1. Overview

Topics to be covered:

• The nature of assertion as expressing commitments
  Assertions and questions in the commitment space framework

• Judgements as a separate act from commitments
• Subjective epistemics as expressing strength of judgments
• Evidentials as expressing source of judgements
• Discourse epistemics

2. Assertions as Commitments

2.1 The dynamic view of assertions

(1) Assertions as modifying the common ground,
   “a body of information that is available, or presumed to be available, as a resource
   for communication” (Stalnaker 1978)

(2) Standard view of assertion in dynamic semantics
   – Common ground is modeled by a set of propositions (context set),
   – Assertion of a proposition restricts the input common ground
     to an output common ground by intersection. +

Example: \( s + \varphi = s \cap \varphi \)

(3) Alternative view: Common ground as sets of propositions
   – Assertion of a proposition adds the proposition to the common ground
   – Context set: the intersection of the propositions of the common ground

Example: \( c + \varphi = c \cup \{\varphi\} \)

(4) Advantages of this view:
   – Meaningful addition of tautologies, e.g. ‘2399 is a prime number’
   – Possible modeling of contradictory common grounds
     (would lead to empty context set)
   – Possible enrichment by imposing a saliency ordering of the propositions

---

1 *thanks to the commentary of Dag Haug and by other participants of the workshop, thanks to funding by DFG, in particular the project Past Tense Morphology in Tense and Modality
2.2 How do speakers add propositions to the common ground?

(5) \( S_1 \) asserts \( \varphi \) at \( c \): \( S_1 \) applies function \( f(\varphi) = \lambda c'[c' \cup \{\varphi\}] \) to \( c \)

(6) Problems:
- This assumes that one speaker \( S_1 \) has authority over the common ground
- Does not appreciate that common ground is negotiated
- Even if \( \varphi \) is accepted to \( c \), it should remain on record that it was \( S \) who introduced \( \varphi \)

(7) Concept of table in Farkas & Bruce 2010:
- Common ground has a negotiating area on which participants place propositions
- After acceptance by other participants, move proposition to permanent common ground
- Problem: After acceptance, information who introduced a proposition gets lost

(8) Participants convey information due to the rules of a particular game, the CG game
But in order that this is not just any arbitrary game, there must be ethical rules attached to it, what are those rules?

(9) Stenius 1968: Produce a sentence in the indicative mood only if its sentence-radical is true.

(10) Lewis 1972: Convention of truthfulness and trust
Problem: This is not just a convention, like driving on the right side of the road?

(11) Lauer 2013: How to get from utterances to propositional updates of information states, in the current framework, how do you get from (b) to (c):
- \( a. \ c + S_1: \text{It is raining.} \)
- \( b. \ c \cup \{S_1 \text{ uttered: } \text{it is raining}\} \) “cautious update”
- \( c. \ c \cup \{S_1 \text{ uttered: } \text{it is raining}, \ldots, \text{‘it is raining’}\} \) “credulous update”

2.3 Three approaches to assertion

(12) Bach & Harnish 1979, Lauer 2013 “I believe”
Speaker expresses a belief in the truth of a proposition
Moore’s paradox: # It is raining, but I do not believe that it is raining.

(13) Bach & Harnish 1979, Truckenbrodt 2006: “you should believe”
Speaker expresses (in addition) the intention that the addressee should form a like belief.
Paradox: # It is raining, but I don’t want you to believe it.

Speaker expresses public responsibility for truth of the proposition, involving social sanctions
Paradox: # It is raining, but I don’t want to be blamed if it is not raining.

2.4 Discussion of the three approaches

(15) The “I believe” approach:
- Assumes that if \( S_1 \) expresses a belief in \( \varphi \), this is reason for others to believe \( \varphi \) as well, provided that \( S_1 \) is well-informed (Lauer 2013), does not want to misinform
- Problem: Difference between \( \text{It is raining and I believe that it is raining} \), if we assume that \( x \text{ believes that } x \text{ believes } \varphi \) is equivalent to \( x \text{ believes } \varphi \).
- Explains Moore’s paradox, does not explain other paradoxes.
- Makes lying, strictly speaking, impossible.

