

## TENSE, PREDICATES, AND LIFETIME EFFECTS\*

In this paper, I explain in which way the temporal location of individuals is determined by the temporal interpretation of a clause. The most drastic effects show up in past tense individual-level clauses (section 1). I argue in section 2 that predicates provide lexically determined minimal requirements on their arguments' lifetimes. The role of tense for lifetime effects is an indirect one: by virtue of its determining the temporal interpretation of the main predicate of a clause, it triggers implicatures which cause lifetime effects. This proposal is refined in section 3 so as to be able to explain the blocking of lifetime effects in certain contexts. This blocking is due to the choice of topics and the choice of values for temporal restrictions. In section 4 I compare my proposal to a proposal of Kratzer (1989b) and argue that my account is more adequate. Kratzer's main claim, that the temporal location of individuals is sometimes directly determined by tense, runs into several problems which are avoided in my account.

## 1. LIFETIME EFFECTS WITH INDIVIDUAL-LEVEL PREDICATES

Kratzer (1989b) notes that past tense sentences exploiting individual-level predicates, as opposed to stage-level predicates, impose restrictions on the lifetime of their subjects. Thus, when the sentences in (1) are uttered out of the blue, they suggest that Gregory is dead at the time of utterance of the sentence; the sentence is either false or a case of presupposition failure in a situation where Gregory is still alive. By contrast, the sentences in (2) can be true and perfectly acceptable when Gregory is alive. The sentences in (1) contain the individual-level predicates *be from America*, *have blue eyes*, and *resemble Jörg Bieberstein*,<sup>1</sup> whereas the sentences in (2) contain the stage-level predicates *be happy*, *have a cold*, and *eat cookies*.

- (1) a. Gregory was from America.  
 b. Gregory had blue eyes.  
 c. Gregory resembled Jörg Bieberstein.

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<sup>1</sup> Some of these predicates can also have stage-level readings. Here and below, the predicates are to be understood as having the individual-level reading. Since *be from America* is a predicate that cannot have a stage-level reading at all, it will be my favorite predicate for my argument in this chapter. The use of this predicate was recommended to me by Angelika Kratzer.

- (2) a. Gregory was happy.  
 b. Gregory had a cold.  
 c. Gregory ate cookies.

Kratzer accounts for the contrast between (1) and (2) by proposing that tense in individual-level clauses does not locate the event time of the main predicate but rather the subject individual.<sup>2</sup> Since the past tense seems thus to limit the lifetime of the subject, I will call effects like the one observed in (1) *lifetime effect*.

However, the lifetime effects observed disappear systematically when the sentences in (1) are put into certain contexts as in (3):

- (3) a. On that day, I was introduced to Gregory and Eva-Lotta. Gregory was from America, and Eva-Lotta was from Switzerland.  
 b. I had a chance to have a closer look at him. Gregory had blue eyes.  
 c. Suddenly I realized a remarkable thing: Gregory resembled Jörg Bieberstein.

Thus it seems that context can play a crucial role for the occurrence or non-occurrence of lifetime effects.

In the following section, I will explain how the lifetime effect observed in (1) comes about and provide an account of the contrast between (1) and (2). The contrast is explained independently of any systematic grammatical differences between stage-level predicates and individual-level predicates.<sup>3</sup> In section 3, I will refine my proposal in order to deal with the contrast between (1) and (3). Let me start by sketching the general framework of temporal interpretation which I will exploit in the remainder of this paper.

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<sup>2</sup> For details of Kratzer's account, see section 4. These and related phenomena were already discussed in Anderson (1973). Interestingly, Anderson has basically the same intuition as Kratzer – namely, that in the relevant examples tense applies to the existence of subject individuals (p. 485). Moreover, Anderson is already aware of some related phenomena that will become relevant later in this paper: that lifetime effects can be neutralized in certain discourse contexts (p. 484) and that subject noun phrases and object noun phrases exhibit asymmetries with respect to lifetime effects (p. 488).

<sup>3</sup> That is not to say that I claim there are no grammatical differences between stage-level predicates and individual-level predicates. I simply remain neutral on this issue.

## 2. A PRAGMATIC EXPLANATION OF LIFETIME EFFECTS

## 2.1. Preliminaries

All accounts of temporal interpretation have to solve the problem of how to deal with the fact that sentences can have either definite or indefinite tense readings. Indefinite tense readings are readings that are paraphrased best with a quantifier over times. This is the case with the sentence *Today Gregory was not happy*, which has the reading ‘It is not the case that **there is a time t** such that t is today and Gregory is happy at t’. Definite tense readings are readings which imply a contextually salient time interval that is relevant for the representation of the reading, as with Partee’s (1973) well-known example *I didn’t turn off the stove*. The strongly preferred reading of this sentence is neither ‘It is not the case that there is a time t such that I turned off the stove at t’ nor ‘There is a time t such that it is not the case that I turned off the stove at t’, but something like ‘**At the designated time t** (e.g., right before I left the house) it is not the case that I turned off the stove at t’. Thus, the most salient reading of the sentence is a definite one, in the sense that the speaker has a particular, contextually salient time interval in mind. Based on the existence of such definite tense readings, Partee (1973) argued that an adequate analysis of tense must provide the option to interpret tense as denoting specific time intervals. But neither the occurrence of indefinite tense readings nor the occurrence of definite tense readings must necessarily lead to the conclusion that tense itself is responsible for the indefiniteness or definiteness. Adopting basically the accounts of Bäuerle (1977, 1979) and Kratzer (1978), and a recent version of these accounts by von Stechow (1992), I will assume that both aspects of tense interpretation are provided by independent elements in LF.

My semantics exploits three basic types, *e*, *t*, and *i*, which are the semantic types of entities, truth values, and (possibly instantaneous) time intervals, respectively. With von Stechow, I will treat tense as a predicate that takes two times as arguments.<sup>4</sup> The lexical entry for past tense, for instance, is as follows.

- (4)  $[[\text{PAST}]] = \text{function } f: D_i \rightarrow D_{\langle i, t \rangle}$   
 such that for any  $t, t^* \in D_i$ ,  $f(t)(t^*) = 1$  iff  $t^* < t$ .

Being a predicate of times, tense itself is neither definite nor indefinite. As a consequence, any definite or indefinite aspects of tense readings

<sup>4</sup> I adopt a slightly modified version of von Stechow’s semantics.

have to come from other sources, sometimes from phonetically empty elements.

The indefiniteness is caused by an obligatory adverb of quantification that can be overt – like *always* – or phonetically empty; in the latter case it gets an existential quantifier meaning by default, represented as ‘ $\exists$ ’.<sup>5</sup>

- (5)  $\llbracket \exists \rrbracket$  = the function  $f: D_{\langle i,t \rangle} \rightarrow D_{\langle \langle i,t \rangle, t \rangle}$   
 such that for any  $p, q \in D_{\langle i,t \rangle}$ ,  $f(p)(q) = 1$   
 iff there is a time  $t^*$  such that:  $p(t^*) = 1$  and  $q(t^*) = 1$ .

Tense functions as a restrictor of the obligatory adverb of quantification.

Temporal definiteness is caused either by explicit definite temporal adverbials (like *today*) or by implicit temporal restrictions of the adverb of quantification. Implicit temporal restrictions are provided by the context and represented as a variable ‘ $C$ ’. Technically, I will assume that these variables are elements of type  $\langle i,t \rangle$  that are interpreted by intersection with other restrictive material in the restrictive clause of the adverb of quantification (see Westerstål (1984) and von Fintel (1994) on an analogous treatment of contextual restrictions of determiner quantifiers). That temporal interpretation is thus relative to the discourse context is marked with a superscript ‘ $c$ ’. The interpretation of  $C$  is captured in (6).<sup>6</sup>

- (6)  $\llbracket C \rrbracket^c$  = the function  $f: D_i \rightarrow D_t$ ,  
 such that for any  $t^* \in D_i$ ,  $f(t^*) = 1$   
 iff  $t^*$  is a subinterval of the time the speaker in  $c$  refers to.

