation according to different realisations of the same expression: the utterance situations had usually been selected so as to uniquely determine the extensions of the deictic words uttered in them. We call such utterance situations **homogeneous**. The classic account (in the version described in Part 1) rests on the idealisation that all utterance situations are homogeneous. If one now manages to reconstruct the notion of homogeneity within the framework of token analysis, then the restriction to homogeneous utterance situations should precisely boil down to the classic account. It is true though that a conceptual reduction of the homogeneous utterance situations to tokens requires a precise account of the connection between realisations of complex expressions and their parts. Under this assumption a homogeneous utterance situation may be defined as an utterance a of a (possibly) complex expression all of whose utterance parts β satisfy the following condition: if the realisations b and b' of β are parts of a, then b and b' have the same intension. The remaining reconstruction of the classic account within the framework of token analysis is but tedious conceptual labour.

A totally different option of rescuing the classic account rests on the assumption that inhomogeneity can have different causes. On the one hand it can occur, as in (17) and (18), if a given situation contains more than one complete utterance of a sentence, discourse, etc. In this case the situation can be split into several situation segments, which are then treated in a classic way. In some cases this splitting may appear artificial, but always seems possible and spares a token analysis. The second kind of inhomogeneity is represented by (19), which displays multiple realisation of a deictic lexeme within the same overall utterance. First of all, it must be noticed that not every deictic word can cause this kind of inhomogeneity. If, e.g., (20) is uttered as a sentence, the two occurrences of (20) never refer to distinct persons:

(20)   Wenn ich noch ein Bier trinke, kann ich nicht mehr fahren.
        [≈ *If I have another beer, I cannot drive anymore.*]

And no gesturing can change that, as in the case of *you: I* always refers to the producer of the utterance of (20). Deictic words, which are susceptible to gestures, are also called demonstratives. The trick is now to assume a contextual parameter for **demonstratives** that shifts the problem of finding an extension to an accompanying demonstration: it is not the token that counts, but the demonstration. (Of course the many cases in which demonstrations are omitted must receive some special treatment.) It should be clear that, from a classic point of view, this method of accounting for inhomogeneous utterance situations is the simplest one. (More on demonstratives in Section 3.2.)

2.5 Epistemological Reinterpretation

This final section is the odd one out in that, strictly speaking, the philosophical perspectives to be opened now do not concern natural language semantics; on the other hand they fit in particularly well, since they show that the area of application of the classic account reaches far beyond descriptive semantics. Like Russell's theory of definite descriptions (for which cf. Article 22 [= Heim 1991]) or Davidson's adverbial semantics (see Article 36 [= Cresswell 1991b]), the Kaplanian theory of context dependence, can be invoked to expound or defend certain philosophical claims and positions. The original motivation for the conceptual apparatus of this chapter is largely due to this philosophical dimension; and its exploration certainly contributes to a fuller understanding of it. Moreover, some of the examples and analyses to be discussed in this connection do play an important rôle in the linguistic application of the classic account; however, these matters will only be addressed in Section 4.2.

To get started, one may recall the introduction of the concept of intension in Section 1, where it was said that the intension of an expression can be thought of as, basically, a method for determining its extension: when applied to an arbitrarily given situation or state of affairs, the intension yields the corresponding extension. In the case of a sentence, the extension is a truth value, so that the intension – in this case also called a **proposition** – may be conceived of as a set of (utterance) situations. Such sets of possible states of affairs can again be construed as pieces of **information**, in a straightforward sense: a set corresponds to the information that all of its elements are in that sense possible that it cannot be excluded that they obtain. (More precise explanations of this way of looking at things can be found in Article 2 [= Cresswell 1991a].) This now suggests that the proposition expressed by a sentence (in an utterance situation) – i.e., its intension – coincides with the information it conveys. Let us capture this in terms of a hypothesis:

(F)   The informational content of a sentence is its intension.

For a large part, this section will be devoted to the refutation of (F); only after that will we finally turn to the philosophical implications.

In order to appreciate what (F) is supposed to mean, it is helpful to reject certain unintended construals of that hypothesis. Thus, e.g., (F) is not intended to mean that a sentence (uttered in a given situation) informs the addressee by precisely the proposition it expresses. What information is actually transferred depends on a lot of, mostly pragmatic, factors that we are not particularly interested in here: as a case in point, the utterance may be intended as ironic and mostly convey information about the speaker's attitude; it may be used – perhaps during an exam – to prove the speaker's competence or, in a parliamentary speech, her quickness at repartee, and thus be quite revealing; it may show whether the speaker is a native, etc. In all such cases, however, the information conveyed by the sentence is superimposed by the circumstances of the utterance. But then (F) only concerns the former: the information conveyed by the sentence according to its **literal meaning**. (See Article 3 [= Wunderlich 1991]).

Even if strictly confined to literal meaning, (F) is not entirely unequivocal. For what a sentence says in an utterance situation may be more or less informative, depending on the addressees' **background knowledge**. The correct

answer to a question in an oral exam ought to be known to the examiner, but it may lead the keeper of the minutes to new insights: in this sense its informational content heavily depends on the hearer. However, this is not what is at stake. In our discussion of Principle (F), we will idealise and abstract away from such differences in background information and make no assumption as to the state of knowledge of the participants in communication. In that sense we are only interested in the **maximal informational content** of a sentence – i.e., that information that it would, on a literal interpretation, convey to a totally uninformed and disoriented audience. Of course, it may be questionable whether such audiences could ever receive any information; but we ought not bother about this purely heuristic idealisation down to its finest ramifications.

After these initial clarifications, we are now in a position to check Hypothesis (F) with some examples. (F) has not arrived overnight and it is thus not too surprising that in a lot of cases this principle does not perform bad at all:

(21)   Tom pennt.
        [≈ *Tom is kipping.*]

For simplicity, let us assume that (21) is an absolute sentence whose intension p thus does not depend on the utterance situation; p thus consists of the situations in which the referent of the proper name *Tom* is performing the act denoted by the predicate *pennt* [≈ *is kipping*]. According to (F), the informational content of (21) then consists in precisely this singular proposition p conceived of as information: anyone who has no further information than p now only knows that it must be excluded that Tom is not asleep. This looks like a correct account of the maximal informational content of the literal interpretation of (21).

Let us now look at a sentence that can express different propositions in different utterance situations:

(22)   Ich bin müde.
        [≈ *I am tired.*]

In order to test (F), we first need some information about the utterance situation: we need to know who is uttering (22). So let us assume that it is Tom. Then (22) essentially expresses the proposition that consists of all situations in which Tom is tired. As far as informational content is concerned, Tom may as well have uttered (22′):

(22′)   Tom ist müde.
        [≈ *Tom is tired.*]

We take it that *Tom* is a **standard name** – a name which, by linguistic convention, refers to Tom directly and absolutely. This assumption is not entirely unproblematic (see Section 1.3). But then (22′) only serves to illustrate an inadequacy of (F) now: according to (F) the informational content of an utterance of (22) by Tom equals the informational content (22′) would have if *Tom* is construed as a standard name.

Of course, an utterance of (22′) by Tom is somewhat weird or baby-like. But then one may – if only for the sake of (F) – assume that the reason for the deviance is of a stylistic or pragmatic nature, and not semantic: (22) and (22′) say the same thing in this situation, and their informational content is thus the same according to (F), but they are subject to different conditions of use to the

effect that (22') is somewhat unacceptable. (F) thus seems to be saved for the moment.

Things are not that simple. For (22) and (22') only convey the same situation to those who are informed about the speaker's identity and thus know that the name *Tom* refers to the speaker of (22). But then this knowledge is not a precondition for understanding the two sentences: obviously (F) is asking for too much from the hearer. That this is a substantial inadequacy of Hypothesis (F), and not just a minor defect, becomes apparent when one passes from the speaker parameter to examples with other kinds of context dependence where disinformation is the rule rather than the exception:

(23)   Morgen ist Nikolaustag.
          [≈ *St Nicholas's Day is tomorrow.*]

(23')   Am 6. Dezember 1985 ist Nikolaustag.
          [≈ *St Nicholas's Day is on December 6, 1985.*]

In this case stylistic differences or doubts as to the standard name status appear less appropriate than in the previous examples. However, in general an utterance of (23) on 5/12/1985 will convey a different piece of information than an utterance of (23'). In our cultural region the information contained in (23) is much more important for the parents of small children than the comparatively banal content of (23'): the former may lead them to a hasty purchase of apples, nuts, and almond kernels[9], whereas the latter should normally have no effect on their behaviour. But then this banal content of (23') – that St Nicholas is coming on 6/12/1985 – is precisely the (singular) proposition expressed by both sentences on 5/12/1985. However, (23) seems to say more. And this informational surplus, this difference in informational content between (23) and (23') is not captured by (F).

What, then, is the piece of information that makes (23) apper so more interesting than (23')? And what makes it so interesting? It appears that the difference seems to be due to the fact that (23) immediately relates the proposition expressed by the two sentences to the utterance situation and can thereby influence the behaviour of those who are informed by it. This immediacy is totally lacking in (23'): winter, spring, summer, or fall, this sentence always says the same thing and, in particular, is not helpful to those who are unaware of the date of the utterance and thus unable to temporally **localise** the utterance sufficiently. In (23) the arrival of St Nicholas is described from within the utterance situation, i.e., from the speaker's point of view, and thus localised by linguistic means; the description in (23') lacks this perspective. This additional localising dimension of informational content is an obvious effect of the variability of the intension of (23), wich in turn can be traced back to the direct referentiality of the temporal adverb *morgen* [≈ *tomorrow*], which helps localising the day following the utterance – and thereby the utterance time itself – in relation to St Nicholas's Day. So where (23') only delivers absolute information on the nature of the world, (23) relates the same piece of information to the speaker's standpoint. This difference in perspective from which the proposition expressed by the two sentences is presented, is missed out from (F).

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[9]The German formulation *Äpfel, Nuss und Mandelkern* is a quote from the popular German Chrismas poem Knecht Ruprecht by Theodor Storm (1817-1888).

A modification of (F) would thus have to take into account the perspective on the information conveyed as introduced by possible deictic parts of the expression uttered. These considerations thus suggest an improvement of (F) by differentiating informational value into an absolute part contributed by the intension and a localising perspective determined by the character. Returning to the above example (23), we would then get the information μ_{23} expressed by (23′) and the localising information ε_{23} that St Nicholas's Day succeeds the day of utterance, i.e., the set of situations s that are set on a 5th of December. This proposition ε_{23} can be obtained from the character χ_{23} of (23) by inserting the point of evaluation s in lieu of the utterance situation s_0: when applied to the point of reference $\langle s_0, s \rangle$, χ_{23} yields the truth value 1 just in case (in s) St Nicholas is going to arrive the day after s_0. By an observation made at the end of Section 2.3, ε_{23} can be obtained from χ_{23} by vertical diagonalisation. We are thus led to the following modification of (F):

(S)   The informational content of a sentence consists of two components:

> a) its intension, which lacks perspective, and

> b) a localisation coded by vertical diagonalisation of its character.

It should be noted that the monstrosity of vertical diagonalisation does not come in at this point: (S) does not serve as the interpretation of a particular syntactic construction.

With (S) it becomes clear why there is no bipartition of information in examples like (23′): for absolute expressions diagonalisation idles – since their characters can be described independently of the utterance situation, whereby the latter cannot be replaced by the point of evaluation: $\varepsilon_{23′} = \mu_{23′} (= \mu_{23})$.

In Section 2.3 we found that vertical diagonalisations is not available in every theory of reference. (S) only makes sense for the classic account from Part 1 as well as the quadrature of parameterisation sketched in Section 2.1. In order to formulate a principle analogous to (S) within the non-quadratic parameterisation from Section 2.1, one needs to bear in mind that the information otherwise available by diagonalisation cannot be distilled from the character so that it is again a proposition – like the result of of horizontal diagonalisation. If (according to this version of the theory) some contextual aspects are ineffable, any localising information would have to be captured by the entire character. We thus obtain:

(E)   The informational content of a sentence consists of two components:

> a) its intension, which lacks perspective, and

> b) a localisation coded by its character.

Unlike (S), (E) postulates a categorial distinction between the two components of information. Following (E), the difference between lacking perspective and localisation does not just concern the content but also the form in which the information is given: the former corresponds to a set of indices, whereas the latter is a character, i.e., a function from contexts to intensions. (S), on the other hand, is compatible with the assumption that information is always propositional.

Demanding the full character for localising information, as in (E), is a bit over-the-top, actually. This can be best seen by extensionalisation in the style of Section 2.2. Characters can then be captured by formulae, which – following the

split of the reference point from Section 2.3 – essentially contain three types of variables: index variables, index-contextual ones (**medial** variables, for short), and purely contextual ones. As a case in point, the character formula for *I am now sleeping* contains an index variable for the point of evaluation (because of the factual dependence of the extension of *am sleeping*), a medial variable (introduced by *now*) for the time of utterance, and a purely contextual variable for the speaker. Now, what is the (localising) information contained in the character χ of this sentence? Roughly speaking, χ informs about the speaker sleeping in the utterance world at the utterance time. In particular, in this respect there is no difference between index variables and medial ones: following Principle (D), both may be made to refer to the utterance situation. When it comes to identifying localising information, the distinction between aspects of the point of evaluation and index aspects of the context turns out to be unnecessary. (By the way, this also shows in the fact that the word *now* only contributes to absolute, not to localising, information.) The character χ in (E) can thus be reduced by identifying index and medial variables (in the extensionalised representation). Starting with the formulation in (S), it is thus natural to perform this identification by vertical diagonalisation and thus replace medial variables by index variables. However, the reverse strategy obviously leads to the same result: a substitution of index by medial variables , i.e., contextual ones. This, however, is nothing more than an application of the $DTHAT$-operator! Surely, the result of such a horizontal diagonalisation is still a character χ' so that nothing seems to be gained in comparison to (E). However, appearances are deceiving. For the character χ' obtained by modification with $DTHAT$ is directly referential and can thus be construed as a function from contexts to truth values or, equivalently, a set of contexts. Since a context is nothing but an n-place list of aspects, this set of contexts in turn corresponds to an n-place relation $!\chi$; in our example $!\chi$ is the relation that holds between an individual x (the speaker), a temporal instant t, and a world w if x is sleeping in w at t.

(E′)   The informational content of a sentence consists of two components:

        a) its intension, which lacks perspective, and

        b) a localisation coded by a relation that corresponds to the horizontal diagonalisation of its character.

In the following we will assume the classic formulation (E) without, however, losing track of the reduction (E′) of χ to the relation $!\chi$, which will come in handy in Section 4.2.

How does any of this relate to philosophy? The connection emerges from a generalisation or, rather, re-interpretation of some central concepts of the theory of reference. First of all, we note that the analytic tools of the classic account naturally carry over from public utterances to **private monologues**. The rôle of the speaker is than played by the person leading the monologue – who is, after all, the intended referent of the word *I* and **counts as** the speaker (in a sense to be further explored in Section 3.1) – and instead of an intersubjectively accessible *utterance situation* with (usually) more than one participant in communication, we are only dealing with the internal state the person is in. Private monologues in which a person imagines the exact wording of a fictional utterance addressed to herself are extremely rare. This anti-social form of communication is mainly found in novels, reports, and other written

texts, where it is used as a trick to describe the state of conscience of a person: the private monologue is supposed to graphically illustrate what the person has in mind. The linguistic formulation thus stands for its content as a content of thought or – more generally – as (momentary) content of conscience, which apart from thought also includes perception (and possibly even emotionally tainted attitudes). The speaker thus becomes a perceiving and thinking being or – philosophically put – a **cognisant subject**; and the utterance situation becomes a **cognitive** (or **epistemic**) **state**. Such is the epistemological reinterpretation of the classic account.

At this point it may be helpful to review some terminological and conceptual subtleties. First of all, one ought to get clear about the difference between the content of consciousness and the epistemic state. The former is abstract; it is a certain piece of (perspectival) information. Principally – but probably not practically – it is possible that the consciousness of two persons coincide in content. But these two persons can never be in the same epistemic state. For the latter is the actual situation the cognisant subject happens to be in; and if we are dealing with two distinct subjects, by definition this distinctness results in a difference in the epistemic state – to wit, a difference in the subject-aspect. The content of consciousness thus corresponds to the subjective picture the person draws of her situation, i.e., of her epistemic state. In particular, this involves localising herself with respect to space, time, and world. Whether this localisation is correct or the subject makes an error or has been deceived, depends on whether the actual epistemic state of the subject is compatible with the content of consciousness – i.e., whether the character, when applied to this situation, yields a proposition that is true in this situation. When determining and evaluating this proposition, contextual and index parameters are evaluated with respect to reality (as opposed to the subject's subjective image of it).

We can now apply this philosophical interpretation to some of the examples discussed above, construing them as private monologues. If Tom utters (22) to himself – or if one can rightly say about Tom that he says (22) to himself – then Tom classifies himself as a tired person. This does not necessarily mean that Tom is in a (physical) state of tiredness: he may be mistaken after all. It does mean that Tom is in a (cognitive) state of taking himself to be tired – a state in which the content of his consciousness ascribes a certain property (tiredness) to the cognisant subject. Thus Tom is not necessarily in a state in which this property is ascribed to Tom as an individual. This subtle difference becomes particularly noticeable in identity crises (which are thus a popular subject of debate in the pertinent philosophical literature).

(23) is more transparent in this respect. If (23) is part of a private monologue performed by Caroline, then Caroline classifies her current state as being temporally located immediately before St Nicholas's Day. Of course, this does not make it December 5th; an error is much more likely than in the previous example. Within Caroline's consciousness, the day of her current state merely possesses a certain property (being the immediate predecessor of St Nicholas's Day). Let us suppose she is actually wrong about this: in truth we have reached December 8th. Does that mean that Caroline – if only momentarily – takes December 8th to be the predecessor of St Nicholas's Day? Well, no. Or only inasmuch as she classifies December 8th as the day of her current epistemic state, as Today. In the momentary world view of her state of consciousness the day of her current state does lie before St Nicholas's Day; and in truth the day of her

current state is December 8th.

Of course, the difference between Caroline's perspective on December 8th as Today and the fact that it is actually the eighth day of the month of December is precisely the above difference between localised and perspectiveless information. Caroline's cognitive state as described by the private monologue (23) is the epistemic analogue to the character in (E), or its diagonalisation in (S). In order to compare Caroline's idea of the world with reality, the statement made in (23) must be interpreted as a claim about reality. The Today of Caroline's perspective thereby becomes the day on which the private monologue (or the thinking corresponding to it) actually takes place – just like the character is turned into the intension by fixing the contextual aspects. The (possibly diagonalised) character of (23) thus describes how Caroline sees the world; on the other hand, the intension (determined at Caroline's actual state) describes how the world is. In the epistemological reinterpretation of the classic account, the difference between (diagonalised) character and intension, as well as that between localising and absolute information, thus becomes a difference between **epistemic** and **metaphysical perspective**. According to the diagonal-free variant (E), this difference is of a categorial nature again. As a consequence, the content of the cognisant subject's consciousness cannot be construed as information in the sense of propositional knowledge as expounded at the beginning of this section. The information χ_{23} Caroline has is not just different from the information that December 8th precedes St Nicholas's day (μ_{23}) – it is a different kind of information, viz. localising information, information as viewed by the subject in her momentary cognitive state.

Alternative (S) is less radical in this respect: according to it, the difference between epistemic and metaphysical perspective is purely a matter of content. Though Caroline does not possess the nonperspectival information μ_{23}, she relies on another piece of information, viz. ε_{23}, which is propositional too. Does this mean that according to (S), the content of Caroline's consciousness is totally devoid of epistemic perspective? Of course not! In μ_{23} the perspective is just part of the content: where χ_{23} has the contextual time (or day) parameters, ε_{23} has the time of evaluation.

The difference between localising and absolute information is best illustrated by the limiting case of zero information or **triviality**. Information is trivial if it is true in arbitrary circumstances so that one does not learn anything by receiving it. In principle, the precise account (E) of the distinction between localisation and lack of perspective allows for two concepts of trivitality: triviality of a character vs. triviality of a proposition. In the light of the epistemological reinterpretation of the classic account these two concepts match two old acquaintances from philosophy (albeit with a grain of salt):

Definition:

(a) A piece of epistemic information χ is ***a priori*** if for any cognitive situations s_0 it holds that:
$\chi(s_0)(s_0) = 1$.

(b) A piece of metaphysical information p is **necessary** if for any situation s it holds that:
$p(s) = 1$.

Though we only introduced these concepts in the context of the epistemological reinterpretation of the classic account, they are frequently directly applied to characters and propositions in the usual sense. The difference between the two concepts is best illustrated by three simple examples:

(24)   Es regnet oder es regnet nicht.
         [$\approx$ *It is raining or it is not raining.*]

(25)   Ich existiere.
         [$\approx$ *I exist.*]

(26)   Renatus Cartesius sum.

(24) is a tautology and thus, in the sense of (D), true in all utterance situations. Hence χ_{24} is *a priori*. In an utterance situation (or relatively to a content of consciousness) s_0, however, the proposition expressed by (24) is equally trivial: it is true of a situation s if it is raining or not raining in s. (24) thus always expresses a necessary truth. The distinction between *a priori* and necessary truth thus does not affect this case.

(25) is different. For if any individual utters (25) in a situation s_0, then in particular, this person also exists in s_0. So χ_{25} is *a priori*. This does not change if one passes from utterances to acts of thinking and takes I refer to the subject of the latter: in this case existence can be proved by way of a venerable Cartesian argument. On the other hand, for any speaker or thinker one may imagine situations s in which he or she does not exist. For such s, however, $\chi_{25}(s_0)(s) = 0$, and hence the proposition expressed by (25) is not a necessary truth. It should be noted that in such a case it must hold that $s_0 \neq s$; in order to prove *aprioricity*, truth on all diagonal points of reference suffices, though. The character of (25) is thus a **contingent *apriori***: χ_{25} is *a priori* but there are points of reference at which the truth value 0 ensues.

Closer inspection of the analysis of (25) suggests how one can use the classic account to construct further *a priori*, and at the same time contingent, truths: starting with an extensional account of the character in the style of Section 2.2, *aprioricity* means that substituting s_0 for s, i.e., applying the operator $DTHAT$, leads to a statement that is true for all utterance or cognitive situations s_0; contingency, on the other hand, arises if 0 comes out for at least one value assignment to s and s_0. This observation can be condensed to the slogan: if a character is trivial as a property (of utterance situations) but not as a relation (between utterance situation and point of evaluation), it is a contingent *apriori*. (One should note in passing that under parameterisation the character construed as a property of utterance situations is nothing but the relation corresponding to it in (E′).) In the case at hand, the effect was due to an interaction of the deictic subject with the absolute predicate: only substituting the evaluation parameter in the predicate makes the statement come out trivial for utterance situations. However, in principle, *aprioricity* is possible without deixis – if the statement the character makes about the point of evaluation happens to be trivial for all utterance situation; and such an *apriori* is contingent if this triviality does not apply to arbitrary situations. The character of the sentence *There is a cognisant being* is an example for such a deixis-free contingent *apriori*.

It was to be expected that (26) is just the opposite of (25). For on the one hand, this sentence can no longer be uttered truthfully today: $\chi(s_0)(s_0) = 0$ for all (this-worldly) s_0 after February 11, 1650. Thus (26) is not *a priori*. On

the other hand, the proposition Descartes Himself expressed by uttering (26) consists of all situations s for which it holds that the speaker, i.e. Descartes, is identical to the bearer of the Latinised (assumedly standard) name *Renatus Cartesius*, i.e. Descartes. This condition is obviously met by all s. So Descartes could express a necessary truth with (26).