(16) The “you should believe” approach:
- Most direct approach to change of common ground
- Explains Moore’s paradox indirectly: I should not order you to believe \( \varphi \) if I do not.
- Does not explain blame paradox.
- Makes assertions a subspecies of commands
- But: \text{Believe it or not / I don’t care whether you believe it, but / Just for the record, it is raining.}
- Makes lying morally objectionable: Do not want others to believe what you do not believe!
The “I am to blame” approach:
– Assumes that if S declares public responsibility for φ, this is reason for others to assume φ
– Reason: S tries to avoid social sanctions, and the other participants know that
– Relation to speaker’s belief: Better declare responsibility for φ only if you believe φ yourself, otherwise you might end up being sanctioned. Explains Moore’s paradox.
– S knows that A knows that S would undergo sanctions if φ is false, and A knows that; by this S can convey φ to A as a conversational implicature if S asserts φ (Grice 1975).
– Explains paradox “... but I don’t want you to believe it”
– Explains “Believe it or not... / Just for the record...”: Cancelling of conversational implicature
– Makes lying expensive: losing face, social capital, ability to communicate in the future

2.5 The commitment view, implemented

Implementation of commitment view in Krifka 2015:
– S₁: It is raining. ⊢ 'It is raining', where S₁⊢φ: the proposition ‘S is publicly committed to the truth of φ’
– The proposition φ itself is then added as a conversational implicature, if no objection, or simple acknowledgement okay. c + ‘S₁⊢It is raining’ + ‘It is raining’
– The source of a proposition, the participant responsible, remains on permanent record
– As common grounds essentially contain commitments, I call them “commitment states”.

Possible reactions after c + S₁⊢'It is raining':
– No. S₂ takes up proposition ‘It is raining’ and asserts its negation, resulting in c + S₁⊢‘It is raining’ + S₂⊢¬'It is raining’, preventing the proposition ‘It is raining’ from becoming part of c,
– Yes. S₂ takes up proposition ‘It is raining’ and asserts it, resulting in c + S₁⊢‘It is raining’ + ‘It is raining’ + S₂⊢'It is raining’, making S₂ also publicly responsible for the truth of φ

The content of the assertion proper, S₁⊢‘It is raining’, cannot be addressed directly by S₂, except by comments like Don’t say that, Take this back, Don’t make a fool of yourself.

Syntactic implementation, assuming of head movement of finite verb, movement of subject:
[ActP. it][CommitP ⊢ is [TP _ _ raining]]

Semantic interpretation:
[[(ActP. it)[CommitP ⊢ is [TP _ _ raining]]]]_{S₁,S₂}, where S₁: speaker, S₂: addressee
= λc[ c + S₁⊢[TP it is raining]]_{S₁+S₂}
= λc[ c + S₁⊢λi[it is raining in i]]
= λc[ c U {λi[S₁ is responsible in i for the truth of the proposition λi[it is raining in i], at i’}]

2.6 Questions in the commitment view

Extension from commitment states to “commitment spaces”: commitment state + possible continuations (Cohen & Krifka 2014, Krifka 2015)

Commitment spaces modeled as sets of commitment states C ordered by set inclusion; the actual commitments are the smallest commitment state, the root of the commitment space, √C

Update with regular speech acts: C + φ = {c ∈ C | √C + φ ⊆ c}

27) Questions as restrictions of continuations that do not change the root (meta speech acts)
   a. monopolar question:  \( C + ?\pi = \{\sqrt{C}\} \cup \{c \in C \mid \sqrt{C} + \varphi \subseteq c\} \)
   b. bipolar question:  \( C + [?\varphi V ?\neg\varphi] = C + ?\varphi \cup C + ?\neg\varphi \)
   c. wh questions, see Krifka 2015

28) More specifically: In a monopolar question *Is it raining?*
   speaker \( S_1 \) imposes on \( S_2 \) to update \( C \) with \( S_2 \vdash \text{‘it is raining’} \);
   \( S_2 \) can perform this update, reject it and answer *no* (\( S_2 \vdash \neg\text{‘it is raining’} \)), or reject \( S_1 \)’s move

29) Syntactic and semantic implementation: \([\text{[ActP } ? \text{[CommitP } \vdash \text{‘it is raining’}]\text{]]}]^{S_1, S_2} \)
   ? has the effect that speaker \( S_1 \) shifts \( x \vdash \ldots \) to \( S_2 \vdash \ldots = \lambda C[\{\sqrt{C}\} \cup C + S_2 \vdash \lambda_i[\text{it is raining in } i]] \)

2.7 Refinements of the commitment view

30) Subtypes of assertions that relate to degrees of seriousness / social consequences:
   - Explicit performatives: *I swear / claim / suggest that he did not steal the money.*
     cf. strength distinctions of speech-act-denoting verbs in Vanderveken 1990
   - Speech act adverbials relating to seriousness: *I honestly did not steal the window.*
   - Invocation of authorities: *Let God be my witness / Jeez, I did not steal the money.*
   - Sanction specification: *For the life of me, I did not steal the money.*
   - Oath phrases:
     a. *wallaadi / winnabi / wiʔingiil ma-ʔaxatt-iš haaga*  (Egyptian Arabic)
        by.good / by.the.prophet / by.the.bible I did not steal anything  (Mughazi 2003)
     b. *ischwör, Alter, war so*  (Kiezdeutsch)
         I.swear, guy, it was like that  (http://www.kiezdeutsch.de/sprachlicheneuerungen.html)