Let me now briefly illustrate with a concrete example how this proposal works. Since I will not be concerned with complex sentences in this paper, and since the evaluation time and the time of utterance coincide for matrix clauses, the time interval a tensed clause applies to can, for the present purpose, safely be identified with the time of utterance. For ease of presentation, I will identify the time of utterance with the present time, i.e. now.

Suppose *Gregory was happy* is uttered in the context given in (7a).

<sup>5</sup> Note that there are also empty operators with a generic or universal meaning.

<sup>6</sup> In a Bäuerle/Kratzer/Stechow type account, temporal definiteness is caused by an obligatory definite time adverbial. This obligatory time adverbial functions as a frame adverbial. The main difference between von Stechow’s proposal and my version of it is that I treat implicit definite temporal adverbials as part of the restrictive clause of the adverb of quantification. The motivation for this modification is that it assigns a generalized quantifier type to the adverb of quantification. As Kai von Fintel pointed out to me, this step makes it possible to treat temporal definiteness as a special case of implicit restrictions of quantifiers that are commonly assumed anyway (cf. von Fintel 1994).

Then the sentence has a hidden structure roughly like (7b). From this hidden structure, the LF (7c) is constructed. The adverb of quantification takes tense and the obligatory definite temporal restriction as its restrictor, whereas the rest of the clause is mapped into its nuclear scope.

- (7) a. On Sunday afternoon, I met Eva-Lotta and Gregory at Harvard Square. Gregory was happy.  
 b.  $\exists C$  Gregory was happy.  
 c.  $\lambda t(\exists[\lambda t^*(C(t^*) \& \text{PAST}(t)(t^*))] [\lambda t^*(\text{be happy}(t^*)(\text{Gregory}))])$

Because of the context provided by the first sentence in (7a), the most natural reading of the underlined clause is one where the implicit  $C$  in the underlined sentence refers to the time on last Sunday afternoon when I met Eva-Lotta and Gregory. The lexical entries of verbs and proper names are given in (8a) and (8b), respectively.<sup>7</sup>

- (8) a.  $\llbracket \text{be happy} \rrbracket^c =$  the function  $f: D_i \rightarrow D_{(e,t)}$   
 such that for any  $t \in D_i$ ,  $x \in D$ ,  $f(t)(x) = 1$  iff  $x$  is happy at  $t$ .  
 b.  $\llbracket \text{Gregory} \rrbracket^c =$  the individual Gregory (of type  $e$ ).

Under these assumptions, the sentence has the truth conditions stated in (9).

- (9)  $\llbracket \exists C \text{ Gregory was happy} \rrbracket^c(\text{now}) = 1$   
 iff there is a time  $t^*$  such that  $t^*$  is a subinterval of the time of last Sunday afternoon when I met Eva-Lotta and Gregory, and  $t^* < \text{now}$ , and Gregory is happy at  $t^*$ .

But what happens when a sentence like *Gregory was happy* is uttered out of the blue? Let us assume for now that in this case,  $C$  simply does not get a value assigned from the context and thus simply does not provide a restrictor for  $\exists$ .<sup>8</sup> This assumption will later have to be revised, but for the initial discussion of the data it is sufficiently adequate. Hence, we get the truth conditions in (10).

- (10)  $\llbracket \exists \text{ Gregory was happy} \rrbracket^c(\text{now}) = 1$   
 iff there is a time  $t^*$  such that  
 $t^* < \text{now}$ , and Gregory is happy at  $t^*$ .

<sup>7</sup> For ease of presentation, I am treating certain complex expressions as lexical items.

<sup>8</sup> The same effect may be obtained by systematically taking the whole time interval from the beginning of the world to its end as a default value for  $C$  in cases where the context does not supply a value for  $C$ . This observation is due to an anonymous reviewer.

Present tense is defined in (11), where “includes” is not necessarily restricted to proper inclusion.<sup>9</sup>

- (11)  $\llbracket \text{PRES} \rrbracket^c =$  the function  $f: D_i \rightarrow D_{(i,t)}$   
such that for any  $t, t^* \in D_i$ ,  $f(t)(t^*) = 1$  iff  $t^*$  includes  $t$ .

Thus, the sentence *Gregory is happy* has the truth conditions in (13).

- (13)  $\llbracket \exists \text{ Gregory is happy} \rrbracket^c(\text{now}) = 1$   
iff there is a time  $t^*$  such that  
 $t^*$  includes now, and Gregory is happy at  $t^*$ .

Next I will consider the semantics of stage-level predicates and individual-level predicates. A crucial difference between them concerns the requirements on the relationship between the time when the predicate can be truly asserted of an individual and the time at which that individual exists.<sup>10</sup> In the following, I will refer to these time intervals as the *situation time* of the predicate (cf. Klein 1994) and the *time of existence* of the individual, respectively. Stage-level predicates refer to temporary properties of individuals. Their situation time usually covers only a relatively small part of the time of existence of an individual. Thus, an individual that is eating cookies does so usually only for a certain time. Individual-level predicates refer to long-time properties of individuals. They cover at least a relatively large part of the individual’s time of existence; with ideal individual-level predicates – such as the predicate *be from America* – the situation time covers all of the time of existence of the individual in question. Thus, a person who is from America is from America during all his/her life. However, both individual-level and stage-level predicates can only be predicated of an individual if that individual is in existence or alive at the time when the property is asserted to hold of the individual. This can be shown with the sentence *Gregory is from America*, which is uttered in two different situations in (14). Suppose Gregory was born in 1947 and is or was in fact from America. In (14a) the sentence is uttered in a situation where Gregory is still alive, and in (14b) in a situation where Gregory is dead. Whereas (14a) is perfectly acceptable, (14b) is inappropriate. In fact, all predicates we have encountered so far behave the same in this

<sup>9</sup> Of course, this definition is only supposed to capture the genuine present use of the present tense. For a survey of other uses of present tense, see for instance Binnick (1991).

<sup>10</sup> The observation of such requirements imposed on individuals by certain predicates is not new. Thus, Kratzer (1989a, p. 619) states that verbs can to different extents impose physical presence requirements on their arguments. And Klein (1994, p. 42) briefly discusses to what extent one may say that individuals’ properties can go beyond their physical existence.

respect; somehow they require the individuals they are predicated of to be alive. (14c) and (14d) illustrate that stage-level clauses show the same effect.

- (14) a. Utterance: “Gregory is from America.” – Situation: Gregory is still alive.  
 b. # Utterance: “Gregory is from America.” – Situation: Gregory is dead.  
 c. Utterance: “Gregory is happy.” – Situation: Gregory is still alive.  
 d. # Utterance: “Gregory is happy.” – Situation: Gregory is dead.

Note, though, that not all predicates impose such a requirement on their subjects. The predicate *famous* is one that does not:

- (15) a. Utterance: “Gregory is famous.” – Situation: Gregory is still alive.  
 b. Utterance: “Gregory is famous.” – Situation: Gregory is dead.

Since predicates such as *famous* do not impose any requirements on their subject’s existence, I will henceforth distinguish them from stage-level predicates and individual-level predicates and call them *existence-independent predicates*. I will come back to their behavior later; at the moment, I want to focus only on individual-level predicates and stage-level predicates.

I account for the inappropriateness of (14b) and (14d) by assuming that lexical entries of individual-level predicates and stage-level predicates specify lifetime presuppositions, i.e., presuppositions that impose minimal requirements on the temporal location of individuals relative to the time at which the predicate is asserted to hold of the individual. In order to capture this basic idea, I suggest lexical entries for individual-level predicates and stage-level predicates as exemplified in (16).

- (16)  $\llbracket \text{be from America} \rrbracket^c =$  the function  $f: D_i \rightarrow D_{\langle e,t \rangle}$   
 such that, for any  $t \in D_i$ ,  $f(t) =$  the partial function  $g: D \rightarrow \{0, 1\}$ ,  
 such that, for any  $x \in D$ ,  **$x$  is in the domain of  $g$  iff  $x$  is alive at  $t$** , and for each  $x$  in the domain of  $g$ ,  $g(x) = 1$  iff  $x$  is from America at  $t$ .