The above definition was presented on the background of Thesis (E). But then the concepts as well as the analysis of the examples carry over to (S) without loss. The epistemological turn of the classic account thus leads to a result that is surprising, at least from a traditional philosophical point of view, viz. that *aprioricity* and necessity are two independent concepts. This is the philosophical implication of the classic account that was announced at the beginning of this section.

In principle, the concepts defined in (a) and (b) can be applied to characters of arbitrary expressions (as opposed to sentences). This merely calls for the insight that in both cases an invariance of extension across certain points of reference is required. Hence a natural generalisation of the *apriori* (a$'$) to arbitrary characters χ is obtained by the condition that any utterance situations s_0 and s_1 satisfy: $\chi(s_0)(s_0) = \chi(s_1)(s_1)$. As an illustration for this *apriori* in a wider sense one may take the character of the definite description *the language of this utterance*: any utterance of this expression refers to German, but in virtually any utterance situation it is at least conceivable and thus (metaphysically) possible that the conversation is led in Old Norse. The corresponding generalisation (b$'$) of the notion of necessity leads to one of the central concepts of Section 1.3, viz. **direct reference**: an intension $\chi(s_0)$ is necessary if $\chi(s_0)(s) = \chi(s_0)(s') = 1$ (for arbitrary s and s'), i.e. if the corresponding expression directly refers to the truth value 1 and the point of evaluation has no rôle to play. As a further conceptual connection between the above definitions and the kinds of reference of linguistic expressions one may mention the incompatibility of deixis and *aprioricity* – also in the wider sense (b$'$) – which may be proved as an exercise.

Direct reference is particularly noteworthy within the framework of the epistemological interpretation of the classic account. On the level of intension, direct reference has been noticed to lead to singular information, information *about* the referent. Since this information lacks perspective, nothing follows about the **mode of presentation**, i.e., the identification of the referent from the subject's point of view: it may be a directly given contextual aspect (Ego, Hic, Nunc), a causally mediated acquaintance (perception, memory), or a reference that is essentially derived by deduction. The last case is found when a detective, after inspecting the scene of a crime, infers the existence of a single culprit whom he classes as belonging to a particular group of persons. In this case the corresponding unperspectival information is a singular proposition about the *actual* criminal; in a certain, trivial sense the detective knows who this person is, but this weak way of identifying him does not suffice for an arrest. This example – and analogous cases can be constructed for other kinds or direct reference – is meant to illustrate that direct reference and singularity are properties of the **objectivised content of consciousness** (as evaluated at the epistemic state) that are independent of the actual identifiability of the referent by the subject. The objectivising step from perspectival information to a single proposition usually goes with a **loss of information**: the same individual frequently corresponds to several modes of presentation. It may thus easily

happen that the same subject has the same piece of unperspectival information in several ways without noticing this; she may also have contradictory singular information about the same individual, which is however presented to the subject in different ways. (Of course, in the second case, not all of the available information can be correct.) For a large part the explanatory power of the epistemological interpretation of the classic account lies in this difference between epistemic and corresponding (i.e., objectivised) metaphysical information.

One of the alternatives to the classic account that has been discussed above resists an epistemological reinterpretation: the token analysis sketched in Section 2.4. The reason for this incompatibility with the perspective taken in the current section becomes apparent by considering a typical utterance for which token analysis is particularly suited:

(27)   Jetzt ist es siebenundzwanzig Sekunden früher als jetzt.
         [≈ *It is now twenty-seven seconds before now.*]

Clearly (27) can be uttered in a delayed way so as to result in something true in that the second token of *now* is uttered exactly twenty-seven seconds after the first one. And the interpretation of this self-fulfilling utterance does not present any difficulty to token analysis: any token of *now* is interpreted at its own instant and as referring to the selfsame. If one tried to construe (27) as a private monologue, though – which obviously is not all that hard – the reinterpretation described in this section fails. Well, at least without further ado, it is not possible to construe the character of (27) as a snapshot of a corresponding content of consciousness. For on the one hand, the classic account leads to an interpretation that is obviously wrong: the word *now* corresponds to a single contextual parameter so that both tokens would refer to the one Now of the cognitive state. Yet on the other side the split into two Now-times as token analysis would have it, is not compatible with the assumption that χ_{27} corresponds to a thought occurring in this state which, by the deictic words it contains, expresses some propositional content from the subject's perspective in this situation: the whole point of (27) is that it presents its more or less trivial content piecemeal, as seen from two different situations. Interpreting some deictic words as demonstratives with an invisible ('private') demonstration, as indicated at the end of the previous section, may be a possible way-out here. The question of whether this strategy is general enough will have to be left open. In any case, adapting token analysis to the epistemological reinterpretation of the classic account, thereby conceiving of the characters of sentences like (27) as contents of consciousness, may call for a more subtle match between characters and epistemic information than we have indicated here.

We finish our philosophical digression with a few warnings. First of all, the above considerations have hopefully made it clear that the philosophical theses associated with the classic account strictly speaking rest on a reinterpretation of the same. This reinterpretation as such does not constitute any evidence for these theses. For this it would first have to be shown that the construal of mental content as character, founded in the idea of private monologues, bears any scrutiny. Furthermore, the above definition would have to be tested for its usefulness as a reconstruction of corresponding classic concepts. Otherwise (25) and (26) may only support a thesis that contradicts the letter but not the content of popular philosophical positions. Finally, this would still not prove that this kind of

support of the controversial thesis is essential to the enterprise: perhaps a proof may be found that is quite independent of the conceptual apparatus borrowed from the theory of reference. In this case the epistemological reinterpretation of the classic account of context dependence would be a misleading detour at best. So there is still a long way to go from the classic account of context dependence to the foundation of the independence of aprioricity and necessity – and particularly the contingent *a priori* purportedly illustrated by (25) – in terms of linguistic analysis; following it here would lead us too far astray though.

3   Aspects of Context

The purpose of this part is largely to give an impression of the ways and possibilities of applying the classic account and its variants. To have a suitable framework, we break down the utterance situation into a list of semantically relevant aspects, as indicated in Section 2.1. In Section 3.1, we will first take a closer look at those parameters that we have already come across a number of times: apart from the aspects describing communicative rôles, which take care of the first and second persons, these are primarily the defining and localising properties of any situation: world, time, and place. The succeeding section is then devoted to such deictic expressions that usually relate to a demonstration accompanying the utterance and thus depend on a 'demonstrative aspect'. In the final section of this part we take a brief look into the abyss of those linguistic means of expression that – instead of depending on a concretely tangible aspect of context – appear to somewhat diffusely relate to what is suggested by the utterance situation.

3.1   Standard Aspects under the Magnifying Glass

From the classic point of view, the prototypical deictic word is the singular first person pronoun. It features in practically all outlines and applications of the classic account. We too used it to motivate the distinction between utterance situation and point of evaluation. Consequently it will be the speaker aspect that we will scrutinise first. It must first be noted that – given its presence in written utterances – the word *ich* [≈ *I*] does not always refer to the **speaker** really. Somewhat more neutrally, one could speak (or write) of an **utterer aspect** that picks out the producer of the linguistic expression (uniquely determined in the utterance situation). Possibly though, this is not general enough either if one wants to plausibly account for the use of *ich* [≈ *I*] in private monologues or other thought-quotations already discussed in Section 2.5:

(28)   'Habe ich heute eigentlich schon gefrühstückt?', fragte sich Wolfgang.
        [≈ *'Did I already have breakfast today?' , Wolfgang wondered.*]

Even if in examples like (28), for the purposes of determining the extension of *ich* [≈ *I*], the utterance situation is shifted in the direction of a point of evaluation, this does not imply how precisely the referent is determined: the act of thought described is not necessarily the only one in the situation at hand. (But then the the thought described in the clause in which the pronoun under scrutiny occurs is uniquely determined: the problems encountered turn out to be similar ones as in token analysis.) But apart from the fact that *ich* [≈ *I*] does not necessarily

refer to the originator of a *linguistic* product, it does not always have to be the *originator* of the linguistic product in question:

(29)   Nimm' mich mit!
         [≈ *Take me along!*]

This unequivocal request is said to be found on condom packages to be provided in public gentlemen's toilets. But who is the originator of these written utterances? The particular tokens are doubtlessly produced by a machine; in this respect the inscription is similar to a business letter where *ich* [≈ *I*] refers to the boss as the *spiritual* originator and not the secretary as the producer of the actual letter. But then (29) is hardly meant as a suggestive remark by the Federal Minister of Health. Rather, the word *mich* [≈ *me*] refers to the rubber protection provided by her ministry – which can hardly be said to be the producer of the said utterance. It is still clear that in this case it is understood as the referent of *ich* [≈ *I*]: the condom **counts as** the speaker.

The speaker parameter, then, just delivers whatever counts as the speaker in the situation at hand. Analogous remarks apply to all contextual parameters to be discussed in what follows. It should be noted, though, that this softening of the aspects is not a purely semantic phenomenon, but can mostly be dealt with in pragmatics, under the heading **rules of accommodation**: in a situation in which nobody is speaking, the hearer – if she wants to understand what is said – will have to connect the word *ich* [≈ *I*] with someone (or something) other; and when it comes to finding this 'speaker substitute', the rules mentioned will be of help to her. Such rules obviously shift a purely contextual aspect, whereby at first blush, they seem to violate the Band on Monsters imposed in Section 1.4. But then rules of accommodation are not semantic operations: such shifts only happen if the semantic rules proper fail. To underline this, we will in such cases speak of **pragmatic** shifts of the relevant aspects.

We do not want to say more about the speaker aspect at this point because we have already encountered it extensively. It should only be mentioned that in German, as in many (if not even all) languages, this aspect is of a purely contextual nature, thus always referring to the utterance situation and never shifting.[10]

After the first person singular, the first person plural, the word *wir* [≈ *we*] is an obvious successor. Ignoring all complications of plural semantics (which are the subject of Article 19 [= Link 1991]), *wir* [≈ *we*] des not appear to pose any problems of particular interest: it obviously refers to a group that is salient in the utterance situation and includes the speaker (or whoever counts as the speaker) plus at least one further person (or a further being that counts as a person). However, closer inspection reveals that (i) not all members of this group need to be present in the utterance situation or (ii) even be alive, that (iii) the determintation of the we-group can be rather vague in actual practice, and that (iv) there may be further, equally salient groups including the speaker. The following example illustrates (i) – (iv):

(30)   Wir sind wieder wer.
         [≈ *We are again someone.*]

_____

[10]This was later challenged by a host of counter-examples from various languages, starting with Schlenker (2003).

In an utterance of (30) by a postwar German federal judge, the latter could use *wir* [≈ *we*] to refer to the group of all Germans. If this utterance is made in a circle of close colleagues, (i) is satisfied. (ii) also holds if one assumes that the speaker refers to the totality of Germans and not the survivors. Some vagueness comes in if one asks whether this totality also includes all those Germans that were born shortly before the end of the war. And in the circumstances the lawyer may just as well have meant himself and his colleagues at the People's Court. The example also shows that the sometimes proposed split (marked in some languages) of *wir* [≈ *we*] into a reading that includes the audience and one that doesn't, does not always help. The same is true of other attempts of disambiguation: the specific choice of the group to which *wir* [≈ *we*] refers is utterly situation-sensitive.

There is no cogent reason for adding a separate contextual parameter for the first person plural. One may equally well describe the extension of *wir* [≈ *we*] by recourse to the speaker aspect and a situation-dependent order of things according to their salience (or pertinence) to be further expounded in Section 3.3: *wir* [≈ *we*] then refers to the highest-ranking group (according to this order) to which the speaker belongs.

Let us now turn to the second person pronouns. Some of the phenomena to be observed here, are the same as, or analogous to, what we found in connection with the first person: addressees are not always really addressed, but only thought as being addressed (as, e.g., in soliloquy or invocations of the gods); the actual reader or hearer does not have to be the addressee (as when a telephone is tapped); the group addressed in plural is not always clearly determined; etc. The only really new thing in comparison to the first person is the distinction made in German (and many other languages) between a familiar and a polite form. It usually does not play a rôle for the determination of extension but – like slant, mentioned in Section 1.3 – belongs to a different semantic layer, viz. **register**; the (quite frequent) case in which the referent of *du* [≈ $you_{[+sing\ -polite]}$] is determined by the fact that she is the only person present that the speaker addresses as *du*, can be dealt with in pragmatic terms – in analogy to the situation in which someone relates a request in French to himself if it is clear to him and the person making the request that he is the only person around that has a command of French. The differences in register in second order personal pronouns are thus not reflected in their characters: *du* [≈ $you_{[+sing\ -polite]}$] and singular *Sie* [≈ $you_{[\pm sing\ +polite]}$] are just as equivalent in character like the personal pronouns *ihr* [≈ $you_{[-sing\ -polite]}$] and plural *Sie* [≈ $you_{[\pm sing\ +polite]}$].

Apart from the producers and the recipients of utterances, place, time, and world of the utterance situation play an important rôle in determining extensions. From the point of view of the theory of reference, the most important difference between these situational parameters on the one hand and those in charge of the interpretation of the first and second person pronouns consists in the fact that the latter are purely contextual, whereas place, time, and world each can be shifted:

(31)   Sicherlich hat es in Rottweil geregnet.
         [≈ *It certainly rained in Rottweil.*]

We take it that (31) is the result of successively modifying the verb *regnen* [≈ *rain*] by the past tense perfect, the complex local adverb *in Rottweil* [≈ *in Rott-*

weil], and the sentential adverb *sicherlich* [$\approx$ *certainly*]; the subject obviously has no semantic rôle to play. It is thus natural to interpret *regnen* [$\approx$ *rain*] itself more or less in the sense of *es regnet* [$\approx$ *it is raining*], i.e., by a character χ that yields the truth value 1 at a point of reference $\langle s_0, s \rangle$ if it is raining in s. The modifiers applied in (31) then shift the point of evaluation: the perfect [translated as past tense] leads to a past s'; by the propositional phrase one gets to an s''' *in Rottweil*; and for the whole sentence (31) possible points of evaluation are employed that cannot be excluded with certainty. Within the framework of a parameterisation (in the sense of Section 2.1) the entire process of determining the extension of (31) in a situation s_0 thus looks roughly like this:

(31) is true in s_0

iff   by (D) and parameterisation

$$\chi_{31}(s_0)(World(s_0), Time(s_0), Place(s_0)) = 1$$

iff   by $\chi_{sicherlich}$

for all worlds w that cannot be excluded in s_0 the following holds:
$$\chi_{es\ hat\ in\ Rottweil\ geregnet}(s_0)(w, Time(s_0), Place(s_0)) = 1$$

iff   by $\chi_{in\ Rottweil}$

for all worlds w thus specified the following holds :
$$\chi_{es\ hat\ geregnet}(s_0)(w, Time(s_0), Rottweil) = 1$$

iff   by $\chi_{Perfect}$

for all such w there is a time t before Time(s_0) such that:
$$\chi_{es\ geregnet}(s_0)(w, t, Rottweil) = 1.$$

It should be noted that this evaluation of (31) only makes substantial use of s_0 as the utterance situation in the very first step – viz., where s_0 is introduced into the index. So one may as well have interpreted (31) within a pre-classic account that merely distinguishes extension and intension, where the former depends on the latter and an index broken down according to its aspects. The reason for this is that the index aspects touched by the intensional operators in (31) are not simultaneously denoted by deictic expressions. And why should they be? Why would one want to first replace, say, the local aspect contextually given (via (D)) and then shift it back? Indeed, a juxtaposition of absolute (*in Rottweil* [$\approx$ *in Rottweil*]) and deictic (*hier* [$\approx$ *here*]) adverbials only appears appropriate if one of them would already suffice. But then such back-and-forth shifting of index aspects does make sense if one of the intensional operators involved is **indiscriminate** in that it refers to more than one aspect: the indiscriminate operator might then first shift the whole index, which may be partially reversed by selectively binding particular aspects. The prime example of such an indiscriminate operator is the clause embedder *dass* [$\approx$ *that*]. For it does make a difference whether, say, Angela utters (32) or (32′) – unless she happens to be in Rottweil:

(32)   Die Leute in Rottweil ärgern sich darüber, dass es ständig regnet.
            [$\approx$ *People in Rottweil are annoyed about the fact that it is permanently raining.*]

(32′)   Die Leute in Rottweil ärgern sich darüber, dass es hier ständig regnet.
            [$\approx$ *People in Rottweil are annoyed about the fact that it is permanently raining here.*]

In both cases *dass* [$\approx$ *that*] shifts the world aspect in the embedded clause to the world of the corresponding point of evaluation. But while in (32) the embedded clause – also due to the occurrence of *dass* [$\approx$ *that*] – is evaluated at the place of the point of evaluation, in (32$'$) this side effects is cancelled by *hier* [$\approx$ *here*]: the place of evaluation is the place of utterance.

What is true of space does not hold of time. For in spite of the above claims, double assignments are in fact possible in the case of the temporal parameter: apart from the past tense perfect in (31), e.g., a temporal adverb may occur without either of these time determinants being sufficient:

(33)   Heute hat es in Rottweil geregnet.
        [$\approx$ *It was raining in Rottweil today.*]

The result of interpreting the perfect as a quantifier over the past before the time of speaking is that (33) says that it rained in Rottweil (some time) before the utterance; the adverb *heute* [$\approx$ *today*] would be redundant then.[11] Swapping the scopes of tense and temporal adverb does not help either: this would make the perfect redundant, and (33) would mean that it is raining in Rottweil *some time* during the day of utterance. However, this is not correct; for the utterance of (33) to be true, the rain must fall *before* it. Clearly, to capture the interaction of tense and temporal adverb, the interpretive techniques are in need of refinement. An obvious but misleading strategy is to change the semantics of perfect – by having the tense (pre-classicly) refer to the time before the *time of evaluation*. Given the scope reversal indicated, this would yield a different reading for (33), but not at all the intended one: the sentence would say that it was raining some time before the day of the utterance. (Without the scope swap one would again get the old, unwanted reading.) Correclty, though, the quantification would have to run over the time *before* the utterance but at the same day, i.e., within the time of the point of evaluation:

(33) is true in s_0

iff   by (D) and parameterisation
$$\chi_{33}(s_0)(World(s_0), Time(s_0), Place(s_0)) = 1$$

iff   by $\chi_{in\ Rottweil}$
$$\chi_{heute\ hat\ es\ geregnet}(s_0)(World(s_0), Time(s_0), Rottweil) = 1$$

iff   by χ_{heute}
$$\chi_{es\ hat\ geregnet}(s_0)(World(s_0), Day(s_0), Rottweil) = 1$$

iff   by $\chi_{Perfect}$
there is a time t before $Time(s_0)$ and within $Day(s_0)$ such that:
$\chi : (s_0)(World(s_0), t, Rottweil) = 1$.

This exemplary and heavily simplified account of the semantic interaction of tense and temporal adverb reveals various aspects at the same time. First of all, the perfect relates the time of the point of evaluation (also known as **reference time**) to the time of the utterance situation (= **speech time**). Secondly, these times would obviously have to be intervals and not just instants; otherwise one

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[11]To be sure, the original German text takes it for granted that such a reading of (33) does not exist!

time of evaluation could not be embedded in the other one. And thirdly, the behaviour of the temporal parameter is more complicated than possibly expected; this becomes particularly clear if one tries to analyse more complex examples with different tenses or other types of temporal adverbials (in particular, frequency adverbs). (We need to refer to Article 35 [= Fabricius-Hansen 1991] for this, though.)

Apart from time and place, our sample analysis of (31) also makes use of the **world parameter**, which was needed for the interpretation of the modal adverb *sicherlich* [≈ *certainly*]. The general idea behind this use of possible worlds has already been explained in Section 1.2, in connection with the interpretation of clause-embedding verbs. (The above interpretation of *sicherlich* [≈ *certainly*] obviously presupposed that embedding under this adverb is a similar phenomenon.) Unfortunately, any deeper investigations into the concept of worlds, of which all versions of the classic account make use, would go beyond the scope of the current article. Let us merely point out that the literature largely agrees that every possible world fully determines all facts – each one in its own way: perhaps there is a world in which the number of hairs on David Lewis's head is twice as large as it actually is, but there is none in which it is indeterminate. On the other hand, there is disagreement among metaphysicians on the question of whether non-actual worlds are to be thought of as concrete universes or as abstract possibilities. Among other things, it hinges on the answer to this question whether one and the same person can exist in a non-actual world and even whether, strictly speaking, it makes sense to consider fictional worlds in which this person has properties he or she does not possess in reality. Surely, as long as these (and similar) philosophical questions on the notion of a world remain unanswered, the classic account is somewhat shaky on its feet.

Place, time, and world are subject to similar reservations as the speaker parameter. As long as no local adjuncts shift it, the place of evaluation coincides with the place of utterance; often, however, the range of the latter is not particularly clear-cut. In different utterances of (34) on different occasions, one may refer to the very room, the region within a radius of c. 100 miles, or even the entire continent in which the utterance takes place:

(34)   Im Frühjahr wird es nur selten wärmer als 34°Celsius.
        [≈ *It rarely gets warmer than 34° Centigrade in spring.*]

This kind of vagueness can also be found for the world and time parameters, which are not safe from pragmatic shifts either. A well-known case is the so-called **historical present**, which frequently counts as a grammatical blunder when used by a pupil but as a stylistic device in the hand of literary writers. Shifting the local aspect only seems possible though if the time follows suit. Finally, shifts of the world are found where the entire utterance situation is 'replaced' as in an opera performance: there the (usually fictional) person represented by whoever is singing counts as the speaker, the time at which the opera is set as the time of utterance, and the world is not the one we live in either.

The analyses of (31)–(33) had shown that the three parameters under scrutiny – place, time, and world – are (semantically) shiftable, and thus index parameters. Hence they are also contextual parameters, if only due to a convention agreed upon in Section 2.1. But are there also *true* index parameters?

In other words, are there words or constructions whose semantic behaviour can only be described under the assumption that they refer to one of the three contextual aspects mentioned? It would seem that, in view of the relativity of the decomposition of situations into aspects the answer to both questions must be negative. It is still worth looking for expressions and constructions that can be described in terms of reference to the place, time, and/or world of utterance in an obvious way. Indeed, at least for the temporal parameter we have already come across such an example: for in the course of the interpretation of (33) it turned out that the perfect [translated as past tense] even made reference to the utterance time if the evaluation time had already been shifted (by a temporal adverb, in the case at hand). This also empirically underpins the contextuality of time. It is harder to find unequivocally deictic expressions for the local aspect. Of course, the word *hier* [≈ *here*], already mentioned above, is a prime candidate, but as we will see in Section 3.3, it does not have to be interpreted by reference to the local aspect at all. As to orientation devices like *links* [≈ left] and *unten* [≈ below], it should at least be noticed that they take the speaker's perspective into account (and thus if anything, the speaker aspect) rather than the place of utterance. However, one may define the local parameter so as to relate to the speaker and his orientation; this is confirmed by the fact that in telephone conversations the place at which the speaker is also counts as the place of utterance. Finally, as far as the world is concerned, it had already been remarked in Section 2.3 (in connection with modal logic) that the horizontal diagonal operator (*dthat*) corresponds to the modal adverb *tatsächlich* [≈ *actually*] when applied to sentences.

A magnifying glass is not a microscope, and so these remarks only offer a glimpse of the problems that the classic account meets when applied to different types of context dependence. The details are far more complex.

