

Non-descriptive/use-conditional meaning in Rational Speech-Act models

Social meanings Since Labov (1963), *variationist sociolinguistics* has long been studying the subtle meaning differences between linguistic variants (see Eckert 2012 for an overview).

- (1) (ING) a. I am walking (*-ing* variant) b. I am walkin' (*-in'* variant)

For example, (1a) and (1b) have the same truth conditions, but after hearing them listeners tend to infer different properties of the speaker: (1a) is associated with education, intelligence, articulateness (clustered as **competent**), and formality and distance (clustered as **aloof**) whereas (1b) is associated with the opposite properties (Campbell-Kibler 2009). To the extent that the inference patterns are different, we can say that the variants in (1) have different *social meanings*. Moreover, people's use of language is sensitive to such social meanings and the context. For instance, Labov (2012) analyzes President Obama's use of (ING) in three recordings taken in three contexts with different levels of formality and finds 72% *-in'* at a barbeque, 33% at the ceremonies that followed and 3% in his DNC acceptance speech.

These rich sociolinguistic phenomena offer an opportunity for connections to semantics and pragmatics. Two fundamental research questions are (i) how to represent social meaning in the semantics and (ii) how to integrate it into the pragmatics. Burnett's (2017, in press) pioneers the use of Bayesian Rational Speech-Act (RSA) models (Frank & Goodman 2012), which addresses (ii). In this paper we will focus on (i). Since standard RSA models only concern descriptive/truth-conditional semantic content, in Burnett's models social meaning is represented and analyzed in the same way as descriptive meaning. We argue that social meaning is not descriptive and should be analyzed in the spirit of Kaplan's (1999) use-conditional meaning. We extend the standard RSA model to represent such meaning and propose this enriched framework as a general paradigm for other use-conditional meanings.

Basic setup and Burnett's analysis Following Burnett, we use Obama's use of (ING) as a working example and assume two candidate utterances u_{-ing} and $u_{-in'}$ that are different only in terms of the realization of (ING). A speaker's persona i is a maximally compatible set of properties. Following Burnett, we assume the relevant properties are **competent** and **aloof** and their opposites. The four possible personae and their names are in the table below.

STERN LEADER	COOL GUY	ASSHOLE	DOOFUS
{ competent , aloof }	{ competent , friendly }	{ incompetent , aloof }	{ incompetent , friendly }

Burnett treats an utterance u 's association with certain properties as a compatibility relation and uses Montague-style lifting to derive the set of personae that u is compatible with. A persona is compatible with u iff it contains a property that is compatible with u . Therefore the only persona incompatible with u_{-ing} is DOOFUS, and the only persona incompatible with $u_{-in'}$ is STERN LEADER. Burnett uses a standard RSA literal listener model, which applies simple probabilistic conditionalization on hearing an utterance u by ruling out personae incompatible with u . This analysis treats social meaning in the same way as descriptive meaning; that is, the effect of uttering u_{-ing} is the same as asserting *I am competent or aloof*. However, there are good reasons to believe that social meanings are non-descriptive. For instance, they share many properties of *expressives* summarised in Potts 2007 (2).

- (2) a. largely independent of the descriptive meanings (Independence)
b. always about the utterance situation itself. (Nondisplaceability)

- c. not propositional and can be hard to pin down (Descriptive ineffability)
- d. performative in that the very act of utterance conveys the meaning (Immediacy)
- e. strengthened when repeated without redundancy (Repeatability)

This is difficult to capture if they are treated as descriptive content in standard RSA models. Consider repeatability (2e) for instance. If Obama wants to construct the COOL GUY persona, then after uttering $u_{-in'}$, which eliminates STERN LEADER, the optimal next utterance should be u_{-ing} , which will eliminate DOOFUS. Having uttered both $u_{-in'}$ and u_{-ing} , no further information will be gained by using either variant and therefore Burnett’s model will predict 50% $-in'$ afterwards, contrary to fact.

Proposal We generalize the literal listener L_0 to integrate both the truth-conditional and use-conditional meanings of an utterance (3).

- (3) $L_0(w, i | u) = L_0(w | u) \cdot L_0(i | u)$, where
- a. $L_0(w | u) \propto \Pr(w) \cdot \delta_{w \in \llbracket u \rrbracket}$ conditioning on the truth of u
where $\delta_{w \in \llbracket u \rrbracket} = 1$ if $w \in \llbracket u \rrbracket$, 0 otherwise $\llbracket u \rrbracket$: truth-conditional meaning
 - b. $L_0(i | u) \propto \Pr(i) \cdot S_0(u | i)$ Bayes update
where $S_0(u | i)$ is a *stereotypical speaker* $S_0(u | i)$: use-conditional meaning

The literal listener updates their prior belief about the world w by conditioning on the truth of the utterance u (3a). Meanwhile, they updates their prior belief about the index i by reasoning about a hypothetical *stereotypical speaker* S_0 (see Henderson & McCready’s (2017) analysis of dogwhistles). Crucially, this speaker is *not* a model of real linguistic agents, but rather a language production model based on ideological stereotypes. For instance, the stereotype that incompetent but friendly people tend to use the $-in'$ variant corresponds to a high value for $S_0(-in' | DOOFUS)$, while the stereotype that competent but aloof people tend to use the $-ing$ variant corresponds to a low value of $S_0(-in' | DOOFUS)$. Assuming that the production probabilities of the other two persona are in between, and a uniform prior over persona, the table below shows the literal listener’s belief after hearing the $-in'$ and $-ing$ variants.

i	STERN LEADER	COOL GUY	ASSHOLE	DOOFUS
$S_0(-in' i)$	0.1	0.4	0.3	0.9
$L_0(i -in')$	0.059	0.235	0.176	0.529
$L_0(i -ing)$	0.391	0.261	0.304	0.043

Representing social meanings in terms of the vernacular speaker S_0 naturally captures the non-descriptive nature of social meanings and accounts for the properties in (2): Nondisplaceability and immediacy directly follow from this setup. Independence holds because w and i are often conditionally independent given u .¹ Descriptive ineffability follows from the fact that it is more difficult to describe the high-likelihood region of S_0 . Repeatability also follows from the probabilistic nature of S_0 . Note that the current approach complements rather than contradicts the multi-dimensional semantic systems (e.g., Potts 2007; Gutzmann 2015) by explaining the differences between descriptive and non-descriptive meanings in a more basic framework of Bayesian reasoning.

¹In the full paper we will discuss the most general formula $L_0(w, i | u) \propto \Pr(w, i) \cdot \delta_{w \in \llbracket u \rrbracket} \cdot S_0(u | \llbracket u \rrbracket, w, i)$, which accounts for cases where descriptive and indexical meanings interact with each other.