Thus the lexical entries for individual-level predicates and stage-level predicates contain a presuppositional condition on their argument’s being in existence or alive.

Consequently, the inappropriateness of (14b) and (14d) is explained as a case of presupposition failure: since the assumption was that Gregory is dead now, there is no time interval  $t$  that includes now such that Gregory

is alive at  $t$ . Thus, there is no time interval  $t$  that includes now such that Gregory is in the domain of *be from America* at  $t$ . Hence (14b) doesn't receive a truth value at all. The same applies to (14d).

Sentence (14a), on the other hand, is predicted to be true. The truth conditions of (14a) are shown in (17). Since I will be looking at cases where the presupposition is satisfied and the sentence as a whole is true, it is – for the present purpose – sufficient to treat the presupposition as part of the truth conditions of the sentence. For ease of presentation, I will do so when giving explicit truth conditions, as in (17).

- (17)  $\llbracket \exists \text{ Gregory is from America} \rrbracket^c(\text{now}) = 1$   
 iff there is a time  $t^*$  such that  
 $t^*$  includes now and Gregory is alive at  $t^*$  and Gregory is from  
 America at  $t^*$ .

Since Gregory is, according to the situation described for (14a), alive now, he is in the domain of *be from America* at a set of intervals that include now. Since Gregory is from America, the sentence is true.

## 2.2. Informativeness

I want to turn now to a pragmatic aspect of past tense sentences and present tense sentences. In particular, I will claim that the sentences *Gregory is from America* and *Gregory was from America* differ with regard to their informativeness. The lack of informativeness leads to a certain type of inappropriateness which will play an important role in the explanation of lifetime effects.

Consider the sentence *Gregory was from America* in a situation where Gregory was born in 1974, is in fact from America, and is still alive (18a). Whereas (18a) is inappropriate, the present tense sentence (18b) is perfectly acceptable in this situation.

- (18) a. # Utterance: “Gregory was from America.” – Situation: Gregory is still alive.  
 b. Utterance: “Gregory is from America.” – Situation: Gregory is still alive.

The oddness of (18a) cannot be caused by presupposition failure, unlike the oddness of (14b) and (14d). Moreover, since there is a time in the past such that Gregory is alive at this time and Gregory is from America, according to our semantics (18a) is predicted to be true. Since there also is a time that includes now such that Gregory is alive and from America at that time, the same holds for (18b), of course. It is important to note

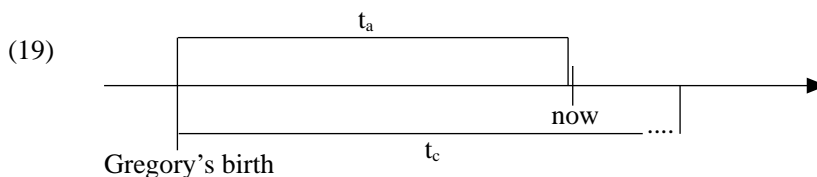


that if Gregory came into existence right now, at this very moment while I utter this sentence, then *Gregory is from America* would be judged true, but *Gregory was from America* would be judged false.

The nature of the inappropriateness of utterances can often be identified by considering the type of correction with which one would typically react to the inappropriateness. With (14b), one would tend to correct the inappropriateness by saying something like: “No, he WAS from America; he died last year . . . .” But with (18a), one would tend to say something like: “. . . and he still IS from America – he is still alive . . . .” Thus, the inappropriateness of (18a) seems to be caused by a lack of information. By saying “. . . and he still IS from America . . . .”, one adds more information – specifically, information concerning the temporal duration of Gregory’s being from America. This is not the case with (14b); when correcting the utterance *Gregory is from America* by saying “No, he WAS from America . . . .”, one explicitly marks the original utterance as somehow fundamentally wrong.

What I want to argue now is that in a situation where Gregory is still alive, *Gregory is from America* (= (18b)) is more informative than *Gregory was from America* (= (18a)). The idea is that in contrast to (18a), (18b) exploits the maximally possible degree of informativeness with respect to the temporal duration of Gregory’s being from America.

With (18a), *Gregory was from America*, the largest time interval for which one can say that Gregory *was* from America is the time interval that starts at Gregory’s birth and ends right before now; it is labelled ‘ $t_a$ ’ in the illustrating picture (19). With (18b), *Gregory is from America*, the largest time interval for which one can say that Gregory *is* from America is the time interval that starts at Gregory’s birth, includes now, and ends at the time of his death; this time interval is labelled ‘ $t_c$ ’ in (19).



Thus, the present tense sentence (18b) provides more information about the duration of Gregory’s being from America than the past tense sentence (18a).

In this sense, present tense clauses quite often are more informative than the corresponding past tense clauses. Note, though, that the particular relationship between present tense clauses and past tense clauses is

not one of unilateral logical implication as required in a classical definition of informativeness (20).

- (20) A proposition  $\Phi$  is more informative than a proposition  $\Psi$  if and only if
1. for all worlds  $w$  such that  $\Phi$  is true in  $w$ ,  $\Psi$  is true in  $w$ , and
  2. it is not the case that for all worlds  $w^*$  such that  $\Psi$  is true in  $w^*$ ,  $\Phi$  is true in  $w^*$ .

As I already indicated above, (1) it is not the case that for all worlds  $w$  such that *A is B* is true in  $w$ , *A was B* is true in  $w$ , and (2) it is not the case for all worlds  $w^*$  such that *A was B* is true in  $w^*$ , *A is B* is true in  $w^*$ . Hence, present tense clauses and their past tense counterparts do not stand in a scalar relationship (cf. Levinson 1983). Rather, when a particular present tense clause is true, the truth of its past tense counterpart may depend on, for instance, facts concerning the situation times of the main predicate – as in the case considered above and illustrated in (19). It can also depend on the aspectual properties of the clause. Thus, achievements and accomplishments in present tense clauses will generally not allow for the uttering of true past tense counterparts; for instance, when *The game begins* can be uttered truly, *The game began* usually cannot. Similar considerations apply to the clauses *Katharina bakes a cake* and *Katharina baked a cake*. Thus the relationship between present tense clauses and past tense clauses is weaker than the one defined in (20) because not all true present tense clauses have a true past tense counterpart.

If this is so, then why does the evidence from corrections suggest that the present tense clause and the past tense clause stand in a scalar relationship such that the present tense clause is more informative than the past tense clause? The relevant correction occurred after an utterance of *Gregory was from America*. Thus, let us consider the situation provided by such an utterance in more detail. Suppose *Gregory was from America* is true. In this case we know the following: if *Gregory is from America* is also true, then the situation time of *be from America* obviously reaches into the past (because of the truth of *Gregory was from America*), i.e., the implication from the present tense clause to the past tense clause is guaranteed. But how about the case where *Gregory was from America* is false? For practical purposes in a concrete discourse, this possibility can be disregarded because conversation takes place under the assumption that utterances are truthful. Hence, when a past tense clause is uttered, for practical purposes – which only care about cases where the past tense clause is true – the present tense clause is justified to count as more informative

than the past tense clause. It seems that this relationship justifies treating past tense clauses and present tense clauses as ordered with regard to informativeness.

Given that (18b) is more informative about the duration of Gregory's nationality, Grice's (1975, p. 45) Maxim of Quantity – "Be as informative as is required, not more and not less" – explains why (18a) appears inappropriate: there is a more informative way of making a statement about the duration of Gregory's nationality. Hence, (21) holds.

- (21) If for some A and some B both "A is B" and "A was B" are true, then use the utterance "A is B" instead of "A was B".

Strictly speaking this does not yet account for why (18a) triggers a lifetime effect. The fact that (18b) is more appropriate than (18a) in a situation where Gregory is alive might, according to (21), justify the intuition that (18a) is less good than (18b), but it does not explain the lifetime effect of (18a). So why is it that (18a) seems to imply that Gregory is dead? I propose that the difference to (18b) with respect to informativeness is the basis for a quasi-scalar implicature which leads to the conclusion that Gregory is dead.

