Distinguishing semantic components of attitude verbs via the German modifier *genau* (‘exactly’)

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1 Introduction

• The German modifier *genau* (‘exactly’) is usually associated with expressing precision, e.g. when modifying numerals (1-a) (cf. [Geurts (2006), Sauerland and Stateva (2007)]).

(1) a. *Cat besitzt genau drei Schweine.*
   Cat owns GENAU three pigs
Cat owns exactly three pigs

• I present new data showing another use of the modifier, which emerges when it combines with some propositional attitude verbs (e.g. *wissen* – ‘know’) as well as all verbs of perception that embed declaratives (2-a+b).

(2) a. *Ich weiß genau, dass es draußen regnet.*
   I know GENAU that it outside rains
   I definitely know that it is raining outside.

b. *Brit hört genau, dass das keine echte Stradivari ist.*
   Brit hears GENAU that this no real Stradivarius is.
   Brit can hear that this is not a real Stradivarius.

• What the modifier intuitively adds: the relevant attitude/perception is in a way extra strong or specifically reliable.

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**Question 1** What’s the function of the modifier, what does it add to the unmodified construction?

**Question 2** Which meaning component of the compatible predicates does the modifier target, how can those predicates be classified?

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• Preview:

- I argue that the compatibility of *genau* is indicative of a semantic component of the verbs that can not be identified (directly) via evidence or certainty, but rather with the more abstract property of considering alternative worlds.

- I suggest that *genau* widens the predicates domain of quantification such that further not-p possibilities can be excluded.

- I connect this idea to Kadmon and Landman (1993) where they argue for a domain widening function of the focussensitive NPI *any*.

2 Distribution

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• The examples in (3-a) show that *genau* can appear with a few different attitude verbs (henceforth ‘know-type’predicates).

(3) a. Danger versteht / weiß / merkt / erinnert sich genau, dass er nicht ins Bett darf. Danger completely understands / knows / is-aware-of / remembers that he is not allowed to enter the bed.

• Whereas all perception verbs can combine with the modifier (4-a), other attitude verbs like *glauben* (‘believe’), *bedauern* (‘regret’), *bereuen* (‘regret’) or *vergessen* (‘forget’) cannot, (4-b).

(4) a. Brit hört / sieht / riecht genau, dass ein Schwein im Zimmer ist. Brit can hear / see / smell that there is a pig in the room.


• All of the verbs compatible with *genau* also embed interrogatives and appear with the modifier in this configuration as well, as exemplified for *wissen* (‘know’), *erinnern* (‘remember’) and *riechen* (‘smell’) in (5):

(5) a. Mo weiß genau, wer zur Party kommt. Mo knows GENAU who to party comes
Mo knows exactly who is going to come to the party.

b. Brit erinnert sich genau, wo Lisa wohnt.
   Brit remembers refl. GENAU where Lisa lives
   Brit remembers exactly where Lisa lives.

c. Tom riecht genau, was gekocht wurde.
   Tom smells GENAU what cooked was.
   Tom smells exactly what was cooked.

- As opposed to declarative embedding contexts, interrogative embedding constructions are also compatible with the counterpart of *genau, ungefähr* (‘approximately’) and can be negated, as it is the case when modifying numerals:

(6) a. Cat besitzt ungefähr dreißig Schweine.
   Cat owns approximately thirty pigs
   Cat owns approximately thirty pigs.

b. Mo weiß ungefähr / nicht genau, wer zur Party kommt.
   Mo knows approximately / not GENAU who to party comes
   Mo knows approximately / doesn’t know exactly who is going to come to the party.

c. *Danger weiß ungefähr / nicht genau, dass er nicht ins Bett darf.
   Danger knows GENAU / not GENAU that he not into bed allowed.
   Lit.: *Danger knows approximately / doesn’t know exactly that he is not allowed to enter the bed.

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- Another difference: in the case of embedded questions, the modifier can appear in the complement clause resulting in a similar meaning, whereas moving the modifier in declarative embedding contexts yields an either ungrammatical result or a different meaning (7-a+b).

(7) a. Brit erinnert sich, wo genau Lisa wohnt.
   Brit remembers refl. where GENAU Lisa lives
   Brit remembers where Lisa exactly lives.

