Modalized Normality in Pictorial Narratives

Dorit Abusch and Mats Rooth

Sinn und Bedeutung 25

Free-perception variety of free indirect discourse

I looked back up the sidewalk, and that angry kid was walking toward me.

Free-perception in comics

Tezuka, Ode to Kirihito, p. 284

Free-perception in comics

Lia, Fluffy

Non-veridical

Free-perception in film

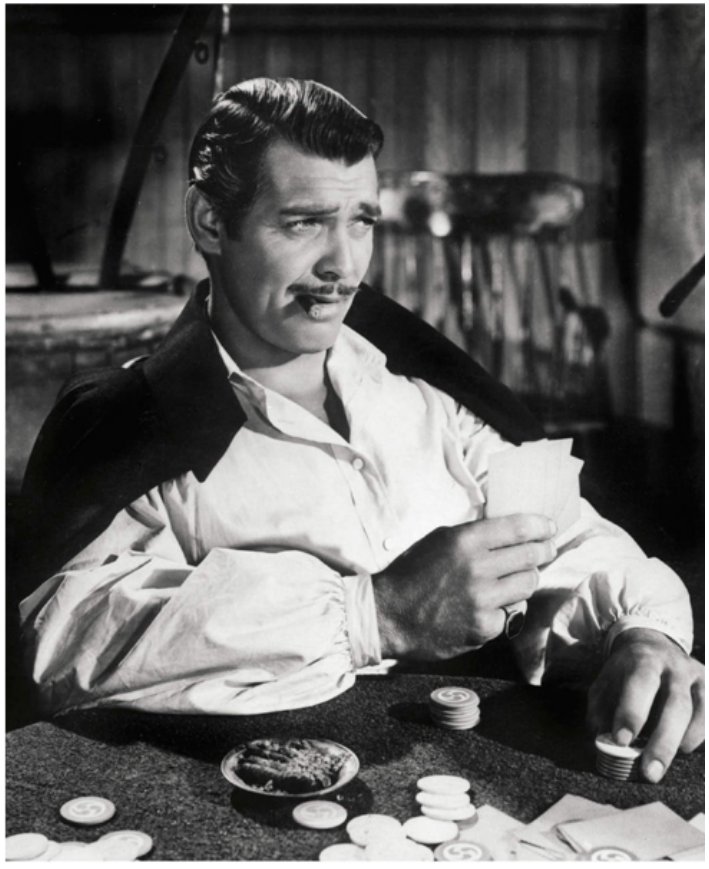
Clip from *The Third Man*, 1949, Carol Reed (dir.), Graham Green (script).

Third man

Play the clip.