### 2.3. A Gricean Explanation: Lifetime Effects as Implicature

Basically, because we assume maximal informativeness when confronted with utterances, a speaker uttering *Gregory was from America* implicates indirectly that Gregory is dead. What he implicates directly is that the property of being from America is "over." The further implication that Gregory is dead follows from the fact that *be from America* is an individual-level predicate. In (22), a justification schema for the implicature and its consequences is spelled out for a situation where a speaker has uttered *Gregory was from America*.<sup>11</sup>

- (22) Working out of the implicature of *Gregory was from America*:
- (a) The speaker has expressed the proposition that **Gregory was from America**.
  - (b) Thus, the speaker is maximally informative about Gregory's being from America – in particular about the duration of Gregory's being from America.

<sup>11</sup> The schema presented here differs somewhat from the one presented in Grice (1975, p. 50). For instance, some steps of derivation concerning the transmission of information between speaker and hearer are left out, and I am adding steps that concern the consideration of alternative expressions and informativeness.

- (c) If the speaker thought that Gregory's being from America is not over, he would have expressed the proposition that Gregory **is** from America, since that would have been a more informative alternative utterance about the duration of Gregory's being from America.
- (d) Thus, the speaker couldn't have been maximally informative about Gregory's being from America unless he thought that Gregory's being from America is over.
- (e) Thus, the speaker has implicated that Gregory's being from America is over.
- (f) Since being from America is a property that, if it holds of an individual at all, holds of that individual over its entire lifetime, and since the speaker has implicated that Gregory's being from America is over, the speaker has implicated furthermore that Gregory is dead.

In this way, the utterance of *Gregory was from America* triggers a lifetime effect.<sup>12</sup>

#### 2.4. Stage-Level Predicates and the Gricean Explanation

We are now in a position to explain why stage-level predicates contrast with individual-level predicates in that they do not trigger lifetime effects. As we will see shortly, they exploit an analogous effect, though.

Recall the contrast between (1) and (2), here illustrated with the individual-level clause (23a) and the stage-level clause (23b).

- (23) a. Gregory was from America.
- b. Gregory was happy.

The reason why (23b), in contrast to (23a), does not trigger a lifetime effect is simply that being happy is usually not a property that holds of individuals during their entire lifetime, but only during certain times. Thus, one would expect that in a justification schema analogous to (22), step (f) would not be performed; the implicature triggered by the use of the

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<sup>12</sup> It seems that Krifka et al. (1995, p. 79 fn. 40) already had a similar analysis in mind for a certain subcase of lifetime effects. They mention that *The dodo was a bird* suggests that the dodo is extinct and observe that "in general, when a necessary property is asserted of a kind in past tense, we can infer that the kind does not exist anymore." Moreover, they also assume that this is a pragmatic effect. Their intuitions differ from mine insofar as they observe that the sentence *The dodo is a bird* "is true as well, in spite of the dodo's being extinct."

past tense in (23b) would be predicted to stop at step (e), so that (23b) ultimately implicates (24).

- (24) Implicature of *Gregory was happy*:  
Gregory's being happy is over.

This prediction is in fact borne out: when a stage-level clause is uttered out of the blue and contains past tense, a hearer concludes that the situation time of the main predicate is over. Sentence (25) for instance seems to imply that Eva-Lotta's walking along the Charles River is over at the time of utterance.

- (25) Today, Eva-Lotta walked along the Charles River.

Thus, past tense triggers implicatures concerning the end of the situation time of the main predicate with both individual-level and stage-level predicates. The only difference between the two types of predicates is that with stage-level predicates, no conclusion about the lifetime of the subject is prompted. This is simply due to the fact that stage-level predicates are known to cover usually only a small part of the subject's lifetime. As a consequence, the termination of states like being happy or activities like walking along the Charles River does not imply anything about the subject's lifetime.

### 2.5. *Predicates for Existence-Independent Predicates*

I now want to come back to the issue of existence-independent predicates like *be famous*. Existence-independent predicates were briefly introduced with (15), repeated here as (26).

- (26) a. Utterance: "Gregory is famous." – Situation: Gregory is still alive.  
b. Utterance: "Gregory is famous." – Situation: Gregory is dead.

The crucial property of existence-independent predicates is that they do not impose a lifetime requirement on their subjects. A sentence like *Gregory is famous* can be uttered appropriately regardless of whether Gregory is dead or alive at the time of utterance. Thus, existence-independent predicates have lexical entries like (27), which do not contain a lifetime presupposition.

- (27)  $\llbracket \text{be-famous} \rrbracket =$  the function  $f: D_i \rightarrow D_{(e,t)}$   
such that, for any  $t \in D_i$ ,  $x \in D$ ,  $f(t)(x) = 1$  iff  $x$  is famous at  $t$ .

This lexical entry does not impose a restriction on how the lifetime of the subject and the situation time of *be famous* have to relate to each other. That is, *be famous* can hold of an individual at some time and place even if the individual is completely absent. It can hold of an individual during part of its lifetime (e.g., Mikhail Gorbachev), after its lifetime (e.g., Paul Gauguin), in principle even before its lifetime (e.g., the baby of Boris Becker),<sup>13</sup> or, of course, during any combination of these possibilities (e.g., Pablo Picasso); and it can hold of non-existent individuals or fictional characters (e.g., Snow White).<sup>14</sup>

What does our analysis predict for existence-independent predicates as far as the presence or absence of lifetime effects is concerned? Since *be famous* does not impose a lifetime presupposition on its subject and since it can hold of an individual during part of its life, we expect that *be famous* should not trigger any lifetime effects. This prediction is borne out. Sentence (28), for example, does not imply that Boris Becker's child is dead.

(28) Boris Becker's baby was famous.

But just as with the stage-level predicates and individual-level predicates above, the past tense in (28) seems to imply that the being famous of Boris Becker's baby is over.

### 2.6. *Predicates with More than One Argument*

So far we have looked only at subject arguments. In general, we can observe that predicates may behave differently with respect to different arguments.<sup>15</sup> The situation time of a predicate may be identical to the time of existence of a certain argument (as with subjects of individual-level predicates) or it may cover only a relatively small part of the time of existence of an argument (as typical with subjects of stage-level predicates); in other cases the predicate does not impose any restrictions on the time of existence of an argument (as with subjects of existence-independent predicates). Here are a few examples that illustrate this:

<sup>13</sup> Boris Becker is a German tennis player about whose baby German newspapers wrote quite a lot before it was born.

<sup>14</sup> The last observation is due to Roger Schwarzschild.

<sup>15</sup> Referring to Tichy (1985), Vlach (1993, p. 259f.) makes a related observation. He suggests that agent arguments and theme arguments, but perhaps not arguments associated with other thematic roles, should be treated as time (and place) dependent. Kratzer (1989a, p. 619) also notes that physical presence requirements can be different for different arguments.

- (29) a. Lord Peter Wimsey talked about Miss Phelps.  
 b. Lord Peter Wimsey invited Harriet Vane for dinner.  
 c. Harriet misunderstood Lord Peter.  
 d. Harriet gave Lord Peter the manuscript of her latest novel.

In the sentences in (29), single underlining marks noun phrases that denote individuals who must, due to the semantics of the verb, be present at the time and place of the event denoted by the verb. Double underlining marks noun phrases that are not subject to such a requirement. Stretching the terminology somewhat, one might say that *talk about*, for instance, is a verb that behaves like a stage-level predicate with respect to the temporal location of its subject argument and like an existence-independent predicate with respect to the temporal location of its object argument. Based on this terminology, we may say that *talk about* has a stage-level subject argument and an existence-independent object argument.

Another interesting case is the verb *resemble*. Given the core meaning of *resemble*, it seems plausible to assume that it is a symmetric predicate: intuitively, A resembles B if and only if B resembles A. But a closer look at the verb reveals that it is in fact asymmetric, namely as far as the temporal location of its arguments is concerned. Consider the sentence *Aunt Theresa resembled my grandmother* (taken from Kratzer 1989b, p. 44) with two different situations, (30a) and (30b).<sup>16</sup>

- (30) a. Utterance: “Aunt Theresa resembled my grandmother.” –  
 Situation: Aunt Theresa is dead; the grandmother is still alive.  
 b. # Utterance: “Aunt Theresa resembled my grandmother.” –  
 Situation: Aunt Theresa is still alive; the grandmother is dead.