   Ruth knows that GENAU it rains.
   Lit.: Ruth knows that exactly it is raining.

- Furthermore the modifier can occur in both positions simultaneously without being redundant (8-a)
I conclude for now that the modifier has two (at least slightly) different functions when combining with know-type or perception predicates:

- In question embedding contexts both functions are available, while the one where the embedded question is modified is the prominent one and intuitively seems to target the granularity of the answers that are denoted by the it.
- In declarative-embedding contexts only one is available. As this use is of main interest for my talk and in order to keep them apart, I’ll focus on such examples in the remainder.

Summing up:

1 A class of verbs can be classified via the property of being compatible with the modifier - included are a few attitude verbs as well as all perception verbs, while other attitude verbs - that form a class with know-type predicates in other respects - are excluded.

2 The modifier seems to have two different functions in those constructions that can be differentiated by the substitutability with the counterpart modifier ungefähr (‘approximately’)

3 Considering the unmodified construction

Main points of this section

1 Approaching the function of the modifier by considering the unmodified construction.

2 Showing that contexts where ‘I know that p’ is felicitous are limited.

Regarding the dialogue in (9), it seems odd for B to use ‘I know that ...’ without any context:

(9) a. A: What’s the capital of Switzerland?


   B: I know, that it Bern is.

   B: I know that it is Bern.

Given scenario A, the use of the construction in (10) however is felicitous:

(10) Scenario A: The teacher just told Susi that the capital of Switzerland is Bern and not, as a lot of people assume, Zurich.


   Susi: I know, that the capital of Switzerland Bern is

   Susi: I know that the capital of Switzerland is Bern.
• Here the construction is used to convey that Susi already knew about p.

• Another context where the construction is felicitous is demonstrated in the dialogue in (11), given scenario B:

(11) Scenario B: Susi has an oral exam in Geography about Switzerland. She fails to answer any question that she is asked. After a while the teacher asks:
   a. Teacher: After all, what do you know?
   Susi: I know, that the capital of Switzerland is Bern.

• Here we get some kind of implicature (that might also be induced by the question) that this is the only thing Susi knows and that there are other p’s which she doesn’t know.

• This effect also emerges in contexts like (12):

(12) a. A: Who is going to come to the party?
   b. B: Ich weiß, dass die Lisa kommt.
   B: I know that Lisa comes
   B: I know that Lisa is coming.

• A third type of contexts are ones in which the attitude ‘know’ is contrasted to weaker attitudes like ‘believe’ or ‘think’ (major stress on ‘know’):

(13) a. A: Do you think your daughter is going to smoke pot at the party?
   b. B: Ich WEISS, dass sie dort Gras raucht.
   B: I KNOW that she is going to smoke pot there.

• Finally, consider the dialogue in (14), where it’s not completely obvious, what ‘I know that...’ does:

(14) a. A: Why won’t you let your daughter go to the party?
   b. B: Ich weiß, dass sie dort Gras raucht.
   B: I know that she there pot smokes
   B: I know that she is going to smoke pot there.

• What might be happening in (14) is again a case of contrasting attitudes, insofar as ‘know’ seems to be the relevant attitude towards p to argue in that way, whereas ‘believe p’ for example would not be sufficient.

**Summing up contexts in which ‘I know that p’ is felicitous:**

1. To convey that p is not new to the speaker
2. To implicate that p is the only thing one knows
3. To contrast the utterance to weaker statements
4 What does the modifier add when used with a first person subject?

Main point of this section

1 Establishing contexts where the modified construction is felicitous whereas the unmodified isn’t.

• Consider the dialogue in (15), where (15-d) only works with the modifier but not without:

  • (15) Scenario C: Susi and Nick are playing ’guess the capital’.
    a. Nick: What’s the capital of Switzerland?
    b. Susi: Bern.
    c. Nick: Wrong, it’s Zürich.
       Susi: I know / know GENAU that it Bern is
       Susi: I ?know / definitely know that it is Bern.
    e. Susi2: Ich WEISS, dass es Bern ist.
       Susi2: I KNOW that it Bern is
       Susi2: I KNOW that it is Bern.