3.2 Demonstratives

The contextual aspects discussed in the previous section have a certain outwardness in common: they all concern objective, more or less easily detectable features of concrete situations. Yet the extensions of linguistic expressions do not always depend on such simple aspects of context only. *Deixis* is Greek for 'showing', and many deictic expressions are typically accompanied by demonstrations. The use of pointing gestures is quite typical of **demonstratives** (whence the term, presumably):

(35)   Das mag ich nicht.
         [≈ *I don't like this.*]

Whoever utters a sentence like (35) may at the same time point to something, and as rule, it is exactly this object which forms the extension of the demonstrative pronoun *das* [≈ *that*]. Often, of course, the pointing gesture is not unambiguous. It may, e.g., be unclear whether by his utterance of (35), the toddler means the ugly plastic plate or the delicious spinach mash on it. Under the assumption that the character of *das* [≈ *that*] can be basically circumscribed by *dasjenige Ding, auf welches der Sprecher zeigt* [≈ *that object to which the speaker is pointing*], it is natural to regard the demonstration as a contextual parameter; this way demonstratives would be treated uniformly in that their

47

extension then only depends on this **pointing aspect**. Now, what distinguishes this pointing aspect from the 'solid' aspects considered in Section 3.1, is the subjective trait that is responsible for possible misunderstandings: what a demonstrative pronoun refers to depends on what the speaker is pointing to, which is not always as clear to the audience as it is to the speaker. What is said by a sentence like (35) in a situation s_0, then, partly depends on what the speaker means by *das* [$\approx$ *that*] in s_0. On the other hand, what she may mean by her utterance (plus pointing gesture) is not arbitrary; after all, she does have to adhere to the usual conventions for demonstrations: thus a substantial part of the object ought to lie on an imaginative line prolonging the pointing finger; any deviation from this rule ought to be justified by special circumstances at least. Furthermore, it is obviously in the speaker's very interest to frame her wording and pointing as clearly as possible. One may thus assume that the goal of the pointing act must be – and normally will be – identifiable as such by the addressees. There is thus a certain amount of intersubjectivity to the pointing aspect.

In order to guarantee the comprehensibility of her intention, the speaker can support her demonstration by additional linguistic measures. Thus she may, for example, use the demonstrative pronoun as an article and provide it with a noun. A noun phrase thus formed and called **demonstrative** from now on may then help avoid impending misunderstandings once and for all. An interesting theoretical question concerns the mode of reference of demonstrative noun phrases: how is the extension of, say, *diesen Fraß* [$\approx$ *this muck*] determined? Under the assumption that *diesen* [$\approx$ *this*] is a truly deictic word (relating to the pointing aspect), the question of the mode of reference of the whole NP reduces to the influence of the article on the evaluation of the noun: nouns do not normally refer deictically, and so one would *diesen Fraß* [$\approx$ *this muck*] expect to have a mixed mode of reference; hence an evaluation at the utterance situation could only be explained by an influence of the deictic article. Given principle (D), this question can only be answered by calling in intensional constructions, of course. Indeed, a lot seems to speak in favour of the assumption that noun phrases with deictic articles are themselves deictic, as the next few examples will show:

(36)   Vor fünf Minuten war dieser Wassertropfen noch gefroren.
        [$\approx$ *Five minutes ago this drop of water was still frozen.*]

In (36) the temporal prepositional phrase and the tense together shift the time of evaluation before the utterance time. Accordingly, the extension of the subject ought to be determined for this past instant. But obviously the specification of the form of the relevant amount of fluid relates to the time of the utterance of (36): whether it already had the form of a drop when frozen obviously does not make a difference to what is said by (36). On the contrary: whoever utters (36′) and points to a drop of water, does not speak the truth even if that drop had just thawed five minutes before the utterance; it is even questionable whether any claim is made at all by (36′) in these circumsatnces.

(36′)   Vor fünf Minuten war dieses Eisstückchen noch gefroren.
        [$\approx$ *Five minutes ago this piece of ice was still frozen.*]

These observations carry over to other types of intensional constructions: the *dass-* [$\approx$ *that-*] clause embedded in (37) must be evaluated at the situations

compatible with the godfather's assumptions:

(37)   Der Pate geht davon aus, dass dieser von uns eingeschleuste Mann absolut vertrauenswürdig ist.
[≈ *The Godfather believes that this man we infiltrated is totally reliable.*]

If, however, a police inspector uses (37) to introduce a new undercover agent to his colleagues, the mafioso mentioned should not – according to the interests of the police authority – hit upon the idea that there is a mole. On the other hand, the police officer could not have provided a characterisation that is only correct from the gangster boss's point of view, with a deictic article. Had the informer been a Ticino farmer's son, (37′) would have been as inadequate as (36′) above:

(37′)   Der Pate geht davon aus, dass dieser ehemalige sizilianische Chorknabe absolut vertrauenswürdig ist.
[≈ *The Godfather believes that this former Sicilian choirboy is totally reliable.*]

Further examples would only corroborate the suspicion that the property of referring deictically is transferred from the article to the entire noun phrase.

The subjectivity inherent to the pointing aspect also pertains to demonstrative noun phrases – if to a far lesser degree: normally the pointing gesture and the property expressed by the noun together do determine one object or (in the plural case) group of objects. But there are also cases in which the noun does not achieve the desired disambiguation of the demonstration. If, say, following the waiter's question who ordered which drink, someone vaguely points in the direction of the tray, articulating:

(38)   Dieses Bier!
[≈ *This beer!*]

he may thereby not be unambiguous because there are three beer glasses of different contents on the tray. This imprecision may have a variety of causes. For one thing, it may have escaped the customer that there are several beers on the tray; on the other hand, it is also possible that his pointing gesture just went wrong. In the first case (38) does not refer to anything. In the second case the question of whether (38) has an extension depends on the referential conditions for demonstrations. Since the speaker's intentions play an important rôle for the latter, the intentional dependence of the demonstration carries over to the determination of the extension of (38). This is the subjective element in the interpretation of demonstrative noun phrases. It should be noted that this is a subjective aspect of determining the extension according to generally binding linguistic rules and not the intention of the speaker to refer to a particular thing. It is useful to fix this difference terminologically. We will call the reference of an expression assumed by the speaker as *subjective reference*. The actual reference made according to the rules of the language is called *objective reference*. It is the latter that is at stake when we talk about extension and its subjective aspects.

Let us summarise our observations on the determination of the extensions of singular demonstrative noun phrases in terms of a rule:

(R$_\Delta$)   Let β be a noun, s_0 an utterance situation and s a point of evaluation. Then: $\chi_{dieses\ \beta}(s_0)(s)$ is that thing x for which the following holds: in

s_0, x is pointed at (by the speaker in s_0) and x is in $\chi_\beta(s_0)(s_0)$.

Using the notation ι common for representing the definite article in logic, (R$_\Delta$) may be paraphrased thusly:

(R'$_\Delta$)   Let β be a noun. Then: *dieses* β may be paraphrased thusly:
$dthat(\iota x(x$ is pointed at & x is a $\beta))$.

Are there, apart from the traditional demonstrative articles (*dieses* [$\approx$ *this*] and jenes [$\approx$ *that*]) any other linguistic expressions that relate to the contextual pointing aspect? Of course, any linguistic utterance may in principle be accompanied by a pointing gesture. But this does not make the expression a demonstrative. If Rumpelstiltskin points to himself yelling:

(39)   Ich bin der Schönste im ganzen Land!
       [$\approx$ *I am fairest of all!*]

it is not by pointing to himself that he is speaking about his own person, but because he is using the first person singular pronoun; by pointing to the queen's child instead, he would have created confusion at best, but in no way would he have managed to shift the (objective) reference of the subject of (39). If someone points to their forehead and insults the person opposite by the words *Du hast sie wohl nicht alle* [$\approx$ *You are not all there*], the pointing may help clarifying the message, but neither the extension of the overall utterance (0 or 1) nor that of any of its parts depends on the target of the pointing gesture (Forehead? Brain? Little birdie?). On the other hand a pointing gesture accompanying a second person pronoun may actually help clearing up the reference, as we had seen in Section 2.4 (in connection with token analysis). This suggests that the addressee aspect relevant for the second person must be determined by taking possible pointing gestures accompanying the utterance (the token) into account. *Hier* [$\approx$ *here*] seems to be even more dependent on the pointing parameter: in the absence of any demonstration, *hier* [$\approx$ *here*] obviously always refers to the place of utterance i.e. to some environment of the speaker depending on various situational factors. If a pointing gesture is added, the place of its targets functions as the referent of *hier* [$\approx$ *here*] though. A particularly noteworthy case arises if this pointing gesture is directed to a representative of the intended object (a symbol in the widest sense possible) – as in the famous finger on the map, which may cause an utterance of (40) to come out as not saying the truth:

(40)   Wir sind jetzt hier.
       [$\approx$ *We are here now.*]

This phenomenon, sometimes called **deixis to the phantasma** in the literature can lead to confusion at times. For on the one hand, it may happen that in a concrete situation it is really unclear whether the symbol or the object symbolised is referred to; and on the other hand, the theoretician, inspired by this kind of misunderstanding, may hit upon the weird idea that this is a linguistic ambiguity – where the indeterminacy of a demonstrative act is all there is.

These last examples were meant to illustrate that accompanying pointing gestures often play an important rôle in the determination of extensions of utterances, but that the exact way in which this rôle is played is quite obviously constrained and controlled by semantic factors.

3.3 Salience[12]

To a large part, the phenomena just observed in connection with demonstrative noun phrases can also be illustrated in terms of (singular) **definite descriptions**, i.e., definite noun phrases of the type *der/die/das + Noun* [≈ *the + Noun*]. Clearly, these too may be accompanied by demonstrations, and they then have the same referential properties like demonstrative noun phrases – as is easily seen by varying the above examples. One may thus speak of a **demonstrative use** of the relevant definite descriptions. In particular, demonstratively used definite descriptions are always deictic. The natural question now is whether one can even deictically refer by a definite description without at the same time pointing at anything.

One can. To see this, one only needs to slightly alter one of the above examples:[13]

(37″)   Der Pate geht davon aus, dass der von uns eingeschleuste Mann absolut vertrauenswürdig ist.
[≈ *The Godfather believes that the man we infiltrated is totally reliable.*]

The detective inspector may say (37″) to his superior without the said agent being present; he thus does not have to point at him. But as in an utterance of (37), it is not the points of evaluation of the subordinate clause that are relevant for the definite description *der von uns eingeschleuste Mann* [≈ *the man we infiltrated*] but the utterance situation itself. The definite description is thus used deictically.

One may object against this somewhat rash proof of a deictic use of definite descriptions that (37″) is perhaps merely a case of flexible scope behaviour (and not of deictic usage) and that, moreover, this kind of anaphoric reference to the utterance situation can be observed in every noun phrase (in one form or another). We will return to this in Section 4.3.

If the referent of a definite description used as in (37″) is not the target of a demonstration, how does the noun phrase get its extension then? Put differently: what are the parameters in charge of definite descriptions used deictically but without demonstrations? One answer consists in ascribing the form $dthat(\alpha)$ to such definite descriptions (cf. Section 1.3) and then compare the descriptive contents: the wanted parameter is defined by whatever they have in common. α is easily found in the case of the above utterance of (37″): the inspector refers to that person x for whom the following holds in the utterance situation: x was infiltrated into the organisation by the police. α thus is the definite description *der von uns eingeschleuste Mann* [≈ *the man we infiltrated*] itself. More precisely: the character of the definite description used deictically in (37″) can be cicumscribed by the intension of the latter when used normally, not deictically. So the inspector uses (37″) as if the definite description under scrutiny were embedded under an invisible *dthat*.

Is (37″) exceptional in this respect? Or can deictic uses of definite descriptions α always be paraphrased by $dthat(\alpha)$? This simple analysis cannot be right

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[12]The German text has *einschlägig(es)*, which normally translates as *pertinent*. Since *salient* is the common term in the English-speaking literature on which this section is based, I used it throughout in the translation – risking to lose a few nuances of the original.

[13]Sæbø(2015: 1144) translates the example without an overt definite article: *our infiltrated agent*.

if the definite description is accompanied by a pointing gesture; for in this case, in order to determinethe extension the pointing aspect must be taken into account. If α is the definite description *der Wassertropfen* [$\approx$ *the drop of water*], say, by adapting (R$'_\Delta$) we obtain, instead of the paraphrase *dthat*(α), the more complicated *dthat*(ιx (*x wird gezeigt* & *x ist ein Wassertropfen*)) [$\approx$ *dthat*(ιx (*x is pointed at* & *x is a drop of water*))].

Even when no demonstration occurs, the deictic use of a definite description α does not necessarily have to come down to *dthat*(α). Let us again look at example (37$''$)! Of course, in an utterance of this sentence the circumstances indicated above may be enriched by assuming that the police authorities are trying to cope with organised crime by a whole squad of narks. Only one of them – this much we will assume – is quite new to the job and it is him that the inspector reports about now. It is clear that the definite description *der von uns eingeschleuste Mann* [$\approx$ *the man we infiltrated*] refers to said agent, who however can hardly be said to be *that* individual who in the utterance situation has the property of being an agent; rather, the person talked about can be characterised as the only agent under discussion in the situation at hand, i.e., as *that salient* (or *pertinent*) individual that has the property expressed by the noun. The following rule of thumb for interpreting deictically used definite descriptions thus emerges:

(R$_\delta$)   Let α be a deictically used definite description of the form $\delta\beta$, where δ is a singular definite article and β the congruent form of a noun. Then α may be paraphrased thusly :
dthat(ιx (*x is salient* & *x is a β*)).

Instead of *x is salient* one could just as well employ the condition *x is relevant*, *x is under debate*, or something like that. The precise wording is of no concern. What is important though is the content of the condition; this is what we will be concerned with in the following.

A weak point of rule (R$_\delta$) is the notion of salience, which we would like to conceive of as a contextual aspect. Since this is a particularly vague but – as we will soon see – versatile notion, a theory of context dependence ought to strive for clarification and precisification. What, then, makes this or that object salient and raises them from the sea of others of its kind in a given utterance situation? In the above example it was the fact that the relevant person had already been under discussion for a while. But there may be quite different reasons. If, say, a babysitter talks to his girlfriend over the phone and utters (41), he can use the subject of the subordinate clause to refer to the children entrusted to him, even though they had not been mentioned before:

(41)   Brunners denken natürlich, dass die Gören längst schlafen.
[$\approx$ *The Brunners think that the brats are fast asleep of course.*]

It may, e.g., be the noise they make that makes said children particularly salient here – or quite simply the fact, well-known and important for the interlocutors, that the speaker is looking after them. Other potential kids known to both may be neglected though: Brunners' kids are *closest* to the communicators' *concerns*. Whatever catches the eye or is obvious in some other way may count as salient. In general it does not suffice that the relevant object (or person) is close to each communicator's concerns. For if perhaps at the beginning of the conversation,

say – our babysitter is uncertain whether his girlfriend knows what he is doing, he would not utter anything like (41) – even if his girlfriend happens to be well-informed about his activities. He will only make use of the definite description *die Gören* [≈ *the brats*] if he knows that the girlfriend too knows who he is talking about. Salience is thus based on a pool of information common to, or commonly accessible to, the communicators.

In at least three ways, salience is not an absolute concept. Apart from (i) its relativity to a situation under consideration, its extension normally also depends on (ii) a relating property: in the above situation, the Brunner offspring may perhaps form a salient group G of *children*, but G is thereby not salient in every sense: if immediately before the conversation – yet unbeknownst to the babysitter or his girlfriend – the Brunner couple had died in an accident, the definite description *die Erben* [≈ *the heirs*] would certainly not refer to G. Finally, salience is also relative in that it is a (iii) gradual property: perhaps the babysitter's girlfriend's siblings are also somehow salient, but then not so salient as the offspring of the Brunner family. The relativity (i) is accounted for by (R_δ) in that the adjective *salient* occurs in the scope of *dthat* whereby its extension is determined relatively to the utterance situation. (ii) and (iii) receive no attention in (R_δ). Though a corresponding amendment of the rule would be possible in principle, it would lead to many technical details that do not have much to do with the subject matter of this chapter. We thus leave it at the above formulation, still keeping in mind that it is in need of some corrections. The remainder of the current section is devoted to an in-depth discussion and explanation of the concept of salience by further pertinent examples.

The things at which the speaker points are of course particularly obvious and salient. Thus rule (R_δ) in principle covers demonstrative uses of singular definite descriptions. Still the salience aspect cannot replace the pointing aspect in all cases: **purely demonstrative** expressions like *das da* [≈ *that one*][14] are normally in need of a pointing hint and cannot simply relate to some obvious referents. For this reason, purely demonstrative expressions are not normally found in written language, potential exceptions being occurrences in comments on pictures or in direct speech.

The place at which the speaker is located is also particularly obvious. One may thus conjecture that the local aspect can in principle be simulated by an interaction of contextual salience with the absolute property of being a place. In the case of *hier* [≈ *here*], the locally deictic word *par excellence*, some observations support this conjecture. To begin with, one should realise that *hier* [≈ *here*] can be used as a demonstrative, i.e., with reference to the target of an accompanying pointing gesture. Hence if *hier* [≈ *here*] is interpreted as *dthat*(ιx x *is salient* & x *is a place*), this semantic aspect comes out automatically: as long as no other place occupies the centre of attention, one may well consider the place of the utterance the only salient one; but if the speaker points to a particular place (or to a symbol for a particular place), this place ousts the place of utterance from its privileged position. Moreover, as in the case of definite descriptions, besides pointing at it, mentioning it may also make a place salient, whereby the extension of *hier* [≈ *here*] changes too. Such changes can happen quickly and abruptly, as the following kind of example illustrates:

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[14]The locution *that one* also introduces an anaphor to a noun. This anaphoric element is not addressed in the text since it is missing from the German original [which literally translates as *that there*].

(42)   Im Alter von sechsundsechzig Jahren reiste Karl erstmals nach Amerika:
        hier fand er endlich jene Freiheit, der er hier so sehr entbehrt hatte.
        [≈ *At the age of sixty-six Karl travelled to America for the first time: it
        is here where he finally found that freedom that he had missed so much
        here.*]

The first *hier* [≈ *here*] in (42) obviously refers to America, whereas the second
occurrence of the same word in the the same sentence refers to Europe, Germa-
ny, or some environment of the place of utterance. One may regard this sudden
change of the extension a pragmatic shift of the place – in analogy to the hi-
storical present mentioned in Section 3.1. Other than that, it only remains to
assume a true ambiguity of *hier* [≈ *here*] – if one were to insist on reducing
references of *hier* [≈ *here*] to the place of utterance to the local aspect; even
so, the remaining readings would have to be interpreted by recourse to different
contextual aspects (what is pointed at, what has been mentioned, . . .). Compa-
red to these alternatives, the analysis in terms of salience has the advantage of
simplicity. Moreover, the referents of deictic definite descriptions may change
under similar circumstances and as quickly as the extension of *hier* [≈ *here*]. The
following examples is a possibly case in point, though suffers from stylistically
clumsiness due to repetition (which may well be intended by the speaker):

(43)   Auf unserer letzten Neuseeland-Rundreise ist uns der Rolls-Royce nach
        zwei Tagen verreckt, aber in Europa haben wir mit dem Rolls-Royce
        bisher Glück gehabt.
        [≈ *On our last New Zealand tour the Rolls-Royce broke down after two
        days, but in Europe we have been lucky with the Rolls-Royce so far.*]

Under the assumption that the luxury vehicle mentioned first in (43) is a rental
car, whereas the second one is part of the utterer's car pool, the extension of
the NP *der Rolls-Royce* [≈ *the Rolls-Royce*] in (43) changes about as swiftly
as the place referred to in (42). So there can be no doubt that something like
salience in the context of speech plays a rôle; and it is this salience that follows
speech time at a good pace. All in all, these observations speak in favour of an
interpretation of the Here as the salient place.

But if the seemingly direct reference of *hier* [≈ *here*] can be dissected by
bringing in the salience aspect, how about the other parameters that initially
seemed equally irreducible? For example, aren't the communicators the most
salient persons in the utterance situation? If that were so, the reference of *ich*
[≈ *I*] and *du* [≈ *you*] would have to be prone to similar diversions as in (42)
and (43). It would seem that pertinent examples are easily found:

(44)   Ich weiß noch, wie der Arzt zu meinem Schwager sagte: 'Das nächste
        Mal kann ich Ihnen vielleicht nicht mehr helfen.'
        [≈ *I still remember the doctor saying to my brother-in-law: 'Next time
        I may not be able to help you again.'*]

In an utterance of (44), the two occurrences of the singular first-person pronoun
do indeed refer to distinct persons. But then any potential suspicion that men-
tioning a different utterance situation creates an even more salient speaker and
thus a new referent of *ich* [≈ *I*], is easily dispelled: clearly, replacing direct by
indirect speech hardly makes a difference to the claim – but only if the person

changes along with the mood:

(44′)   Ich weiß noch, wie der Arzt zu meinem Schwager sagte, dass er ihm das
         nächste Mal vielleicht nicht mehr helfen könne.
         [≈ *I still remember the doctor saying to my brother-in-law that he might*
         not be able to help him again next time.]

(44″)   Ich weiß noch, wie der Arzt zu meinem Schwager sagte, dass ich ihm
         das nächste Mal vielleicht nicht mehr helfen könne.
         [≈ *I still remember the doctor saying to my brother-in-law that I might*
         not be able to help him again next time.]

In contradistinction to (44), the second *ich* [≈ *I*] in (44″) must refer to the
speaker of the overall utterance, just like the first one; consequently, in contra-
distinction to (44′), (44″) is not even a rough paraphrase of (44). We will draw
two important conclusions from this trivial observation: first, (44) presents no
reason for a salience interpretation of *ich* [≈ *I*]; second, direct speech is a wide
sphere.[15]

    We draw the first conclusion indirectly: if the difference in extension between
the two occurrences of *ich* [≈ *I*] in (44) is to be explained by the fact that
mentioning a different utterance situation with a different speaker makes the
latter more salient than the actual producer of the utterance, then it could
hardly be avoided that this line of argument carries over to (44″); but this is
undesired – in view of our simple observation. The conclusion we will draw is
somewhat bolder but has rarely been seriously doubted in the literature: change
of topic, diversion, and other salient means of changing salience cannot change
the extension of *ich* [≈ *I*]; thus the salience parameter is not relevant for the
interpretation of the first person. The attentive reader will notice that this
reasoning stil leaves unexplained why descriptions like *this person* normally do
not refer to the speaker – which might be taken care of by a general pragmatic
principle of maximising presuppositional information, along the lines of Heim
(1991: 515). In particular, it is not trivial in that it could be used to explain
any deictic reference. And what is right for the first person also holds for the
second one. As far as the time and the world of the utterance are concerned,
we will however leave open whether these parameters too might be replaced by
analyses in terms of salience.

    That **direct speech** is a field of its own can be seen from the fact that
it admits, or even forces, the otherwise impossible shift of *ich* [≈ *I*]. But this
is not the only, or even the most obvious, peculiarity of direct speech. On the
contrary: closer inspection reveals that the alleged shift of the extension in (44)
is a side effect of a more general re-interpretation of all expressions occurring
in direct speech (= **quotations**). In fact, a suitable variation of the examples
shows that a quoted *ich* [≈ *I*] may not only refer to a different speaker but also
to several speakers, or nobody at all:

(45)   Schon oft hat ein Arzt zu meinem Schwager gesagt: 'Das nächste Mal
        kann ich Ihnen vielleicht nicht mehr helfen.'
        [≈ *Many times a doctor said to my brother-in-law: 'Next time I may*
        not be able to help you again.']

