Social Meaning, Sociolinguistic Variation and Game-Theoretic Pragmatics: Introduction

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ESSLLI 2017, Toulouse: Day 1
Welcome to ESSLLI 2017!

Course website
https://www.irit.fr/esslli2017/courses/6
Apéro socio (ApSo)

Picnic to talk about social meaning (and other things . . .)

Thursday Evening 20h15

- After evening lecture: *Logic, Information, and Computational Social Choice*.

Port de la Daurade (in front of the Place de la Daurade)
BYOB (and food)
This course

Main goal
To explore how recent developments in formal pragmatics, particularly game theoretic pragmatics, can be used to develop a framework for the formal analysis of social meaning and sociolinguistic variation.
What is social meaning?

A first definition... Information encoded in pronunciations, morphemes, words or constructions that expresses aspects of the speakers’ properties, stances and identities.
First examples: Expressives

(1)  T-V distinction
   a.  Je peux *vous* aider?
   b.  Je peux t’aider?
       ‘Can I help you?’ (also honorifics)

(2)  Swear words
   a.  Mike Tyson won another fight. (McCready, 2012)
   b.  Fucking Mike Tyson won another fight. He’s wonderful.
   c.  Fucking Mike Tyson got arrested again for domestic violence.
First examples: Discourse particles

(3) Terms of address
   a. What are we doing tonight?  (Kiesling, 2004)
   b. Dude, what are we doing tonight?
   c. Babe, what are we doing tonight?

(4) Discourse *like*
   a. What are we doing tonight?
   b. Like, what are we doing tonight?
(5) Optional determiners (Acton, 2014)
   a. Americans love cars.
   b. The Americans love cars.

(6) Grammatical gender (Burnett and Bonami, 2017)
   a. La parole est à Madame le ministre. Masculine
   b. La parole est à Madame la ministre. Feminine

(7) Intensifiers (Beltrama and Staum Casasanto, 2017)
   a. John is really tall.
   b. John is totally tall.
First examples: Sociophonetic variables

(8) (ING)
   a. I’m working on my paper. \[\text{[iŋ]}\]
   b. I’m workin’ on my paper. \[\text{[iŋ]}\]

(9) /t/ release
   a. We should mee\[^t^h\]. released ‘t’
   b. We should mee\[^t\]. unreleased ‘t’

(10) 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).
- In formal semantics/pragmatics (Kaplan, 1999; Potts, 2005; McCready, 2004; Smith et al., 2010; Acton, 2014; Beltrama, 2016; Burnett, 2017) (also: the papers at the IASM workshop next week!).
Social meaning has been extensively studied:

- In linguistic anthropology and socio-cultural linguistics, more generally (see Bucholtz and Hall, 2005, 2008, for reviews).
- In variationist (quantitative) sociolinguistics (Labov, 1963), especially within the Third Wave approach (Eckert, 2000, 2012).
- In formal semantics/pragmatics (Kaplan, 1999; Potts, 2005; McCready, 2004; Smith et al., 2010; Acton, 2014; Beltrama, 2016; Burnett, 2017) (also: the papers at the IASM workshop!).

This course contributes to the research programme bringing these different subfields together.
Questions explored in this course

1. Is social meaning a unified phenomenon?
2. Are the inferences triggered by socially meaningful expressions significantly different from other kinds of pragmatic inferences?
3. What are appropriate formal frameworks for modelling social meaning and its relationship to sociolinguistic variation, scalar implicatures?
Questions explored in this course

1. Is social meaning a unified phenomenon?
   ▶ **Hypothesis:** Inferences about speaker properties/identities/stances can be triggered by aspects of the truth-conditional, expressive and indexical meaning of their utterance.

2. Are the inferences triggered by socially meaningful expressions significantly different from other kinds of pragmatic inferences?

3. What are appropriate formal frameworks for modelling social meaning and its relationship to sociolinguistic variation, scalar implicatures?
Questions explored in this course

1. Is social meaning a unified phenomenon?

2. Are the inferences triggered by socially meaningful expressions significantly different from other kinds of pragmatic inferences?
   
   ▶ Hypothesis: Social implicatures are generated by the same general mechanisms as other kinds of pragmatic inferences (interactive, rational, informativity-based reasoning).

3. What are appropriate formal frameworks for modelling social meaning and its relationship to sociolinguistic variation, scalar implicatures?
Questions explored in this course

1. Is social meaning a unified phenomenon?
2. Are the inferences triggered by socially meaningful expressions significantly different from other kinds of pragmatic inferences?
3. What are appropriate formal frameworks for modelling social meaning and its relationship to sociolinguistic variation, scalar implicatures?