31) Invoking another authority that is to blame if proposition is false:
   a. *The weather forecast says it will rain.*  b. *According to the weather forecast, it will rain.*
   c. *It will rain, the weather forecast says.*  d. *Laut (dem) Wetterbericht wird es regnen.*
   (cf. Koev 2017)

32) What about epistemics, evidentials?
   a. *It probably / certainly is raining.*  b. *I think / believe it is raining.*
   c. *It must / might be raining.*  d. *It seems to be raining.*

33) Assertion + Epistemic evidence for *it likely is raining*; \( P \) : probability
   a. von Fintel 2003: \( \lambda c[c + \text{ speaker has put forward } \varphi \land P(\text{‘it is raining’}) > 0.5] \)
   b. Cohen & Wolf 2011: *Assert (‘it is raining’, P(‘it is raining’) > 0.5)*
   c. Epistemic on the expressive dimension: \( \langle \text{‘it is raining’, } P(\text{‘it is raining’}) > 0.5 \rangle \)

Problems:
   a. Why is assertion “weakened” by epistemic?
   b. Why \( \checkmark \text{ It likely will rain.} \text{ but } \# \text{ It will rain. It likely will rain.} \)
   c. Why \( \# \text{ It will rain. (It is likely).} \)  (elaboration)
   d. Why \( \# \text{ It will – likely – rain.} \)  (parentheses)

34) Wolf 2015: objective / descriptive vs. subjective / expressive epistemtics
   a. *It is probable that it will rain tomorrow.*  \( P_{\text{assert}}(P(\text{rain}) > 0.5) \geq \text{high} \)
   b. *It will probably rain tomorrow.*  \( P_{\text{assert}}(P(\text{rain}) \geq \text{high}) > 0.5 \)

35) Problem:
   Can commitment strength (backed by social sanctions) really be captured by probability?
3. Epistemics and Judgements

3.1 Peirce and Frege on Judgement and Assertion

(36) Charles Sanders Peirce on Assent / Judgement vs. Assertion (Tuzet 2006)

An act of **assertion** supposes that, a proposition being formulated, a person performs an act which renders him liable to the penalties of the social law (or, at any rate, those of the moral law) in case it should not be true, unless he has a definite and sufficient excuse; and an act of **assent** is an act of the mind by which one endeavors to impress the meanings of the proposition upon his disposition, so that it shall govern his conduct, this habit being ready to be broken in case reasons should appear for breaking it. (CP 2.315)

What is the essence of a **Judgment**? A judgment is the mental act by which the judger seeks to impress upon himself the truth of the proposition. It is much the same as an act of asserting the proposition, or going before a notary and assuming formal responsibility for its truth, except that those acts are intended to affect others, while the judgment is only intended to affect oneself. (CP 2.252)

(37) Frege on **Gedanke** (Proposition), **Urteil** (Judgement) and **Behauptung** (Assertion)

In einem Behauptungssatz ist also **zweierlei** zu unterscheiden: der Inhalt, den er mit der entsprechenden Satzfrage gemein hat und die Behauptung. (…) In einem Behauptungssatze ist **beides** so verbunden, daß man die Zerlegbarkeit leicht übersieht. Wir unterscheiden demnach 1. das Fassen des Gedankens -- das Denken, 2. die Anerkennung der Wahrheit eines Gedankens – das Urteilen 3. die Kundgebung dieses Urteils -- das Behaupten. (Frege 1918, *Der Gedanke*).

I propose a correction: All **three** aspects may be combined in an assertion.

3.2 Propositions, Judgements and Assertions

(38) There are **three** distinct semantic operations;
  a. Forming a **proposition** / thought φ which has truth conditions
  b. Forming a **judgement** of x concerning a proposition φ, a **private** act
  c. Forming an **assertion** of x of φ, a **public** act with social consequences

(39) We can distinguish between:
  a. x asserts a **simple proposition** φ, in order to introduce φ to the common ground
  b. x asserts a **judgement** by x about a proposition φ in order to introduce φ to the common ground

(40) Reason for asserting judgments: Weakening of commitment by committing to a weaker proposition
  a. *It will likely rain* weaker than *It will rain*, as private beliefs are not easily checked publicly.
  b. Karttunen 1972, Veltman 1996: *It is the mailman* “stronger” than *It must be the mailman*.
  c. Experimental result by Knobe & Yalcin 2014 for extracontextual assessors (eavesdroppers):
     a. S₁: *John is dead*. E knows that John is not dead, judges what S₁ said as false.
     b. S₁: *John might be dead*. E knows that John is not dead, judges what S₁ said as true.

