The base model

The first iteration of the model consists of

- A large set of (apparently semantically inert), sentence-like strings of sounds, _*sentences*, $s_1..s_k$.
- A large set of speakers or _*agents* $a_1..a_n$.
- For each _agent a_i, a _*value* function,

$$V_i : s, t, \mathbf{x} \rightarrow v$$

where s is a _sentence, t is a time, $\mathbf{x}$ is a point in 3-dimensional space representing a_i's position at t, and v is a number between 0 and 1 with 0 representing maximum _disvalue, 1 maximum _value, and 0.5 indifference. A _sentence token is a complex of the form $<s, t, \mathbf{x}>$; a _sentence type is just s.

_Pleasure

A distinction is made between _value , which is meant to correlate to a feeling of something's being the case, even if trivial or banal, and a provisional, model-specific feeling associated with novel, _valuable _sentences, _*pleasure*. _Pleasure will ultimately be discarded from the model, but until it is, it will serve as the only motive for exchanging _sentences – for _conversing. The sole goal of talk in the model is to maximize _pleasure.

The model, first refinement – focus of attention

To reflect the fact that our reaction to a sentence may depend on where our attention is focused – for example, where we are looking– a second, 3-dimensional position argument, $\boldsymbol{\xi}$, is added to represent this for a_i:

$$V_i : s, t, \mathbf{x}, \boldsymbol{\xi} \rightarrow v.$$

A _sentence token is now a complex of the form $<s, t, \mathbf{x}, \boldsymbol{\xi}>$. One utterance corresponds to arbitrarily many token _sentences, insofar as it can be evaluated at arbitrarily many values of $\boldsymbol{\xi}$.

The model, second refinement – simultaneously _valued _sentences

The next parameter to add is a set, B, of token _sentences, representing the token _sentences _valued by a_i at t, excluding potentially s itself:

$$V_i : s, t, \mathbf{x}, \boldsymbol{\xi}, B \rightarrow v.$$

Note that B makes the _value function impredicative, as plausibly it should be.

Note also that at a time, B may contain token _sentences from other times and places, just as I may now believe a thing you said yesterday.

_Belief

_agent a_i *_believes* a token _sentence <$s, t, \mathbf{x}, \boldsymbol{\xi}$> *iff* $V_i(s, t, \mathbf{x}, \boldsymbol{\xi}, B) > 0.5$, where B is the set of token _sentences _believed by a_i at t excluding s.

The model, last refinement – _context

The final parameter to add is a set, C, of token _sentences representing the _sentences heard at recent times $t' < t$ by a_i at t, excluding s itself – the *_context* of s:

$$V_i : s, t, \mathbf{x}, \boldsymbol{\xi}, B, C \rightarrow v$$

A token _sentence is now <$s, t, \mathbf{x}, \boldsymbol{\xi}, C$> – change the _context, and the token _sentence is changed.

_Observation and _theory _sentences

A token _sentence s is an *_observation* _sentence for a_i *iff* the _value of s is independent of B and varies with t, $\mathbf{x}$, $\boldsymbol{\xi}$ and C. A token _sentence which is not an _observation _sentence is a _theory _sentence.

Aggregate _value

The aggregate _value A_i for a_i of a set of token _sentences B is,

$$A_i(B) = \sum_{j=0}^{n} V_i(s_j, B \setminus \{s_j\})$$

where s_j are the elements of B.

Maximal _belief set for *a*

B is the (or a) maximal _belief set for _agent a *iff* the aggregate _value of B for a is greater than or equal to the aggregate _value for a of any other set, B'.

_True-for-*a*

A _sentence s is *_true for a iff s* is an element of the (or a) maximal _belief set for a. The parenthetic *"or a"* is included because nothing in the model precludes the existence of more than one maximal set.

Combined aggregate _value

The *combined aggregate _value* for the speakers of a _language of a set of _beliefs B is,

$$C(B) = \sum_{i=0}^{n} A_i(B)$$

where i ranges over all _agents who speak the _language.

Maximal _belief set (punkt)

B is the (or *a*) *maximal _belief set iff* the combined aggregate _value of *B* is greater than (or equal to) the combined aggregate _value of any other set, *B´*.

_True (punkt)

_sentence *s* is *_true iff B* is the maximal _belief set (or a maximal _belief set) and $s \in B$ and $C(B) > C(B) \setminus \{s\}$.

Words

Logic

Atomic _sentence

A _sentence *s* is atomic *iff s* contains no _logical connective or _quantifier.

_Moment

A _moment is a complex of the form $\langle t, \mathbf{x}, \boldsymbol{\xi}, C\rangle$.

_Truth set of a _phrase at a _moment

A set *M* of token _sentences is the *_truth set* at a _moment *m* of a _phrase *p iff M* is the set of all and only the _true atomic _sentences containing *p* at *m*.

_Observation and theory _truth sets of a _phrase

A _truth set *M* at a _moment *m* of a _phrase *p* is an *_observation* _truth set *iff* the _truth set of *p* at *m* contains _observation _sentences. A _truth set of a _phrase which is not an _observation _truth set is a _theory _truth set.