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[15]In the meantime the topic has been seriously addressed in formal semantics. See Maier
(2014) for a survey.

(45')   Es ist nicht auszudenken, wass passiert, wenn ein Arzt zu meinem
         Schwager sagt: 'Das nächste Mal kann ich Ihnen vielleicht nicht mehr
         helfen.'
         [≈ *It does not bear thinking about what happens if a doctor says to my
         brother-in-law: 'Next time I may not be able to help you again.'*]

The simplest explanation for the initially somewhat confusing behaviour of quoted *ich* [≈ *I*] is that direct speech is a meta-linguistic locution; that thus, strictly speaking, the extension of quoted *ich* [≈ *I*] is the word *ich* [≈ *I*] itself; and that the impression of a different 'secondary' extension only arises from what the corresponding sentence says about this word. Among other things, this explanation is supported by the fact that, at least in certain circumstances, quoted expressions may derive from different languages. However, we will not go further into this discussion because it would take us away from our topic. It should only be remarked that the details of the apparently quite straightforward meta-linguistic construal of direct speech lead to many, partly surprising problems. Apart from the notorious difficulties of the relation between language and meta-language in general, it is primarily the lack of a clear separation between the two levels in natural language that deserves mentioning.

Even though not every form of context dependence can be related to salience, it is still possible for most ways of referring to the utterance situation. This will be illustrated by way of a case study, the interpretation of **possessives**, with which we end the section.

There are principally two kinds of possessives in German: those that, together with a (possibly syntactically complex) noun, in turn form a noun; and those that syntactically behave like (definite) articles and complete a noun to a noun phrase. In view of their position within the NP we will call them **right** and **left adjuncts**, respectively. Let us first turn to the right adjuncts:

(46)   Guinivere [*sic!*] ist die Gemahlin Arthurs.
        [≈ *Guinevere is the consort of Arthur.*]

(47)   Lancelot ist ein Getreuer Arthurs.
        [≈ *Lancelot is a follower of Arthur.*]

(48)   Excalibur ist das Schwert Arthurs.
        [≈ *Excalibur is the sword of Arthur.*]

Details aside, the interpretation of (46) is unproblematic: it is a statement of identity between Guinivere, denoted by the subject, and that person that is married to the king denoted by the possessive *Arthurs*. In this context, *Gemahlin* [≈ *consort*] may be construed as denoting a function whose arguments and values are both human beings. We will thus call nouns like *Gemahlin* [≈ *consort*] **functional nouns**.

Only a small faction of nouns are functional. Cases like (47) are much more frequent: any decent king has a large flock of followers. Hnece the required functional value needed is a set, which boils down to interpreting *Getreuer* [≈ *follower*] as a relation between persons. Such nouns are therefore called **relational nouns**. Functionality may, of course, be conceived of as a special case of relationality, whereby (46) and (47) can be interpreted by a single rule: in both cases the extension of a noun α is fed an argument. More precisely:

(G$_Q$) Let α be a relational noun, β a proper name in the genitive, s_0 an utterance situation, and s a point of evaluation. Then:
$$\chi_{\alpha\beta}(s_0)(s) = \{x \mid x \ \chi_\alpha(s_0)(s) \ \chi_\beta(s_0)(s)\}$$

The notation and the idea behind this rule are readily explained on the basis of examples (46) and (47): when applied to *Getreuer Arthurs* [$\approx$ *follower of Arthur*], the extension delivered by (G$_Q$) is the set of (persons) x for which it holds that: $x \ G \ a$, where G is the extension of *Getreuer* [$\approx$ *follower*] and a the carrier of the name *Arthur*; a follower of Arthurs thus has to be someone who stands in a certain relation (of following) to Arthur. For the interpretation of *Gemahlin Arthurs* [$\approx$ *consort of Arthur*] we will of course have to conceive of marriage as a relation that holds between x and y just in case x is the consort of y. (G$_Q$) then delivers the set of consorts of a; it is then the task of the definite article to extract the sole member from that set and make it the extension of the whole noun phrase.

Now, how does all this relate to context dependence in general and salience in particular? The arguments of relational nouns are not always explicitly mentioned as in (46) and (47). One also finds them frequently in sentences like:

(49) Arthur fühlte sich einsam: die Gemahlin war unpässlich, und die Getreuen hatten ihn verlassen.
[$\approx$ *Arthur felt lonely: the consort was indisposed, and the followers had left him.*]

Neither of the two relational nouns has been supplied an argument here. But then this is not really necessary: from the fact that no argument is mentioned in (49), one may conclude that in both cases Arthur is the missing person. Why? Because he had just been mentioned and is thus the obvious choice. So Arthur is salient. We thus get to the following **ellipsis rule**:

(G$_\emptyset$) Let α be a relational noun, $\emptyset$ an empty genitive noun phrase, s_0 an utterance situation, and s a point of evaluation. Then the following holds:
$$\chi_{\alpha\emptyset}(s_0)(s) = \{x \mid x \ \chi_\alpha(s_0)(s) \ y\},$$
where y is salient in s_0 (as an argument of α).

(G$_\emptyset$) presupposes a syntactic analysis according to which relational nouns require a possessive the absence of which is somehow structurally marked (in our case by an empty NP). This leaves open whether *every* omission of a possessive of a relational noun must be interpreted in the sense of (G$_\emptyset$), i.e., as **definite**. As already mentioned in Section 1.3, an additional **indefinite** rule that binds the relevant argument position is at least plausible.

We now turn to the presumably most frequent kind of right possessives, as exemplified in (48). There is nothing relational about the noun *Schwert* [$\approx$ *sword*]: obviously, it merely expresses a property. It thus belongs to the large group of **saturated nouns** which, just like the relational ones, may be equipped with right possessives. Many of these cases suggest an ownership relation. *Schwert Arthurs* [$\approx$ *sword of Arthur*], however, may also refer to rental swords used by Arthur, or ones that he restores for the British Museum. The relation established between the objects with the property expressed by the saturated noun and the extension of the noun phrase does not have to be one of ownership.

From the speaker's point of view, however, it better be clear which relation R is meant. R thus needs to be salient. Here is an interpretation along these lines:

(G_R) Let α be a saturated noun, β a proper name in the genitive, s_0 an utterance situation, and s a point of evaluation. Then:
$\chi_{\alpha\beta}(s_0)(s) = \{x \mid x \in \chi_\alpha(s_0)(s) \ \& \ x \, R(s) \, \chi_\beta(s_0)(s)\}$,
where R is salient in s_0 (as a relation between elements of the extension of α and the extension of β).

Under the assumption that ownership is salient as long as anything speaks against this, (G_R) also takes care of a lot of cases in which the possessive expresses a possessive function proper. Ownership then is the **default value of salience** for relations. According to (G_R) whether the relation R contributed by the utterance situation does or does not hold, depends on the point of evaluation. Why is that so? The justification again derives from embedding in intensional environments:

(50) Lancelot glaubt, dass der Becher Arthurs Gift enthält.
[$\approx$ *Lancelot thinks that the cup of Arthur contains poison.*]

According to an obvious interpretation, (50) says that among the situations compatible with Lancelot's beliefs are only such s for which it holds that the cup from which Arthur is drinking in s, contains poison in s. Ownership is apparently not salient for this interpretation, rather the desired R must be the relation holding between tippler and cup. However, this relation is only salient insofar as it holds in Lancelot's belief worlds. Thence the dependence of R on the point of evaluation, as required by (G_R).

The effect of (G_R) may also be construed as a situation-dependent reinterpretation of the relevant noun: in the pertinent utterance situations, the normally saturated noun *Becher* [$\approx$ *cup*] is interpreted like a relational noun *Becher$_R$* [$\approx$ *cup$_R$*]. One may therefore entertain the idea of replacing the salience-based rule (G_R) by an ambiguity analysis of the noun in question, where the most frequent reading is provided by the ownership reading. What speaks against such a lexical ambiguity is the fact that the number of potential readings is principally unlimited. We would thus face a kind of **polysemy**, a systematic ambiguity within the lexicon, and (G_R) serves to describe this polysemy. We will return to this in Section 4.4.

Another conceivable strategy consists in dropping (G_Q) and instead generalising (G_R) to arbitrary nouns: the problematic distinction between relational and non-relational nouns could be evaded by interpreting words like *Gemahlin* [$\approx$ *consort*] like the saturated *Gemahlin von jemandem* [$\approx$ *someone's consort*] and leave it to the salience parameter to find the correct relation (of marriage). This procedure would also explain why occasionally even in uses of typically relational nouns, different relations come to the fore, apparently are forced by the context: thus, e.g., in a conversation among psychotherapists the utterer of (51) may refer to a female part of the patients of his esteemed colleage:

(51) Die Ehefrauen des Dr. Leid sind allesamt hysterisch.
[$\approx$ *The wives of Dr Leid are all hysterical.*]

However the inherent relationality of some nouns cannot be explained away so easily. The strategy indicated cannot explain the simple and obvious difference

in meaning between *Vorabend* [≈ *evening before*] and *Abend* [≈ *evening*] – or only in a strained way: the evening before a day is at the same time the evening of a day (though of a different one). 'Saturating' the two words thus leads to the same result. Why, then, should this result sometimes make one relation salient and sometimes the other one?

Examples like (51) can actually be explained in the spirit of the above rules. To begin with, the relational noun *Ehefrauen* [≈ *wives*] can be contextually saturated by the rule (G_Q); to achieve this, a plural version of (G_Q) would be needed though, which would then put a group of salient husbands in the argument position. In the case of an acute lack of such men, one would have to resort to the indefinite rule of saturation merely indicated above. The result of this re-categorisation is a saturated noun, thus making (G_R) applicable and bringing in the salient thereapist-patient-relation.

Let us now briefly address left possessives. First, some examples:

(46′)   Queenie Vera ist Atzes Braut.
        [≈ *Queenie Vera is Atze's bride.*]

(47′)   Latzehos ist Atzes Kumpel.
        [≈ *Latzehos is Atze's chum.*]

(48′)   Exknallibus ist Atze's Knarre.
        [≈ *Exknallibus is Atze's shooting iron.*]

It is obvious that the left possessive always introduces a definite element into the noun phrase: *Atzes Braut* [≈ *Atze's bride*] means something like *the* bride of Atze, *Atzes Kumpel* [≈ *Atze's chum*] means *the* chum of Atze's, etc. By and large, the left possessive may be construed as a combination of right possessive and definite article. The rôle of the salience parameter is then the same as in the above cases – ignoring potential interferences with the interpretation of the article. The construction is worth mentioning because it directly relates to the interpretation of possessive pronouns mentioned in Section 1.3. The relation is this: the position within the NP occupied by the left possessive is that of the article. One could thus regard this construction a re-categorisation of the genitive NP as an article (with neutral gender and case). Let us refer to this re-categorisation as **possessivisation**. It is then apparent that the very same construction is blocked for personal pronouns: *seiner Getreuer [≈ $he_{genitive}$ *follower*]. The place of the expected genitival form of the personal pronoun is then taken by the possessive pronoun. Hence the possessive pronoun comes out as the result of the possessivisation rule (left possessive) applied to the personal pronoun; it is thus outside the reach of hypothesis (L).[16]

Just as it introduces missing arguments and relations in possessives, salience often comes to rescue when gaps need to be filled in logical form. In this way the number of required contextual aspects reduces dramatically. In particular, all sorts of abstruse alleged context parameters can be eliminated – like the **Previous Drink Coordinate (PDC)** that is occasionally mentioned in the literature and that is meant to see to it that the request *Noch so eins!* [≈ *Another such one!*] addressed at a waiter is not only interpreted correctly by him, but also by semantic theory. Roughly, instead of the *ad hoc* PDC one merely needs a similar strategy of interpreting ellipses as in the case of possessives plus

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[16]See Zimmermann (2004) for more on this.

an interpretation of the word *so* [≈ *such*] as depending on the salience aspect: the former introduces the contextually salient property of being desired by the customer, while *so* [≈ *such*] refers to the sort of drink that is relevant for this property. Of course, the devil is in the detail again, but this kind of exploiting saliences is intuitively and theoretically more satisfactory than a bunch of 'ad-hockeries' like the PDC.

Even after fully exploiting the descriptive potential of the salience parameter, a few additional irreducible aspects remain: at least the speaker parameter appears to resist any reduction to salience. A further aspect of context that is equally irreducible but has not been mentioned so far, is the **degree of precision** of a statement. This is the parameter that is responsible for a generous interpretation of such pieces of information like *zwei Millionen Einwohner* [≈ *two million inhabitants*] and that can be shifted by certain degree adverbs like *ungefähr* [≈ *approximately*] or *haargenau* [≈ *exactly*] (and thus proves to be an index parameter). The non-reducibility of the degree of precision to salience in the utterance situation could be brought out in analogy to the above considerations on the irreducibility of the speaker made in connection with (44).

We do not wish to leave the topic of salience without remarking on the dark side of this very handy parameter. The diversity of the examples discussed in this section ought to suggest that any attempt of making this concept more precise is likely to be extremely hard. This is particularly true if one strives for a *non-circular* explanation that determines the objects, relations etc. salient in a situation without referring to the extensions of the utterances made in it – which are to be found on its very basis, after all. The following example indicates that this might not always be possible:

(52)   Beim Überschreiten des Innenhofes hat sich Martin das Bein gebrochen.
        [≈ *When crossing the inner court, Martin broke his [lit.: the] leg.*]

Even under the assumption that Martin is the most salient person when (52) is uttered, the fact remains that he is a featherless *biped*. But is seems to be the very fracture mentioned in (52) that directs the attention to one of the two extremities. The broken leg becomes salient, or so it seems, by talking about it.

4   Problems

In this part we will gnaw at the roots of the classic account and its variants. The problems the following four sections are about are quite different in nature. They only have in common that they help shaking the view expounded in the first three parts of the article. As a side product, we will also come across some further applications of the classic account.

4.1   Binding

We start with the question of whether personal pronouns of the third person singular satisfy Hypothesis (L) from Section 1.3. Here is an innocuous example:

(53)   Er ist ein Genie.
        [≈ *He is a genius.*]

We may imagine that (53) has been uttered about Wim Wenders in a discussion at a film critics meeting. In this context it is clear the pronoun *he* refers to the director of *Paris, Texas*: Wim Wenders is the most pertinent individual in this discussion (as far as being a genius is concerned). This suggests the following simple rule of interpretation for *he*:

(R_{er})   Let s_0 be an utterance situation and s a point of evaluation. Then: $\chi_{er}(s_0)(s)$ is the most pertinent individual in s_0.

(R_{er}) is far from being perfect. The rule does not even suffice for the analysis of (53), because it ignores the relativisation to geniuses. If the discussion has surrounded his most current opus, this film could be as pertinent as its main actor. But as a property of actors, being a genius is totally unfitting; it is an attribute of artists. This is why Wim Wenders is more pertinent than his work in view of what is said about the referent of the subject in (53). Integrating these observations in a reformulation of (R_{er}) would obviously call for a detailed token analysis.

A similar, though less easily fixed, inadequacy concerns the gender of the pronoun. It is conceivable that Wim Wenders is not the only creative person under debate. Maybe Doris Dörrie has been discussed just as much. However, it is clear that *he* in (53) can hardly refer to the latter director – however pertinent she may be as a topic and a candidate for geniality: her biological gender demands to refer to her with feminine pronouns. On top of its thematic pertinence in the situation, the third person pronoun singular also imposes a linguistic side-condition: its gender needs to fit the referent. In the case of persons this means that, as a rule, male sex correlates with masculine gender, whereas female sex correlates with feminine gender. However, this is not the full story. Firstly, one may, after all, relate to a female person by the noun *Mädchen* [≈ *girl*] or *Fräulein* [≈ *Miss*] and then refer to her with a neuter pronoun; and even cases in which a person is male and a female person refers to her have been attested.[17] Secondly, there are many creatures and objects that do not possess any natural gender, or whose natural gender is quite irrelevant for the choice of the (German) pronoun. Tom-cats are cases in point. They can be referred to with the feminine noun *Katze* [≈ *cat*], followed by references with feminine pronouns; and similarly for cups, which may be referred to as *Tasse* [≈ *cup*], a feminine noun. On the whole, the selection of pronominal gender is as much dependent on natural properties of the referent as on descriptions of it immediately prior to the utterance. The following version of (R_{er}), which is presented without justification or further comment, improves on the inadequacies just mentioned:

(R^2)   Let x be an occurrence of the personal pronoun *er* [≈ *he*] in sentence α uttered in situation s_0, and let s be a point of evaluation. Then: $\chi_{er}(s_0)(s)$ is the most pertinent individual in s_0 as regards $[\lambda_x\ \alpha]$ that either (a) has been referred to in s_0 shortly before x with a masculine noun phrase, or (b) is known (by all communicators in s_0) to be in the extension of a common masculine noun.

Here $[\lambda_x\ \alpha]$ is that property that an individual y possesses in a situation s' if

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[17]The German original is self-fulfilling in that it contains the feminine pronoun *sie* [≈ *her*], which is used anaphorically to the noun *Person* [≈ *person*], the grammatical gender of which happens to be feminine.

the substitution x by a standard name of y results in a sentence that is true at the point of reference $\langle s_0, s' \rangle$.

The role of the property $[\lambda_x \, \alpha]$ in (R²) is to compare potential referents of *er* [≈ *he*] with respect to the property expressed by α. As the notation suggests, this way of determining a property by hypothetical substitution of potential alternatives to the occurrence of a pronoun corresponds to **abstracting** from the concrete value of a variable. As is customary in the socalled **substitutional interpretation** of variable-binding, the above definition of $[\lambda_x \, \alpha]$ presupposes that any relevant object possesses a (standard) name; this presupposition could be avoided in various ways, which would however make rule (R²) even more cumbersome than it already is. We will shortly return to the rôle of binding x in (R²). Before this, we need to establish that this meaning rule does satisfy constraint (L).

(R²) does, of course, confirm hypothesis (L). Since the (meta-linguistic) variable s does not even occur in the definiens of the extension of *er* [≈ *he*] , the application of $\chi_{er}(s_0)$ always leads to the same result in different points of evaluation. Thus *er* [≈ *he*] comes out as directly referential. Moreover, since utterance situations may differ as to the pertinence of particular individuals, the equation $\chi_{er}(s_0) = \chi_{er}(s_1)$ is not generally valid. So according to (R²), *er* [≈ *he*] is deictic and in particular satisfies (L).

If *er* [≈ *he*] is deictic, the binding performed for determining the property $[\lambda_x \, \alpha]$ boils down to an abstraction from the utterance situation. Does (R²) therefore evade the ban on monsters (M)? No. For (R²) is not concerned with determining the extension of the meta-linguistic expression $[\lambda_x \, \alpha]$. The latter does get defined in a side-remark, but this is merley an explanation of the notation used. The abstraction from the utterance situation in $[\lambda_x \, \alpha]$, then, happens in the metalanguage; and there, no doubt, it is licit – even unavoidable: *any* meaning rule discussed in this chapter refers to utterance situations in general and thus abstracts away from them.

(R²) could certainly be further refined in various respects. Whatever the details may be: the confirmation of (L) by the direct referentiality of personal pronouns should not be affected. The scene is thus ready for the problem to be discussed now. So let us raise the curtain – enter:

(54)   Jeder Kritiker lässt gern einfließen, dass er ein Genie ist.
        [≈ *Every critic likes to slip into the conversation that he is a genius.*]

First of all it may be observed that (54) contains the embedded clause variant of (53) as a part. So what has been said about (53), should carry over to (54). In a situation in which Wim Wenders is under discussion, (54) could be paraphrased as follows:

(55)   Jeder Kritiker lässt gern einfließen, dass Wim Wenders ein Genie ist.
        [≈ *Every critic likes to slip into the conversation that Wim Wenders is a genius.*]

Of course, this is a possible interpretation. However, (54) possesses another reading, according to which the pronoun *er* [≈ *he*] relates back to the subject of the entire sentence. This *backward reference* must not be understood as the pronoun being proxy for the subject; for (55′) is clearly distinct from this (or any other) reading of (54):

(55′) Jeder Kritiker lässt gern einfließen, dass jeder Kritiker ein Genie ist.
[≈ *Every critic likes to slip into the conversation that every critic is a genius.*]

While (54) may well be true in the backward-referring, **anaphoric reading**, (55′) is certainly false. Hence a pertinence-based analysis in the style of (R²) and extended to quantified noun phrases, does not help for (54). More likely, what is needed is a technique of variable binding as familiar from logic. Usually, anaphoric relations are represented by binding invisible variables in an underlying structure. For the relevant reading of (54), the sentence would have to be dissected into its subject *jeder Kritiker* [≈ *every critic*] and a so-called **matrix** or **open formula** of the form *x lässt gern einfließen, dass x ein Genie ist* [≈ *x likes to slip into the conversation that x is a genius*]. In order to construct the desired sentence (54) from subject and matrix, a special syntactic operation Q called **quantifier binding** is needed, whose semantic counterpart Σ_Q has the same effect as a quantifier (relativised on the extension of the noun and) binding the variable x. Σ_Q thus operates on characters to the following effect:

(Q_S) $\Sigma_Q(\chi_{jeder\ Kritiker}, \chi_{x\ lässt\ gerne\ einfließen,\ dass\ x\ ein\ Genie\ ist})(s_0)(s) = 1$ if for any substitution of a standard name k for an individual from the extension $\chi_{Kritiker}(s_0)(s)$ it holds that:
$(\chi_{k\ lässt\ gerne\ einfließen,\ dass\ k\ ein\ Genie\ ist})(s_0)(s) = 1.$

In the above form, Σ_Q is not compositional (cf. Article 7 [= von Stechow 1991]). A reformulation in accordance with the principle of compositionality would have to invoke **assignments** instead of the substitution of standard names of different critics, and have the extension of the matrix depend on them. (Q_S) then becomes:

(Q_B) $\Sigma_Q(\chi_{jeder\ Kritiker}, \chi_{x\ lässt\ gerne\ einfließen,\ dass\ x\ ein\ Genie\ ist})(s_0)(s) = 1$ if for all assignments b of x to an individual from the extension $\chi_{Kritiker}(s_0)(s)$ it holds that:
$(\chi_{k\ lässt\ gerne\ einfließen,\ dass\ k\ ein\ Genie\ ist})(s_0)(s) = 1$ at the assignment b.

Strictly speaking, this formulation is not compositional because it rests on a dissection of the subject (for the relativisation). This compositionality problem is quite independent of our current concerns though, and it can be solved by the usual tools of quantificational semantics (see Article 21 [= van Eijck 1991]). Here we are mainly interested on the final side-condition in (Q_B): *at the assignment b*. In order for the extension determined by the character to depend on an assignment, the latter would have to appear in the domain of that character. In principle it may do so in three places: (i) as part of the utterance situation, i.e., contextually; (ii) as part of the point of evaluation, i.e., indexicalistically; (iii) as a separate argument on top of utterance situation and point of evaluation, i.e., independently. However, all three solutions come with their vagaries.

   Ad (i): Conceiving of assignments as contextual parameters **weakens** of the ban on monsters (M). As is plain from (Q_B), the very point of (the compositional interpretation of) quantificational binding is abstracting from some fixed assignment and thus investigating dubbings different from a single, contextually given one (and maybe salient in the utterance situation). (QB) would thus lead to a shift of the utterance situation, thereby being a monster.