(41) Lauer 2013 only has (39)(b), i.e. asserting φ is always committing to a judgement (belief) of φ however, there is a difference between S₁: *It is raining*. and S₁: *I believe that it is raining*, even though *I believe that I believe that φ* probably entails: *I believe that φ*

(42) Two uses of judgement/belief clauses:
  a) With ‘I [prop.attitude] φ’, speaker S₁ wants to add proposition ‘S₁ believes φ’ to common ground
  b) With ‘I [pro.attitude] φ’, speaker S₁ wants to add φ itself to common ground, if φ is a QUD

(43) Two claims for case (b):
  (i) there are special grammatical forms for (b): epistemic adverbials, embedded root clauses
  (ii) [prop.attitude] must assign high or at least non-zero subjective probability to φ
(44) No negated epistemic adverbials (Bellert 1977, Ernst 2009):
*It will likely / unlikely rain. vs. It is likely / unlikely that it will rain.* (objective epistemics)

(45) No embedded root phenomena in negative contexts:
*Iglube, es wird regnen. vs. *Ich glaube nicht, es wird regnen.
vs. Ich glaube (nicht), dass es regnen wird.

### 3.3 Judgements in syntax and semantics

(46) Subjective modals to express confidence of speaker, addressee, attitude holder:

- a. Peter: *It will likely rain.* assertion – speaker
- b. Mary, to Peter: *Will it likely rain?* question – addressee
- c. Peter thinks that it will likely rain propositional attitude – subject, here: Peter

(47) Assume a judgement phrase for expressing the confidence of a judger in a proposition \( \phi \);
when asserted, the speaker \( S \) commits to the proposition that \( S \) has the specified confidence in \( \phi \),
in a propositional attitude context, it is expressed that the subject has the specified confidence in \( \phi \);

(48) The judger aligns with the judge parameter of personal taste / perspective predicates by default:

- a. *The pizza is tasty.* default judge: speaker
- b. *Is the pizza tasty?* default judge: addressee
- c. Peter thinks that the pizza is tasty. default judge: subject, here: Peter

(49) TPs are interpreted as propositions with a judge parameter
that figures in the interpretation of perspective expressions and predicates of personal taste,
in addition to parameters for speaker, addressee etc.

\[
[[TP \text{ the pizza is tasty}]]^{\text{v-a}} = \lambda j [\text{the pizza is tasty for } j]
\]

(50) JP that makes the judge parameter accessible for semantic operators:

\[
[[JP [J [TP \text{ the pizza is tasty}]]]]^{\text{v-a}} = \lambda j [[[[TP \text{ the pizza is tasty}]]^{\text{v-a}}]] = \lambda j \lambda i [\text{the pizza is tasty for } j \text{ in } i]
\]

(51) JP can be modulated by subjective epistemic operators:

- epistemic particles (German wohl, Zimmermann 2004; English perhaps),
- epistemic adverbials (certainly, likely, possibly)
- epistemic modals in subjective reading (may)

### 3.4 Subjective vs. objective epistemic operators and judgements

(52) Lyons 1977:
Subjective: Poss + it-is-so + Alfred is unmarried.
*Alfred may be unmarried.* Objective: I-say-so + Poss + Alfred is unmarried.

(53) Papafragou 2006: \([\text{might } \phi]^{\text{con,i}} = \forall x \in G_{\text{con}} \exists i' \in f_\phi(i) \ [\phi]^{\text{con,i'}}\]

\( G_{\text{con}} \): group of knowers whose knowledge is relevant; subjective: \( G_{\text{con}} = \{ \text{speaker(con)} \} \),
\( G_{\text{con}} \) might be specified, e.g. as reported by the weather forecast
cf. also Kratzer 1981, Tancredi 2007, Portner 2009

(54) Wolf 2012, 2015: expressive (better: judgmental) vs. descriptive epistemic modality

(55) Epistemic adjectives vs. epistemic adverbials:

a. *It is likely that it will rain.* – objective
b. *It likely will rain.* – subjective

(56) Objective epistemics are at-issue:

- a. \( S_1 \): *It is likely that it will rain.* – \( S_2 \): *I don’t believe it.*
  - i) \( S_2 \) does not believe that it is likely that it will rain, picking up ‘It is likely that it will rain’
  - ii) \( S_2 \) does not believe that it will rain, picking up embedded ‘it will rain’
- b. *It is not likely that it will rain.* / *It is unlikely that it will rain.*
(57) Subjective epistemics are not-at-issue (Murray 2010)
   a. S₁: It likely will rain. – S₂: I don’t believe it.
      only (ii): S₂ does not believe that it will rain.
   b. * It not likely will rain. / * It unlikely will rain.
   c. S₁: It likely will rain.
      S₂: Yes. S₂: No.
      i) ‘It will rain’
      ii) ‘It will likely rain’ - confirming act
   d. S₁: It likely will rain. – S₂: I don’t believe you. challenges (i), hereby not accepting (ii)

(58) Objective epistemics occur in non-assertive environments, subjective epistemics don’t:
   If it is likely that it will rain / If it will ”likely / “perhaps rain, we should take umbrellas.

3.5 Implementation of subjective / objective epistemics

(59) Assume for concreteness a probability-theoretic approach to epistemics:
   P(x, i, ϕ): the probability that x assigns at index i that ϕ is true at i

(60) Objective epistemics are proposition-internal, relating to the TP:
   a. [[TP it is likely that it will rain]][^a] = λj[P(x, i, λi'[it will rain in i']) > 0.5],
      x: a contextually salient authority, as unspecified: one with which the speaker aligns
   b. As reported by the the weather forecast, it is likely that it will rain.
      λj[P(report of the w.f. in i, i, λi'[it will rain in i']) > 0.5],
      speaker considers w.f. relevant, otherwise there is no add this to the common ground

(61) Subjective epistemics are proposition-external, related to the judgement phrase, JP:
   a. [[JP [ J [TP it will rain]]]][^a] = λjλi'[it will rain in i]
   b. [[JP likely [ J [TP it will rain]]]][^a] = λjλi[P(j, i, λi'[it will rain in i']) > 0.5] epistemic adverbial
   c. [[JP perhaps [ J [TP it will rain]]]][^a] = λjλi[P(j, i, λi'[it will rain in i']) ≠ 0] epistemic particle
   d. [[JP [J must [ J [TP it rain]]]][^a] = λjλi[P(j, i, λi'[it rains in i']) = 1] epistemic particle

(62) Anaphoric uptake:
   a. S₁: (61)(a,b,c,d), S₂: I (don’t) believe it. – S₂ does (not) believe that it rains (TP)
   b. S₁: (61)(a,b,c,d), S₂: I believe so, too. – S₂ does aligns with S₁’s JP
   a. JPs are not propositions, type st, but functions from judgers to propositions, type est,
      no anaphoric uptake for such functions by it, that.

(63) a. In [ActP ... [CommitP ... [JP ... [TP ... ]]]], only TP can relate to “factual” common ground
   b. Anaphoric means to relate to judgements, acts: That’s right, I agree, Well said! ...

(64) Not accessible to negation: *It not likely will rain, *It not perhaps will rain
   a. JPs cannot be negated, as they are not propositions, type st, but of type est.
   b. Why: *It unlikely will rain – as speaker wants to propose TP, P(s, i, [[TP]]) must exclude 0

3.6 Judgement phrases in assertions and questions

(65) Alignment of Committer of CommitP and Judge of JP:
   S₁: It will likely rain. – S₁ claims responsibility for truth of: S₁ thinks it is likely that it will rain.

(66) Committing to a judgement phrase without epistemic modifier:
   [[CommitP it [CommitP ⊢ will [JP [[TP _ _ rain]]]]]][^a]
   = λs [s⊢[[JP [TP it will rain]]][^a](s)], = λs [s⊢λi'[it will rain in i]]

(67) Committing to a judgement phrase with subjective epistemic modifier:
   [[CommitP it [CommitP ⊢ will [JP likely [J [TP _ _ rain]]]]]][^a]
   = λs [s⊢[[J likely [TP it will rain]]][^a](s)], = λs [s⊢λi[P(s, i, λi'[it will rain in i']) > 0.5]]
Assertion of commitment phrase with a judgement phrase with epistemic modifier:

\[ S_1 \text{, to } S_2: \lambda\mathcal{C} \{c \in \mathcal{C} | \nabla\mathcal{C} + S_1 \vdash \lambda i[P(S_1, i, \lambda i[\text{it will likely rain in } i]) > 0.5] \subseteq c \} \]

Additional specification of a commitment phrase operator (just for illustration)

\[ S_1 \text{, to } S_2: \lambda\mathcal{C} \{c \in \mathcal{C} | \nabla\mathcal{C} + S_1 \text{ honestly responsible for: } \lambda i[P(S_1, i, \lambda i[\text{it will rain in } i]) > 0.5] \subseteq c \} \]