Tensed _sentence

Explanatory note:

The concept of a _sentence type is extended to include a parameter doing the work of simple verb tense. A _sentence type may thus now be denoted by an ordered pair, $\langle s, q\rangle$, where *q* may have the values *present*, *past* or *future*. The value of *q* is understood to be conveyed by the speaker – for example by her uttering it along with a _sentence: “Bob is black-haired (*past*)”, “Bob is grey-haired (*present*)”, “Bob is bald (*future*)”. For notational simplicity, $\langle s, present\rangle$ can still be written as just ‘*s*’.

The model is constrained so that if u is the _truth set of a _phrase at $<t, \mathbf{x}, \boldsymbol{\xi}, C>$ then for every element of u of the form $<<s, past>, <t, \mathbf{x}, \boldsymbol{\xi}, C>>$ it happens that there exists one or more moments $<t', \mathbf{x}', \boldsymbol{\xi}', C>$ such that $t' < t$ and $<<s, present>, <t', \mathbf{x}', \boldsymbol{\xi}', C>>$ is _true. The correlate point applies for $<<s, future>, <t, \mathbf{x}, \boldsymbol{\xi}, C>>$ and $t' > t$. (If ‘Bob was black-haired.’ is true now, then there are arbitrarily many points in the past when ‘Bob is black-haired.’ was true.)

Extending this treatment of tense, let the model also permit a _sentence type to be represented as an ordered pair $<s, \tau>$, where τ is a time.

If $\tau = t$, then $<<s, \tau>, <t, \mathbf{x}, \boldsymbol{\xi}, C>> = <<s, present>, <t, \mathbf{x}, \boldsymbol{\xi}, C>>$ - ie, the _sentence is present-tensed.

If $\tau < t$, then if $<<s, \tau>, <t, \mathbf{x}, \boldsymbol{\xi}, C>>$ is _true then so too will be $<<s, past>, <t, \mathbf{x}, \boldsymbol{\xi}, C>>$. And again the correlate point applies for $<<s, future>, <t, \mathbf{x}, \boldsymbol{\xi}, C>>$ and $\tau > t$. Furthermore, if $<<s, past>, <t, \mathbf{x}, \boldsymbol{\xi}, C>>$ is _true then there will be at least one time $\tau < t$ such that $<<s, \tau>, <t, \mathbf{x}, \boldsymbol{\xi}, C>>$ is _true, and similarly for future tense statements and $\tau > t$.

Call $<<s, \tau>, <t, \mathbf{x}, \boldsymbol{\xi}, C>>$ the *de-indexicalized* correlate of $<<s, q>, <t, \mathbf{x}, \boldsymbol{\xi}, C>>$

Notes: context remains the same. Elements of context may have $t > t'$, noting that there are assumed to be no spatial indexicals (*here*, *there*, *etc*.) in the model.

_Truth set correlates

_Truth sets w_1 and w_2 are correlates *iff* their de-indexicalized correlates are identical.

_Moment line of a _phrase

A set l of _moments is a *_moment line* of a _phrase p *iff* the _truth sets of p at every _moment m in l are correlates, each is a non-empty _observation _truth set, and the components $<t, \boldsymbol{\xi}>$ of the _moments of l jointly constitute a smooth space-time curve.

Concrete singular _term

A _phrase p belonging to a _true atomic token _sentence $<<s, q>, t, \mathbf{x}, \boldsymbol{\xi}, C>$ is a concrete singular _term *iff* there exists a _moment line l of p and either
1) $<<s, q>, t, \mathbf{x}, \boldsymbol{\xi}, C>$ is an observation _sentence and $<t, \boldsymbol{\xi}>$ is on l
or
2) there is a _truth set correlate at some _moment $<t', \mathbf{x}', \boldsymbol{\xi}', C'>$ of the _truth set of p at $<t, \mathbf{x}, \boldsymbol{\xi}, C>$ which is a non-empty _observation _truth _set and $<t', \boldsymbol{\xi}'>$ is on l.

Sameness of concrete singular _term _reference

Two concrete singular _terms c_1 and c_2 have the same _reference *iff* c_1 and c_2 have the same _moment line.

_Sentential complement of a _phrase

A _phrase *q* is the *_sentential complement* of a _phrase *p* in an atomic _sentence *s iff q* is the _phrase remaining when *p* is removed from *s*.

_Predicate

A token _phrase *p* at a _moment *m* is a *_predicate iff* the _sentential complements of *p* of the elements of the _truth set of *p* at *m* all are concrete singular _terms. //what about ‘colour’? “Red is a colour”

_Complement set of a _predicate

A set *E* of _concrete singular _terms is the _complement set of a token _predicate *p* at a _moment *m iff E* is the set of the _sentential complements of *p* of the elements of the _truth set of *p* at *m*.

Sameness of _predicate _reference

Two token _predicates p_1 and p_2 have the same reference *iff* p_1 and p_2 have the same _complement set.