  • What (15) shows is that the modified construction can be used to disagree with a proposition (or an attitude towards it) that is assumed to be true by the collocutor, by somehow underlining the strength/reliability of one’s knowledge.

  • The modifier can be omitted by either putting major stress on weiß (’know’) or by adding a sentence that is ought to prove the reliability of the knowledge (like for example: ’I actually live in Switzerland’) (I am going to come back to that).

  • An analogous example including a verb of perception is given in (16):

    (16) Scenario C: Brit is in a musical instrument shop and wants to buy a violin. The seller brings a violin on which ’Stradivarius’ is written. Brit doesn’t believe that it is real.
    a. Brit: That doesn’t look like a real one.
    b. Seller: But it is!
       Brit starts playing.
       Brit: I hear / hear GENAU that this no real Stradivarius is
       Brit: I hear / can hear that this is not a real Stradivarius.
       Brit2: I hear that this no real Stradivarius is
       Brit2: I can HEAR that this is not a real Stradivarius.

• Here again, the modified statement is used to disagree with a proposition that is assumed to be true by the collocutor by underlining the strength/reliability of one’s perception (major stress on the verb or an addition like ’I build violins myself’ again enables to omit the modifier).
5 Evidence and Certainty

Main points of this section

1 Ruling out evidence as the semantic component targeted by the modifier based on the lexical entry for wissen and the incompatibility of erinnern ('remember') and genau.
2 Ruling out certainty as the crucial component by showing semantic differences between knowledge and certainty.

5.1 Evidence

- Following the lexical entry (based onHintikka (1969)) of wissen + DECLARATIVE it expresses a relation between the referent of the matrix subject and the content of the embedded clause. It requires that the referent believes the proposition and has enough evidence in the world of evaluation and furthermore includes a factivity presupposition, as it presupposes the truth of its complement.

\[ [[\text{wissen}_{\text{DECL}}]]^w = \lambda p. \lambda x : p(w) = 1 . x \text{ believes } p \text{ in } w \text{ and has enough evidence for } p \text{ in } w \]

- As according to this definition wissen$_{\text{DECL}}$ already includes the requirement of having enough evidence and therefore is an all-or-nothing concept, there shouldn't be anything like 'extra strong evidence'.

- Additionally, erinnern ('remember'), that falls into the know-type class, intuitively does not seem to involve evidence - which is a further argument against the hypothesis that genau relates to the quality of evidence.

5.2 Certainty

- If certainty was the relevant component we would assume sicher sein ('be certain') to be compatible with the modifier as well, which is not the case:

(17) a. *Ich bin genau sicher, dass die Lisa zur Party kommt.
     I am GENAU certain that the Lisa to Party comes.
     Lit.: *I am exactly certain that Lisa is going to come to the party.

- There seems to be a semantic difference between the two predicates concerning the fact that certainty doesn’t involve knowledge. A few examples to illustrate that difference:

(18) a. A: Do you know if Lisa is coming to the party?
    b. B: Nein, aber ich bin sicher, sie liebt doch Parties.

    B: No but I am sure she loves prt. parties
    B: No, I don't, but I am certain she will for she loves parties.

- In (18) B is negating A’s question if B knows whether p. Still it is possible for B to say that she is certain, leading to the conclusion that one can be certain about p without knowing p.
Another difference that concerns factivity is shown in (19):

(19) a. Der Peter ist sicher, dass die Susi kommt, aber ich glaube nicht, dass das stimmt.
   The Peter is sure that the Susi comes but I believe not that that stimmt.
   Hans is certain that Susi is going to come but I don’t believe that to be true.

b. ??Der Peter weiß, dass die Susi kommt, aber ich glaube nicht, dass das stimmt.
   The Peter know that the Susi comes but I believe not that that stimmt.
   ??Peter knows that Susi is going to come but I don’t believe that to be true.

Other than know, be certain doesn’t seem to be factive as it is possible for the speaker in (19-a) to disagree with p, whereas (she knows that) someone else is certain of. (19-b) only (marginally) works with a specific prosody indicating a meaning like ‘Peter claims/believes to know that p’.