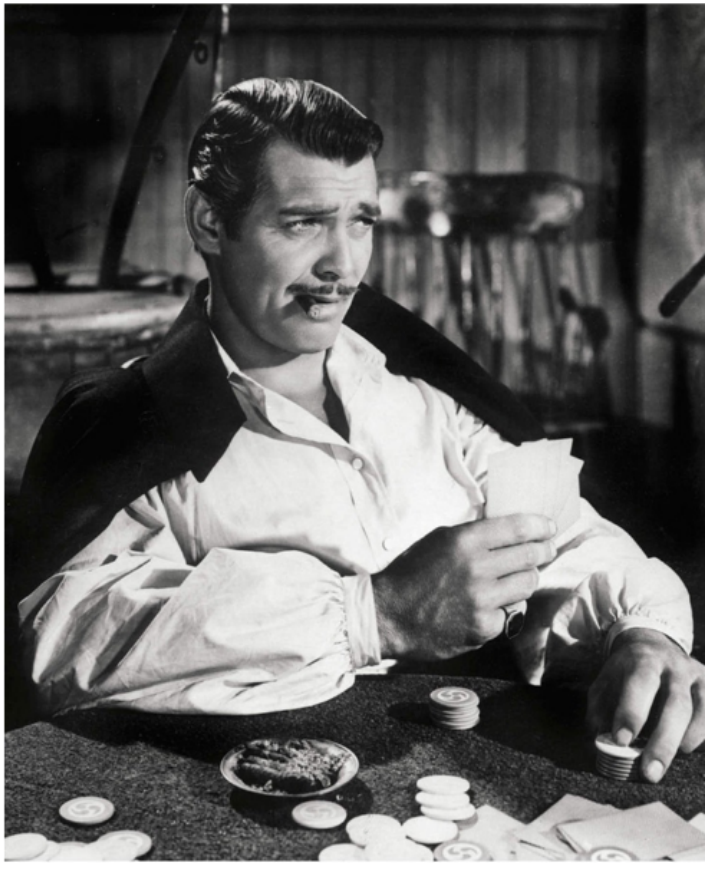
Third man

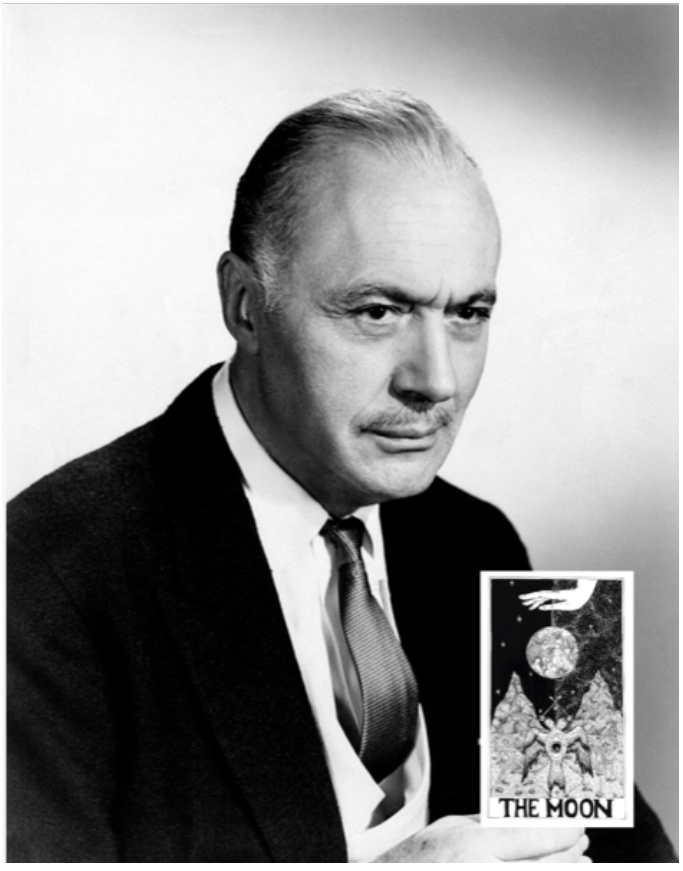
Gable and Boyer playing cards v1



Running example of veridical free perception sequence

Gable and Boyer playing cards v2





Running example of non-veridical free perception sequence

Hintikka analysis of free perception

The Formal Semantics of Free Perception in Pictorial Narratives *

Dorit Abusch and Mats Rooth

Cornell University, Ithaca, NY, USA
da45@cornell.edu mr249@cornell.edu

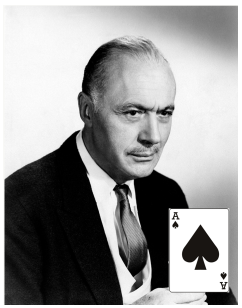
... constructed using event-sequence models.

Hintikka analysis of free perception

The event-type e_{ga} is the event-type of Gable veridically looking at a scene that looks exactly like this from his geometric perspective.

Precondition of the event

Event e_{ga} can happen only in a world w where Gable is facing a scene that looks exactly like this from his geometric perspective. If w satisfies the precondition, w has a successor we_{ga}.



Typically w has other successors. This is a branching-time modal space.

Epistemic consequences of events ...

... are captured with an event alternative relation for each agent. The set of event alternatives to e_{ga} for Gable is the unit set of e_{ga}.

Epistemic consequences of events ...

Let w be a world that satisfies the pre-conditions of e_{ga}, so that there is a world we_{ga}. Then the epistemic alternatives for Gable in we_{ga} are worlds of the form vd, where:

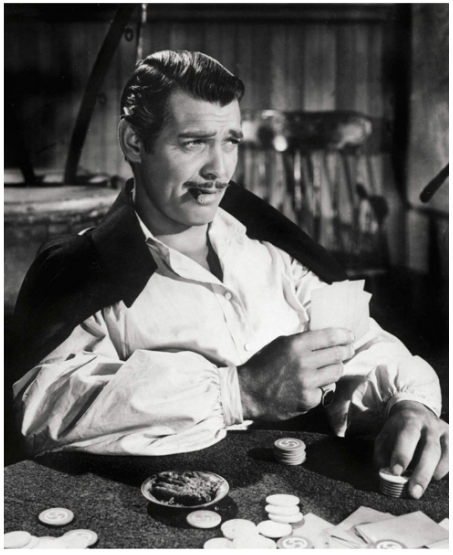
1. v is an epistemic alternative to w for Gable
2. d is and event-alternative to e_{ga} for Gable, i.e. $d = e_{ga}$.
3. v satisfies the preconditions of d, i.e. v satisfies the preconditions of e_{ga}.

