

# Formal Approaches to Social Meaning, Variation and Identity Construction

Heather Burnett

Laboratoire de Linguistique Formelle  
CNRS & Université Paris-Diderot

Limits of Variability in Language Summer School (Day 1)

# Welcome to the LVL Summer School!

## Course Website

[http://www.heatherburnett.net/  
potsdam-summer-school.html](http://www.heatherburnett.net/potsdam-summer-school.html)

## My email

[heather.susan.burnett@gmail.com](mailto:heather.susan.burnett@gmail.com)

# This course

## Main goal 1

Introduce the empirical phenomena of **social meaning**, **sociolinguistic variation** and **identity construction** through language.

## Main goal 2

Show how we can approach the analysis of these phenomena from a perspective informed by **formal semantics and pragmatics**.

# What is social meaning?

## Social meaning (a first definition)

Information encoded in pronunciations, morphemes, words or constructions that expresses aspects of the speakers' **properties**, **stances** and **identities**.

## Identity construction through language (a first definition)

How we use socially meaningful language to build, establish and reinforce our place(s) in our community/ies.

# First examples: Expressives

- (1) Swear words
  - a. Mike Tyson won another fight. (McCready, 2012)
  - b. **Fucking** Mike Tyson won another fight.
  
- (2) Slurs and identity categories (Kaplan, 1999)
  - a. Heather is a **lesbian**.
  - b. Heather is a **dyke**.
  
- (3) T-V distinction
  - a. Je peux **vous** aider?
  - b. Je peux **t'**aider?  
'Can I help you?' (also honorifics) (Brown et al., 1960)

## First examples: Discourse particles

- (4) Terms of address (Kiesling, 2004)
- a. What are we doing tonight?
  - b. **Dude**, what are we doing tonight?
  - c. **Babe**, what are we doing tonight?
- (5) Discourse *like* (D'Arcy, 2005)
- a. What are we doing tonight?
  - b. **Like**, what are we doing tonight?

## Functional categories

- (6) Optional determiners (Acton, 2014)
- a. Americans love cars.
  - b. **The** Americans love cars.
- (7) Grammatical gender (Burnett and Bonami, 2017)
- a. La parole est à Madame **le** ministre. Masculine
  - b. La parole est à Madame **la** ministre. Feminine
- (8) Intensifiers (Beltrama and Staum Casasanto, 2017)
- a. John is **really** tall.
  - b. John is **totally** tall.

## First examples: Sociophonetic variables

(9) (ING)

a. I'm work**ing** on my paper.

[iŋ]

b. I'm work**in'** on my paper.

[in]

(10) /t/ release

a. We should mee**[t<sup>h</sup>]**.

released 't'

b. We should mee**[t]**.

unreleased 't'

(11) Creaky voice

a. Oh my god.

modal voice

b. **Oh my god...**

creak

Social meaning has been extensively studied:

- ▶ In linguistic anthropology and socio-cultural linguistics (see Bucholtz and Hall, 2005, 2008, for reviews).
- ▶ In variationist (quantitative) sociolinguistics (Labov, 1963), especially within the **Third Wave** approach (Eckert, 2000, 2012).

An emerging area of study in formal semantics/pragmatics (Kaplan, 1999; Potts, 2005; McCready, 2004; Smith et al., 2010; Acton, 2014; Beltrama, 2016; Burnett, 2017).

## Why a formal approach?

- ▶ Linguistic communication and identity construction through language are extremely complex cognitive and social processes.
- ▶ A lot of open issues in the study of language, variation and identity are very subtle.
- ▶ Formalization can be a powerful tool for carefully distinguishing different aspects of theoretical proposals and for precisely identifying empirical predictions made by competing analyses.

## Not so fast!

We need to use a formalism that is appropriate for the data that we want to model.

- ▶ Many mathematical approaches to meaning allow contextual factors to play only a restricted role (see Récanati, 2003, for discussion).
- ▶ Many tend to study only the behavior of the listener, not the speaker.

## McConnell-Ginet's Challenge

(McConnell-Ginet, 1985, 160)

*Many critics would say that rigor in linguistics has been achieved at the price of rigor mortis. The radical operation required to 'isolate' the language system has killed it: formal rules and representations provide no insight into language as a human activity. The defense against this malpractice charge, of course, is to develop an account of the relation between abstract linguistic systems and the mental states and processes, social actions and cultural values, that infuse them with life.*

## Working hypothesis in this course

**Epistemic game theory** can be used to formalize key aspects of current sociolinguistic theories.

- ▶ The idea that language can be conceptualized as a game dates back at least to Wittgenstein (1953).
- ▶ The proposal that game theory could be useful for analyzing sociolinguistic interaction has been explored by a number of scholars in anthropology, sociology and philosophy, including Goffman (1970); Bourdieu (1977); Gumperz (1982).
- ▶ Initial interest in marrying mathematical and ethnographic studies of linguistic interaction dates back to the 1970s, when game-theoretic methods started to become widely used outside economics (Osborne, 2004).