6 Lewis 1996

Main points of this section
1 Considering Lewis account of knowledge ascription via the exclusion of possibilities.
2 Arguing that the function of the modifier is widening the domain of quantification over possible worlds.

According to Lewis (1996) one knows that p if one can exclude every not-p possibility apart from those possibilities that are properly ignored.

Lewis introduces a bunch of rules to demonstrate what kind of possibilities can be potentially ignored and argues that a crucial property of these possibilities is that we don’t even think of them.

That means: whenever a possibility is under consideration, it can not be ignored anymore.

He subsequently distinguishes between three classes:
- possibilities that can only be excluded (e.g. those under consideration)
- possibilities that can only be ignored (e.g. the possibility of hallucinating)
- possibilities that can either be ignored OR excluded

To illustrate the third class, he gives an example that follows a reasoning as follows: To utter ‘I know that the cat is not in the office’ the possibility that the cat secretly crawled into the drawer (and therefore wasn’t seen when checking the office) can be properly ignored (unless it is under consideration).

But this possibility can of course be excluded as well: by checking the drawer.
Lewis argues further that the more potentially excludable possibilities one excludes, the better knowledge one has: the knowledge of the fact that the cat is not in the office is better when the possibility of it having crawled secretly in the drawer is excluded, than it is, when this possibility is simply ignored.

I argue that this 'better knowledge' is what the modifier induces:

\[ \textit{genau} \] widens the predicates domain of quantification such that any possibility that falls in Lewis' third class - worlds that can either be excluded or ignored - is in the domain and can thus be excluded.

### 7 Domain widening

**Main points of this section**

2. Showing that the domain shift from bare wissen to genau wissen parallels the shift from 'An NP' to 'Any NP'.

The idea that an element induces widening of the domain of quantification (in this case over individuals) was proposed for the NPI and free choice (FC) particle any by Kadmon and Landman (1993). (cf. Krifka (1995), Lahiri (1998) & Chierchia (2006))

Kadmon + Landman argue that the meaning of any is the semantic operation that is associated with: widening the domain of quantification by widening the interpretation of the Noun Phrase (NP) along a contextually given dimension.

They argue that NPs with FC any have the usual properties of a generic indefinite plus the force of any (widening + strengthening). Widening is demonstrated with examples like (20), where A's utterance in (20-c) indicates a shift in what counts as 'owl', relative to what it might have been before (sick owls are to count as well):

(20) a. A: An owl hunts mice.
    b. B: A sick owl doesn’t hunt mice.
    c. A: Wrong. ANY owl hunts mice.

Here the difference between 'an owl' as a generic indefinite and 'any owl' as a generic indefinite plus any force should become clearer: 'Any owl' can include something that 'an owl' can not.

For NPI any they assume the usual semantic properties of an indefinite NP (plus any-force). As it appears merely in downward entailing contexts, here on the other hand something is excluded, that the bare indefinite doesn’t exclude. Compare 'I don’t have any potatoes' with 'I don’t have potatoes'.
7.1 Back to wissen

- With this in mind let’s go back to wissen and consider the dialogue below, where I adapted Lewis’ example:

(21) a. A: Do you know where the cat is?
   b. B: Ich weiß, dass sie nicht im Büro ist.
      B: I know that it’ is not at the office.
   c. A: Couldn’t it be hiding in the drawer? Or under the carpet?
   d. B: Nein, ich weiß genau, dass sie nicht im Büro
      B: No, I definitely know that it isn’t at the office.

- B’s utterance in (21-b) of the form ‘I know that p’ seems to leave the possibility open for A to challenge B’s knowledge by bringing up possibilities that might have been not considered by B, (21-c).

- By uttering (21-d), a statement of the form ‘I know genau that p’, B is indicating the she has considered and excluded any possible not-p world, even ones that could also have been properly ignored.

- In that way it seems to resemble the function of any in (20):

   ‘I know that p’, just as the generic ’An NP’, sets a context where more exceptions are allowed - ‘I know genau that p’ subsequently, as the generic ’Any NP’, rules out further exceptions by widening the domain of quantification (here over possible worlds) and ruling out any not-p possibility that can potentially be excluded.