In (30b), the sentence is uttered in a situation where the subject argument of *resemble*, Aunt Theresa, is still alive, whereas the object argument, the grandmother, is dead. In this situation the sentence seems infelicitous, because it implicates, contrary to fact, that the subject argument, Aunt Theresa, is dead. If *resemble* were a completely symmetric predicate, one

<sup>16</sup> For a presentation and critique of Kratzer’s account of the data see below, section 4. Note that, like Kratzer, I am exclusively interested here in the individual-level reading of *resemble*. Obviously, *resemble* has also a stage-level reading, as can be nicely illustrated with the following very plausible example (which is due to Arnim von Stechow, p.c.): *Randi used to resemble Franzis, but now she resembles Wladimir*. With the stage-level reading, there arise of course no lifetime effects. It is admittedly not easy to distinguish between the two readings of *resemble*. If I understand Kratzer right, the idea of the individual-level reading of *resemble* is to talk about a very fundamental resemblance. Thus, Kratzer introduces the example in her paper suggesting that Aunt Theresa is/was almost a perfect clone of the grandmother.

would expect it to show a similar effect in (30a), where the object argument, the grandmother, is still alive, whereas the subject argument, Aunt Theresa, is dead. But (30a) shows no such effect; it is perfectly acceptable and does not implicate anything about the grandmother's lifetime. Thus it seems that *resemble* has an individual-level subject argument but an existence-independent object argument. I will come back to the case of *resemble* when discussing Kratzer's analysis of these and other examples.

### 3. CONTEXTUAL RELATIVIZATION OF LIFETIME EFFECTS

In section 2 I have explained how the occurrence of lifetime effects with past tense individual-level clauses can be accounted for. The purpose of section 3 is to refine the analysis in order to account for cases where one might expect lifetime effects, but where they are in fact blocked.

#### 3.1. *The Blocking of Lifetime Effects in Certain Contexts*

Consider again (3), here repeated as (31). It seems that implicatures of the type derived in (22) can be deleted or blocked in certain contexts. None of the underlined clauses in (31) trigger lifetime effects, although it was precisely the same clauses that triggered lifetime effects in (1), where they appeared without context.

- (31) a. On that day, I was introduced to Gregory and Eva-Lotta. Gregory was from America, and Eva-Lotta was from Switzerland.  
 b. I had a chance to have a closer look at him. Gregory had blue eyes.  
 c. Suddenly I realized a remarkable thing: Gregory resembled Jörg Bieberstein.

Why do the lifetime effects disappear in these contexts? At first sight, there appear to be two plausible explanations for the blocking of lifetime effects in (31).

First, it is widely assumed that past tense is not always interpreted as past tense, but seems to be deleted sometimes in the semantic representation when embedded under another occurrence of past tense. These so-called sequence-of-tense constructions then get a simultaneous interpretation. Thus, in addition to an interpretation roughly like (32b), (32a) can get an interpretation like (32c), where the embedded past tense does not seem to be interpreted relative to the evaluation time provided by the matrix clause.



- (32) a. Gregory said that he was bored.  
 b. There is a time  $t^*$  before now, such that Gregory said at  $t^*$  that he was bored at a time  $t^{**}$  before  $t^*$ .  
 c. There is a time  $t^*$  before now, such that Gregory said at  $t^*$  that he was bored at  $t^*$ .

In light of sequence-of-tense constructions, one might assume that the sentences in (32) exhibit a similar effect across sentence boundaries. Thus, the past tense in constructions like (32) could perhaps be only morphologically relevant and be eliminated for some reason in the semantic representation. If that were so, then it would seem plausible that past tense in such constructions loses its ability to trigger lifetime effects. Although appealing at first sight, this approach proves to be untenable: other languages that do not show sequence-of-tense effects in general show the same effect as the one observed in (31). This is the case with Russian; the Russian translation corresponding to (31c) is acceptable (Maria Babyonyshev, p.c.). Thus we can conclude that sequence-of-tense phenomena don't play a role in (31c) or similar examples.

The second analysis of the effect in (31), which is the one we will adopt, focuses on the fact that what the examples have in common is that they appear in specified temporal contexts which relativize their temporal interpretation to particular times. As I will explain shortly, when informativeness requirements apply to such context-restricted structures, lifetime effects are predicted to be neutralized.

Consider again the sentences in (31). The sentences have implicit temporal restrictions which are assigned a value by the context – i.e., a value is provided by the preceding linguistic context, e.g. by an explicit temporal adverbial in (31a) and by previously mentioned events in (31b, c). In (33) the contextually provided temporal restriction is represented as the expression in square brackets.<sup>17</sup>

- (33) a. On that day, I was introduced to Gregory and Eva-Lotta.  
 [when I was introduced to Gregory and Eva-Lotta on that day]  
Gregory was from America, . . .  
 b. I had a chance to have a closer look at him.  
 [when I looked at him] Gregory had blue eyes.  
 c. Suddenly I realized a remarkable thing:  
 [when I looked at him] Gregory resembled Jörg Bieberstein.

<sup>17</sup> The particular choice of values here is only one of several possibilities.

Let us see how the temporal restrictions provided by the context lead to the blocking of lifetime effects. The truth conditions of *Gregory was from America* in the temporally specific context (33a) can be stated as in (34).

- (34)  $\llbracket \exists [\text{when I was introduced to Gregory and Eva-Lotta on that day}] \text{Gregory was from America} \rrbracket^c (\text{now}) = 1$   
 iff there is a time  $t^*$  such that  $t^*$  is a subinterval of the time when I was introduced to Gregory and Eva-Lotta on that day, and  $t^* < \text{now}$ , and Gregory is alive at  $t^*$ , and Gregory is from America at  $t^*$ .

The fact that (33a) does not trigger a lifetime effect can now be derived as in (35).

- (35) Derivation of the lack of a lifetime implicature in (33a):
- (a) The speaker has expressed the proposition that **there is a time  $t^*$  such that  $t^*$  is a subinterval of the time when I was introduced to Gregory and Eva-Lotta on that day, and  $t^* < \text{now}$ , and Gregory is from America at  $t^*$ .**
  - (c) Since the day denoted by *that day* is over at the time of utterance of (33a), the time during which Gregory is from America that is located within that day is over at the time of utterance of (33a) anyway. Consequently, the speaker does not have any alternatives of expressing anything about the duration of Gregory's being from America; i.e., the choice of the use of present tense does not exist, because the time interval of that day does not include now.

Thus, informativeness considerations cannot take place with (33a). As a consequence, (33a) does not implicate anything about the duration of Gregory's being from America, and in turn it does not implicate anything about Gregory's lifetime being over now. Thus, the analysis predicts the blocking of lifetime effects here.

It is important to note that the choice of the value 'when I was introduced to Gregory and Eva-Lotta on that day' is not obligatory in a continuation of the first sentence of (33a). But if it is chosen, then we predict that the use of past tense in the continuation is obligatory. However, other choices of values are also conceivable and can be appropriate. When another value is chosen, this can affect other properties of the continuing sentence. Thus, as an anonymous reviewer observed, *Gregory is from America* is also a possible continuation of the first sentence of (33a). However, this continuation requires a different choice of value for  $C$ , namely the time of existence of Gregory. Note that intuitively, when *Gregory is from America*

is uttered as a continuation of the first sentence of (33a), the attention seems to be shifted from that day to Gregory; i.e., it seems that Gregory becomes something like the topic of the continuation. As will become clear shortly, this will be predicted by my final analysis of how values of *C* are determined in out-of-the-blue sentences.

### 3.2. *Informativeness and Lifetime Effects in Out-of-the-Blue-Sentences: The Final Analysis*

Let's go back to the sentences where the lifetime effects are not neutralized. In order to treat them adequately, we have to reconsider our hypothesis of what happens to *C* when there is no explicit contextually salient time interval provided in the context.