This interest never flourished into a full-fledged research program because:

- ▶ Understanding an utterance in its social context usually involves reasoning under **uncertainty**.
- ▶ **Epistemic** models, which take into account agents' reasoning, only became popular in the 1980s (Perea, 2012).

### Game theoretic pragmatics (since Benz et al. (2004))

Much progress has been made in the application of epistemic game theory to linguistic communication.

# Plan

## Diagnosing social meaning: sounds

- Sociophonetic interpretation

- Sociophonetic variation

## Diagnosing social meaning: beyond sounds

- Code switching in Catalonia

- Morpho-syntax & lexicon

## Introduction to decision theory

- A decision-theoretic model of code-switching in Catalonia

## Plan for the rest of the class

# Social Meaning as Pragmatic Enrichment

(12) (ING)

- a. I'm working on my paper. [ɪŋ]  
b. I'm workin' on my paper. [in]

- ▶ From (12-a), we conclude the speaker is working on their paper.
  - ▶ We infer something additional. . .
- ▶ From (12-b), we conclude the speaker is working on their paper.
  - ▶ We infer something additional. . .

# Diagnosing social meaning

Two ways of diagnosing a social meaning difference between alternatives:

1. **Interpretation:** Judgments or interpretation experiments.
2. **Variation:** Socially conditioned patterns of use.

# Matched Guise Technique

## Matched Guise Technique (Lambert, 1967, et seq.)

An experimental method widely used in social psychology and variationist sociolinguistics to assess listeners' implicit attitudes towards speakers of different linguistic varieties.

- ▶ Participants listen to samples of recorded speech that have been designed to differ in specific and controlled ways.
- ▶ They hear one of two recordings (**guises**) which differ only in the alternation studied.
- ▶ After hearing a recording, participants' attitudes towards the recorded speaker are assessed (via interviews/focus groups and/or questionnaire/survey).

# (ING)

Campbell-Kibler (2006, 2007): A MGT study with stimuli formed from the speech of 8 speakers.

## Sample results

1. Speakers were rated as significantly more **educated** and more **articulate** in their *-ing* guises than in their *-in'* guises.
2. Speakers were significantly more likely to be described as a **redneck** in their *-in'* guises than in their *-ing* guises.
3. One male speaker (Jason) is significantly more likely to be described as **gay** in his *-ing* guise.

## /t/ release

Podesva et al. (2015): A MGT study with stimuli formed from the speech of 6 American politicians (Obama, Edwards, Pelosi, W. Bush, H. Clinton, Rice).

### Sample results

- ▶ John Edwards is rated as significantly more **articulate**, more **authoritative** and less **Southern** in his released /t/ guise than in his flapped guise.
- ▶ Articulateness has been associated with released /t/ in other studies (Bunin Benor, 2001; Bucholtz, 1996; Podesva, 2006; Eckert, 2008).
- ▶ Nancy Pelosi is rated as significantly more **sincere** and **friendly** in her non-released/flapped guise than in her released /t/ guise.

## Diagnosing social meaning: variation

We can also observe social meaning differences through studies of socially conditioned variation:

1. **Style shifting:** Intra-speaker differences in use based on social situation.
2. **Social stratification:** Inter-speaker differences in use based on social group.

If we find differences in how people in different social contexts and of different social groups use variants, there must be some (possibly slight) meaning difference between them that makes speakers in one context/social group to prefer one variant over another.