Questioning a commitment phrase, shift of judge to addressee (interogativity flip, Faller 2002)

\[ S_1 \text{, to } S_2: \lambda\mathcal{C} \{\nabla\mathcal{C} \cup \{c \in \mathcal{C} | \nabla\mathcal{C} + \nabla S_2 \vdash \lambda i[P(S_2, i, \lambda i[\text{it will rain in } i]) > 0.5] \subseteq c \} \]

Subjective + objective epistemic operator o.k. not subjective + subjective

It is perhaps likely that it will rain,

\[ S_1 \text{, to } S_2: \lambda\mathcal{C} \{c \in \mathcal{C} | \nabla\mathcal{C} + S_1 \vdash \lambda i[P(S_1, i, \lambda i[\text{it will rain in } i]) > 0.5] \neq 0 \subseteq c \} \]

3.7 Judgement phrases in propositional attitudes

John thinks that it likely will rain.

Embedded judgement phrase:

\[ [\lambda j[\text{think}(i)(\lambda i[\text{it will rain in } i]) > 0.5] \]

Filling argument slot of propositional attitude predicate

\[ [\lambda i[\text{think}(i)(\lambda i[\text{it will rain in } i]) > 0.5] \]

John has a thought that can be characterized as: he considers it > 0.5 likely that it will rain.

a. John thinks that perhaps it will rain. subjective epistemic
b. *John doubts that perhaps it will rain. subjective epistemic
c. John doubts that it is likely to rain. objective epistemic

d. *John doubts that perhaps it will rain. subjective epistemic

negation does not have scope over a JP, as negation is a propositional operator

High negation in questions is possible:

Isn’t this perhaps too simple?

Cf. Krifka 2015 for high negation in questions as applying to CommitP;

speaker tests whether addressee would refrain from committing to the unnegated proposition

\[ = \lambda\mathcal{C} \{
\nabla\mathcal{C} \cup \{c \in \mathcal{C} | \nabla\mathcal{C} + \neg S_2 \vdash \lambda i[\text{this is too simple in } i] \subseteq c \}
\]

3.8 Non-at-issuerness

Assumption here:

a. Regular semantic representation: ActP [CommitP [JP [TP]]]

b. In a non-embedded clause, only material in the TP can be at-issue
c. Material in JP, CommitP just helps to make TP-material become part of the common ground

i) CommitP: Declare responsibility

ii) JP: relate responsibility to judgement strength, thus lowering responsibility

Differs from approaches that have the effect of JP / CommitP on a separate, “expressive” layer, e.g. Wolfs 2014;

explains why #It is raining (I think it is likely.) is odd, as it involves a full commitment to ‘It is raining’
Example with speaker attitude in JP vs. TP:

a. \( S_1: \text{It will likely rain.} \)

\[
\begin{align*}
[\text{Act}\ i \vdash \text{will}_{\text{commit}}] & \vdash [\text{JP} [\text{TP} \downarrow \text{rain}]] \\
& = \lambda C + S_1 \lambda i \{ P(S_1, i, \lambda i [\text{it will rain}] > 0.5) \}
\end{align*}
\]

\( S_2: \text{I don't believe it. (=} \text{that it will rain.}) \)

b. \( S_1: \text{I think it is likely that it will rain.} \)

\[
\begin{align*}
[\text{Act} I [ \text{J think}_{\text{commit}}] & \vdash [\text{JP} [\text{TP} \downarrow \text{it is likely that it will rain}]] \\
& = \lambda C + S_1 \lambda i \{ P(S_1, i, \lambda i [\text{it will rain}] ) \}
\end{align*}
\]

\( S_2: \text{I don't believe it. (i) that you think it is likely (ii) that it will rain.} \)

### 3.9 Evaluation dimensions beyond Truth

Dimensions: the True, the Good, the Beautiful; here we have a closer look at the Good.

a. \( \text{Es regnet leider} / \text{gottseidank} / \text{(un)glücklicherweise}. \) subjective, not-at-issue
   ‘Unfortunately / fortunately, it is raining.’

b. \( \text{Es ist schade} / \text{gut, dass es regnet}. \) objective, at-issue
   ‘It is (un)fortunate that it is raining’

Flip / shift with subjective goodness evaluations?

a. \( * \text{Regnet es leider?} \) ‘It is unfortunately raining?’

b. \( \# \text{Peter glaubt, dass es leider regnet, aber ich finde es gut}. \) ‘Peter thinks that it is unfortunately raining, but I like it.’

c. \( \# \text{Peter findet, dass es leider regnet}. \) ‘Peter finds it unfortunate that it is raining, but I like it.’