- Kadmon + Landman argue for any that the widening doesn’t have to be total, in (20) for example baby owls can still be excluded of the generic ’Any NP’. Still the widening can be total, e.g. when there is no salient dimension given by the context and when expressions like ’absolutely any’ or ’any...whatsoever’ are used.

- The widening in the case of genau is total in respect of any possibility that can be potentially excluded. 

- This is reflected in the dialogues in (15) and (16), repeated here in (22) and (23): Based on the totality of the widening, the function of the modifier can be understood as follows: Whatever not-p possibility you are going to suggest, I have already excluded it.

(22) Scenario C: Susi and Nick are playing ‘guess the capital’.
   a. Nick: What’s the capital of Switzerland?
   b. Susi: Bern.
   c. Nick: Wrong, it’s Zürich.
      Susi: I know / definitely know that it is Bern.

(23) Scenario C: Brit is in a musical instrument shop and wants to buy a violin. The seller brings a violin on which ‘Stradivarius’ is written. Brit doesn’t believe that it is real.
   a. Brit: That doesn’t look like a real one.

1In contrast to Kadmon + Landman I assume seemingly stronger statements like for example ganz genau (‘completely exactly’) to have the same force as bare genau.
b. Seller: But it is!

Brit starts playing.


Brit: I hear / can hear that this is not a real Stradivarius.

8 Other verbs

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- I suggest that all and only those verbs that are compatible with the modifier share two properties:

  - **They entail knowledge**: From every statement of the form ‘x perception-verb that p’ or ‘x know-type-predicate that p’ it follows that ‘x knows that p’.

  - Perception verbs additionally involve information about a rather physical process whereas know type predicates involve information about a cognitive process via which the knowledge is gained.

  - Accordingly they share the relevant property for being compatible with *genau*: they refer to possibilities for all of which it is decided whether they are compatible with the actual world or not.

  - **They embed interrogatives as well as declaratives**: while this is rather a syntactical fact, it is for now needed to exclude *bereuen* and *bedauern* (‘regret’) as the first property seems to be shared by these verbs as well, whereas the second isn’t. Still, I hope to come up with a better story regarding the exclusion of these predicates in the course of future work.

    - A first idea in what direction this exclusion could go: all of the know type predicates discussed here - *verstehen* (‘understand’), *merken* (‘realize’), *erinnern* (‘remember’)- as well as the perception verbs refer to a process that sort of leads to knowledge. *Bedauern* and *bereuen* (‘regret’) on the other hand rather presuppose knowledge (cf. Appendix).

9 Open Question: Stress

- Kadmon + Landman discuss a related question as they note that *any* in its domain widening use tends to bear major stress.

- They target the question whether the widening is induced by focus rather than by *any* itself and therefore compare the two dialogues below:

  (24) a. A: And then all the owls go on a mice hunt.
      b. B: The healthy ones go, that is?
      c. A: No, no - ALL the owls go.
b. B: A healthy one, that is?
c. A: No, ANY owl.

- For (24) they argue that the widening is indirectly and therefore another case of selection of a wide domain of quantification is at work: By repeating ’all’, A rejects the correction suggested by B, retaining the domain of quantification she had in mind to start with.

- A’s utterance in (25-c) on the other hand, due to them, directly indicates a shift in what counts as ’owl’, relative to the possibility pointed out by B.

- I think that for modified wissen and stressed wissen respectively it is the case as well that both forms achieve similar results but are based on different mechanisms.

- Focused wissen indicates that the strongest interpretation available is intended. As, regarding its scalar alternatives, unstressed wissen already is the strongest statement, the domain is affected. The result is a ’maximal interpretation’ similar to the one caused by genau: the exclusion of every possibly excludable possibility.