Epistemic consequences of events ...

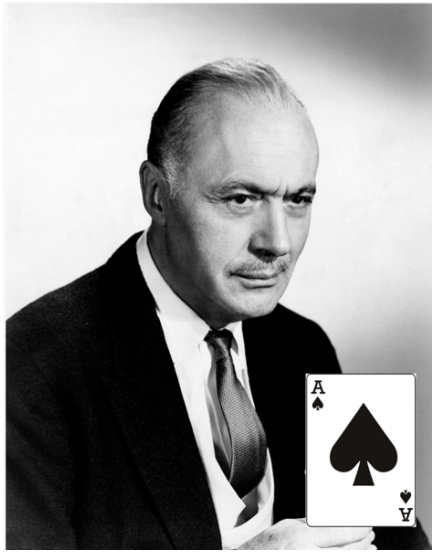
Epistemic alternatives to Gable in we_{ga} are ones of the form ve_{ga} where he has just looked at a scene like the second picture. This captures

1. introspection, Gable knows he is looking, and
2. veridicality, because v must satisfy the preconditions of e_{ga}.

LF of example v1



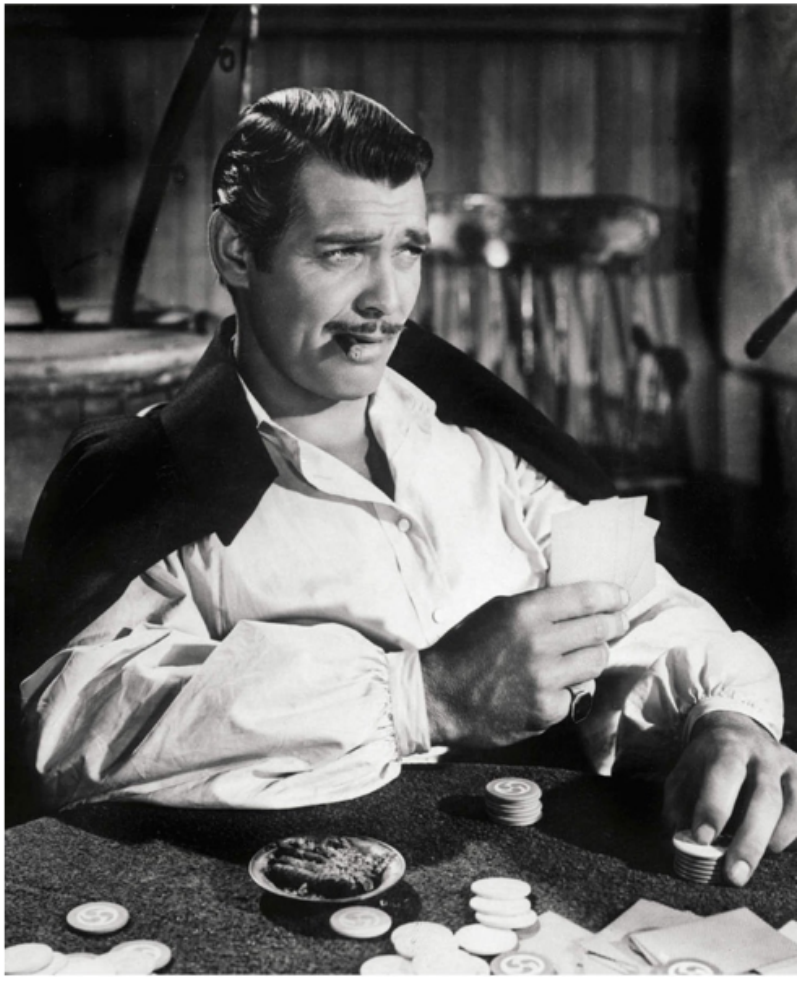
$x\ V(1)$



A Bug

This syntax-semantics interface and model construction entails that Gable picks up *all* the information in his field of view. This is incorrect as a description of human agents.