Recall that on our previous treatment of *Gregory was from America* uttered out of the blue, *C* simply did not get a value assigned from the context and thus did not provide a restrictor for  $\exists$ , as shown in (36a). This gave us the truth conditions in (36b).

- (36) a.  $\exists$  Gregory was from America.  
 b.  $\llbracket \exists$  Gregory was from America  $\rrbracket^c$  (now) = 1  
 iff there is a time  $t^*$  such that  
 $t^* < \text{now}$  and Gregory is alive at  $t^*$  and Gregory is from America at  $t^*$ .

Unfortunately, there is evidence that this approach is insufficient. Specifically, it is unable to explain a shifting of lifetime effects that can occur with predicates that have more than one argument. Consider (37). In contrast to the English sentence *Aunt Theresa resembled my grandmother* (= (30)) and its German equivalent *Tante Theresa ähnelte meiner Großmutter*, here the sequencing of the noun phrases is changed. The dative object *meiner Großmutter* is topicalized into the preverbal position.<sup>18</sup>

- (37) Meiner Großmutter ähnelte Tante Theresa.  
 [<sub>OBJ</sub> my grandmother] resembled [<sub>SUBJ</sub> Aunt Theresa]  
 'Aunt Theresa resembled my grandmother.'

The interesting observation about (37) is that compared to (30), the lifetime effect has shifted. Recall that with (30), repeated here as (38), we observed a lifetime effect concerning Aunt Theresa; in order for the sentence to be

<sup>18</sup> The possessive pronoun *meiner* ('my') is added in this example to make clear that the noun phrase in topicalized position is the dative object.

appropriate when uttered out of the blue, Aunt Theresa had to be dead. The grandmother being dead with Aunt Theresa being alive did not save the sentence.

(38) Aunt Theresa resembled my grandmother.

But with (37) it seems that the being dead of either Aunt Theresa or the grandmother is sufficient to make the sentence fully acceptable. If we apply the simplified approach of (36), this contrast between (37) and (38) remains a mystery.

I propose that especially in temporally unspecific contexts, when there is no better candidate around for assigning values, elements whose denotation does not directly provide a time interval are able to supply values for *C*. In particular, I want to argue that noun phrases can play this role by providing the time of existence of the individual they denote. Thus, let us assume that *Gregory* provides the value for *C* in *Gregory was from America* when uttered in a temporally unspecific context. The truth conditions of the sentence can then be stated as in (39b).

- (39) a.  $\exists$  [Gregory's time of existence] Gregory was from America.  
 b.  $\llbracket \exists$  [Gregory's time of existence] Gregory was from America  $\rrbracket^c$   
 (now) = 1  
 iff there is a time  $t^*$  such that  $t^*$  is a subinterval of Gregory's time of existence, and  
 $t^* < \text{now}$  and Gregory is alive at  $t^*$  and Gregory is from America at  $t^*$ .

The fact that (39a) triggers a lifetime effect can now be derived basically as in (22), with a slightly different step (*a*) as in (40).

- (40) (a) The speaker has expressed the proposition that **there is a time  $t^*$  such that  $t^*$  is a subinterval of Gregory's time of existence, and  $t^* < \text{now}$ , and Gregory is from America at  $t^*$ .**

The crucial difference between (33a) and (39a) thus is that (33a) cannot implicate anything about whether the duration of Gregory's being from America reaches into the present, because the temporal specification restricts the perspective on Gregory's being from America exclusively to the past. With (39a), no such restriction applies.

There is of course another question to be asked: why is it the subject noun phrase whose denotation provides a value for *C*? So far I have just stipulated that *Gregory* is the relevant noun phrase in our example. But at first sight it seems just as plausible to assume that *America* serves as the

relevant provider of a temporal value. If that were the case, then in this case no serious problem would arise, because the time of existence of America includes the time of existence of Gregory. But consider sentence (41), in a situation where Gregor is still alive. The crucial point here is that the USSR doesn't exist anymore.

(41) Gregor was from the USSR.

There is a very clear intuition that there *Gregor was from the USSR* triggers a lifetime effect. If *the USSR* were to serve as the provider of the value for C in this example, this would be unexpected. Since the time of existence of the USSR is over now, the lifetime effect should disappear. But it does not.

Thus, to come back to our earlier example, there must be at least some strong preference for taking *Gregory* instead of *America* as the value provider. I want to propose here that this effect is due to a preference to take topical noun phrases as providers of values for C. Since subject noun phrases are default topics, it follows automatically that in our example *Gregory* is the strongly preferred value provider.<sup>19</sup> The preference for topical elements as value providers is actually not very surprising. Topical elements are in general especially salient contextually and are particularly good providers of restrictive material for quantifiers (see von Stechow 1994). Thus, it seems very plausible that in contexts that do not supply genuine temporal restrictions, topical elements are the preferred candidates for supplying the temporal restrictions.

Also, the shift of the lifetime effect in (37) can now easily be explained. Let's assume that the topicalization of *meiner Großmutter* leads to a situation where this noun phrase is preferentially understood as the topic of the sentence.<sup>20</sup> Thus, for (37) we predict the truth conditions in (42).

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<sup>19</sup> This can probably be related to another observation: Declerck (1991, 344 f.) discusses briefly the following pair of sentences, which illustrates a related phenomenon with present perfect:

- (i) Einstein has visited Princeton.
- (ii) Princeton has been visited by Einstein.

Here, (i) suggests wrongly that Einstein is still alive, whereas (ii) suggests that Princeton still exists. According to Declerck this observation goes back to work by Curme and Jespersen in the thirties (Curme 1931 and Jespersen 1931).

<sup>20</sup> Things are in fact not that simple. It seems that topicalization in German can lead to either a preferentially topical or a preferentially focal nature of the topicalized element. But since the lifetime effect in (38) can apparently concern either the grandmother or Aunt Theresa, this is no problem for my approach.

- (42)  $\llbracket \exists$  [my grandmother's time of existence]  
 meiner Großmutter ähnelte Tante Theresa $\rrbracket^c$  (now) = 1  
 iff there is a time  $t^*$  such that  $t^*$  is a subinterval of my grand-  
 mother's time of existence, and  
 $t^* < \text{now}$  and Aunt Theresa is alive at  $t^*$  and Aunt Theresa  
 resembled my grandmother at  $t^*$ .

Thus, because of the temporal restriction provided by the topical noun phrase *meiner Großmutter*, the implicature of (42) is derived as sketched in (43).

- (43) (a) The speaker has expressed the proposition that **there is a time  $t^*$  such that  $t^*$  is a subinterval of the grandmother's time of existence, and  $t^* < \text{now}$ , and Aunt Theresa resembled the speaker's grandmother at  $t^*$ .**  
 (f) Aunt Theresa's resembling the grandmother during a maximally long subinterval of the grandmother's existence can be over if and only if either Aunt Theresa is dead (since resembling the grandmother is a property that, if it holds of an individual at all, holds of that individual during all its lifetime) or the grandmother is dead. Furthermore, since the speaker has implicated that Aunt Theresa's resembling his grandmother during a maximally long subinterval of the grandmother's existence is over, the speaker has implicated that either Aunt Theresa or the grandmother is dead.

In this way, the assumption that topical noun phrases are able to supply values for  $C$  can explain data that would remain unexplained otherwise.

Note that the present analysis is also supported by the data we discussed in connection with (33a) above; there we observed that the choice of value 'the time of existence of Gregory' for  $C$  goes together with the intuition that the attention of the discourse is shifted to Gregory.

Finally, let me add a remark on the status of implicit temporal restrictions as compared to overt temporal adverbials. As is well known, overt temporal adverbials are generally unacceptable with individual-level predicates: the underlined sentence in (44) is at least strange, if not ungrammatical.

- (44) #[On that day, I was introduced to Gregory and Eva-Lotta.] When I was introduced to them, Gregory was from America.

Since an implicit element with a meaning similar to that of *when I was introduced to them* was able to provide a value for  $C$  in (33a), it seems

unexpected that the sentence is so strange. The strangeness of (44) seems to depend only on the fact that (44) is an individual-level clause; there seems to be some kind of incompatibility of temporal adverbials and individual-level predicates involved. According to Kratzer (1989b), this is due to the argument structure of individual-level predicates, which does not provide a slot for location arguments. Hence, implicit temporal restrictions, which are acceptable in individual-level clauses, must have a status quite different from that of overt temporal adverbials.