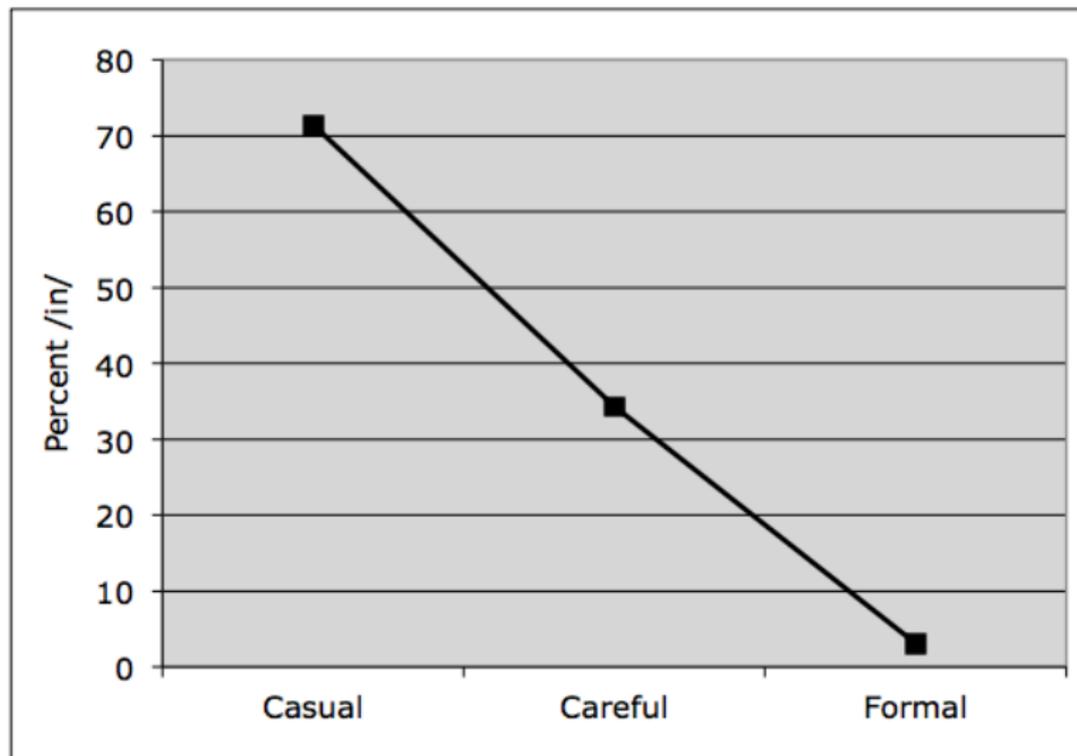
## Style Shifting (Intra-Speaker Variation)

(Labov, 2012, 22) finds significant differences in President Obama's use of (ING) across three contexts.

- ▶ **Casual:** BBQing at a Father's Day BBQ on the White House lawn (72% -in').
- ▶ **Careful:** Answering political questions after the BBQ (33% -in').
- ▶ **Formal:** Scripted acceptance speech at the DNC (3% -in').

# Obama's Use of (ING) (Labov, 2012)

Figure 3. President Obama's use of (ING) in three contextual styles.



# Convention

## Why this pattern?

Labov (2012): As a community, we have **conventionally** associated meanings with *-in'* and *-ing*, which allow us to communicate extra information to each other through phonetic variation.

- ▶ *This consensus is publicly available and in one sense, understood by all. In the classroom, or on the pulpit, people will attribute the use of the **-in'** form to laziness, ignorance, or just plain rascality.*
- ▶ *Yet the high value we put on the **-in'** norm in other contexts is not hidden from public view. When we see the large illuminated sign, DUNKIN' DONUTS, we recognize the claim that **dunkin'** doughnuts taste better than **dunking** doughnuts. . .*
- ▶ *A Philadelphia travel agency is named with an electric sign spelling out CRUSIN'. We understand this as an advertisement that we will have a better time **cruisin'** than we would **cruising**. (Labov, 2012, 22)*

# Beyond Obama

Style shifting is widespread.

- ▶ Podesva (2004) (cited in Eckert (2005)) finds significant differences in a medical student's use of /t/ release in a clinic setting and when he is at a BBQ.
- ▶ More and more studies of private citizens (Cheshire, 1982; Podesva, 2007; Kiesling, 2009; Gratton, 2015; van Hofwegen, 2017, among others).

## Social Stratification (Inter-Speaker Variation)

Labov (1963)'s study of /aw/, /ay/ centralization.

- ▶ 69 sociolinguistic interviews on Martha's Vineyard, an island south of Cape Cod in Massachusetts.
- ▶ The main industries on the Vineyard were in the process of moving from whaling and fishing to tourism, creating significant hardships for islanders who had built their lives around the fishing industry.
- ▶ Labov's participants were divided with respect to how they viewed these changes, having reactions "varying from a fiercely defensive contempt for outsiders to enthusiastic plans for furthering the tourist economy" (Labov, 1963, 28).

# Social meaning on Martha's Vineyard

## Observation

Rather than being conditioned by gender, age or other similar categories, centralization on Martha's Vineyard was best predicted through looking at speakers' orientations towards or away from the island and the old way of life.

- ▶ More locally oriented individuals show much higher degrees of centralization (Labov, 1963, 30).

	Speaker 1	Speaker 2
Down-island, leaving	00-40	00-00
Up-island, staying	90-100	113-119

Table: Centralization indexes for four 15 year old students

## Style at Belten High (Eckert, 2000)

Eckert (1989, 2000)'s studies of **styles** (collections of variables/other semiotic resources) in Belten High, a high school in a middle class suburb of Detroit.