Typical information picked up by viewer

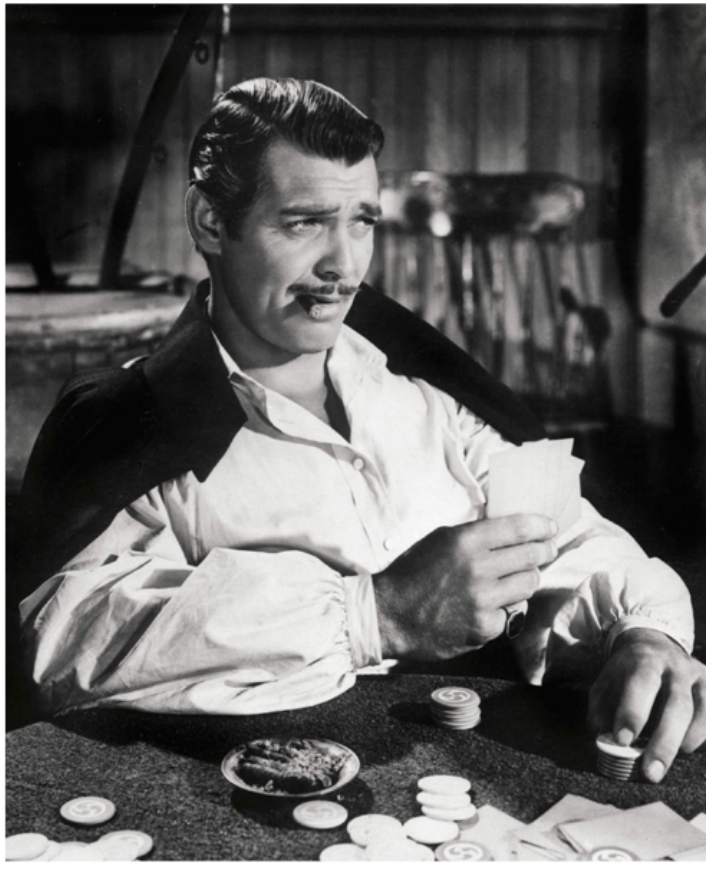


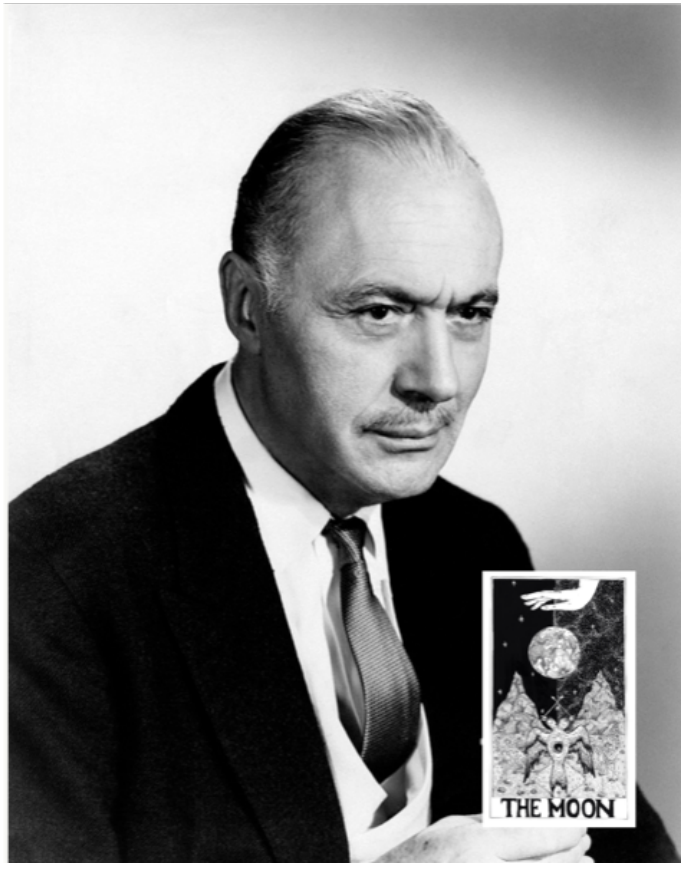
In typical sequences of perception events, the viewer picks up little information about Gable's left hand holding the chips.

Problem 1

Naive application to pictorial free perception of Hintikka semantics for the information of agents has the agent (the one depicted as looking) gaining too much information in a described situation.