#### 4. A COMPARISON WITH KRATZER'S (1989B) PROPOSAL

##### 4.1. *Kratzer's Treatment of Lifetime Effects*

In her paper on 'Stage-Level and Individual-Level Predicates' (Kratzer 1989b, pp. 42–45), Kratzer proposes that tense is a predicate that generally relates to external arguments.

- (45) Kratzer's generalization on tense and external arguments (original version): The tense predicate always relates to the external argument of the main predicate.

When combined with Kratzer's analysis of the difference between stage-level predicates and individual-level predicates in terms of what their underlying external arguments are, the proposal makes interesting predictions. According to Kratzer, stage-level predicates always have a Davidsonian argument denoting a spatiotemporal location as external argument. Individual-level predicates have an external argument denoting an individual (if they are unergative); they do not have any location argument. Roughly speaking, the individual-denoting external arguments of individual-level predicates are usually syntactically realized by noun phrases, whereas the external location arguments of stage-level predicates are often phonetically empty, although they can be made explicit by overt location arguments.

The generalization predicts that in stage-level clauses, tense is applied to a location argument. For individual-level clauses, it predicts that tense is applied to a noun phrase argument, implying (in contrast to a proposal of Enç 1981) that, at least in some cases, tense plays an important role for the temporal interpretation of noun phrases. Thus in Kratzer's account, a stage-level clause like (46a), *Gregory was available*, has the logical form (46b), where the external location argument of the stage-level predicate *available* is represented by the variable *L* and past tense is represented by the predicate *before now* that applies to the location argument.

- (46) a. Gregory was available.  
 b. [before now (L)] & [available (Gregory, L)]<sup>21</sup>

An individual-level clause like (47a) has the logical form (47b).

- (47) a. Gregory was intelligent.  
 b. [before now (Gregory)<sub>3</sub>] & intelligent (he<sub>3</sub>)

Kratzer argues that much as past tense in (46) ultimately locates the contextually relevant event of Gregory's being available in the past, so past tense in (47) locates the individual Gregory in the past. Kratzer's comments suggest that the denotation of the tense predicate *before now* applied to the denotation of a proper name, i.e., applied to an individual, yields a proposition that is true if and only if the individual in question is totally located in the past, that is, the individual existed in the past but not in the present.<sup>22</sup> "Existence" of a person means that person's being alive. Thus, locating an individual temporally in the past means nothing else but locating that individual's existence or lifetime totally in the past. For example, *before now (Gregory)* is true if and only if Gregory lived in the past and is dead now. This prediction is in accordance with intuitions; as we have seen, individual-level clauses with past tense exhibit lifetime effects.

Kratzer's proposal gains even more support by a look at the behavior of the predicate *resemble*. Recall my brief discussion of *resemble* in section 2.6. The surprising observation with *resemble* was that it is an asymmetric predicate as far as the temporal location of its arguments is concerned, although its core meaning seems to be symmetric. The relevant examples are repeated here as (48) [= (30) above].

- (48) a. Utterance: "Aunt Theresa resembled my grandmother." –  
 Situation: Aunt Theresa is dead; the grandmother is still alive.

<sup>21</sup> Note that (46b) contains free occurrences of L. Kratzer assumes that free occurrences of the location variable L can get bound by quantifiers if they appear as part of a more complex construction, or else they may be supplied with a value by the context of use (p. 6). Thus, L in (46b) is a kind of deictic temporal pronoun, suggesting an account of tense reference in terms of Partee's (1973) proposal that tense can denote a particular, contextually determined time interval (see also section 2.1 above). Although there are problems with the assumption of free occurrences of L (cf. Bäuerle 1977, 1979) and the tense semantics I exploited above differs somewhat from Kratzer's approach, I will keep my discussion in this section as close to Kratzer's assumptions as possible.

<sup>22</sup> Note that this assumption in itself implies an asymmetry between the application of tense to individuals and to location arguments: whereas *before now (Gregory)* locates Gregory totally in the past, *before now (L)* typically does not locate the whole event associated with L in the past. We have seen an illustrating example in section 2.4.: *Today, Eva-Lotta walked along the Charles River.*



- b. # Utterance: “Aunt Theresa resembled my grandmother.” –  
 Situation: Aunt Theresa is still alive; the grandmother is dead.

(48) suggests that the past tense imposes a lifetime effect on the subject argument (as can be concluded from the oddness of (48b)) but not on the object argument (as can be concluded from the acceptability of (48a)). Within Kratzer’s account, this is strong support for her claim that tense locates the external argument temporally. Under the assumption that *resemble* is a symmetric predicate, the asymmetry appears to be caused by the different status of the arguments as either external or internal.

Kratzer suggests that the tense predicate can also relate to an external noun phrase argument by relating to the Davidsonian argument of the noun in a quantificational noun phrase. This is illustrated with the quantificational noun phrase *all applicants* in (49).

- (49) a. All applicants were from America.  
 b.  $\text{all}_x$  [applicant (x, L) & before now (L)] [from America (x)]

Note that (49) shows clearly that the relevant notion of “external argument” is a syntactic one, as suggested by Williams (1981), and not a semantic one; i.e., Kratzer’s generalization captures the intuition that tense relates to that argument of the main predicate which is generated VP externally. For individual-level predicates, this argument is usually realized as a noun phrase. As we can see with (49b), relating tense to a noun phrase is meant to include the possibility that tense can, for instance, relate to the location argument of the nominal predicate if it is a stage-level predicate. Thus, “relate to a noun phrase” is supposed to mean “relate to some semantic part of the noun phrase.” The syntactic notion of “external argument” contrasts with a semantic notion according to which the external argument of a predicate can be described as that argument which is taken as the last argument of the predicate in question. If the generalization were supposed to refer to semantic external arguments, then tense in (49) could only relate to the individual variable *x*, which represents the semantic external argument of the predicate *be from America*.

The claim that tense always relates to the external argument of a clause is connected to Diesing’s (1988, 1992) proposal, according to which material within the VP is mapped into the nuclear scope in logical form, whereas material in IP is mapped into the restrictive clause in logical form. At S-structure, tense is realized by INFL. Hence tense is realized outside of VP and – according to Diesing’s mapping hypothesis – has to appear in the restrictive clause at logical form. Thus we can reformulate and specify (46) in the spirit of Kratzer’s work as follows:

- (50) Kratzer's generalization on tense and external arguments (explicit version): The tense predicate always applies to some part of the syntactic external argument of the main predicate and appears at LF in the restrictive clause.

As Kratzer mentions, her proposal can be considered under two different perspectives: tense might either be interpreted as part of the truth-conditional meaning of its clause or as part of the clause's presuppositions.

In the remainder of this section, I will discuss the generalization in (50). I will argue that it runs into a number of problems. First, the proposal cannot account in a uniform way for all cases where lifetime effects occur; there are predicates that trigger lifetime effects although they arguably have an argument structure where this is, within the assumptions of Kratzer's theory, unexpected. Second, other predicates that are according to grammatical criteria classified as individual-level predicates do not trigger lifetime effects. Third, the proposal leaves open what happens in ergative individual-level predicate constructions; i.e., it is not clear what tense relates to in constructions that do not provide a D-structure external argument. Finally, it seems to be impossible to represent certain scope readings of sentences that contain adverbs of quantification and quantificational noun phrases.

#### 4.2. *Wrong Predictions with Existence-Independent Predicates and Ergative Verbs*

A problem with Kratzer's account is that with existence-independent predicates, tense applied to an individual can refer to times that reach beyond the lifetime of that individual, even if the predicate behaves with respect to grammatical tests like an individual-level predicate. (51a), for example, is a completely acceptable sentence, although *berühmt sein* ('be famous') seems to be an individual-level predicate, as the unacceptability of (51b) in connection with Kratzer's criteria for individual-level predicates versus stage-level predicates suggests; thus, according to Kratzer's assumptions, the external argument of *berühmt sein* is an individual, and furthermore, according to her generalization, tense should apply to this individual. Moreover, the tense of (51a) is present tense and would thus locate Picasso's lifetime in the present, if tense located lifetimes in the way suggested by Kratzer; but Picasso is dead now.