Subjective goodness always related to the speaker, modeled as expressive meaning:

a. \( [\text{TP leider [TP es regnet]}]^{\text{aka}} \) \( = \lambda i [\text{it is raining in i}], \text{expressive: } \lambda i'[\text{s considers } \lambda i [\text{it is raining in i}] \text{unfortunate in i}'] \)

b. \( [\text{TP es ist schade, dass es regnet}] \) \( = \lambda i'[x \text{considers } \lambda i [\text{it is raining in i}] \text{unfortunate in i}'], \text{expressive: } – \)

c. \( [\text{TP ich finde es schade, dass es regnet}]^{\text{aka}} \) \( = \lambda i'[s \text{considers } \lambda i [\text{it is raining in i}] \text{unfortunate in i}'], \text{expressive: } – \)

Interactions of the True with the Good:

a. \( \text{Es regnet wahrscheinlich leider} \) ‘it will probably rain, the raining is unfortunate’

b. \( \text{Es regnet leider wahrscheinlich}. \) ‘it will probably rain, it is unfortunate that it will rain’

### 4. Evidentials and judgements

Evidentials often difficult to tease apart from epistemics, do not express the confidence of a judger that a proposition is true, but rather the source of the judgement (de Haan 2000, Hacquard 2011), e.g. a person, a rumor, a sensory channel

Here I propose no separate projection for evidentials, but that they specify the judge parameter of a judge phrase; consequence: evidentials are always not-at-issue, as judge phrases are not-at-issue

### 4.1 Non-reportative Evidentials: Sensory, Inferential

Non-reportative evidentials specify the nature of the judge relation, e.g. sensory channel: hearing, source of knowledge: inferential
Example: **auditory evidentials**, \( \text{fápli-ya-li-hawa-t} \)
e.g. Koasati (Kimball 1991)
be.windy-ABILITY-AUDIT-PAST
‘one could hear the wind occasionally’

\([ [ \text{JP AUDITORY } [ J \left[ \text{TP it is raining} \right] ] ] ] = \lambda j \lambda i [ \text{hear} (j, [[ \text{it is raining} ]]^{a,j})] \),
where \text{hear} (j, \varphi): \text{in i, person j has auditory evidence for the truth of } \varphi

Example: **inferential evidentials** \( \text{es regnet woh} \)
e.g. German \( \text{wohl} \)
‘presumably it is raining’

Doherty 1979: presenting a hypothesis,
Zimmermann 2004: expressing a conjecture (“Vermutung”) by speaker or addressee,

\([ [ \text{JP INFER } [ J \left[ \text{TP it is raining} \right] ] ] ] = \lambda j \lambda i [ \text{infer} (j, [[ \text{it is raining} ]]^{a,j})] \),
where \text{infer} (j, \varphi); \text{in i, person j has inferential evidence for the truth of } \varphi

Assertion of non-reportative evidentials serve to reduce the blame if proposition is false,
as sensory evidence / inferential evidence is not always to be trusted.

Meaning contribution of \( \text{wohl} \) is not-at-issue (Zimmermann 2004):
\( S_1: \text{Es regnet woh} \)
\( S_2: \text{Das glaube ich nicht} \). ‘I don’t believe it’, i.e. \( S_1 \) strictly believes that it is not raining.

Interrogative flip, as j is specified as addressee in questions: \( \text{Regnet es woh} \)?

### 4.2 Reportative Evidentials

Reportative evidentials shift the evidence holder

Example hearsay evidential; cf. Schenner 2008. \( \text{Es soll regnen} \). ‘Reportedly, it will rain’

Not-at-issue

\( \neg S_2: \text{Das glaube ich nicht} \). ‘I do not believe that’, i.e. that it will rain.
meaning contribution: \( \neg \, ?? \text{Wenn es regnen soll, dann müssen wir einen Schirm mitnehmen} \).

\([ [ \text{JP es } [ \text{soll } [ \text{TP regnen} ]]] ]^{a,a} = \lambda j \lambda i \exists x [x \vdash 'it will rain'], \text{i.e. some x claims that it will rain}\.

\([ [ \text{CommittP es } [ \vdash \text{JP } [ \text{soll } [ \text{TP regnen} ]]] ] ]^{a,a} = s \vdash \lambda i \exists x [x \vdash 'it will rain'], \text{i.e. speaker s is responsible for the proposition that some x claims that it will rain}\.

\( S_1: \text{Laut Wetterbericht wird es regnen} \). ‘According to the weather forecast it will be raining.’