- ▶ Within the high school, there was a high degree of inter-speaker variation, polarized largely around two social groups in the school: the *jocks* and the *burnouts*.
- ▶ Members of these two groups distinguished themselves through their actions, their attitudes, their ways of dressing.
- ▶ Members of these two groups also distinguished themselves through their use of sociophonetic variables.

## We are what we do

In the whole population, use of variants was best predicted by students' urban/suburban orientation and/or institutional engagement.

- ▶ Urban orientation measured by activities like **cruising**.
- ▶ Institutional engagement measured by participation in (school's) **extra-curricular activities**.

Variable		+Cruising	-Cruising	Input	Sig.
(^) backing	Girls	.563	.458	.422	.000
	Boys	.530	.460	.447	.014
(e) backing	Girls	.544	.464	.331	.029
	Boys	.557	.437	.368	.001
(ay) raising	Girls	.765	.381	.011	.000
	Boys	.636	.295	.009	.004
...	...	...	...	...	...

Table: Factor weights for cruising at Belten High (Eckert, 2000, 151)

## Beyond sounds (code switching)

Woolard (1989, 2009); Woolard and Gahng (1990)

The social meaning of Catalan vs Castilian in Barcelona (1983-2007).

- ▶ Under Franco, the Catalan language was repressed in Catalonia, with Castilian being the sole language of government and education.
- ▶ Large immigration from southern Spain (Castilian speakers) in the 1960s, followed by stagnation of immigration in the 1970s.
- ▶ After Franco's death, Catalonia became autonomous and officially bilingual (1979).

## Language policies promoting Catalan

Starting in the 1980s, the Catalan government enacted aggressive policies making Catalan the language of government and education.

- ▶ Most of the territory is passively bilingual (Catalan-Castilian).

### Puzzle: Why do Castilian speakers resist Catalan?

Despite passive bilingualism and language policies, many Castilian speakers report not regularly speaking Catalan.

- ▶ Young working class native Castilian speakers are particularly resistant.

## Social meaning differences: Catalan vs Castilian

Woolard (1989): A MGT experiment in 1980 with young Catalan and Castilian speakers (and native Catalan and Castilian guises).

- ▶ (Non)native Catalan guises were rated significantly higher on **status** properties (intelligent, cultured, hardworking. . . ) by everyone.
- ▶ Non-native Catalan guises were rated very low on **solidarity/friendliness** properties (likeable, amusing, attractive. . . ) by native Castilian speakers.
- ▶ Native Castilian guises were rated very high on **solidarity/friendliness** properties by native Castilian speakers.

## Social meanings of Catalan/Castilian in 1980s

Speaker	Listener	Language	Listener's Interpretation
Catalan	Catalan	Catalan	+status, +solidarity
	Catalan	Castilian	-status, -solidarity
	Castilian	Catalan	+status, ± solidarity
	Castilian	Castilian	- status, ± solidarity
Castilian	Catalan	Catalan	+status, ± solidarity
	Catalan	Castilian	-status, ± solidarity
	Castilian	Catalan	<b>+status, -solidarity</b>
	Castilian	Castilian	<b>-status, +solidarity</b>

If you are Castilian (speaking to a Castilian):

- ▶ If you speak in Catalan, you may sound more intelligent, but you may also sound unfriendly.
- ▶ If you speak Castilian, you may sound friendlier, but you may also sound less intelligent.

Speakers who value solidarity over status should choose Castilian.

- ▶ In many societies, working class individuals tend to value solidarity more than (upper) middle class individuals (Bourdieu, 1979; Lamont, 1992, 2009, among many others).

## Socio-semantic change

Woolard (2009, 2016): Same MGT experiment in 2007.

- ▶ Catalan guises were rated significantly higher on status properties by everyone.
- ▶ No difference on solidarity/friendliness properties for any speakers and any guises.
- ▶ 'Severing' of the link between language and ethnicity in Catalonia.

## Social meanings of Catalan/Castilian in 2000s

Speaker	Listener	Language	Listener's Interpretation
Catalan	Catalan	Catalan	+status, ± solidarity
	Catalan	Castilian	-status, ± solidarity
	Castilian	Catalan	+status, ± solidarity
	Castilian	Castilian	- status, ± solidarity
Castilian	Catalan	Catalan	+status, ± solidarity
	Catalan	Castilian	-status, ± solidarity
	Castilian	Catalan	<b>+status</b> , ± solidarity
	Castilian	Castilian	<b>-status</b> , ± solidarity

## Meaning and change

Speakers who value solidarity over status should not necessarily choose Castilian.