Ad (ii): The **indexicalisation** of assignments allows for two variants that differ in the relation between the bound variable in the matrix formula and the personal pronoun on the linguistic surface. (ii-a) The pronouns corresponding to the bound variables are construed as reflexes of quantificational binding which, in their phonetic form and syntactic and morphological behaviour, happen to match the true personal pronouns in the sense of (R^2). While the latter are analysed as deictic expressions, the bound pronoun is essentially a different word (or syntactic phenomenon) that has nothing to do with direct reference, only with intensionality – for this is what an index shift by quantificational binding would come down to. We thus have an **ambiguity analysis** of third person pronouns. What speaks against such a construal is the redundancy or awkwardness it creates in linguistic descriptions: each pronoun functioning as a bound variable would have to be doubly classified and described in the lexicon; or else the operation F introduces these pronouns **syncategorematically** (i.e., without lexical access), where the morphological information needed for the congruence with the antecedent NP would have to be reproduced in the formulation of this rule. Moreover, an explanation would be needed why this kind of ambiguity occurs in very many languages. (ii-b) The bound variables are construed as ordinary pronouns in the matrix. In this case the correct semantics of pronouns cannot possibly look as in (R^2), though. For on the one hand, the extension of the pronoun does not depend on the index but on the context; and on the other hand, this rule does not make mention of an assignment in the first place. The second flaw is easily fixed: the dependence of a pronoun's extension on the utterance situation as described in (R^2), can be re-interpreted as a function from utterances to (possible) extensions. Thus conceived, the assignment would then still have to be shunted off to the index – otherwise we would not have gone beyond the monstrous solution (i) of the problem. What speaks against this indexicalistic construal of the variable extensions of pronouns is a fundamental assumption of the classic account, viz. the principle (F) postulating the connection between intension and information, or one of its variations (cf. Section 2.5). In any formulation, the information conveyed by the sentence, i.e., *what is said by the sentence in the situation*, coincides with its intension (in s_0). This identification is incompatible with assumption (ii-b), which implies that pronouns need to be interpreted as absolute. To see this, one may consider any sentence with a 'free' personal pronoun:

(56)   Sie hat einen Holzkopf.
        [≈ *It has a wooden head.*]

Let us assume that (56) is uttered in a situation in which the subject refers to a glove puppet on the speaker's raised hand. The information thereby conveyed is the same as that expressed by (57):

(57)   Diese Puppe hat einen Holzopf.
        [≈ *This puppet has a wooden head.*]

However if the pronoun is interpreted as absolute, the intensions would be distinct: (56) would incorporate the procedure for identifying the reference of the subject into the intension, whereas the proposition expressed by (57) would be directly about the displayed puppet.

It is here that the problem of quantificational binding reveals its very depth:

it indicates a tension in the classic account between the characterisation of intensions as absolute information on the one hand and the non-shiftability of the utterance situation on the other hand. The role of pronouns as directly referential expressions, skipping the level of extensions, stands against their function as quantified variables to be interpreted by abstraction or shifting; and this conflict cannot be resolved classicly in a satisfying way. As long as this conflict is confined to a narrowly limited area like the domain of quantificational binding, it is tempting to regard *ad hoc* solutions like (ii-a) for the best way out. However, as we will still see in Section 4.3, binding is much more pervasive than one could hope at our current state of discussion.

Ad (iii): The conflict just described can be evaded by adding a third component to the points of reference: as an equal to context and index, the latter then also contain an assignment to pronouns, which could be construed as unambiguous words – as in variant (ii-b) above. Two objections can be raised against this **strategy of avoidance**. To begin with, it does not guarantee that further phenomena come up, comparable to variable binding and demanding a division of the point of reference in four, five, or six components. Furthermore, over and above pure ostension, one ought to have a criterion of identifying the phenomenon of quantificational binding and distinguishing it from ordinary intensionality by index shifting; that finding such a criterion is not trivial can be seen from the fact that, following the procedure described in Section 2.2, the latter can be construed as variable-binding too.

4.2 Perspectival Shifts

We have seen in Section 2.5 that according to the epistemological reinterpretation of the classic account, characters correspond to momentary contents of consciousness. Since one may refer to the thoughts and perceptions of persons by clause-embedding verbs like *glauben* [≈ *believe*], *befürchten* [≈ *fear*], *hoffen* [≈ *hope*], *ahnen* [≈ *suspect*] etc., one may suspect that an adequate semantics of these verbs ought to analyse them as **characteral attitudes**, i.e. as (index-dependent) relations between individuals and characters. Such a classification of clause-embedding verbs, however, contradicts the standard assumption made in Section 1.2 (and elsewhere) that they express propositional attitudes; it also seems to be incompatible with the Ban on Monsters (M). We would thus want to scrutinise the rôle played by characteral attitudes in the logical analysis of language.

First of all, it must be stressed that the epistemological interpretation of the classic account does not preclude an interpretation of clause-embedding verbs as propositional attitudes; for even if it is the function of an attitude verb to ascribe to an individual a content of consciousness of a certain type further characterised by the complement clause, this characterisation could still be made by means of a proposition. More specifically, this possibility can be illustrated by the following semantic rule (R_{meinen}), which is not totally implausible given the epistemological interpretation:

(R_{meinen}) Let ψ be a verb phrase of the form *meint, dass ϕ* [≈ *thinks that ϕ*], where ϕ is a (subordinate) clause; and let s_0 and s be an utterance situation and a point of evaluation, respectively. Then $\chi_\psi(s_0)(s)$ is the set of those individuals x that satisfy: the proposition expressed

by ϕ is implied by x's content of consciousness $\chi^{x,s}$ in s.

Here, thinking is taken to be an emotionless attitude characterising the content of consciousness. One may note in passing that (R_{meinen}) is in accordance with Hypothesis (L): *meinen* [$\approx$ *think*] refers absolutely.

The condition imposed by (R_{meinen}) is to be understood as implying that x's content of consciousness $\chi^{x,s}$ (in the world and at the time of the point of evaluation s), taken as a character, is such that the perspectiveless information $\chi^{x,s}(s^x)$ – i.e., (in the terminology of Section 2.5) the objectivised content of consciousness – only contains situations in which p holds; here s^x is the cognitive state of x, i.e., the situation s as seen by x: s^x and s are as similar as possible, but x is the Ego, the cognisant subject, in s^x. In order to see the motivation and working of this rule, one can apply (R_{meinen}) to a simple example:

(58)   Martin meint, dass ich lisple.
         [$\approx$ *Martin thinks that I have a lisp.*]

If Maria utters this sentence in a situation s_0, the truth value is determined with the help of (R_{meinen}) as follows:

(58) is true in s_0

iff   by (D)
$$\chi_{58}(s_0)(s0) = 1$$

iff   obvious
Martin stands in $\chi_{meinen}(s_0)(s_0)$ to $\chi_{ich\ lisple}(s_0)$

iff   by (R_{meinen})
$$\chi^{Martin,s_0}(s_0^{Martin}) \text{ implies } \chi_{ich\ lisple}(s_0)$$

iff   given χ_{ich} and the comments on (R_{meinen})
for every situation s the following holds: $s \in \chi^{Martin,s_0}(s_0^{Martin})$ implies: Maria $\in \chi_{lispeln}(s)$.

Given the truth condition thus reduced, Maria's utterance of (58), then, says that Maria has a lisp in any situation that is compatible with Martin's content of consciousness (at the time of the utterance situation). Clearly, this is not an unwanted result. Here we are mostly interested in how it comes about. For on the one hand, (R_{meinen}) interprets the clause-embedding verb as a propositional attitude, while on the other hand this rule takes the content of consciousness as a character. The trick plainly consists in the **perspectival shift**: first, the character of the subordinate clause is evaluated at the utterance situation – in accordance with the principles of the classic account; the result is a certain (in this case: singular) proposition. Then the point of evaluation is slightly shifted to the subject's epistemic perspective, from where the (singular) proposition is viewed. So the utterance situation is only used to determine the proposition expressed by the subordinate clause; but it is ignored in determining the subject's attitude. Clearly, this procedure exactly matches the interpretation of attitude verbs already sketched in Section 2.1. What is new here is merely that the attitude subject is assumed to have an epistemic perspective.

The epistemic perspective in (R_{meinen}) is not such a big deal though. For a second glance reveals that, as a matter of principle, it never enters the interpretation of attitude reports. Intuitively, the reason is that the rule merely boils down to a comparison of two perspetiveless propositions anyway: one is the intension ν of the embedded clause, the other one is the subject's content of consciousness μ, objectivised and deprived of its perspective; and the two are compared with respect of the question whether the former implies the latter (in the sense of set inclusion). Both the character of the embedded clause and, in particular, the subject's epistemic view are ignored in (R_{meinen}).

In Section 2.5 we already noticed that the loss of the epistemic perspective by objectivisation may result in a loss of information: different individuals may be presented to the subject in different ways. This loss of information is reflected in specific semantic effects of the rule (R_{meinen}). The first, harmless effect is felt if, say, Martin and Maria are facing each other in s_0, Martin's content of consciousness χ^{Martin,s_0} covers the character $\chi_{du\ lispelst}[\approx \chi_{you\ have\ a\ lisp}]$, but Martin does not only take the person opposite to have a lisp, but also his landlady, without making a connection between the two, even though it is Maria in both cases. Given these assumptions (R_{meinen}) makes (58) true for two independent reasons, as it were: the intension of the embedded clause is the same singular proposition p like the one expressed by *Du lispelst* [$\approx$ *You have a lisp*] or *Meine Vermieterin lispelt* [$\approx$ *My landlady has a lisp*] in Martin's epistemic state. The first effect of (R_{meinen}), then, simply is that the same description of Maria covers two independent views of Martin, thus attributing a certain **indeterminacy** to Maria's utterance (58).

A reverse effect is observed if Martin – perhaps due to a new haircut or perceptual disruption – does not recognise the person opposite to him as his life companion whom he takes to not have a lisp. Then a character roughly corresponding to the sentence *Meine Lebensgefährtin lispelt nicht* [$\approx$ *My life companion does not have a lisp*] would also be part of Martin's current content of consciousness. Since Maria is Martin's actual life companion it now follows that the objectivised content of consciousness $\chi^{Martin,s_0}(s_0^{Martin})$ also implies the opposite of p. $\chi^{Martin,s_0}(s_0^{Martin})$ is thus contradictory and implies any proposition whatsoever – as one easily verifies.

So Maria could also have claimed that according to Martin there were zebras in Kreuzlingen and – according to (R_{meinen}) – would have been right in any case. This defect of (R_{meinen}) can be eliminated rather easily without changing the essence of the rule: instead of taking contents of consciousness to be characters, one could represent them more adequatley by sets of characters – intuitively corresponding to the sentences held true by the subject. The absurd consequence about (58) would then be avoided; on the other hand, Maria's utterance of (58′) would still be true, which; this, however, is not unwelcome given the circumstances and in particular, Martin's unshakable belief in the pure articulation of his life companion Maria:

(58′)   Martin meint, dass ich nicht lisple.
          [$\approx$ *Martin thinks that I do not have a lisp.*]

This technique of avoiding contradictions – essentially an adaptation of the so-called **neighbourhood semantics** of propositional attitudes – has its limits, which show particularly clearly if the embedded clause or its negation is neces-

sarily true without being *apriori*. A typical case can be found if Maria makes an allusion to her perfect disguise in claiming truthfully:

(59)   Martin meint, dass ich Maja bin.
         [≈ *Martin thinks that I am Maja.*]

At least under the assumption the *Maja* is a stadard name (of Maria's friend), the embedded *that*-clause in (59) expresses a contradictory proposition. From this it immediately follows that according to (R_{meinen}) any utterance attributing to Martin a false belief would be true in the circumstances – including, say:

(59′)   Martin meint, dass ich Ruth Rendell bin.
         [≈ *Martin thinks that I am Ruth Rendell.*]

The inference from (59) to (59′), however, is quite risky, especially since there is not the slightest similarity in appearance between Maria's friend and the great British crime writer.

    The limits reached here by the rule (R_{meinen}) are, of course, also the limits of the propositions underlying the classic account, which already in Section 1.1 had been assessed as too coarsely grained. The inference from one contradiction to any other one (classically: the same!) or from one attitude to a contradiction to the attitude to any contradiction can be argued for completely indepedently from the rule at hand simply in view to the concept of a proposition and the Ban on Monsters. In the current context, any criticism of (R_{meinen}) that rests on the obviously inadequate treatment of examples such as (59) and (59′) could thus be felt as beside the point. We will still see, though, that the connection between the fine-grainedness of the concept of a proposition and the inclusion of epistemic perspectives in the semantics of attitude reports is tighter than it would seem (or can be made tighter, at any rate). Still, in view of a skeptical readership we will pretend that these are two completely independent phenomena.

    Disregarding such problems, then, attitude reports with clause-embedding verbs can be accounted for rather satisfactorily by means of the rule (R_{meinen}), which is unspecific as to epistemic modes of presentation. However, this unspecific element is not welcome in all types of attitude reports:

(60)   Bettina meint, mit Eddy Merckx verheiratet zu sein.
         [≈ *Bettina believes herself to be married to Eddy Merckx.*]

Unlike the examples considered so far, (60) does not appear to be a sentence embedding (on the surface). That this example opens a new dimension can be seen if one tries to interpret (60) by means of (R_{meinen}) and construe the infinitival as expressing an incomplete proposition to be completed by the matrix-subject:

(60′)   Bettina meint, dass sie mit Eddy Merckx verheiratet ist.
         [≈ *Bettina thinks that she is married to Eddy Merckx.*]

The personal pronoun inserted in the embedded clause would then be construed as bound by the matrix-subject (in the sense of the previous section), of course. (That extensional coincidence based on contextual salience does not suffice in this case, can be seen from analogous examples with a quantified subject; syntactically speaking, we are dealing with **control** by the matrix-subject.) Still, in all other respects the interpretation could run along the lines of (R_{meinen}).

Since in the case of (standard) names, binding and substitution do not create a difference in intension – in both cases a singular proposition about the referent ensues – and only the intension is relevant for (R_{meinen}), we can ignore the problems addressed in Section 4.1 and just replace (60′) by (60″):

(60″)   Bettina meint, dass Bettina mit Eddy Merckx verheiratet ist.
          [≈ *Bettina thinks that Bettina is married to Eddy Merckx.*]

(Here we are, of course, assuming that the two occurrences of the name *Bettina* in (60″) refer to one and the same person, Bettina.) According to (R_{meinen}), then, (60) and (60″) say the same thing. But is that so? In the majority of circumstances the two sentences will indeed come down to the same thing, but maybe not in all circumstances. A situation in which (60) is false but (60″) true could go like this: somewhere in the attic Bettina finds an old wedding photograph of herself and her husband Wendelin. On the photograph, Wendelin is partly concealed and in his sporting outfit. The rest is obvious: Bettina thinks that the depicted athlete is the great Belgian cyclist and the unrecognisable bride the latter's wife. According to (R_{meinen}) this should be a clear case: in the situation at hand, the singular proposition expressed by the embedded clause in (60″) (in any utterance situation) follows from Bettina's objectivised content of consciousness: the woman in the picture that Bettina looks at is, according to her, married to Eddy Merckx; and as a matter of fact the woman thus described is Bettina herself. However, the falsity of (60) seems to be unaffected by this story: Bettina does not believe anything as false as is implied in (60). It seems as if for (60) to be true, the subject of the attitude would have to be presented to Bettina *as the subject*; the proposition expressed by the embedded clause (in a pertinent utterance situation) thus cannot just *somehow* result from objectivising one of Bettina's convictions – as (R_{meinen}) would have it – but in a highly specific way, viz. by evaluating the speaker- or subject-parameter (in a certain epistemic state of Bettina). The attitude ascribed to Bettina in (60), then, needs to be a **de se** belief (to use a common term). And it is this side condition that is violated when (60) is reduced to the paraphrase (60″); and the culprit is, of course, the indeterminacy of (R_{meinen}) observed above.

Several objections may be raised against these considerations. On the one hand, it is not obvious that (60″), or even (60′), would really be true in the circumstances described. In the end, such a criticism would already complain the lack of the subject's epistemic perspective in the rule (R_{meinen}). In that case we would not have had to resort to the infinitival variant in the first place. We will not go into this kind of criticism because, on the one hand, the question of the truth values of these sentences might not be answerable in a theory-neutral way; and on the other hand, rejecting (R_{meinen}) on account of its lack of epistemic perspective is in line with our argumentation anyway. A second objection may, of course, go in the opposite direction and simply question the falseness of (60). The infinitival embedding would then be correctly interpreted by (R_{meinen}). Still, under this assumption, one would have to explain (perhaps pragmatically) why (60) does at least *appear to be false* in the situation at hand. The mere possibility of such an explanation cannot be doubted here; but we assume that the falseness of (60) is a semantic phenomenon, due to the literal meaning of the sentence. Further objections might concern the particular mode of presentation of Bettina by way of a photography. In that case the reader is

asked to come up with a better example.

At this point the question obviously arises whether the subtle meaning difference between (60) and (60′) could not be accounted for by a more accurate paraphrase maybe by:

(60$_s$)   Bettina meint$_{de\ se}$, dass sie mit Eddy Merckx verheiratet ist.
        [≈ *Bettina thinks$_{de\ se}$ that she is married to Eddy Merckx.*]

We will leave it open what the exact relation between the two verbs *meinen* [≈ *think*] and *meinen$_{de\ se}$* [≈ *think$_{de\ se}$*] might be. We will show instead that a compositional interpretation of the paraphrase (60$_s$) is by no means a trivial matter. Let us first take a look at the intended interpretation of *meinen$_{de\ se}$* [≈ *think$_{de\ se}$*]:

(R$_{meinen_{de\ se}}$)Let ψ be a verb phrase of the form *meint$_{de\ se}$, dass ϕ* [≈ *thinks$_{de\ se}$ that ϕ*], where ϕ is a (subordinate) clause; and let s_0 and s be an utterance situation and a point of evaluation, respectively. Then $\chi_\psi(s_0)(s)$ is the set of those individuals x that satisfy: that character χ which applied to a point of reference $\langle s_1, s' \rangle$ yields the truth value 1 if the speaker of s_1 satisfies the proposition $\chi_\phi(s_0)$ expressed by ϕ in s', is implied by x's content of consciousness $\chi^{x,s}$ in s.

The hitherto undefined notion of implication for characters may either be construed as entailment on all diagonal points of reference – in analogy to the *a priori* introduced in Section 2.5 – or as elementhood – if contents of consciousness are to be reconstructed by sets of characters.

What (R$_{meinen_{de\ se}}$) means is best seen by way of example (60$_s$). In this case the rule demands (of a point of evaluation) that Bettina's content of consciousness (in that situation) imply the character of the sentence *Ich bin mit Eddy Merckx verheiratet* [≈ *I am married to Eddy Merckx*]; for the latter is precisely true at a point $\langle s_1, s' \rangle$ if the speaker in s_1 satisfies the proposition expressed by *sie mit Eddy Merckx verheiratet ist* [≈ *she is married to Eddy Merckx*]. Thus (R$_{meinen_{de\ se}}$) indeed seems to give the intended *de se* interpretation.

We cheated in formulating the decisive detail of (R$_{meinen_{de\ se}}$). For we forgot to say what it means for an individual x to *satisfy* a *proposition*. At first blush this seems a harmless oversight. For in this case we are only interested in singular propositions p that all consist of precisely the situations in which a certain, fixed individual x_p has a certain, fixed property E_p; and what is meant by satisfaction of p by x (in s) is, of course, that x possesses the property E_p (in s). However, this definition obviously only makes sense if the property E_p can be uniquely determined from the singular p. This, however, cannot be expected in general: in our example this determination fails already, since the proposition is just as much about Eddy Merckxs as it is about Bettina, although the two are ascribed quite different properties. According to (R$_{meinen_{de\ se}}$), then, (60$_s$) would have to have a reading according to which Bettina takes herself to be married with Bettina. This, however, is obviously absurd.

The situation is not hopeless. For (R$_{meinen_{de\ se}}$) can be saved if we only manage to uniquely determine the object of the proposition expressed by the subordinate clause as the position of the pronoun that refers back to the attitude subject. Apart from some marking of the attitude as a *de se* belief, the

70

paraphrase thus also needs to have a marking of the pronouns as bound to the speaker-perspective:

(60$_C$)   Bettina meint$_{de\ se}$, dass sie* mit Eddy Merckx verheiratet ist.
    [≈ *Bettina thinks$_{de\ se}$ that she* is married to Eddy Merckx.*]

The asterisk precisely indicates that the pronoun is the **theme** of the proposition expressed by the clause. For this purpose, then, the concept of a theme would have to be made precise somehow. This could be done, e.g., by **structuring** the whole proposition p into theme and rest (= **rheme**), construing it as a pair $\langle x_p, E_p \rangle$, say. The details of defining such refined propositions are too tricky to be presented here. (See Article 34 [= Bäuerle 1991] for this.) We just mention the principle possibility of making (R$_{meinen_{de\ se}}$) precise in terms of thematically structured propositions.

Version (60$_C$) shows the way to a totally different possibility of interpreting (60) within the classic account, but without refining propositions. For if the marked pronouns are always interpreted as expressing the subject's perspective, they are themselves completely redundant – as long as the places in which they belong are somehow marked. One could thus reduce (60) to (60*) instead of (60$_C$):

(60*)   Bettina meint$_{de\ se}$, dass * mit Eddy Merckx verheiratet ist.
    [≈ *Bettina thinks$_{de\ se}$ that * is married to Eddy Merckx.*]

The difference between (60$_C$) and (60*) is that the latter contains an embedded incomplete clause, one with a gap; the embedded clause lacks a subject, which makes it (at least semantically) a kind of VP. One could thus reduce the extension of the construction '*meinen* + Infinitival' to the character of this VP – and not to the complete clause, as in (R$_{meinen}$). Indeed, nothing is more obvious at the surface; this VP is just the embedded infinitival (ignoring the finiteness of the verb). (R$_{meinen}$) may then be replaced by an according rule. This is what it looks like:

(R$_{meinen\ +\ \text{INF}}$)Let ψ be a verb phrase of the form meint, *dass* ϕ [≈ *takes oneself to* ϕ], where ϕ is an infinitival (with *zu* [≈ *to*]); and let s_0 and s be an utterance situation and a point of evaluation, respectively. Then $\chi_\psi(s_0)(s)$ is the set of those individuals x that satisfy the following condition: x's content of consciousness $\chi^{x,s}$ in s implies that character χ which applied to a point of reference $\langle s_1, s' \rangle$ yields the truth value 1 if at s', the speaker of s_1 has the property $\chi_\phi(s_0)$ expressed by ϕ, i.e. if $\chi_{ich}(s_1)(s') \in \chi_\phi(s_0)(s')$.

Testing (R$_{meinen\ +\ \text{INF}}$) on example (60) is left to the reader. We also point out that according to this rule, infinitival embedding under *meinen* [≈ *think*] is not a monster, which may be seen from the fact that in the above specification of the verb phrase's extension, the character of the embedded infinitival is only mentioned insofar as its intension in the utterance situation is considered. Thus for two intensionally equivalent infinitivals the same set of thinking individuals results. The gentle reader is asked to verify this claim in relation to example (60) and by considering sentence (61), as uttered by Eddy Merckx:

(61)   Bettina meint, mit mir verheiratet zu sein.