Hallucination and misperception



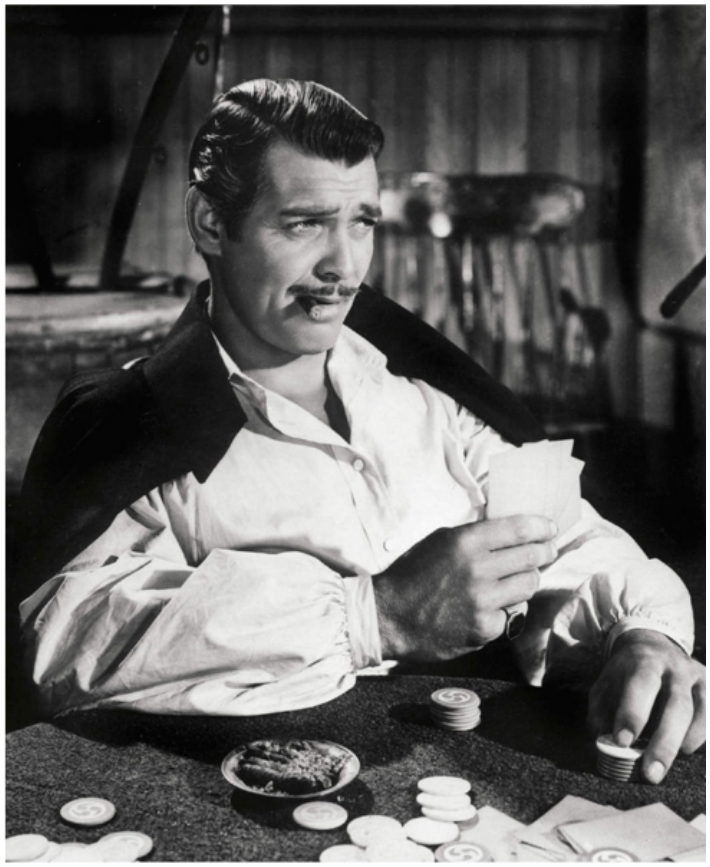


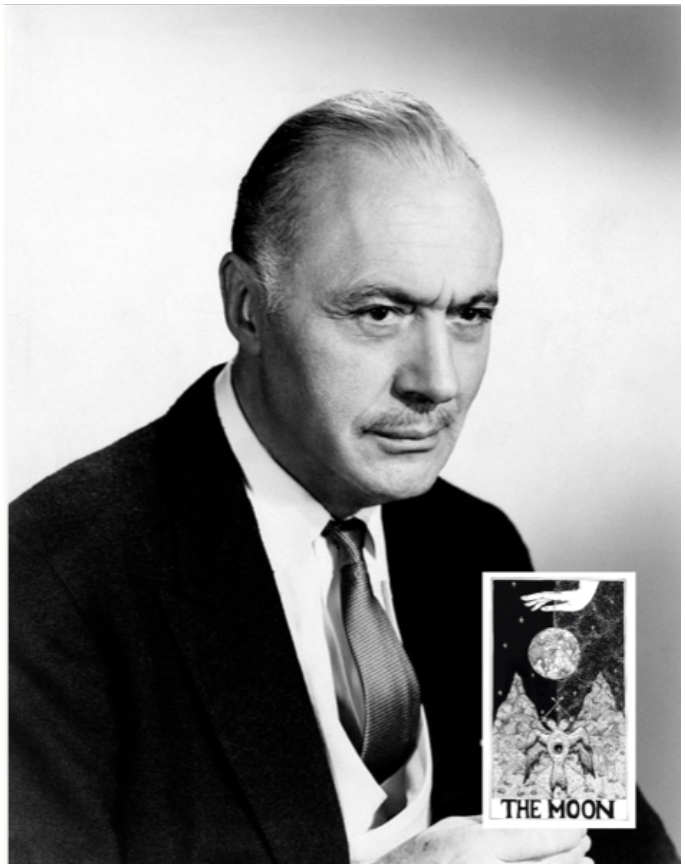
Naive Hintikka analysis of misperception ...

... has Gable's information state after looking entailing the content of the second panel. All of Gable's world-alternatives look like the panel from his geometric perspective.

The mechanics for this in event-sequence models are covered in a moment.

If this were veridical perception ...





... Gable would normally not pick up all of the information available in his field of view. Why should he pick up so much information (all of the information in the second picture) when looking non-veridically?

Naive Hintikka analysis of misperception ...

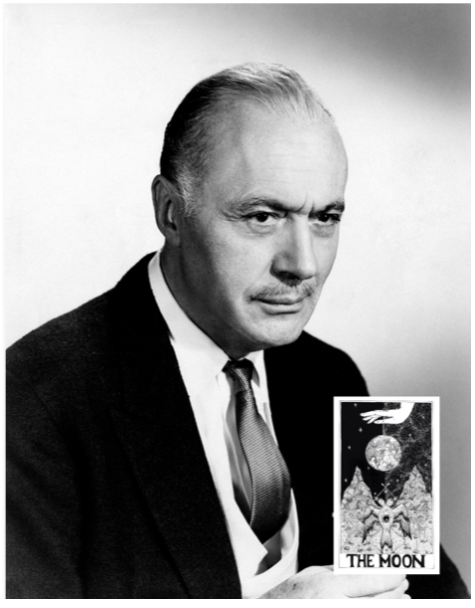
... has the agent picking up far more information in non-veridical scenarios than in veridical ones (assuming Problem 1 has been addressed).