### Change in meaning correlates with change in use

- ▶ Habitual use of Catalan by native born Catalonians rises in 2012 (Gov. Catalonia, 2013).
- ▶ Much more use by young native Castilian speakers (Woolard, 2009, 2016).

# Morpho-syntax & Lexicon

## Question

Can we apply these same social meaning diagnostics to phenomena more commonly studied in formal semantics and pragmatics?

## Intensifiers with open scale adjectives

- (13) a. John is **very** tall.  
b. John is **really** tall.  
c. John is **totally** tall.

Many formal semantic analyses of intensifiers within degree (free) approaches. . .

### Contribution to identity construction

- ▶ Beltrama and Staum Casasanto (2017): In a MGT experiment, speakers using *totally* (13-c) are rated as significantly more friendly, outgoing and cool.
- ▶ Speakers using *totally* are rated as significantly less intelligent, mature and articulate.

## Optional determiners

- (14) a. Americans love cars.  
b. **The** Americans love cars.

Many formal semantic analyses of definites and bare plurals. . .

Contribution to identity construction (Acton, 2014, 110)

- ▶ Expressing social relations between group members.

Party	Dem the-%	Rep the-%	Dem N	Rep N
Democrats	30.4%	54.4%	11 352	18 992
Republicans	53.3%	26.1%	13 007	11 042

# Summary

- ▶ Listeners draw inferences about the properties that characterize the speaker based on their language use.
  - ▶ These inferences play a role in determining which variants speakers' chose.
- ▶ Phonological variants have identity constructing functions.
  - ▶ Morpho-syntactic and lexical variants also have identity constructing functions.

# Summary

- ▶ Listeners draw inferences about the properties that characterize the speaker based on their language use.
  - ▶ These inferences play a role in determining which variants speakers' chose.
- ▶ Phonological variants have identity constructing functions.
  - ▶ Morpho-syntactic and lexical variants also have identity constructing functions.

## Rest of this course

Develop a formal account of social implicatures and the identity construction process using the tools from [game-theoretic pragmatics](#).

# What is game theory?

Game theory is a mathematical formalism for describing situations of **strategic interaction**.

## Basic components of a game (Jäger, 2011)

- ▶ There are (at least) two players.
- ▶ The players interact and the interaction results in a particular **outcome**.
- ▶ The outcome of the interaction depends on the choice of **strategy** of each player.
- ▶ Each player has a **preference ordering** over outcomes.
  - ▶ Preferences are usually encoded as numerical values (utilities or payoffs) that are assigned to possible outcomes.

# Decision theory

Suppose we restrict our attention to the behaviour of a single agent: what reasoning underlies their choices?

## Theory of Rational Choice

An agent chooses the best action according to their preferences, among all the actions available to them.

## Basic decision theoretic model

A basic model with three components:

1. An agent (decision-maker).
2. A set  $A$  consisting of all the actions that, under some circumstances, are available to the decision-maker.
3. A specification of the agent's preferences.

### Utility function

Preferences are represented by a *utility function*  $u$  from actions to  $\mathbb{N}$  such that:

$$(15) \quad u(a) > u(b) \text{ iff the decision-maker prefers } a \text{ to } b.$$

## Ordinal utility function

The precise values assigned to the actions don't matter. Only the  $>$  relation matters.

- (16)    a.  $u(a) = 42; u(b) = 5$   
          b.  $u(a) = 6; u(b) = 5$

Equivalent

## Cardinalizing utility function

The precise values assigned to the actions encode degree of preference.

- (17)    a.  $u(a) = 42; u(b) = 5$   
          b.  $u(a) = 6; u(b) = 5$

Not equivalent

# A model of Castilians speaking to Castilians (1980s)

Suppose you are Castilian and you meet another Castilian. You have to **choose** which language to speak to them.

- ▶  $A = \{\text{Speak Castilian (CAST), Speak Catalan (CAT)}\}$

## Preferences

Because of the social meaning of the different languages, choosing CAST or CAT will have different outcomes.

- ▶ If you speak in Catalan, you may sound more intelligent, but you may also sound unfriendly.
- ▶ If you speak Castilian, you may sound friendlier, but you may also sound less intelligent.

## Two kinds of Castilians in the 1980s

(18) Status-oriented Castilian

a.  $u(\text{CAT}) > u(\text{CAST})$

Ordinal

b.  $u(\text{CAT}) = 2, u(\text{CAST}) = 1$

Cardinal

(19) Solidarity-oriented Castilian

a.  $u(\text{CAST}) > u(\text{CAT})$

Ordinal

b.  $u(\text{CAST}) = 2, u(\text{CAT}) = 1$

Cardinal

We could assess how status or solidarity-oriented speakers are via questionnaire or experiment.