According to ($R_{meinen + INF}$), thoughts are **self-ascriptions** of properties. Since in the case of (60) the property ascribed happens to be the intension of the embedded infinitival, the interpretation following ($R_{meinen + INF}$) is very direct and elegant. Thus viewed, it is superior to the reduction ($R_{meinen_{de\ se}}$) of infinitival embedding to clausal embedding, which can only be made precise at the price of more finely grained propositions. On the other hand, the interpretation of perspectival binding by structured propositions is a more universally applicable strategy than the surface-oriented interpretation of infinitival embedding as self-ascription, given that it can even solve the problem of attitudes toward contradictions mentioned in connection with (59) and (59′).

A connection can be made between the interpretation of thinking *de se* as self-ascription of a certain property and the version (E′) of the distinction between perspectiveless and localising information mentioned in Section 2.5. The connection is seen most clearly on the basis of a parameterisation of utterance situations and points of evaluation (in the sense of Section 2.1). To make it, though, one needs to assume that there is exactly one contextual paramater, to wit the speaker. Given (E′) the rule ($R_{meinen + INF}$) can then be equivalently reformulated thusly:

($R'_{meinen + INF}$) Let ψ be a verb phrase of the form *meint, dass ϕ* [$\approx$ *thinks that ϕ*], where ϕ is an infinitival (with *zu* [$\approx$ *to*]); and let c and i be a context and an index, respectively. Then $\chi_\psi(c)(i)$ is the set of those individuals x that satisfy the following condition: the speaker of every context c' in $!\chi^{x,i}$ is in $\chi_\phi(c)(i(c'))$.

Under the given assumptions, the equivalence of this formulation to the original rule is readily shown. After all, (E′) was based on the idea that the localising information of a character χ is already part of its horizontal diagonalisation $!\chi$ taken as a set of contexts. In particular, then, entailments of contents of consciousness $\chi^{x,s}$ must be representable as entailments of $!\chi^{x,i}$ (where i is the parameterisation of s as a point of evaluation). But what does it mean that a character χ is entailed by the set $!\chi^{x,i}$ of contexts? A randomly picked examples may be of help here: obviously Alain's content of consciousness implies the character $\chi_{mir\ ist\ kalt}$ [$\approx \chi_{I\ am\ cold}$] if Alain ($=: x$) takes himself to be in a situation whose Ego is cold at its place in its world etc., i.e., if $\chi_{mir\ ist\ jetzt\ hier\ tatsächlich\ kalt}$ [$\approx \chi_{I\ am\ actually\ cold\ here\ now}$] is true at all contexts in $!\chi^{x,i}$ – in the spirit of the default principle (D). But this just means that $!\chi^{x,i}$ is a subset of $!\chi_{mir\ ist\ kalt}(x)$ [$\approx !\chi_{I\ am\ cold}(x)$]. In the case at hand, the implication between $\chi^{x,s}$ and χ demanded by ($R_{meinen + INF}$) thus becomes a subset relation between $!\chi^{x,i}$ and the set of contexts c' for which $\chi_{ich}(c')(i(c'))$ lies in $\chi_\phi(c)(i(c'))$. It is then clear that ($R'_{meinen + INF}$) is indeed but a reformulation of ($R_{meinen + INF}$) on the basis of (E′).[18]

The version ($R'_{meinen + INF}$) is particularly revealing if the embedded infinitival ϕ does not contain any deictic elements. In this case the rule says that all index parameters are to be occupied by the subject's epistemic situation as represented by a context c'. Following our assumption, the only additional

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[18] The German original of this paragraph contained a number of errors – missing 'x's mostly, which I hope to have all eliminated in the translation.

contextual parameter is the speaker, who according to $(R'_{meinen\,+\,\text{INF}})$ is also determined by c'. The attitude reported in a sentence like (62) thus boils down to a localisation of the subject's epistemic situation: the sentence is true if Alain takes his own situation to be one at whose time, place, world, etc. the subject is cold:

(62)   Alain meint zu frieren.
        [≈ *Alain 'thinks' (i.e., takes himself) to be cold.*]

The contribution the infinitival embedded in (62) makes to determining the extension thus reduces to the set of contexts c' whose speaker possesses the property expressed by the verb. According to $(R'_{meinen\,+\,\text{INF}})$, the subject the infinitival lacks is thus implicitly construed as an aspect of a context from the content of consciousness of the attitude subject. The embedded infinitival thus seems to be a direct expression of a certain localising information in the sense of the distinction (E′). It must be noted, though, that this localisation cannot be obtained from the infinitival character by the !-operator but only by an interpretation of the vacant subject position (in the meta-linguistic explanation). But still: when applied to examples like (62), $(R'_{meinen\,+\,\text{INF}})$ does give a nice illustration of (E′): localising information may be thought of as properties expressed by absolutely referring infinitivals.

Before leaving the field of attitude verbs for good, it should be mentioned that the interpretation of attitudes *de se* by self-ascription, which we had introduced with verbs of infinitival embedding, may in principle carry over to verbs of clausal embedding. The semantic technique needed for this is the **gap inheritance** (or 'gap projection') known from categorial grammar, which we cannot go into for reasons of space though. (Article 7 [= von Stechow 1991] contains an extensive account.) This hint may allay any remaining skepticism towards the above interpretation (R_{meinen}) of clause embedding verbs, due to possible *de se* readings. Patient readers will notice that the details get very complex once they try to account for the subtle difference in meaning between (63) and (63′) themselves, relying on the pertinent rules:[19]

(63)   Lakoff träumte, dass er Brigitte Bardot war und ihn selbst küsste.
        [≈ *Lakoff dreamt that he was Brigitte Bardot and kissed him.*]

(63′)   Lakoff träumte, dass er Brigitte Bardot war und sich selbst küsste.
        [≈ *Lakoff dreamt that he was Brigitte Bardot and kissed her-/himself.*]

In (63,) the accusative personal pronoun is supposed to relate back to the matrix subject *Lakoff*, while the reflexive in (63′) is meant to be bound to the subject *er* [≈ *he*] of the embedded clause. Even those who (like the current author, on days with an odd date) do not really get the reading according to which Lakoff sees the world in his dream by BB's eyes, are heartily invited to assume this very interpretation by way of an exercise.

The examples considered in this section have in common that – quite in the

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[19]The German examples do not translate well into English. For one thing, the German reflexive pronoun *selbst* is not marked for gender – thence the options in (63′), which do seem to make a difference in English! For another thing, judgments of the corresponding sentences (in whichever version) may differ between the two languages, and presumably even between speakers of either language. Readers who want to know more about this may try to get hold of a 1994 handout by Irene Heim entitled: 'Puzzling reflexive pronouns in *de se* reports'.

spirit of the classic account – the deictic elements they contain always relate directly to the utterance situation, and that other perspectives, alien to this situation, are never considered in determining the intensions of any expression parts: (R_{meinen}) leaves the pertinent modes of presentation of the referents of directly referential expressions open and, in particular, does not have them depend on the expressions used in the attitude report; and though ($R_{meinen\,+\,INF}$) requires a particular perspective for the implicit subject of the infinitival, this subject is interpreted syncategorematically and thus not as a linguistic expression whose character marks the attitude in question as *de se*. However, in order to lead the classic account on tricky ground in the area of attitude reports, apparently more is needed than just examples that need to be interpreted in terms of different utterance situations or epistemic states. In order to get clear about what a potential counter-example to the classic account would have to look like, one may at this point consider a remote interpretation of the embedded infinitival according to which the position of the implicit subject is taken by *ich* [≈ *me*] and at the same time it is required that the extension of this covert *ich* [≈ *me*] be determined at the epistemic state of the attitude subject. Such a systematically shifted interpretation of *ich* [≈ *me*] obviously has the same effect as the above interpretation of the infinitival embedding; but then this rather *ad hoc* substitution of the utterance situation is alien to the classic account and avoidable – as proved by the equivalent rule ($R_{meinen\,+\,INF}$). (On top of that, it would lead to syntactic complications.) Still, the question remains whether there aren't any examples for which such a substitution of the utterance situation by a different epistemic perspective would be the only possibility. In particular, this would be the case, of course, if the relevant deictic element appears on the linguistic surface and not – like the purported *ich* [≈ *me*] of the infinitival – could be explained (or explained away) by grammatical analysis. Here is a case in point:

(64)   Schweißgebadet wachte Tom mitten in der Nacht auf: morgen war Heiligabend, und er hatte völlig vergessen, dem Weihnachtsmann seinen Wunschzettel zu schicken.
[≈ *Bathed in sweat, Tom woke up in the middle of the night: it was Christmas Eve tomorrow, and he had completely forgotten to send his wish list to Father Christmas.*]

The problem lies in the temporal adverb *morgen* [≈ *tomorrow*] which normally refers to the day after the utterance situation (and is thus deictic). In the case at hand, it is not a hundred percent clear what *morgen* [≈ *tomorrow*] refers to at all: is it the day following the point of evaluation, or is it the following day according to Tom? Whatever the answer, at least in the most obvious reading of (64), the utterance situation appears to be irrelevant for determining the extension of *morgen* [≈ *tomorrow*]. It seems as if, for the short instant of the utterance of *morgen* [≈ *tomorrow*], it had to be replaced by a different situation. We have found our counter-example, then.

Or maybe not? After all, the reasoning in the above paragraph rested on the assumption that *morgen* [≈ *tomorrow*] is deictic and thus gets its extension from the utterance situation. But then (64) precisely shows that this cannot be so. Perhaps, then, instead of revising all of the classic account, we better just give up the assumption that *morgen* [≈ *tomorrow*] is deictic and on the contrary take

(64) as indicating that it is an absolute word that describes the day following the point of evaluation. If we further assumed that the sentence *morgen war Heiligabend* [≈ *it was Christmas Eve tomorrow*] in (64) is embedded under an invisible attitude predicate (with *Tom* as an invisible subject), we would apparently get quite close to the intended interpretation of (64). What speaks against this easy solution is the fact that examples like (64) are very rare and in the vast majority of cases the adverb *morgen* [≈ *tomorrow*] does refer to the utterance situation, which would have to be explained somehow. What speaks *in favour* of an absolute interpretation, on the other hand, is the fact that an analogous shift of the utterance situation appears to be impossible for such clearly deictic words like *ich* [≈ *I*]: (64′) expresses something totally different from what (64) does.

(64′)   Schweißgebadet wachte Tom mitten in der Nacht auf: morgen war Heiligabend, und ich hatte völlig vergessen, dem Weihnachtsmann meinen Wunschzettel zu schicken.
[≈ *Bathed in sweat, Tom woke up in the middle of the night: it was Christmas Eve tomorrow, and I had completely forgotten to send my wish list to Father Christmas.*]

Clearly, it is questionable whether any decisive evidence against the classic account can be derived from such isolated examples. Sentences like (64) appear somewhat metalinguistic anyway, or at any rate somehow marked. Maybe the recherché-ness of such alleged counter-examples is a hint, after all, that the classic account's analysis of the normal case is not totally off the mark.[20]

4.3   Scopism, Holism, and Quantified Contexts

This section is not so much about an area of phenomena that can not, or only unsatisfyingly, be accounted for by the classic account, but rather about a different approach to the semantics of deictic expressions: **scopism**. There are two reasons why we are dealing with his alternative only here and not already in Part 2: on the one hand, no one ever appears to have worked out a serious scopist analysis of the phenomenon of deixis; its very possibility is merely a spectre wandering through the classicly influenced literature. On the other hand, the very criticism of scopism brings up deep insights into – and possibly grave objections against – the classic account itself.

In order to see at all how (and, indeed, that) scopism is originally motivated, we first present an example that applies the **scope analysis** that is at the heart of scopism to certain absolutely referring expressions:

(65)   Anfang der siebziger Jahre war in der National-Zeitung zu lesen, in schwerer Zeit habe der Kanzler das Vaterland im Stich gelassen.
[≈ *At the beginning of the seventies it was written in the National-Zeitung that the chancellor had left the homeland in the lurch during hard times.*][21]

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[20]Since the article was written, the formal semantics literature on free indirect discourse has grown impressively. See Eckardt (2014) for a book-length treatment.

[21]The *National-Zeitung* is an ultra-right-wing weekly German newspaper. The example alludes to West German chancellor Willy Brandt, who had spent the years of Nazi rule in Scandinavian exile.

We are only interested in one rather specific semantic aspect of (65), viz. the contribution the definite description *der Kanzler* [≈ *the chancellor*] makes to the extension; and concerning this noun phrase, it is mainly the temporal dependence of its extension that we want to focus on. First of all, though, we need to somehow get a grip on the coarse structure of (65). We assume that *war in der National-Zeitung zu lesen* [≈ *(it) was written in the National-Zeitung*] is a subject-less attitude predicate whose extension (at a point of evaluation) comprises the propositions that are expressed by the sentences asserted by the National-Zeitung (at the same point). The adverbials *Anfang der siebziger Jahre* [≈ *at the beginning of the seventies*] and *in schwerer Zeit* [≈ *during hard times*], on the other hand, (existentially) quantify over particular temporal intervals of the time of evaluation. The whole sentence then says that there was a time t at the beginning of the 70s such that in the edition of the National-Zeitung that appeared at t, an assertion was made that is true if there is a time t' between 1933 and 1945 at which the proposition p expressed by the sentence *der Kanzler hat das Vaterland im Stich gelassen* [≈ *the chancellor had left the homeland in the lurch*] was true. According to the semantics of definite descriptions sketched in Section 3.3 what p is depends on whether the description *der Kanzler* [≈ *the chancellor*] is supposed to be interpreted as deictic or as absolute; the embedded clause happens to be ambiguous in this respect. According to the first reading at the time of writing this chapter the intension p_d of the embedded clause would contain exactly the (fictional and actual) situations in which Helmut Kohl leaves the homeland in the lurch; the second reading p_a, on the other hand, consists of the situations s in which the chancellor in s leaves the homeland in the lurch. In the first case, then, (65) would boil down to the claim that the National-Zeitung has scrutinised Helmut Kohl's past at the beginning of the 70s; in the second case it would be insinuated that the rag had accused the Chancellor of the Reich, Adolf Hitler, of treason. One cannot deny that (65) does indeed have these – obviously false – readings.

The problem is, of course, that (65) is somehow right. But at the time the ultra-right press had neither been onto the conservative from the Palatinate nor onto the racist from Braunau. Rather, the target of its attacks had been Willy Brandt, who at the time was the Federal Chancellor in office. Apart from p_d and p_a, then, the embedded clause also seems to be able to express the proposition p_m that is true of precisely those situations in which that person who had been chancellor at the date t of the pertinent date of publication of the National-Zeitung, had left the homeland in the lurch during the Third Reich. This third (or intermediary) reading that obviously cannot be obtained by splitting up the definite description *der Kanzler* [≈ *the chancellor*] into two readings, comes out naturally now under a scope analysis.

We only give a rough sketch of the procedure; the details can be looked up elsewhere. We refer to Articles 22 [= Heim 1991] and 7 [= von Stechow 1991]. Indeed, we already came across the technique in Section 4.1 when we decomposed sentences into noun phrases and open formulae to account for quantificational binding. We can now perform similar decompositions for (65) and its clausal parts, although no pronoun needs to be bound in that case. We are particularly interested in three of these decompositions because, as we will soon see, they correspond to the three readings observed. To begin with one can decompose (65) into the (absolutely interpreted) noun phrase *der Kanzler* [≈ *the chancellor*] and the remaining matrix m_d, *Anfang der siebziger Jahre war in der National-*

Zeitung zu lesen, in schwerer Zeit habe x das Vaterland im Stich gelassen [≈ *at the beginning of the seventies it was written in the National-Zeitung that x had left the homeland in the lurch during hard times*]; this decomposition can then be interpreted so that the extension of m_d is the set M_d of individuals that satisfy the matrix (in lieu of x) and that the whole sentence is true if the extension of the definite description is an element of M_d. A second possibility ensues if we merely decompose the embedded clause into *der Kanzler* [≈ *the chancellor*] and the matrix m_m, *in schwerer Zeit habe x das Vaterland im Stich gelassen* [≈ *x had left the homeland in the lurch during hard times*] and interpret everything accordingly. Thirdly and finally, we can decompose the embedded clause 'below' the temporal adverb into *der Kanzler* [≈ *the chancellor*] and a matrix m_a, *x habe das Vaterland im Stich gelassen* [≈ *x had left the homeland in the lurch*]. As one now easily verifies (and the notation already indicates), these three decompositions correspond exactly to the three readings made out earlier. This was the scope analysis of (65).

It is remarkable that the scope analysis can do without an ambiguity in the definite description *der Kanzler* [≈ *the chancellor*]. One might, at this point, draw the (albeit premature) conclusion that precisely this assumption is redundant. We leave the point open for the time being and first turn to a more radical speculation that seems to equally suggest itself. To this end, we take a closer look at how the directly referential reading of the definite description *der Kanzler* [≈ *the chancellor*] is covered by the scope analysis of (65). We already mentioned that the desired effect is achieved by decomposing the entire sentence into the relevant noun phrase plus the remaining matrix: the extension of the NP is then determined at the situation relevant for the whole sentence, and given principle (D), this happens to be the utterance situation. Of course, this effect does not depend on the details of example (65): as soon as a sentence is decomposed into an NP plus the remaining matrix and interpreted in the way indicated, the extension of the NP only depends on the utterance situation – to wit, due to (D). In this sense direct referentiality can be simulated by scope. Since the complex apparatus of scope analysis is needed anyway, it is only fair to ask why one should not apply it on the very terrain of the classic account, the semantics of deictic expressions. It is precisely this transferral of the scope-analytic techniques just described to deictic expressions that we here call **scopism**. Let us take a closer look at where this speculation is leading us.

First of all it needs to be made clear that a scope analysis of deictic expressions cannot proceed exactly along the lines of the above example. For the very point of such expressions as *ich* [≈ *I*] and *jetzt* [≈ *now*] is to always relate to the utterance situation and not – like *der Kanzler* [≈ *the chancellor*] relate it to or not relate to it, depending on the reading (decomposition). A transferral of the scope analysis to deictic expression would thus have to block any reading according to which they are not interpreted as depending on the utterance situation. That erecting such a blockade cannot be a trivial enterprise may already be gleaned from the fact that a simple regulation according to which every deictic element α leads to a decomposition of the entire sentence $\phi(\alpha)$ into α plus remaining matrix $\phi(x)$, cannot work for the simple reason that the entire sentence may contain more than one deictic element. Apart from this technical detail, a reduction of deixis to scope behaviour would lead to a serious conflict with any kind of compositionality principle. For a sentence containing deictic material, could practically never be embedded in another sentence without the-

reby changing its meaning: by the embedding a new decomposition ensues that is generally not equivalent to the original decomposition. In a way, this is where the target of the classic account against scopism lies; more about this later. Let us first see what may be gained by accounting for deixis in terms of the scope analysis.

It is easy to pin down what makes scopism so attractive as compared to the classic account: it can do without a distinction between utterance situations and points of evaluation, and hence without character as an additional semantic level, on top of extension and intension. Since the distinction of character and intension had been motivated by the classic analysis of deictic expressions in intensional environments, this is not particularly surprising. However, it is worth investigating what happened to the original pair of situations within a scopist analysis. To this end, we will consult a variant of an example that had once (in Section 1.2) served us to motivate the duality of utterance situation and point of of evaluation:

(66)   Monika vermutet, dass ich nicht spreche.
        [$\approx$ *Monika suspects that I am not speaking.*]

According to the classic account, the logical form of (66), when formulated in the extensionalised notation of Section 2.1, looks somewhat like this:

(66$'$)   SUSPECT(s, Monika, $\{s|\ \neg$SPEAK(s, EGO(s_0))$\}$)

In the metalanguage of (66$'$) we made use of the common notation for set abstraction by curly brackets. It should be noted that the variable between '$\{$' and '$|$' is bound in the set term[22] and thus differs from the first, free occurrence of s in (66$'$); we made use of the same variable to stress that the same kind of reference to points of evaluation is made. But then the following – fully equivalent – notation is less confusing:

(66$_c$)   SUSPECT(s, Monika, $\{s'|\ \neg$SPEAK(s', EGO(s_0))$\}$)

Let us now compare this formula with the result of a corresponding scope analysis. For this, we first need to decompose (66) into the deictic *ich* [$\approx$ *I*] and the remaining matrix *vermutet, dass x nicht spricht* [$\approx$ *suspect that x is not speaking*]. (Morphological finesses are again discounted.) The latter contains no deictic elements – at least if we ignore finiteness – and thus has the following, absolutely referring form:

(67)   SUSPECT(s, Monika, $\{s'|\ \neg$SPEAK(s', x)$\}$)

The scope analysis now forms a set out of (67) and assigns to (66) the statement that the extension of *ich* [$\approx$ *I*] is an element of that set. We thus obtain:

(67$'$)   EGO(s_0) $\in \{x|$ SUSPECT(s, Monika, $\{s'|\ \neg$SPEAK(s', x)$\}$)$\}$

We have followed the classic account in making the extension depend on two situations, although we ultimately want to show that according to the scopist approach one situational dependence is fully sufficient. If our suspicion is correct, then, in (67$'$) the free occurrence of s (indicating the point of evaluation of the

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[22]More accurately, '$s|$' binds any (free occurrence of) 's' in its scope.

predicate SUSPECT) and s_0 (which is in charge of determining the extension of *ich* $[\approx I]$) could be replaced by the same variable; and since the speaker parameter EGO only makes sense as relating to the utterance, this variable ought to be s_0. From $(67')$ we thus obtain a formula that can be brought into the following more compact form, again after renaming bound variables:

(66_s) SUSPECT$(s_0$, Monika, $\{s'|\ \neg$SPEAK$(s', \text{EGO}(s_0))\})$

We thus see that in the scope analysis (66_s) the pair of utterance situation and point of evaluation underlying the classic analysis (66_c), has been replaced by the corresponding horizontal diagonal point: the scope analysis is thus equivalent to a horizontal diagonalisation of the classic analysis. So there is a small difference between the two analyses. Does this refute our conjecture that scopism may simulate the classic account, but without characters? Not quite.

The key to clarifying the relation between the two approaches lies in the default principle characteristic of the classic account. For Principle (D) says that a sentence is true in precisely the (utterance) situations in which its horizontal diagonalisation is true. In this way the originally two-dimensional concept of truth of the classic account becomes one-dimensional. From the above observations concerning (66) – which could be generalised to arbitrary sentences, given a suitable precise formulation – we conclude that scopism leads to the same one-dimensional concept of truth as does the classic account. Inasmuch the central semantic concepts can be reduced to the concept of truth (relativised to utterance situations), then, scopism – assuming its feasibility – matches the classic account, at least in descriptive respects. A classic criticism against equating direct reference and wide scope would thus either (a) present *external* criteria for preferring semantic theories that go beyond descriptive adequacy; or (b) name at least one classicly (as opposed to scopistically) definable concept that is not only of interest from within the classic account itself.