This is implausible.

Problem 2

Example v2 in event sequence models

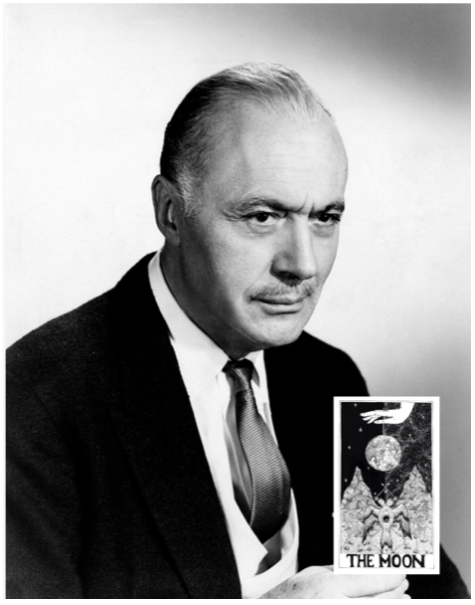
The event-type e_{gm} is the event-type of Gable veridically looking at a scene that looks exactly like this from his geometric perspective.



This is *not* what happens in the base world of a described situation in scenario v2.

Example v2 in event sequence models

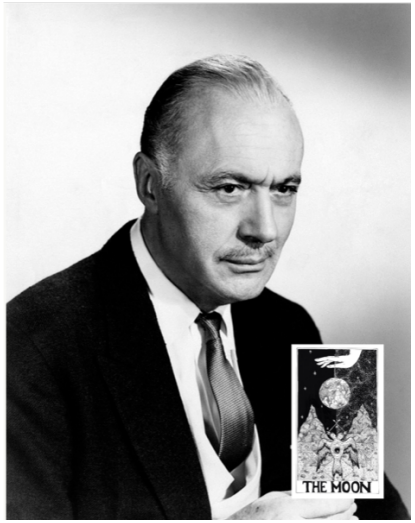
The event-type e_{gm} is the event-type of Gable veridically looking at a scene that looks exactly like this from his geometric perspective.



e_{gm} is what happens in Gable's *alternatives* in scenario v2.

Misperception event

The event-type e_{gam} is the event-type of Gable facing a scene like the left picture, while thinking he is looking at a scene like the right picture.



The set of event alternatives for e_{gam} is the unit set of e_{gm}. This models the epistemic effects of e_{gam}.

Misperception event

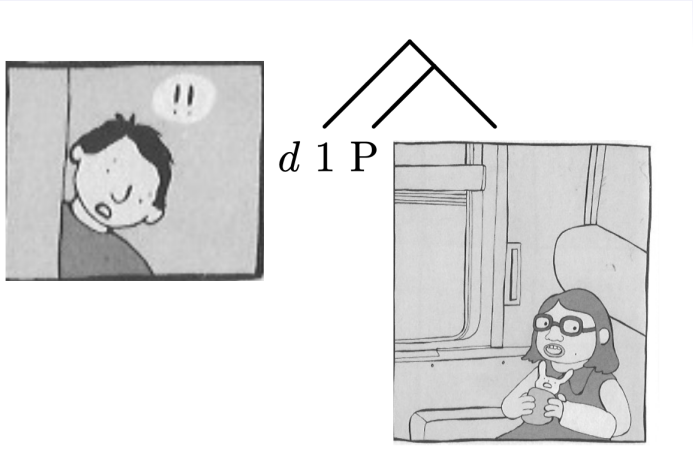
The set of event alternatives for e_{gam} is the unit set of e_{gm}, which is an event of *veridically* looking at a moon tarot card.

Gable doesn't know he is hallucinating.

The LF non-veridical examples

d 1 P

... has to involve embedding.