# Rationality

## Theory of Rational Choice

An agent chooses the best action according to their preferences, among all the actions available to them.

## Predictions for 1980s Castilians

- ▶ **Status-oriented Castilian:** Choose CAT
- ▶ **Solidarity-oriented Castilian:** Choose CAST

# Approximate rationality

Hypothesis: Agents are approximately rational (Anderson, 1991)

1. **Rationality:** They are trying to maximize utility.
2. **Approximately:** They may not always pick the optimal action.
  - ▶ Computation can be impeded by time/resource constraints.
  - ▶ There may be some **inherent variability** (Weinreich et al., 1968) in action selection.

## Softmax choice rule

Agents pick actions with a probability ( $P()$ ) that is proportional to their utility.

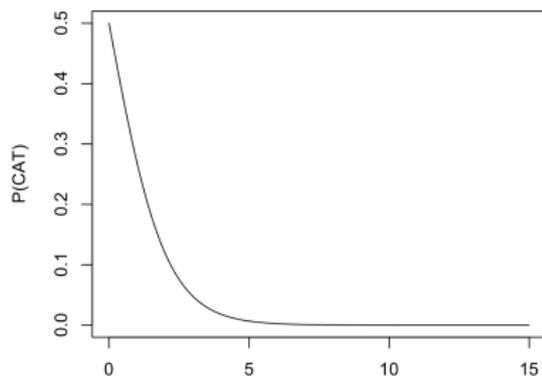
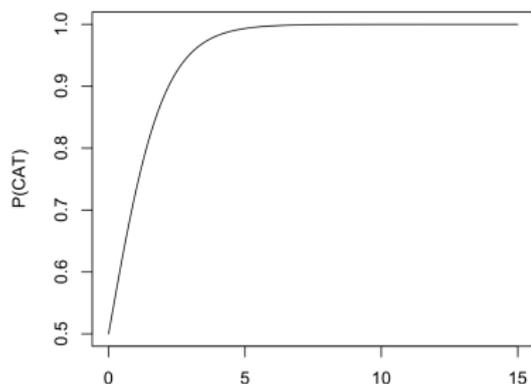
Soft-Max Choice (Luce, 1959; Sutton and Barto, 1998)

For a parameter  $\lambda$  (the **temperature**):

$$P(a) = \frac{\exp(\lambda * u(a))}{\sum_{a' \in A} \exp(\lambda * u(a'))}$$

- ▶  $\lambda$  introduces some non-determinacy into the model.
- ▶ Setting  $\lambda = \infty$  recovers optimal choice.
- ▶ When modelling actual quantitative studies, the value for  $\lambda$  that best fits the observed data can be estimated (as in Goodman and Stuhlmüller, 2013; Franke and Degen, 2016).

## Predictions for Castilians (1980s)



Predicted probability of using Catalan by status-oriented (left) and solidarity-oriented (right) Castilians by values for  $\lambda$

# Costs

What if you want to come across as intelligent, but you're not perfectly bilingual in Catalan?

- ▶ We can decompose the utility function ( $u()$ ) into preferences ( $v()$ ) minus costs ( $c()$ )

(20) For all actions  $a \in A$ ,  $u(a) = v(a) - c(a)$

$a$	$v(a)$	$c(a)$	$u(a)$
CAT	2	1	1
CAST	1	0	1

Table:  $u()$  for status-oriented Castilian, where CAT is costly.

When two actions have equal utility, we predict 50-50 variation.

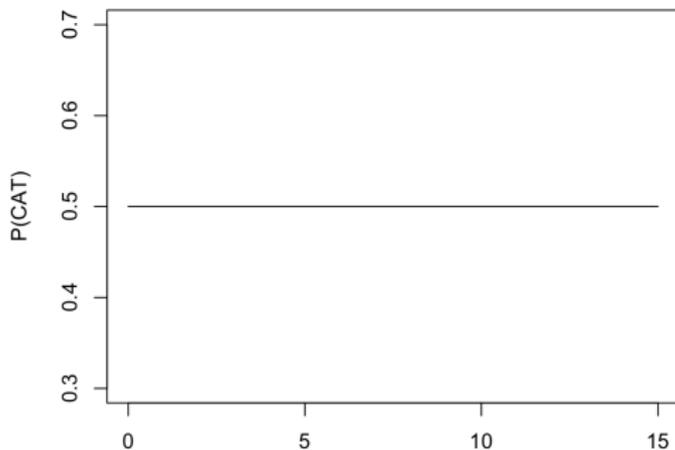


Figure: Pr(CAT) by  $\lambda$

## Two kinds of Castilians in the 2000s

By 2007, the social meaning of CAT and CAST has changed:

- ▶ Catalan still makes Castilian speakers sound more intelligent.
- ▶ Castilian doesn't make make a difference to friendliness.