- (51) a. Picasso ist berühmt.  
Picasso is famous

- b. \*Keine Philosophen sind berühmt.  
no philosophers are famous

A further problem is that the effect of individual location Kratzer observes with external arguments also shows up with syntactically non-external arguments – in cases where this is predicted by pragmatic reasoning. For instance, the effect arises with the surface subject of some ergative individual-level predicates. Surface subjects of ergative verbs are supposed to be syntactically underlyingly VP-internal arguments. Among ergative verbs (cf. Perlmutter and Postal 1984, pp. 98f.) there are several that give rise to lifetime effects: *exist*, *happen*, *occur*, and predicates describing sizes; shapes, weights, and colors. Without an appropriate context narrowing down the relevant time, the following examples are only acceptable in case Gregory is dead and Isolde is sunk or destroyed or something like that, respectively.

- (52) a. Gregory existed.  
b. Isolde [a boat] was almost oval.

Thus, lifetime effects can also occur with non-external arguments. This does not, of course, show that Kratzer's generalization is inadequate. But it shows that there are at least some cases of lifetime effects that have to be explained independently of her generalization. There must be some mechanism or principle responsible for the lifetime effects in those cases which cannot be captured by the generalization. The question arises, then, whether this device may also be able to explain the cases that were supposed to be captured by Kratzer's generalization. If this is so, then Kratzer's explanation will lose much of its explanatory value. The temporal location of individuals is obviously independent of tense sometimes. This raises the question whether the temporal location of individuals has anything directly to do with the application of tense to them or whether it is just a matter of predicate semantics.

#### 4.3. "Relating to the External Argument"

In this subsection, I want to point out a startling aspect of Kratzer's generalization. I mentioned above that Kratzer suggests that the tense predicate can also relate to an external noun phrase argument by relating to the Davidsonian argument of the noun in a quantificational noun phrase, as shown in (53).

- (53) a. All applicants were from America.  
b.  $\text{all}_x$  [applicant (x, L) & before now (L)] [from America (x)]

Obviously, Kratzer exploits a syntactic notion of “external argument”; thus, tense is claimed to be able to relate to the syntactic external argument of the main predicate – in the case of (unergative) individual-level predicates, to a noun phrase. The syntactic notion of “external argument” contrasts with a semantic notion, according to which the external argument of a predicate can be described as that argument which is taken as the last argument of the predicate in question. If the generalization were supposed to refer to semantic external arguments, then tense in (53) could only relate to the individual variable  $x$ , which represents the semantic external argument of the predicate *be from America*.

Note, though, that there is no motivation why another possibility should be excluded, namely that tense relates to the variable  $x$  within the restrictor of the quantifier, thus giving rise to the hypothetical LF (53c).

(53) c.  $\text{all}_x$  [applicant ( $x$ , L) & before now ( $x$ )] [from America ( $x$ )]

But such an LF must be excluded, for it predicts the availability of a reading for (53a) that is clearly not available: ‘All  $x$  such that  $x$  was an applicant and  $x$  is dead now were from America.’ Thus, if (53c) were a possible LF for (53a), then the sentence should be able to be judged true in a situation where there have been five applicants A, B, C, D, and E for a certain position last year, one of which has died meanwhile. The one who died was A; A was from America. The other four applicants, B, C, D, and E, are from France and still alive. It is clear that in such a situation (53a) would not be judged true. Thus, (53c) must be excluded as an LF for (53a); tense never functions as (part of) a restrictor for nominal determiner quantifiers. Within Kratzer’s framework, it is not obvious how to account for this fact.

#### 4.4. *Problems with the Interaction of Tense and Adverbs of Quantification*

In this section finally, I will argue that the interaction of adverbs of quantification and quantificational noun phrases raises serious problems for Kratzer’s approach. When adverbs of quantification and quantificational noun phrases cooccur in a clause, they display scope ambiguities. In this subsection, we will be concerned with certain readings where the adverb of quantification has wide scope over the quantificational noun phrase. As we will see shortly, it is not at all clear how the crucial readings can be represented.

In German, scope readings of adverbs of quantification and quantificational noun phrases are in general strongly determined by the surface

ordering of the operators. For the individual-level clause (54a), for instance, only the wide scope reading (54b) of the adverb of quantification is available.

- (54) a. . . . weil meistens die meisten Professoren intelligent waren.  
           since mostly the most professors intelligent were  
           ‘since mostly most professors were intelligent.’
- b. For most times  $t^*$  such that  $t^*$  is before now, for most  $x$  such that  $x$  is a professor at  $t^*$ ,  $x$  is intelligent.

How can this reading be represented in accordance with Kratzer’s generalization, her assumptions about LF, and their consequences?

Since *intelligent sein* is an individual-level predicate, tense should apply to its external argument, that is, to the noun phrase *die meisten Professoren*. Thus, tense should appear as part of the restrictive clause of the determiner quantifier, and the account consequently predicts the tripartite structure (54c) as part of the LF representation of (54b).

- (54) c. . . . MOST<sub>x</sub> [<sub>RC</sub> professor ( $x$ , L) & before now (L)]  
           [<sub>NS</sub> intelligent ( $x$ )]

But if tense appears in the restrictive clause of the determiner quantifier, then it cannot simultaneously appear in the restrictive clause of the adverb of quantification. This consequence is certainly unwanted: first, intuitions are very clear about the fact that tense serves as the restrictor of the adverb of quantification in reading (54b), and second, if tense cannot appear in the restrictive clause of the adverb of quantification, then the resulting LF will be ill-formed because the adverb of quantification does not bind a variable in its restrictive clause, as shown in (54d).

- (54) d. \* MOSTLY<sub>t</sub> [<sub>RC'</sub> \_\_\_\_] [<sub>NS'</sub> MOST<sub>x</sub> [<sub>RC</sub> professor ( $x$ , L) & before now (L)] [<sub>NS</sub> intelligent ( $x$ )]]

Thus it is not at all obvious how reading (54b) can be represented within Kratzer’s framework. This is a serious problem for Kratzer’s generalization on the application of tense.

## 5. CONCLUSION

I have adopted an account of temporal interpretation where obligatory, possibly phonetically empty definite temporal restrictions and adverbs of quantification are responsible for definite and quantificational aspects of tense readings, respectively. Values for temporal restrictions can be provided

by, for instance, an overt temporal adverbial or by other temporal specifications provided by the context. I have argued that noun phrases as well can determine the value of implicit temporal restrictions. This opens the possibility of noun phrases playing an important role in the temporal interpretation of clauses.

As part of the lexical entries of stage-level and individual-level predicates, but not of existence-independent predicates, I have introduced minimal temporal presuppositions that require for individuals to be alive in order to serve as arguments for these predicates. The temporal presuppositions explain why the application of stage-level predicates or individual-level predicates to dead individuals leads to inappropriate clauses. The inappropriateness of applying individual-level predicates in connection with a past tense to individuals who are still alive and who provide the only temporal restrictor for the clause is explained by pragmatic considerations involving the Gricean maxim of informativeness.

The temporal location of individuals is in no case directly determined by tense. Rather, effects of temporal location of individuals are directly caused by lexical properties of the predicates involved. This holds for subjects as well as objects and for internal arguments as well as external arguments. In this mechanism, tense plays only an indirect role, by virtue of its determining the temporal interpretation of the main predicate of a clause.

I have also presented Kratzer's account of lifetime effects with past tense individual-level clauses and shown that her proposal runs into many problems which can be avoided in mine. Thus, my proposal seems to be more adequate for dealing with the phenomena that were discussed in this paper.

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Fachbereich Germanistik – Semantik  
 Humboldt-Universität  
 Schützenstr. 21  
 D-10117 Berlin, Germany  
 E-mail: Renate.Musan@rz.hu-berlin.de