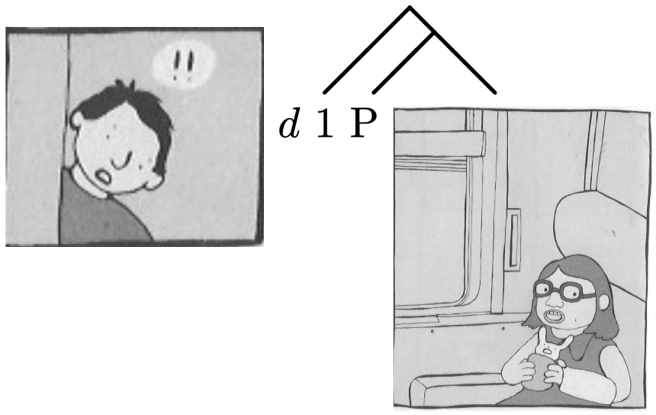


d introduces dref for Michael

P This semantics ...

we satisfies the formula iff *e* is an event of the center looking, and

every event-alternative *f* to *e* (for the center) and alternative *v* to *w* (for the center) where *vf* is defined is such that *v* looks like the embedded picture from the geometric perspective of the center.



Roughly, the center does some perceptual action, every alternative to which is consistent with the picture.

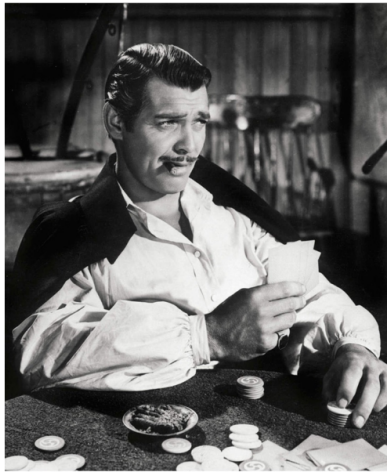
This has the agent gaining too much information (Problem 2).

Plan

Add more events of normal looking in the model construction, to fix Problem 1.

Apply this to the alternatives instead of the base in the internsional construction, to fix Problem 2.

Veridical semantics

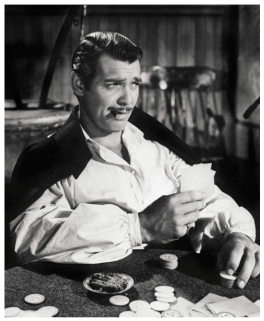


$x\ V(1)$

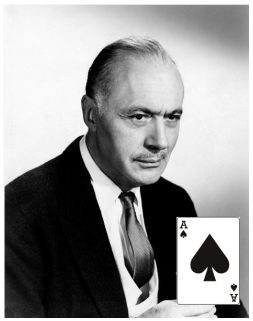
Gable faced a scene like the second picture, and did a looking action that he could do while facing such a scene.

This was problematic (Problem 1), fundamentally because the model construction does not include enough events of normal looking. Not because of the syntax-semantics interface.

Veridical semantics



$x \; V(1)$



e_{ga} Gable picking up all of the information in the second picture.

These are events of normal looking in Gable's situation:

e_{ga1} Gable taking a low-acuity view of the whole scene, focalizing Boyer's face, and focalizing the ace.

e_{ga2} Gable taking a low-acuity view of the whole scene, focalizing the ace, and focalizing the tie.

Normal looking

In the scenario, it is understood that when Boyer holds up the ace, Gable would focalize it in any normal looking event. This is the source of the implication that Gable gets the information that an Ace is held up.

What looking events are normal depends on the scene, but also on other aspects of the state, e.g. whether Gable is tired, and whether he more interested in ties than cards.

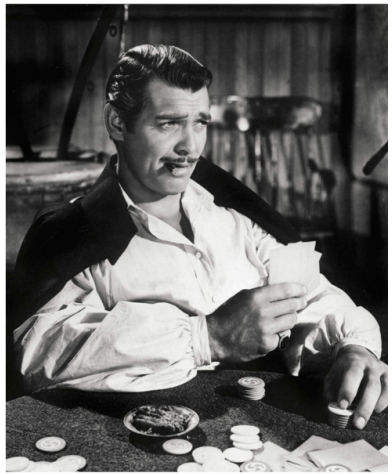
Normal looking

Collapse such things into a predicate N where

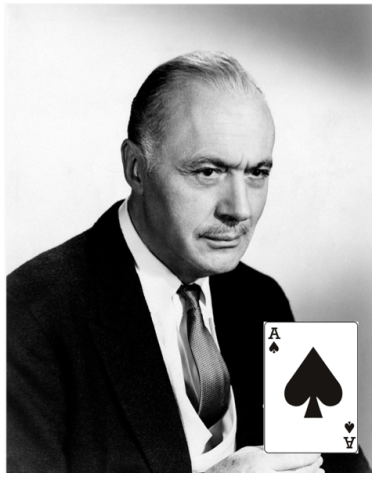
$$N(e, \sigma, \mathcal{O})$$

means that event e is something that could normally happen in state σ given ordering source $\mathcal{O}$.