(21) **Status-oriented Castilian:**  $u(\text{CAT}) = 2, u(\text{CAST}) = 1$

(22) **Solidarity-oriented Castilian:**  $u(\text{CAST}) = 1, u(\text{CAT}) = 1$   
or  $u(\text{CAT}) = 2, u(\text{CAST}) = 1$

# Modeling the relation between change in social meaning and change in language use

## Predictions

All Castilians should use Catalan at least some of the time.

- ▶ Change in the social meaning of Catalan >>> Change in speaker utility >>> Change in language use.

## Discussion question

What about native Catalan speakers?

# Plan

## Tuesday

Game theoretic models for sociolinguistic variation: style shifting.

## Wednesday

Game theoretic models for sociolinguistic variation: social stratification.

## Thursday

Language change in game-theoretic pragmatics.

## Friday

The borders of truth-conditional and social meaning: the case of slurs

# References I

- Acton, E. K. (2014). *Pragmatics and the social meaning of determiners*. PhD thesis, Stanford University.
- Anderson, J. R. (1991). Is human cognition adaptive? *Behavioral and Brain Sciences*, 14(03):471–485.
- Beltrama, A. (2016). *Bridging the gap. Intensifiers between semantic and social meaning*. PhD thesis, University of Chicago.
- Beltrama, A. and Staum Casasanto, L. (2017). Totally tall sounds totally younger: Intensification at the socio-semantics interface. *Journal of Sociolinguistics*, 21(2):154–182.
- Benz, A., Jäger, G., Van Rooij, R., and Van Rooij, R. (2004). *Game theory and pragmatics*. Springer.
- Bourdieu, P. (1977). The economics of linguistic exchanges. *Social science information*, 16(6):645–668.
- Bourdieu, P. (1979). *La distinction: critique sociale du jugement*. Les éditions de minuit, Paris.
- Brown, R., Gilman, A., et al. (1960). The pronouns of power and solidarity.
- Bucholtz, M. (1996). Geek the girl: Language, femininity, and female nerds. *Gender and belief systems*, pages 119–132.
- Bucholtz, M. and Hall, K. (2005). Identity and interaction: A sociocultural linguistic approach. *Discourse studies*, 7(4-5):585–614.
- Bucholtz, M. and Hall, K. (2008). All of the above: New coalitions in sociocultural linguistics. *Journal of Sociolinguistics*, 12(4):401–431.
- Bunin Benor, S. (2001). The learned /t/: phonological variation in orthodox jewish english. *University of Pennsylvania Working Papers in Linguistics*, 7(3):2.
- Burnett, H. (2017). Sociolinguistic interaction and identity construction: The view from game-theoretic pragmatics. *Journal of Sociolinguistics*, 21(2):238–271.
- Burnett, H. and Bonami, O. (2017). Madame le/la ministre: Variation and change in grammatical gender in the Assemblée Nationale. *Under review*.
- Campbell-Kibler, K. (2006). *Listener perceptions of sociolinguistic variables: The case of (ING)*. PhD thesis, Stanford University.
- Campbell-Kibler, K. (2007). Accent,(ing), and the social logic of listener perceptions. *American speech*, 82(1):32–64.
- Cheshire, J. (1982). Variation in an English dialect: A sociolinguistic study. *Cambridge Studies in Linguistics London*, 37.