10 Sum up

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<td>1 Based on the property of being compatible with genau a set of verbs - that usually don’t form a class - can be classified.</td>
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<td>2 Predicates compatible with the modifier all embed declaratives as well as interrogatives. The question regarding the relation of the modifier’s functions in the different embedding contexts needs further investigation. (cf. Appendix)</td>
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<td>3 Based on the discussion of the (limited) contexts where ’I know that p’ is felicitous, contexts where ’I know mod that p’ can be used were established: genau is used to strictly disagree with every not-p possibility.</td>
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<td>4 After excluding evidence and certainty as the crucial components targeted by the modifier, I argued that the function of the modifier is widening the domain of quantification over possible worlds (Based on Lewis 1996).</td>
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<td>5 I furthermore argued that this widening function resembles the one of any - first discovered by Kadmon + Landman 1993 - in many ways.</td>
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<td>6 Finally I argued for an independent property that is shared by all of the verbs compatible with wissen, which is entailing knowledge.</td>
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<th>What that suggests:</th>
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<tr>
<td>1 If this is on the right track, there must be a further component in the semantics of wissen, that is not explicitly expressed in Hintikka’s classical approach.</td>
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<td>2 There seems to be a larger set of worlds affected as usually assumed: we do not only have to look at worlds that are compatible with what is believed, but also at those, that are excluded.</td>
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11 Appendix

11.1 Different embedding contexts

- In section 2 I claimed that there are two different uses of genau in WH-embedding contexts and that only one of those is available in declarative embedding contexts.

- In WH-constructions however, it is hard to keep the functions apart, as always both interpretations seem to be available simultaneously.

- Regarding the example in (26), for the WH-conjunct the two interpretations are: 1) Gina knows the exact number of teeth this shark has, namely 30.653 2) Gina knows the fact that this shark has 30.653 teeth with great certainty.

- If the first interpretation is available in (26) and given that it can be differentiated from the second, the claim that the modifiers function differs depending on the embedding context is challenged:

(26) a. Dass es regnet und wieviele Zähne dieser Haiisch hat, weiß die Gina genau.
    That it rains and how-many teeth this shark has knows the Gina genau.
    Intended: Gina definitely knows that it is raining and she knows exactly how many teeth this shark has.

- The example shows that in a topicalized structure involving ellipsis, weiß genau can be shared by both conjuncts, implying that the modifier is semantically identical in both functions.

- Nevertheless the differences pointed out in section 2 suggest the opposite - that constitutes a puzzle for future work.

11.2 Speaker-orientation?

- If the subject is other than first person, at first sight, there seems to be a shift, such that the the speaker’s attitude seems to be modified (27):

(27) a. Danger weiß genau, dass er nicht ins Bett darf.
    Danger knows genau that he not into bed allowed.
    Danger definitely knows that he is not allowed to enter the bed.

- What genau indicates here is the the speaker is especially sure about the subject being a holder of the knowledge of p, which suggests the modifier to be speaker-oriented.

- This hypothesis doesn’t hold when the construction is embedded:

(28) a. Susi vermutet, dass Danger genau weiß, dass er nicht ins Bett darf.
    Susi assumes that Danger knows genau that he not into bed allowed.
    Susi assumes that Danger definitely knows that he is not allowed to enter the bed.
b. (28) very informally means that in most of the worlds compatible with Susi’s believe, Danger knows p with great certainty.

• The contrast between (27) and (28) needs further investigation.

11.3 Regret

• As argued in section 8, ’bereuen’ and ’bedauern’ (regret) that also somehow involve knowledge of the embedded clause, still differ in that respect from the other verbs belonging to the genau-compatible class.

• I claimed further that while the other relevant verbs entail knowledge, ’regret’ presupposes it, (29):

  (29) a. Ich glaube zu wissen / mich zu erinnern, dass ich die Lisa eingeladen habe.  
  I believe to know / refl. to remember that I the Lisa invited have  
  I believe to know / to remember that I invited Lisa.

  b. ‘Ich glaube zu bereuen / bedauern, dass ich die Lisa eingeladen habe.  
  I believe to regret / regret that I the Lisa invited have  
  I believe to know / to remember that I invited Lisa.

I believe to regret that I invited Lisa.

• While when ’know’ or ’remember’ (as well as all the other verbs compatible with genau) are embedded under ’believe’ (30-a), what is challenged, is the the truth of the embedded declarative.

• On the other hand, when ’regret’ is embedded under believe, the question whether the embedded declarative holds is not under consideration. The only reading that is available is one where I’m not sure about my feelings towards the embedded proposition and assume that what I feel, might be regret.

References