▶ Hypothesis: Game theory will give us a mathematical and computational framework for bringing social meaning and sociolinguistic variation into the scope of formal pragmatics.
▶ This framework will be articulated using Iterated Best Response signalling game models (Franke, 2009; Frank and Goodman, 2012; Franke and Jäger, 2016, a.o.).
Plan

Introduction

Diagnosing social meaning: sounds
  Sociophonetic interpretation
  Sociophonetic variation

Diagnosing social meaning: beyond sounds
  Code switching
  Morpho-syntax & lexicon

Introduction to Game Theory
  Architecture
  Nash equilibrium
  Modelling of code switching example
(11) (ING)

a. I’m working on my paper.  

b. I’m workin’ on my paper.

- From (11-a), we conclude the speaker is working on their paper.
  - We infer something additional. . .

- From (11-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).

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.

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

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).
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).

<table>
<thead>
<tr>
<th></th>
<th>Speaker 1</th>
<th>Speaker 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Down-island, leaving</td>
<td>00-40</td>
<td>00-00</td>
</tr>
<tr>
<td>Up-island, staying</td>
<td>90-100</td>
<td>113-119</td>
</tr>
</tbody>
</table>

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**.

<table>
<thead>
<tr>
<th>Variable</th>
<th>+Cruising</th>
<th>-Cruising</th>
<th>Input</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(˄) backing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Girls</td>
<td>.563</td>
<td>.458</td>
<td>.422</td>
<td>.000</td>
</tr>
<tr>
<td>Boys</td>
<td>.530</td>
<td>.460</td>
<td>.447</td>
<td>.014</td>
</tr>
<tr>
<td>(e) backing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Girls</td>
<td>.544</td>
<td>.464</td>
<td>.331</td>
<td>.029</td>
</tr>
<tr>
<td>Boys</td>
<td>.557</td>
<td>.437</td>
<td>.368</td>
<td>.001</td>
</tr>
<tr>
<td>(ay) raising</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Girls</td>
<td>.765</td>
<td>.381</td>
<td>.011</td>
<td>.000</td>
</tr>
<tr>
<td>Boys</td>
<td>.636</td>
<td>.295</td>
<td>.009</td>
<td>.004</td>
</tr>
</tbody>
</table>

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.
- After Franco’s death, Catalonia became autonomous and officially bilingual.
- Aggressive policies making Catalan the language of government and education.
Why are Castilian speakers resisting Catalan?

<table>
<thead>
<tr>
<th>Age group</th>
<th>Catalonia-born</th>
<th>Speak Catalan frequently</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-20</td>
<td>87%</td>
<td>43%</td>
</tr>
<tr>
<td>21-30</td>
<td>68%</td>
<td>49%</td>
</tr>
<tr>
<td>31-40</td>
<td>48%</td>
<td>44%</td>
</tr>
<tr>
<td>41-50</td>
<td>45%</td>
<td>46%</td>
</tr>
<tr>
<td>51-60</td>
<td>53%</td>
<td>58%</td>
</tr>
</tbody>
</table>

Table: Linguistic profile of Adults in BCN in 1983, based on (Woolard and Gahng, 1990, 64)

- Young WC native Castilian speakers are particularly resistant to Catalan.

▶ (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.
If you are 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.
Socio-semantic change


- Catalan guises were rated significantly higher on status properties by everyone.
- No difference on solidarity/friendliness properties for any speakers and any guises.

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

Change in meaning correlates with change in use

- Habitual use of Catalan by native born Catalonians rises to 65.3% in 2012 (Gov. Catalonia, 2013).
- Much more use by young native Castilian speakers (Woolard, 2009, 2016).
- ‘Severing’ of the link between language and ethnicity in Catalonia.
Question
Can we apply these same social meaning diagnostics to phenomena more commonly studied in formal semantics and pragmatics?
Intensifiers with open scale adjectives

(12) 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 (12-c) are rated as significantly more friendly, outgoing and cool.
- Speakers using totally are rated as significantly less intelligent, mature and articulate.
Optional determiners

(13)  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.

<table>
<thead>
<tr>
<th>Party</th>
<th>Dem the-%</th>
<th>Rep the-%</th>
<th>Dem N</th>
<th>Rep N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Democrats</td>
<td>30.4%</td>
<td>54.4%</td>
<td>11,352</td>
<td>18,992</td>
</tr>
<tr>
<td>Republicans</td>
<td>53.3%</td>
<td>26.1%</td>
<td>13,007</td>
<td>11,042</td>
</tr>
</tbody>
</table>
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. Morphy-syntactic and lexical variants also have identity constructing functions.
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*. 
Given that game theoretic models already exist for some kinds of pragmatic phenomena, we ask:

**What if social meaning and pragmatic meaning involve the same inference-making process?**

There exist fundamental similarities between (14) and (15).

(14) I’m work\textit{in} on my paper.  
\implies The speaker is \textit{friendly}.  
\textbf{Social implicature}

(15) Milou ate \textit{some} of the cookies.  
\implies Milou ate some \textit{but not all} of the cookies.  
\textbf{Quantity implicature}
What is Game Theory?