Advocates of the classic account usually try to meet the demands (a) and (b) in one fell swoop. We had already seen that scopism is marked with the blemish of non-compositionality. Compositionality, then, is the external criterion adduced by the classic camp. Scopism does not satisfy it; on the other hand, the classic account – again assuming the realisability of the programme – subscribes to the Ban on Monsters (M), thereby satisfying a relatively strict compositionality requirement: compositionality not only holds at the level of characters, but also on the intensional level. At the same time, the *intension* is the most important concept to instantiate (b) against purported scopists: the scope analysis blurs the distinction between character and intension. We may illuminate this classic criticism by the above example. The small difference between (66_c) and (66_s) precisely consists in the fact that only the classic variant distinguishes between utterance situation and point of evaluation (by choosing different variables). The definition of the intension based on the character formula (66_c) takes advantage of this difference by assigning a specific value to the former but not to the latter. Such differentiated assignments are impossible for (66_s) since it contains one free variable only, whose occurrences must all receive the same value. The undefinability of intension explains the failure of compositionality: it is the intension that is needed for embeddings into intensional environments. It would still have to be shown, though, that intensions are of any interest over and above their rôle in compositional interpretation. For this it suffices to focus

on a particular type of intensions, viz. propositions. They had already been in-troduced by an intuitive motivation as the *contents* of sentences, as *that what sentences say*. They have thus obtained an extra-theoretic characterisation – if only somewhat vague one. More precisely, the classic concept of a proposition claims to capture a pre-theoretic phenomenon. This claim of the classic account, to capture the statements made by sentences (in utterance situations) becomes manifest in splitting the informational content in two components in (E). It is here where scopism fails: since the concept of a proposition expressed cannot be defined within it, it cannot come up with a counterpart to (E) either. In particular, it thus does not lend itself to the epistemological considerations in Section 2.5.

We will not go into the classic criticism (a) of scopism concerning composi-tionality here because it is obviously justified.[23] Rather, we are more interested in objection (b) that the classic concept of a proposition is of independent in-terest. We already mentioned that the pre-theoretic notion of what is said is somewhat vague. Let us substantiate that by way of an example:

(68)   Ich bin jetzt in Grasse.
        [≈ *I am in Grasse now.*]

What is said by (68) obviously depends on the circumstances in which the sentence is uttered. By an utterance of (68) in the year 1959, Günter Grass would have said something different from what Patrick Süskind could do with the same sentence in 1989: in the first case the utterance would boil down to the claim that the famous social democrat had been in the perfume town at a certain time in the fifties, whereas the second utterance says of a certain contemporary author that he spends a certain later time in the *Provence* town. At any rate, this is what the classic account teaches. But is it true? Let us imagine both utterances of (68) had been written on picture postcards sent by the authors to their literary agents. At the book fair, the two agents now meet and one of them, seeing the other's card, makes the following comment:

(69)   Das hat Grass damals auch geschrieben; in Wirklichkeit hat er sich dann
        in Godesberg herumgetrieben.
        [≈ *This is what Grass wrote at the time too; in truth he had been in
        Godesberg then.*][24]

We are interested in the first three letters [≈ the first four letters of the trans-lation] of (69) with which the speaker refers to the claim made in Süskind's card. Since according to our story at least the first half of (69) is right, the ex-tension of *das* [≈ *this*] in this reading (A) cannot be the proposition expressed on Süskind's picture postcard (according to the classic account); for during the party convention Günter Grass certainly did not spend any thoughts about the future whereabouts of his future colleague. In a sense, then, what is said by the utterance of (68) under scrutiny is not the same as the intension of the sentence. Of course, even in that situation, one *may* construe this notion in the sense of

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[23]I am no longer so sure of this; but what can be said in favour of compositionality is that it is a useful methodological principle regulating what meanings (denotations, semantic values,...) are.

[24]The example alludes to the 1959 Godesberg convention, where the German Social De-mocrats decided on their party programme for the next decades; it is unlikely that Grass partook in it though, given that he only became a party member in 1982.

the classic account: Süskind's agent might try to be funny and counter his colleague's utterance by his admiration for the far-sightedness of the author of the *Tin Drum*; or express his amazement that the author promoted by himself had already been interested in politics at such an early age. In the first case (B) he would then have understood *das* [≈ *this*] in the sense of *dass Süskind zur Zeit der Abfassung seiner Karte in Grasse war* [≈ *that Süskind was in Grasse at the time of writing his card*], i.e., the intension of the relevant utterance of (68); in the second case (C) he would obviously have the demonstrative refer to the proposition expressed by *Süskind befindet sich 1959 in Grasse* [≈ *Süskind is in Grasse in 1959*]. Note that all three ways of construing *das* [≈ *this*] are legitimate in the situation at hand, even if two of them appear outlandish for factual reasons; and all three possibilites are obtained by horizontal diagonalisation of the character of (68) by relating different situational parameters to the utterance situation; but then it is by no means clear that one of these three interpretations hits what is meant by the sentence (in the situation) in a special way that the other two miss. Using the above notation of extensionalisation, one may represent the three construals of (68) in the situation at hand in the following way:

(68_A) LOCALISED(World(s_0), Time(s_0), EGO(s_0), Grasse)

(68_B) LOCALISED(World(s_0), 1989, Süskind, Grasse)

(68_C) LOCALISED(World(s_0), Time(s_0), Süskind, Grasse)

The claim the classic account makes to reconstructing a pre-theoretic notion is thus anything but obvious; rather, the example gives rise to the suspicion that the vague everyday concept of what is said sways between the intension (68_B) in the classic sense and other possibilities of abstracting from aspects of the utterance situation. At best, the alleged reconstruction is a normative intervention in ordinary language: always use the notion of what is said in the sense of the classic concept of the proposition expressed. Grass's agent's utterance of (69) then displays a lax use of language.

Of course, the classic account and its predecessors first and foremost employed intensions and, in particular propositions, to determine the contribution a part of a linguistic expression makes to the extension of the whole expression in a non-extensional environment. This way of determining propositions is immune against the above critical remarks. But based on it alone no objection against scopism can be raised that essentially goes beyond the allegation of non-compositionality – or at most that the concept of a (compositional) contribution to the extension is of independent (empirical?) interest. If the classic account is to make any further claim based on its concept of a proposition, it would have to resort to a dubious form of normativity.

The way the intension is set up on the classic account, does not only get it into conflict with the pre-theoretic notion of what is said, but just as often with a *environment-sensitive* notion of the contribution to the extension, as based on plausibility considerations. This is at least so in the context of parameterisation. As we have seen in Section 2.3, (always under the assumption that every contextual parameter is also part of the index) paramaterisation boils down to a tripartition $\langle i, i', c \rangle$ of any point of reference into the aspects i of the point of evaluation, the index aspects i' of the utterance situation, and the purely contextual aspects c of the utterance situation. In which list of aspects a parameter

P finds itself, depends on its **shiftability**: if there is a(n intensional) construction that makes the extension of an entire expression depend on the extensions of its parts at such situations that differ from the utterance situation in P, then P is part of the index; otherwise P is purely contextual. It should be noted that this classification of P is once and for all and, in particular, independent of the construction responsible for shiftability: if there is but a single shift concerning parameter P, the latter is on principle part of the index; in this case any intensional construction needs to account for the dependence of the extension on the value of P must be accounted for – and be it only *pro forma*. The casue for certain lacks of plausibility may be seen in this inflexibility in the tripartition of the points of reference.

A few examples hopefully show what is at stake here. In their analysis we will even more depart from any standards of descriptive semantics than we have already done in this chapter. May the didactic goal of elucidating a general theoretic point justify unscrupulousness towards the data and their description!

A modal adverb like *möglicherweise* [≈ *possibly*] relates to the world parameter and none other, at least according to a natural semantic analysis:

(70)   Möglicherweise war alles umsonst.
         [≈ *Possibly everything was for free.*][25]

If after finishing an opulent meal in a restaurant, Fritz several times unsuccessfully asks for the bill and then expresses his hope by (70), he thereby says that at least in certain, presumably unrealistic situations s, it so happens that the sentence embedded under the modal adverb, *es war alles umsonst* [≈ *everything was for free*], is true in s. Not every conceivable s is talked about then, but only those that are located at the same place at the same time, but not necessarily in reality. So it is only the world aspect that is shifted. This dependence on the world aspect thus appears a natural choice for the contribution to the extension of the whole sentence.

A local adverb like *nirgends* [≈ *nowhere*] relates to the place parameter and none other, at least according to a natural semantic analysis:

(71)   Nirgends gibt es einen für diese Zwecke geeigneteren Ort.
         [≈ *Nowhere is there a more suitable place for this drawing pin.*][26]

If a pupil, after having been asked by his teacher to take away the thumbtack on her chair, replies (71), he thereby says that no situation s is such that the sentence embedded under the local adverb, *es gibt einen für diese Zwecke geeigneteren Ort* [≈ *there is a more suitable place for this drawing pin*], is true in s. Not every conceivable s is talked about then, but only those that are located in the same world at the same time, but not necessarily at the same place. So it is only the place aspect that is shifted. This dependence on the place aspect thus appears a natural choice for the contribution to the extension of the whole sentence.

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[25]This is the translation of the reading under scrutiny. According to a much more prominent reading, (70) translates as: *Possibly everything was in vain.* The source of the ambiguity is the (predicative) adjective *umsonst* [≈ *free/in vain*].

[26]This is the translation of the reading under scrutiny. According to a much more prominent reading, (71) translates as: *Nowhere is there a more suitable place for these purposes.* The source of the ambiguity is the noun *Zwecke* [≈ *purposes/drawing pin*].

The observations made in connection with (70) and (71) are not a hundred percent compatible with the classic account. For if the analysis of (70) shows that the world parameter is shiftable and the analysis of (71) indicates shiftability of the place parameter, then in either of the two cases the shiftability observed in the other case would have to enter the global concept of the intension, which is independent of the specific construction. In both cases, the contribution of the embedded clause to the extension of the whole sentence would have to be the dependence on world, space, and further aspects observed in other environments. Thus, according to the classic account, what a part of an expression contributes to the extension of the whole, strictly speaking depends on all non-extensional constructions of the language under analysis (or on their grammatical description). In this sense there is a **holistic** element attached to the classic theory. An alternative to this holism might consists in a more flexible account of points of reference. Here we will only sketch a conceivable strategy; whether it ultimately leads to more intuitive results, is in the lap of the semantic gods.

For this sketch we assume a fixed parameterisation. For any set M of index parameters, then, an M-point (of reference) is a pair consisting of a context and an M-index, i.e., a list of index aspects that only contains a value for every element of M. An M-index m can be incorporated into an ordinary index i by replacing the corresponding aspects by m; we write the result as i/m. At any (parameterised, unsplit, and possibly disharmonious) point of reference $\langle c, i \rangle$, any ordinary character χ then naturally determines an M-intension called $\chi(c)(i - M)$, which is a function from M-indices to extensions: for any M-index m, the value of $\chi(c)(i - M)$ is $\chi(c)(i/m)$. In close analogy to the concepts introduced in Section 1.4, an n-place syntactic operation F may now be called M-**intensional** if M-intensionally equivalent parts of expressions always lead to extensionally equivalent wholes, i.e., if for all characters $\chi_1, \chi_1', ..., \chi_n, \chi_n'$ and all points of reference $\langle c, i \rangle$, the following holds:

$$\chi_1(c)(i - M) = \chi_1'(c)(i - M), ..., \chi_n(c)(i - M) = \chi_n'(c)(i - M) \text{ implies:}$$
$$\Sigma_F(\chi_1, ..., \chi_n)(c)(i) = \Sigma_F(\chi_1', ..., \chi_n')(c)(i).$$

And by the same analogy, such a syntactic construction F is M-intensional if the corresponding semantic operation Σ_F can always, i.e., at every context c, be reduced to an operation Σ_F^c on M-extensions in that for any characters $\chi_1, ..., \chi_n$ and indices i the following holds:

$$\Sigma_F(\chi_1, ..., \chi_n)(c) = \Sigma_F^c(\chi_1(c)(i - M), ..., \chi_n(c)(i - M)).$$

If the above sample analyses of (70) and (71) were correct, then the addition of a modal or local adverb would be {World}- and {Place}-intensional, respectively. Again in analogy to Section 1.4, we leave the specification of the corresponding M-intensional operations to the reader. And we refrain from carrying over the considerations on canonicity made in connection with intensional and mixed constructions.[27]

The goal of all this sophistry is to provide a conceptual frame for a softened version of the classic account. The prime idea is to find, for any syntactic operation F, a minimal set M of index parameters such that F is M-intensional.

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[27]See the first three sections of Zimmermann (2018) for more on this.

Once such minimal sets of parameters have been found – as a rule, this should not be to hard – the classic dichototomy of intensionality and extensionality in grammar can be replaced by a whole spectrum of M-intensionalities like **temporality** ($M = \{\text{Time}\}$), **modality** ($M = \{\text{World}\}$), **propositionality** ($M = \{\text{Time, World}\}$), etc. In the beginning this is merely a refinement of the classic account. However, the situation changes once M-intensions are not just used to classify syntactic constructions but also enter different parts of the theory, as would be the case if, say, the Principle (E) brought up perpectiveless information in terms of the whole spectrum of M-intensions that are obtained by abstracting from some index aspects while supplying the others by the context. Ignoring the assumed pure contextuality of the speaker parameter, one would thus have a starting point to account for the elusiveness of what is said, observed in connection with (68); said gap could then be closed either by quadrature or by extending the concept of M-intensionalities.

The above remarks are admittedly rather sketchy and unfinished,[28] but may be taken as an inspiration for further scrutinising the recently found, slightly unsettling phenomenon of **quantified contexts**. The phenomenon occurs when seasoned contextual parameters all of a sudden are caught shifting, i.e., bound by linguistic operations. In Section 1.3 we already mentioned a harmless case, one that may be explained in classic terms:

(72)   Vater werden ist nicht schwer.[29]
         [≈ *It is not hard to become a father.*]

On the assumption that *Vater* [≈ *father*] is a functional noun and that, furthermore, a missing argument is supplied by the context, we seem to have a serious problem. Obviously, on its most straightforward reading, (72) does not say that being the father of a particular kid that has perhaps been mentioned immediately before the utterance of the sentence, is a burden; rather, what is apparently intended is a statement on paternity in general. Depending on the scope of the negation, the argument position is thus quantified existentially or universally. In any case, one would then have to abstract from the slot intended for contextual filling, which is not possible by the rules of the classic account.

The problem about (72) can be solved in several ways. First of all it must be noted that the relevant deictic position is invisible and thus, like the missing subject of the infinitival in the previous section, can be manipulated rather easily: perhaps the construction underlying the quantified reading is not the deictic possessivisation discussed in Section 3.3. Another explanation is purely pragmatic: there is something proverbial about (72). And in speaking words of wisdom, one does sometimes abstract from context. Here is a case in point:

(73)   Ich kann doch nicht einerseits andauernd Nächstenliebe predigen und
         andererseits sämtliche Nachbarn verklagen.
         [≈ *I cannot permanently preach charity and at the same time sue all
         my neighbours.*]

The word *ich* [≈ I] in (73) is not so much understood as denoting the speaker

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[28]A slightly more extensive treatment of parametrisation can be found in the last section of Zimmermann (2012).

[29]Cf. fn. 2 for the source of this quotation.

than as standing proxy for his perspective or rôle (of a moral subject).[30] There are good reasons for assuming that such quantifications can be shoved to the type of speech act and thus to pragmatics. And whatever works with (73) should also work for (72).

The next two examples show that refuge in pragmatics does not bring relief from the evil of quantified contexts:

(74)   Die meisten Unternehmen sprechen die Preisgestaltung mit der Konkurrenz ab.
     [≈ *Most companies arrange pricing with their competitors.*]

(75)   Jeder Gast ist mir willkommen – und sei es nur, damit wir über den Rest der Welt lästern können.
     [≈ *Any visitor is welcome – and be it only so that we can make malicious remarks about the rest of the world.*]

It should be clear that an interpretation of (74) as talk about competitors in general leads to a weird reading. But then there is again the possibility of explaining away the contextual shift by another possessive construction that neither fills in the context nor quantifies (existentially or otherwise) but introduces a variable for later binding (in the sense of Section 4.1).

(75) is harder. The problem is that the word *wir* [≈ *we*] does not refer to a particularly salient group that includes the speaker, as we would have expected given the discussion in Section 3.1. Instead the word appears to act as a variable bound by the main clause subject and ranging over relevant groups including the actual speaker: *wir* [≈ *we*] means something like *ich und der jeweilige Gast* [≈ *I and the corresponding guest*]. However, this way the salience aspect in charge of picking out the right group gets bound; according to the classic account it thereby turns out to be part of the index. But then the pronoun *ich* [≈ *I*] contradicts hypothesis (L); for in determinig the extension of *wir* [≈ *we*] in (75), the speaker aspect is still contributed by the context.

All these examples apparently indicate that the distinction between (shiftable) index and context aspects does quite not work as postulated by the classic account. Whether some softer variant of the theory could be of help, is not clear though. More recently, ways of radically revising or even replacing the classic account of deixis have been investigated. The starting point of some of these investigations are certain inadequacies of the scope analysis of definite descriptions and quantifying noun phrases. As a case in point, the scope analysis cannot really explain why (76) can (also) be understood as saying that said former Nazi had been mayor only at the time preceding the activities reported in the second

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[30]The German text adds the strange qualification:

     which is quantified by the introductory sentence.

which derives from an earlier version (Zimmermann 1988) that contained a different example in lieu of (73):

(*)   So ist das nun einmal im Leben: was ich will, das darf ich nicht, und was ich darf, das will ich nicht.
     [≈ This, then, is what life is like: whatever I wish to do, I am not allowed to do, and whatever I am allowed to do, I do not wish to do.]

If I recall it correctly, it was Manfred Krifka who suggested to replace (*) with something along the lines of (73).

sentence:

(76) Nach dem Krieg blieben viele der Parteimitglieder ohne Gesinnungs-
wechsel im Amt. Der Bürgermeister, der freilich inzwischen hatte zurück-
treten müssen, wurde noch Jahre später auf NPD-Kundgebungen gese-
hen.
[≈ *After the war many of the party members staid in office without
any change of attitude. The mayor, who in the meantime had to resign
though, had been seen at NPD-rallies years later.*][31]

As a substitute for the scope analysis, strategies of distributing (variables for)
points of reference have therefore been frequently proposed in order to determine
the reference of absolute parts of expressions. This strategy can then again be
pursued in the analysis of deixis. Whether the problems of the classic account
mentioned in this section can be solved that way and what new problems it
may create, is a different matter, of course. But certainly a new perspective will
ensue.

4.4 Misuse

To finish off the article, we present two extensions of the classic account which
though partly adhering to the letter, are alien to its spirit. The first of these
extensions results from the possibility of weird paramaterisations, already men-
tioned at the beginning of Part 3 and not easy to exclude on theoretical grounds;
the second one is a revision that once again reinterprets the consequences of the
epistemological re-interpretation discussed in Section 2.5. Obviously these days
the fact that the classic account is not able to defend itself against such – by no
means fictional – cases of misuse ought to give every responsible scientist cause
for thought.

Concerning the first kind of misuse, it suffices to notice a salient peculiarity
of deictic words. It is, e.g., one of the characteristics of *ich* [≈ *I*] that it may
have different extensions in different situations. In that the deictic word does not
differ from most absolute words. If the classic account is right, the difference
lies in the fact that the situational dependence may make a contribution to
determining the extension in the case of an absolute word, but not for a deictic
one. Obviously, however, different extensions in different situations may also be
encountered for quite different reasons. Apart from the difficult case of proper
names (which are the topic of Article 16 [= Lerner & Zimmermann 1991]),
we particularly find changing extensions where intensions change too, to wit
in **ambiguities**. And as in the case of deictic expressions, the change of the
intension as such does not contribute to determining the extensions. Just like
ich [≈ *I*] always refers to the speaker of the utterance situation, an ambiguous
word like *Schloss* [≈ *castle / lock*] always refers to whatever is meant by *Schloss*
[≈ *castle / lock*] in the utterance situation. Let us illustrate this with a more or
less arbitrary example:

(77) Caroline hat vor, sich morgen ein Schloss zu kaufen.
[≈ *Caroline is planning to buy a castle / lock tomorrow.*]

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[31]The NPD [*Nationaldemokratische Partei Deutschlands*] is an ultra-right-wing political
party found in West Germany in 1964.

(77) has (at least) four readings that result from multiplying the lexical ambiguity of *Schloss* [≈ *castle / lock*] with a structural (scope) ambiguity we are not interested in here (arbitrary vs. specific *castle / lock*).[32] For example, according to one of these four readings, Caroline is planning (in the sense of an analysis given in Section 4.2) to have the property that an individual x has in a world w just in case in w there is a castle that x buys in w on the day following the utterance of (77). A reading (77) does not have is one according to which Caroline's longing is directed to arbitrary times that are followed by days at which she then buys the castle: *morgen* [≈ *tomorrow*] is counting from the day of utterance. Likewise, there is no reading according to which Caroline wants to buy something on the day following the utterance that is either a padlock or a building – depending how *Schloss* [≈ *castle / lock*] is understood in the situation of the transaction: disambiguation thus takes place in the utterance situation.

The fact that lexical disambiguations take place in the utterance situation now be seen as a hint that ambiguous lexemes refer to the utterance situation. Lexical ambiguity would then be a special case of direct reference. And the conceptual apparatus of the classic account could then carry over from determining reference to disambiguation – which is normally thought to be prior to it. Obviously, all it takes for this move, is a reference to the reading of a(n ambiguous) lexeme expressed in the utterance situation – or, if we are into parameterisation: a (purely contextual) **disambiguation parameter**. The introduction of such a parameter constitutes the first of the cases of misuse announced above. Let us get clear about some consequences of this disgraceful practice.

A first reason for being skeptic about a disambiguation parameter is that it destroys the principle (L) about the bipartition of the lexicon. This is again readily seen from example (77). In the reading considered above, Caroline's plan is not directed to the objects that are castles at the time of utterance: in our rapid times, what is a castle today may be a ruin tomorrow. So the extension of *Schloss* [≈ *castle / lock*] needs to be determined at the point of evaluation. But then the lexeme *Schloss* [≈ *castle / lock*] would have a mixed mode of reference: due to disambiguation, the extension would depend both on the utterance situation and on the point of evaluation.

Further uneasiness against disambiguation by the utterance situation comes once one notes that it expands the sphere of influence of token analysis:

(78)   In Carolines Schloss muss das Schloss am Hauptportal erneuert werden. [≈ *In Caroline's castle /* ♯*lock the* ♯*castle / lock at the main portal needs to be replaced.*]

A single utterance situation for (78) would determine the very same reading for both occurrences of *Schloss* [≈ *castle / lock*]. To avoid this, one would thus have to split up the situation in the sense of token analysis. Without a disambiguation parameter there would be no need for this.

And there is more. Once the context is burdened with the labour of disambiguating (78), one ought to throw (79) in too:

(79)   Ein Wechsel der Bank bewirkt keinen Unterschied im Gehalt.

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[32]The English translation is also 'attachment'-ambiguous as to whether *tomorrow* modifies *planning* or *buy*; the German original lacks this ambiguity: the adverb *morgen* [≈ *tomorrow*] can only modify *kaufen* [≈ *buy*].

[≈ *A bill / change of the bank / bench does not make a difference in salary / content.*]

(79) possesses (at least) eight readings most of which are of course rather peculiar due to their content. The difference with (78) is that the ambiguities in (79) cannot be traced back to the **words** but rather to coinciding **word forms**. *Wechsel* may denote a change or a means of payment, but only in the second case can it also be pluralised. (The assessment of this example may be subject to dialectal variation!) Pluralisation also exposes the two readings of the form *Bank* as belonging to different words.[33] The case of *Gehalt* is even simpler: apart from other morphological differences, we have two genders. [34] If one now wanted to disambiguate (79) by recourse to the characters of these words and thus have a single word *Bank* with a context-dependent intension, one would have difficulty in explaining why the plural sometimes is *Banken*, and sometimes *Bänke*, and why on top of this, the intension depends on the choice of the plural form. On the other hand, if one were to assign characters to the forms themselves, one would give up the concept of a word for lexical purposes and could no longer explain why, e.g., in the vast majority of cases, morphologically tightly related forms also happen to have the same characters. To avoid such absurd consequences, one would have to restrict the range of activity of the disambiguation parameter to true lexical ambiguity – unsystematic ambiguity on the word level. However, given that disambiguation also happens on the level of forms, these would have to be accounted for in different terms, perhaps by pragmatically explained strategies of understanding. The assumption of such additional strategies beyond the disambiguation parameter makes the latter redundant though: resolving an ambiguity like (79) does not seem to be a principally different enterprise from disambiguating (78), and so strategies for solving the first problem should carry over to the second one.