# References II

- D'Arcy, A. F. (2005). *Like: Syntax and development*. PhD thesis, University of Toronto.
- Eckert, P. (1989). *Jocks and burnouts: Social categories and identity in the high school*. Teachers College Press.
- Eckert, P. (2000). *Language variation as social practice: The linguistic construction of identity in Belten High*. Wiley-Blackwell.
- Eckert, P. (2005). Variation, convention, and social meaning. In *Annual Meeting of the Linguistic Society of America, Oakland CA*, volume 7.
- Eckert, P. (2008). Variation and the indexical field. *Journal of sociolinguistics*, 12(4):453–476.
- Eckert, P. (2012). Three waves of variation study: The emergence of meaning in the study of sociolinguistic variation. *Annual review of Anthropology*, 41:87–100.
- Franke, M. and Degen, J. (2016). Reasoning in reference games: Individual-vs. population-level probabilistic modeling. *PloS one*, 11(5):e0154854.
- Goffman, E. (1970). *Strategic interaction*, volume 1. University of Pennsylvania Press.
- Goodman, N. D. and Stuhlmüller, A. (2013). Knowledge and implicature: Modeling language understanding as social cognition. *Topics in cognitive science*, 5(1):173–184.
- Gov. Catalonia (2013). *Language Use of the Population of Catalonia*. Catalonia Ministry of culture.
- Gratton, C. (2015). Indexin' gender: variable (ING) and the creation of non-binary trans identities. *New Ways of Analyzing Variation*, 44.
- Gumperz, J. J. (1982). *Discourse strategies*, volume 1. Cambridge University Press.
- Jäger, G. (2011). Game-theoretical pragmatics. In van Benthem, J. and ter Meulen, A., editors, *Handbook of Logic and Language*, pages 467–491. Elsevier, Amsterdam.
- Kaplan, D. (1999). The meaning of ouch and oops: Explorations in the theory of meaning as use. *Manuscript, UCLA*.
- Kiesling, S. F. (2004). Dude. *American speech*, 79(3):281–305.
- Kiesling, S. F. (2009). Style as stance. *Stance: sociolinguistic perspectives*, 171.
- Labov, W. (1963). The social motivation of a sound change. *Word*, 19(3):273–309.
- Labov, W. (2012). *Dialect diversity in America: The politics of language change*. University of Virginia Press.
- Lambert, W. E. (1967). A social psychology of bilingualism. *Journal of social issues*, 23(2):91–109.

# References III

- Lamont, M. (1992). *Money, morals, and manners: The culture of the French and the American upper-middle class*. University of Chicago Press.
- Lamont, M. (2009). *The dignity of working men: Morality and the boundaries of race, class, and immigration*. Harvard University Press.
- Luce, R. D. (1959). On the possible psychophysical laws. *Psychological review*, 66(2):81.
- McConnell-Ginet, S. (1985). Feminism in linguistics. *For Alma Mater: Theory and Practice in Feminist Scholarship*. Ed. Paula A. Treichler, Cheri Kramarae, and Beth Stafford. Urbana: U of Illinois P, pages 159–76.
- McCready, E. (2004). Two Japanese adverbials and expressive content. In *Semantics and Linguistic Theory*, volume 14, pages 163–178.
- McCready, E. (2012). Emotive equilibria. *Linguistics and Philosophy*, 35(3):243–283.
- Osborne, M. J. (2004). *An introduction to game theory*, volume 3. Oxford university press New York.
- Perea, A. (2012). *Epistemic game theory: reasoning and choice*. Cambridge University Press.
- Podesva, R. (2004). On constructing social meaning with stop release bursts. In *Sociolinguistics Symposium*, volume 15.
- Podesva, R. (2006). *Phonetic detail in sociolinguistic variation: Its linguistic significance and role in the construction of social meaning*. PhD thesis, Stanford University.
- Podesva, R. (2007). Phonation type as a stylistic variable: The use of falsetto in constructing a persona. *Journal of sociolinguistics*, 11(4):478–504.
- Podesva, R. J., Reynolds, J., Callier, P., and Baptiste, J. (2015). Constraints on the social meaning of released /t/: A production and perception study of US politicians. *Language Variation and Change*, 27(01):59–87.
- Potts, C. (2005). *The logic of conventional implicatures*. Number 7. Oxford University Press on Demand.
- Récanati, F. (2003). Embedded implicatures. *Philosophical perspectives*, 17(1):299–332.
- Smith, E., Hall, K. C., and Munson, B. (2010). Bringing semantics to sociophonetics: Social variables and secondary entailments. *Laboratory Phonology*, 1(1):121–155.
- Sutton, R. S. and Barto, A. G. (1998). *Reinforcement learning: An introduction*. MIT press.
- van Hofwegen, J. (2017). *Everyday styles: Investigating the full scope of variation in the life of an individual speaker*. PhD thesis, Stanford University.

# References IV

- Weinreich, U., Labov, W., and Herzog, M. (1968). Empirical foundations for a theory of language change. In Lehmann, W. P., editor, *Directions for historical linguistics: A symposium*, pages 95–195. University of Texas Press, Austin.
- Wittgenstein, L. (1953). *Philosophical investigations. Philosophische Untersuchungen*. Macmillan.
- Woolard, K. A. (1989). *Double talk: Bilingualism and the politics of ethnicity in Catalonia*. Stanford University Press.
- Woolard, K. A. (2009). Linguistic consciousness among adolescents in catalonia: A case study from the barcelona urban area in longitudinal perspective. *Zeitschrift für Katalanistik*, 22.
- Woolard, K. A. (2016). *Singular and plural: Ideologies of linguistic authority in 21st century Catalonia*. Oxford University Press.
- Woolard, K. A. and Gahng, T.-J. (1990). Changing language policies and attitudes in autonomous catalonia. *Language in Society*, 19(3):311–330.