Veridical semantics with normality implicature



$x \; V(1)$



True in *we* only if in *w* Gable faced a scene like the second picture, and did a looking action *e* that he could *normally* do while facing such a scene,

$$N(e, \sigma(w), \mathcal{O}).$$

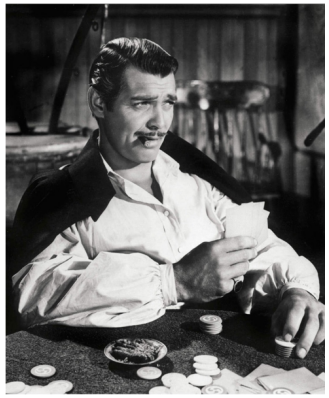
Veridical semantics with normality implicature

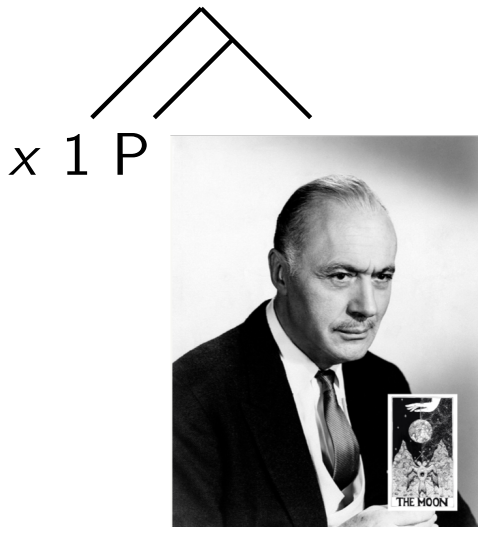
True in *we* only if in *w* Gable faced a scene like the second picture, and did a looking action *e* that he could *normally* do while facing such a scene,

$$N(e, \sigma(w), \mathcal{O}).$$

The normality condition does not need to be included in the semantics of $V(1)$, because normality implicatures are typical in narratives.

Intensional semantics roughly





Gable did a perceptual action, the *alternatives* to which are ones that he could normally do when facing a scene like the second picture.

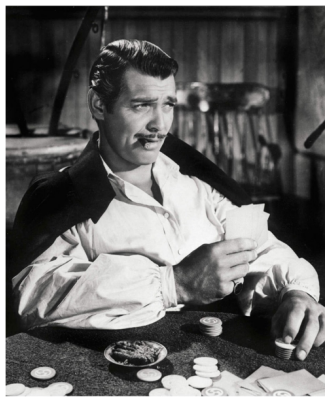
This doesn't entail getting all the information in the second picture, because in such a situation, Gable can look normally without getting all of the information in his field of view.

Notation

v	information state (world plus dref values)
$[\![p]\!]$	viewpoint-centered pictorial content
$v[\![p]\!]$	v restricted by the stative information that the center is facing a scene like picture p

Proper formulation of this requires guarded string models, Campbell and Rooth (in prep), Epistemic Semantics in Guarded String Models.

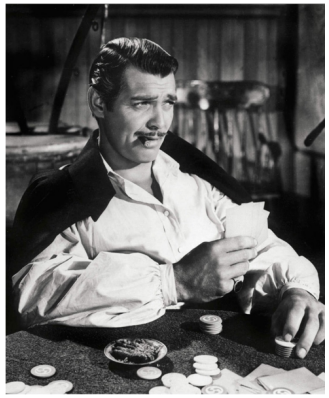
Intensional semantics



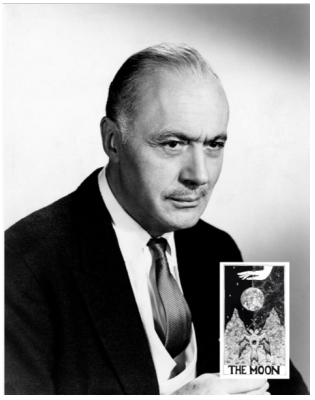
is true in *we* only if

for every alternative world v to w
for every alternative event f to e such that vf is defined
$v[\![p_2]\!]f$ is defined and $\mathcal{N}(f, \sigma v[\![p_2]\!], \mathcal{O})$.

Summary



x 1 P



Instead of Gable doing a looking action the alternatives to which entail the complete perception of the second picture, Gable does an action the alternatives to which entail the normal perception of the second picture.

This is easier to satisfy. Gable does not have to hallucinate the specific configuration of the tie.