In the case of structural ambiguity, too, the assumption of a disambiguation parameter is likely to lead to problems. After all, at least according to folklore, determining the extension of complex expression is guided by syntactic structure, which is thus presupposed for these purposes. Yet according to an equally common view, structural ambiguity is triggered by syntactic structure, which is why the identification of the correct reading by means of a contextual parameter – however this might work – again seems to be redundant.

Little can be said against disambiguation by context dependence though if it is restricted to **polysemies**, i.e. ambiguities on the word level with an obvious, systematic connection between the readings. A typical case is the possibility to use names of institutions that are hosted in buildings to also refer to these buildings:

(80)   Die Universität ist vollkommen uninteressant.
        [≈ *The university is totally uninteresting.*]

If an architect utters (80) in a talk on the lake city Constance, he may thereby (a) express an expert aesthetic judgment about a certain edifice, or give his audience to understand that (b) architecture is not among the subjects taught at the university in that town. If one were to resolve this ambiguity by a disambiguation

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[33] *banks* translates as *Banken*, *benches* as *Bänke*.

[34] *salary* translates as *das Gehalt*, which is neuter; *content* translates as *der Gehalt*, which is masculine.

parameter, one could raise the same objections as against the above cases. But then the systematicity of this ambiguity at the same time opens quite a different possibility of putting the classic account of context dependence to work. Thus: one may underlay reading (a) a more complex logical form in which the subject of (80) corresponds to a description like *the building corresponding to the university* or (should the polysemy instantiate a more general phenomenon) *the concrete object corresponding to the university*.[35] It would then be up to a contextual parameter to contribute the pertinent relation of correspondence. Even if this proceeding may appear somewhat strained here, we would still want to point out the principle possibility of such a semantic resolution of polysemies and the principle difference from assuming a disambiguation parameter: the reduction of polysemies to hidden context variables sketched here – and already mentioned in Section 3.3 – presupposes a systematic predictability of readings to a high degree. In particular, it is not at all certain that all phenomena treated as polysemies in the literature can or should be treated in this way.

That the classic account should not be employed to resolve lexical ambiguities does of course not mean that any description or explanation of this everyday process is incompatible with the classic account. It is just that determining the correct reading is not part of semantics but of pragmatics. From the classic point of view, the question of which reading of a (surface) form is meant by a particular utterance is thus not so much a matter of determining extension than akin to questions like what the speaker may have intended with his utterance; which language this utterance is made in; and whether it says anything at all or is rather a cough or a parrot-fashion repetition.

Much more could be said about the relation between context dependence and ambiguity, but here we are primarily interested in the aspect of perverting the classic account by adding a disambiguation parameter. We repeat that, apart from hypothesis (L), no theory-internal reasons seem to speak in favour of excluding such a parameter and therefore sense an unsatisfactory lacuna in the classic theory.

The second instance of theory misuse starts with the observation made, and philosophically twisted, at the end of Section 2.5, viz. that the classic account offers two independent concepts of triviality: apriocity, which pertains to characters, and necessity, which is a property of propositions. The first plays a rôle that is analogous to validity in logic: a valid formula is one which, regarded on its own and not as part of another formula, is always true (i.e. in all models); likewise a sentence is *a priori* true if it is always true (i.e. in all contexts) when it is uttered in isolation, i.e. unembedded. Since it makes a difference whether a sentence is logically trivially true or whether it expresses a necessary proposition, one may see this as a new take on the notorious lack of fine-grainedness of propositions, which, as we have seen in Section 4.2, primarily shows in the fact that according to the classic account, equivalent sentences may replace each other all too easily. But *a priori equivalence* – coinciding extensions in all utterance situations – does not necessarily imply *intensional equivalence*, i.e. (in the case of sentence) sameness of the propositions expressed. Thus (81) and (81′) are *a priori* equivalent but according to the classic account, they never express the same proposition:

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[35]No pun intended: *concrete* translates German *konkret*, which unambigiously denotes the opposite of *abstract*.

(81)   Alain geht zur Schule.
         [≈ *Alain is going to school.*]

(81′)   Alain geht jetzt zur Schule.
         [≈ *Alain is going to school now.*]

The intensional difference between these two sentences also explains – according to the classic view anyway – why they behave differently when embedded under, say, the temporal prepositional phrase *nächstes Jahr* [≈ *next year*]. Might one then not assume an equally subtle difference between (81) and the logically equivalent (81′), which by analogy only shows in embeddings under, say, attitude verbs?

(81″)   Wenn Alain nicht zur Schule geht oder Tom den Kindergarten besucht, dann geht Alain zur Schule.
         [≈ *If Alain is not going to school or Tom is going to kindergarten, then Alain is going to school.*]

(We are of course assuming that in (81″) *wenn – dann* [≈ *if – then*], *nicht* [≈ *not*], and *oder* [≈ *or*] are to be construed in the sense of classic propositional logic; readers with scruples may change the example.) The assumption of possible intensional differences between logically equivalent sentences constitutes the second case of misuse of the classic theory of reference discussed here. Let us get clear about some presuppositions of this disgraceful practice.

We do not wish to call into question that logical equivalence implies *a priori* equivalence. Consequently, pairs of sentences like (81) and (81′) must be assigned the same truth value in all utterance situations. The most obvious method to guarantee this (and the only one considered here) is simply to assign the logical material occurring in such sentences (in our case: the connectives) the logically expected extension at all pertinent points of reference: so at any point of the form $\langle s_0, s_0 \rangle$, *nicht* [≈ *not*] denotes the inversion of truth values, etc. The *a priori* equivalence of (81) and (81′) then is primarily achieved by compositionality. Of course, we now must not – as is otherwise done on the classic account – have this **standard behaviour** of logical material carry over to arbitrary points of reference; for as is easily checked, this way the corresponding sentences would also come out as intensionally equivalent, which is what we want to avoid. So we need points $\langle s_0, s \rangle$ at which, say, *nicht* [≈ *not*] does not denote the inversion of truth values. Let us call such points $\langle s_0, s \rangle$ **non-standard points**. Now, there are two problems connected with the introduction of non-standard points that do not seem to have a satisfactory solution. This fact plus the observation that there seems to be no intuitive parallelism between the contrast (81) vs. (81′) on the one hand and the difference between (81) and (81″) on the other hand, make this indicated possibility of fine-graining propositions appear an error.

Both problems suggest that the notion of a non-standard point is rather obscure; the assumption of an intensional difference between (81) and (81″) thus implies the existence of highly dubious objects. Problem Number One is simply: what should a non-standard point $\langle s_0, s \rangle$ look like in the first place, what is its internal structure? We can only say that s_0 and s cannot be the same situation. But it remains unclear whether the two have anything in common, or whether they can have anything in common (e.g., their time or place); where s can be an utterance situation; whether s can, or even must, be disharmonious;

etc. The problem is not that these questions could not be answered in a way that finally some concept of fine-grained proposition evolved. The problem is that apparently any way of answering these questions seems arbitrary. A non-standard point is just a point of reference at which logic no longer works. Why this is so and what the point of reference looks like apart from that, does not matter as long as it is not on the diagonal. And this last-mentioned constraint, merely driven by the effort of guaranteeing the apriocity of logical truth, looks particularly arbitrary.

Problem Number Two concerns the non-standard behaviour of logical expressions: if the ordinary, logically expected extension is taboo, then what is the extension of a logical expression at a non-standard point? Does the word *nicht* [$\approx$ *not*], e.g., always denote either the inversion function or some other particular function, or does the extension of the negative particle vary from one non-standard point to the next? Can the extension of an otherwise extensional connective become intensional at a non-standard point? How many logical expressions can deviate from their standard behaviour at a non-standard point: all of them, five, or only one at a time? For these questions too, the problem is not that they could not be given some answer but what answer should be given.

Obviously, the common cause of these problems is that the notion of a point of reference at which logic fails, does not really mean anything. It was merely the idea to exploit a certain property of the classic account to finegrain the concept of a proposition that led to the assumption that such points exist in the first place. Or maybe they had been there all along without anybody noticing? And maybe the assumption mentioned in Section 1.3, usually taken for granted, viz. that logical words are both deictic and referential and thus always have the same extension, was plainly false? Indeed: isnt't a fictional situation in which a language is spoken that differs from German only in the semantics of some (for us) logical words, a good start for constructing a non-standard point? No. For the determination of extensions by classic characters does not follow the rules of the language spoken in a given situation. If this were so, we could not even interpret sentences about pre-historic times; and sentences about foreign countries and cultures would end up with the wrong truth conditions galore. Moreover, the addition and consequential interpretation of such utterance situations would immediately result in empty concepts of aprioricity and necessity. So the fact that even at exotic points of referents do we need to determine extensions according to the actual rules of German, precisely shows that there cannot be non-standard points within the classic account.

One may, of course, turn the necessity of the unknown non-standard points into the virtue of their indeterminacy. An analogy to a procedure of interpreting linguistic expressions that is quite common in logical semantics (and was called **abstract** and **formal** in Section 2.1). For instead assigning characters to expressions (by listing them, in the case of lexical expressions, and via rules otherwise) it is normally only indicated what such an assignment looks like in general. This procedure leaves a lot of room for concrete specifications that are usually of no concern to semantics. This room could then be extended by adding arbitrary non-standard points as a matter of definition. As a consequence, every answer to the questions asked two paragraphs earlier would lead to a theoretically possible interpretation. Although one may cunningly evade embarrassing questions about the nature of things in this way, no insights in the actual working of language would be gained; only a well-behaved formal apparatus for

modelling would be enforced. And is this supposed to be the point of the whole enterprise?

5 Historical and Bibliographic Remarks

The literature on context dependence is extremely voluminous and only fragmentarily known to the current author. The following hints thus make no claim to completeness, and not even to representativity. Only the most important sources the text is based on are listed, together with a few classics as well as select works that go deeper into detail. The remarks loosely follow the content and order of the main text; sections correspond to parts $(1-4)$, and paragraphs to sections (1.1, etc.).

5.1 Concerning the Classic Account

The observation that linguistic expressions sometimes refer to the world and thus have extensions, is too obvious for historical reference. Frege (1892) is an early attempt to obtain extensions (*Bedeutungen*) for *arbitrary* linguistic expressions. The idea of identifying the extension of a sentence with its truth value as well as the introduction of vicarious extensions (*Sinne*) to salvage a(n implicit) principle of compositionality, goes back to the same work. The set-theoretic definition of truth values and its motivation in terms of predicate logic only appears in Tarski (1936) though. The characterisation of intensions as functions determining extensions ultimately originated with Carnap (1947), where however the differences with Frege's *Sinne* are explicitly pointed out (in §29).

Semantic accounts of clausal embeddings along the lines of (R*) are part of a logico-semantic folklore starting with Hintikka (1969); the notion of a singular proposition goes back to Kaplan (1975), where a connection is made to Russellian ontology. The fact that deictic expressions do not smoothly fit into the picture obtained by the distinction of extension and intension has already been seen in Frege (1918/19). The account given in the text follows the spirit of Kaplan (1977), the primary source of the theory of reference that is called 'classic' here. The exact origins of this theory cannot not be fully traced but seem to lie in California: Kamp (1971) and Vlach (1973) are among the early precursors; Montague (1968: Section 3) and Montague (1970: Section 4) are further early (though not very explicit) testimonials. The first chapter of Kratzer (1978) offers a good and extensive introduction.

The distinction between different kinds of reference within the classic account is too obvious to be attributed to anyone. Hypothesis (L) is probably novel (but not particularly original either). The connection between (L) and the separation of finiteness from the lexical verb has been pointed out by Arnim von Stechow (in a comment to a predecessor of this article). Filling in underdetermined dimensions by the utterance situations has been proposed in Bartsch (1986); a corresponding inclusion of standards can be found in E. Klein (1980). The operator *dthat* is pre-classic and derives from Kaplan (1978); see also Kaplan (1977: Chapter XVII).

The General Principle of Compositionality can be found in Montague (1970: Sections 3 and 4), where monsters are explicitly allowed. The first plea for a

Ban on Monsters is in Kaplan (1977: VIII), where the term 'monster' originates too. The monstrous analysis of dimensional adverbs again follows ideas from Bartsch (1986). Pinkal (1977: Chapter 6) points out further monsters that dwell in the area of modifier semantics.

5.2   Concerning the Variants and Alternatives

Situational paramters and aspects already appear in the earliest formulations of the classic account and before: see, e.g., (the pre-classic) Scott (1970) and (the classic) Kaplan (1979). Indeed, there is a case for viewing parameterisation as the 'official' version of the classic account and regard whatever we have been calling 'classic' as a heuristic illustration at best.[36] Disharmonious lists of index aspects are argued for in Lewis (1980: Section 6), where one also finds a plea for the preservation of utterance situations to stop the wild ranking of contextual parameters deplored in Cresswell (1972: Section 4). In Kaplan (1977) this question is only addressed in passing (and left open, in footnote 16).

Tichý (1971) is an early advocate of extensionalised logical forms. More recent works have been inspired by Gallin (1975: §8) though. The reformulation (EM) of the Ban on Monsters is part logico-semantic folklore. From its earliest versions, the classic account has already been conceived of as an *abstract* theory of reference: see, e.g., Kaplan (1979). Montague (1970: Section 4) is a version in which not even (D) can be formulated without further axiomatic assumptions; as a case in point the diagonal makes its appearance as the set of '*designated* points of reference of logically possible models' (*ibid.*, 382).

The primary source of two-dimensional modal logic is Segerberg (1973), where the connection with context dependence is already mentioned. The differences between two-dimensional modal logic and the classic account due to the asymmetry of the 'dimensions' have been stressed chiefly in Chapter VIII of Kaplan (1977). The idea of quadrating characters to make all deictic expressions circumscribable can be read into Stalnaker (1981: Section IV), where the contexts and indices are confusingly referred to as 'worlds'.

The analysis of deixis as token reflexivity is older than the classic account and goes back to Reichenbach (1947: 50). In Cresswell (1973: Chapter 8) it has been advertised as an alternative to the classic account that gets closer to the nature of language. The importance of demonstrations for the classic theory had already been seen in Kaplan (1977: Chapter II). A detailed classic treatment of inhomogeneous utterance situations can be found in von Stechow (1979).

The analogy between the semantics of deictic expressions and the analysis of epistemic situations has a pre-history that goes back to Russell (1940) at least; the modern classic is Castañeda (1966). Forbes (1989) offers an extensive discussion of the philosophical aspects (as well as further references). The identification (F) of informational content and intension is from Frege (1892). The notion of a standard name goes back to Kaplan (1968: §VIII). Version (S) of the

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[36]At this point the German text contains the following parenthetical remark:
'(Apart from this there is a further terminological trap in our account: the English adjective *indexical* does not correspond to our *indexikalisch* [≈ *index_{adj}*]; the latter derives from *index* - which usually translates into English as *index*, while the former corresponds to the German word *deiktisch* [≈ *deictic*] and thus pretty much means the opposite!)'. To escape this terminological conflict the English translation avoids the adjective *indexical* altogether, thereby making the above remark pointless.

construction of the epistemic perspective corresponds to the strategy in Stalnaker (1978); the formulation follows a proposal from Lewis (1980: 94). (E) can be found in Kaplan (1977: Chapter XVII). The result of the reduction (E′) is the (independently motivated) characterisation of self-localisation in Lewis (1979b) – minus the identification of individuals and contexts (of a certain parameterisation), which would have required the ontology advertised there. Identity crises have been much discussed ever since Perry (1977), a further classic. The account of the opposition between (one type of) apriroicity and (metaphysical) necessity follows the reconstruction in Kaplan (1977: Chapter XVII) of a congenial distinction from Kripke (1972). The proof of the existence of any thinking being can be found in Descartes (1641: *Mediatio* II,3). Example (27) to illustrate the incompatibility of token analysis with the epistemological interpretation of the classic account was proposed by Jean-Yves Lerner (in a discussion with the author). That the epistemological reinterpretation is merely an analogy had already been indicated in Kaplan (1977: Chapter XX). Williamson (1986) gives an example of a contingent *a priori* that is free of deictic reference.

5.3   Concerning the Aspects of Context

Extensive considerations on the determination of the speaker in a given utterance situations, as well as further examples along the lines of (29), can be found in Kratzer (1978: 17–27). The idea to account for at least part of such phenomena by pragmatic rules of accomodation goes back to Lewis (1979a) and generalises the strategy in Stalnaker (1973). (More on this in Article 10 [= Haas-Spohn 1991].) One attempt to control the notorious vagueness of the 1st and 2nd plural person pronouns by disambiguation is Gardies (1985: 127–134); a unifying treatment of *we* (or, rather, German *wir*) can be found in Kratzer/von Stechow (1977: 109–115). More about the local parameter, which has been rather neglected in the text, can be gleaned from Fillmore (1975), W. Klein (1978) and von Stechow (1982), among others. (See also Article 37 [Wunderlich & Herweg 1991].) The literature on the temporal parameter is so extensive that citing particular items could only be misleading; the above discussion was inspired by Bäuerle (1979), where a detailed account of the interaction of tense and temporal adverb can be found. (See also Article 35 on tense [= Fabricius-Hansen 1991].) Among the important contributions on the nature of possible worlds are Kripke (1972: Lecture 1), Kaplan (1975), and Lewis (1986).

In Kaplan (1977: Chapter II), demonstrations play the rôle of a typical contextual parameter and are even used to motivate the distinction between intension and character. Possibly subjective traces of the demonstration parameter are rejected as irrelevant for objective reference in Kaplan (1978: 182–186); Kaplan's arguments are conclusively rejected in Bach (1987: 182–186). The distinction between subjective and objective reference is further explored in Castañeda (1977) and Kripke (1977). The notion of 'deixis to phantasma' goes back to Bühler (1934: §8), where it is used in a wider sense though.

One of the earliest and most influential contributions on the deictic use of definite descriptions is Donnellan (1966); the criticism in Kripke (1977) is at least as important. Salience has been brought up by Lewis (1979a: Example 3). An example from W. Klein (1978: 26) acted as a model of sentence (42). The complicated relation between direct speech and context dependence is scrutinised in Grabski (1981). The account of possessives is meant to match the folklore

view of this phenomenon (which has certainly been described elsewhere too). The PDC is a bogyman from Cresswell (1972: 8). The degree of precision as a contextual parameter can be found in Lewis (1980: Section 5). A few years ago (over coffee), Irene Heim has first introduced the author of this chapter to examples like (52); in the meantime they have become familiar to all semanticists.

5.4 Concerning the Problems

A precise approach to the interpretation of personal pronouns with a hierarchy of salience can be found in Smaby (1979: Section 2). The account of quantificational binding reflects the most popular treatment of quantification from Montague (1973). Further details can be gleaned from Article 21 [= van Eijck 1991]. The solution (i) of the status problem of assignments that buys monsters, has been pursued in Montague (1970: Sections 6 and 7). The ambiguity analysis (ii-a) is proposed in Bennett (1978) and Janssen (1980); shunting assignments off to the index is a bogyman and is not likely to be defended by any supporter of the classic account of reference; its refutation is inspired by the corresponding passages in Kaplan (1977: Chapter II). Giving assignments a special status is the helpless way out taken in Kaplan (1979).

Unsurprisingly, in the literature on linguistic analysis, the debate about the correct interpretation of attitude reports cannot always be clearly distinguished from the debate about the correct account of cognitive, epistemic, etc. attitudes; most of the references given for Section 2.5 thus directly transfer to 4.2. Rule (R_{meinen}) is the obvious translation of the common semantics of attitude verbs given in Section 1.2 into the framework of the classic account (and its epistemological interpretation); a similar rule (for *say*) can be found in Kaplan (1977: Chapter XX).[37] Von Stechow (1984: Section 2) makes the inadequate treatment of attitudes towards contradictions the main target against (R_{meinen}). Neighbourhood semantics ultimately goes back to (and is implicit in) Montague (1968: Section 1). The term 'attitude *de se*' originates with Lewis (1979b); an asterisk on the pronoun to indicate it can already be found in Castañeda (1966). The phenomenon as such has been expounded in Geach (1957) already. Within the framework of possible worlds semantics, splitting up propositions into theme and rheme has been made precise in Cresswell/von Stechow (1982) and first exploited to account for attitudes *de se* in von Stechow (1984). Sentence (63) is an example due to Lakoff (1970: 245),[38] where the problem is – wrongly, presumably – portrayed as an ontological one. Enemies of systematic grammar love to bring up passages like (64) in bar-room discussions to prove the rank growth of language – not without justification, as the classic account would have to say!

The account of certain ambiguities created by definite descriptions in terms of scope analysis is usually attributed to Bertrand Russell; Whitehead/Russell (1910: 69–71) is a *locus classicus*. That disambiguation of the noun phrase itself does not suffice, is shown in many places – e.g. Kripke (1977: Section 2). The classic argument directed against a scope analysis of deixis relying on the proposition expressed, can be found in Kaplan (1977: Chapter IX); again there is

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[37]See von Stechow & Zimmermann (2005) on generalising this rule to *de se* readings of attitude reports.

[38]Actually, Lakoff gives the following example, thereby evading the gender-problem indicated in footnote 17 above:

I dreamt that I was Brigitte Bardot and that I kissed me.

a close analogy to the line of argument in Kripke (1972: Lecture 1). The fixed rôle to be played by a pre-theoretic notion of proposition – which is actually much more vague – is clearly seen in Lewis (1980: Section 11); one can find similar considerations on Kripke's theory of names in Evans (1979: 164). Stalnaker (1981: Section IV), on the other hand, pleads for a situation-dependent concept of proposition. Distinguishing between different kinds of intensionality is common in logical semantics, though usually not made heavy weather of. In Kaplan (1977: footnote 13.2) an example in the style of (72) and (73) is mentioned and attributed to Richmond Thomason. Kaplan comments: 'What shall one say about this?' Partee (1989) talks about quantified contexts. Bäuerle (1983), Enç (1986), and Dalrymple (1988) criticise the scope analysis and speculate about how it can be overcome.

It appears that Bennett (1978: 9f.) is the most prominent place where a disambiguation parameter has been proposed and where, moreover, the necessity of token analysis is pointed out with reference to an example similar to (78). The remarks about the pragmatic ('pre-semantic') status of disambiguation follow Kaplan (1977: ch. XXII). The proposal to exploit the classic account to fine-grain propositions can be found in Montague (1970: Section 4). The above criticism is inspired by Cresswell (1975: Section 1). The fact that the rules of language do not change with points of evaluation has, e.g., been pointed out in Kripke (1972: Lecture 2). The abstract, formal approach to modelling is characteristic of almost the entire Montagovian tradition; like Cresswell (1973), we proceeded naively and directly in this chapter – mainly for expository reasons.

5.5   Concerning the Historical and Bibliographic Remarks

If possible, years following author names refer to the date of *first publication*. In some cases the texts are slightly older. Thus the pre-classic text Kaplan (1978) had already been written in 1970. The classic Kaplan (1977) has meanwhile appeared in the volume by Almog *et al.* (eds.) (1989), together with later comments by Kaplan and others.

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