Possibly at-issue meaning contribution:

a. \( S_2: \text{Das glaube ich nicht} \).
   i) ‘I do not believe that it will rain’ (preferred)
   ii) ‘I do not believe that the weather forecast predicted so’

b. \( \text{Wenn es laut Wetterbericht regnet, müssen wir einen Schirm mitnehmen} \).

c. \( \text{Laut Wetterbericht regnet es nicht} \).
   i) According to the w.r., it will not rain.
   ii) ‘It is not the case that according to the w.r. it will rain’

Possibly interpretable in TP or JP?

a. \( [[\text{TP laut WB } [ \text{wird es regnen} ]]] ]^{a,j} = \lambda i [ \text{weather-report } \vdash 'it will rain'] \)
b. \( [[\text{JP laut WB } [ J \left[ \text{TP es regnen} \right] ] ] ] = \lambda j \lambda i [ \text{weather-report } \vdash 'it will rain'] \)

Asserting reportative evidential helps to introduce proposition when source is trusted,
while the speaker can shift responsibility to the indicated source.

Similar use with embedded clauses, especially with root clause syntax in German:
\( \text{Der Wetterbericht sagt (*nicht), es wird regnen} \). (Simons 2007; Krifka 2014 for proxy speech acts)
5. Discourse epistemics

5.1 German mögen / mag

(106) literal meaning: ‘to want, to like’, cognate with may, historically ‘be able to’, cf. vermögen

(107) Das mag in der Theorie stimmen, tuagt aber nicht für die Praxis.
‘(granted that) this may hold in theory, but is not useful for practical purposes’

(108) Objective epistemic modal? Probably not.
   a. S₁: Das mag in der Theorie stimmen.
      S₂: I don’t believe it.
      ‘I do not believe that it holds in theory’, rather than ‘I do not believe that it can hold in theory’
   b. *Wenn das in der Theorie stimmen mag, dann muss die Theorie schlecht sein.
      ‘If this may hold in theory, the theory must be bad.’

(109) Subjective epistemic modal?
   Not really, as it cannot serve to introduce a proposition into discourse.
   S₁: Wir mögen die Atmosphäre durch SO₂-Injektionen abkühlen können, aber...
      ‘We may be able to cool down the atmosphere with SO₂ injections, but...’
   S₂: #Du willst wirklich behaupten, dass wir mit SO₂-Injektionen die Erde abkühlen können?
      ‘You really want to claim that we can cool down the atmosphere with SO₂ injections?’

(110) What is rather going on:
   Speaker grants a proposition to the addressee without claiming it,

5.2 Implementation of discourse epistemics

(111) Idea: mag φ guarantees that φ in at least one continuation of input commitment space C,
   cf. interpretation of modals in dynamic semantics as checks of input states, Veltman 1996.

(112) C + \[mag \phi\] = C, iff \(\exists \in C[\phi \in c]\), else undefined; C may become accommodated accordingly
   i.e. \(\[mag \phi\] = \lambda C. \exists \in C[\phi \in c][C]\) (i.e. \(\lambda C[C]\) restricted to those C where \(\exists \in C[\phi \in c]\)

(113) Syntactic implementation:
   \[\langle ActP \[das \]. CommitP \[mag \[TP \[in der Theorie stimmen]]]]\] = \(\lambda C . \exists \in C[\phi \in c][C]\)

(114) Not possible in propositional attitude verbs, as they do not embed CommitP:
   *Peter weiß, dass es regnen mag. vs. Peter weiß, dass es regnen soll / kann.
   Peter knows that it rain MAG Peter knows that it rain REPORT / POSS

(115) Other discourse epistemics? E.g., future:
   Dieses Tier dort – das wird ein Esel sein.
   ‘that animal over there – this will (turn out to) be a donkey’
   in all inertia developments of the common ground, φ will turn up in a commitment state c

(116) Combination with other modal operators:
   a. Epistemic modal (objective, subjective?)
      Es mag regnen können, aber wir machen auf jeden Fall einen Spaziergang.
      it MAG rain POSS
      ‘Granted that it might rain, but in any case, we go on a walk.’
   b. Evidential, possibly with shift to addressee?
      Es mag wohl regnen, aber wir machen auf jeden Fall einen Spaziergang.
      ‘Granted that you have evidence that it is raining, but...’

(117) Es mag vielleicht möglich sein, dass dein Vorschlag semantisch plausibel ist,
er hat aber leider viele syntaktische Fragen unbeantwortet gelassen.

‘Granted that it is perhaps possible that your proposal is semantically plausible, but it unfortunately left many syntactic issues unanswered.’

6. References