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

- Since at least the late 1970s it has been possible to say with confidence that game theory is the most important and useful tool in the analyst’s kit whenever she confronts situations in which what counts as one agent’s best action (for her) depends on expectations about what one or more other agents [might] do, and what counts as their best actions (for them) similarly depend on expectations about her.

Game Theory Basics

Basic components of a game (see Osborne and Rubinstein, 1994)

- 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 ($u$).
Strategic game (with ordinal preferences)

1. a set of players (\(N = \{p_1, \ldots p_n\}\)).
2. for each player, a set of actions (\(\langle A_1, \ldots A_n \rangle\)).
3. for each player, preferences over the set of action profiles (\(A_1 \times \ldots \times A_n\)).

Action profiles

Tuples of all possible combinations of individual choices.

- For two players \(i, j\), with two sets of actions \(A_i, A_j\), this game's action profiles are \(A_i \times A_j\).
- So \(u(\langle a_i, a_j \rangle) = n\) for some \(n \in \mathbb{N}\).
Prisoner’s dilemma

- Two suspects in a major crime are held in separate cells. There is enough evidence to convict each of them of a minor offense, but not enough evidence to convict either of them of the major crime unless one of them acts as an informer against the other (confess).
- If they both stay quiet (deny), each will be convicted of the minor offense and spend one year in prison.
- If one and only one of them confesses, she will be freed and used as a witness against the other, who will spend four years in prison. If they both confess, each will spend three years in prison.
Strategic game

- Players: \( N = \{\text{player 1, player 2}\} \)
- \( A = \{\text{confess, deny}\} \)
- Preferences over action profiles: \( \{u_1, u_2\} \)

(16) Constraints on \( us \)

a. \( u_1(\text{confess, deny}) > u_1(\text{deny, deny}) > u_1(\text{confess, confess}) > u_1(\text{deny, confess}) \)

b. \( u_2(\text{deny, confess}) > u_2(\text{deny, deny}) > u_2(\text{confess, confess}) > u_2(\text{confess, deny}) \)

\[
\begin{array}{cc}
  & c & d \\
\hline
  c & 2,2 & 0,3 \\
  d & 3,0 & 1,1 \\
\end{array}
\]

Figure 1.1: The prisoner’s dilemma
Solution Concept

This game is really just a model of the situation and does not specify what the agents in fact do, (or should do, if we are being prescriptive).

Solution concept

An algorithm that specifies how the game is/should be played.

- Specifies the idealized behavior of agents in the situation that is modelled by the game.
Nash equilibrium

An action profile \( a^* \) with the property that no player \( i \) can do better by choosing an action different from \( a_i^* \), given that every other player \( j \) adheres to \( a_j^* \).

(17) an action profile \( a^* \) such that for all \( i \in \mathbb{N} \) there is no \( a_i \in A_i \) for which

\[
(a^*_{\_i}, a_i) \prec_i a^*
\]

\((a^*_{\_i}, a_i)\) is the tuple that results from replacing the \( i \)-th component of \( a^* \) with \( a_i \).
Prisoner’s Dilemma

The action pair (confess, confess) is a Nash equilibrium because

- given that player 2 chooses confess, player 1 is better off choosing confess than deny.
- given that player 1 chooses confess, player 2 is better off choosing confess than deny.

No other action profile is a Nash equilibrium.

- Players = \{Castilian speaker 1, Castilian speaker 2\}
- A = \{speak Castilian, speak Catalan\}
- Preferences over action profiles = \{u_1, u_2\}
Payoff functions for 1980s Catalonia

For Castilian speakers speaking to Castilian speakers:

▶ Speaking Catalan makes you sound more intelligent, competent etc. than speaking Castilian.
  ▶ +1 for Catalan; -1 for Castilian.

▶ Speaking Catalan makes you sound less likeable, attractive etc. than speaking Castilian.
  ▶ -1 for Catalan; +1 for Castilian.
Sample payoff functions

<table>
<thead>
<tr>
<th></th>
<th>Catalan</th>
<th>Castilian</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catalan</td>
<td>0,0</td>
<td>0,0</td>
</tr>
<tr>
<td>Castilian</td>
<td>0,0</td>
<td>0,0</td>
</tr>
</tbody>
</table>

4 equilibria

If you grew up speaking Castilian, there is no motivation to change.
For Castilian speakers speaking to Castilian speakers:

- Speaking Catalan makes you sound more intelligent, competent etc. than speaking Castilian.
  - +1 for Catalan; -1 for Castilian.

- No difference in solidarity/likeability for speaking Castilian/Catalan.
Sample payoff functions

<table>
<thead>
<tr>
<th></th>
<th>Catalan</th>
<th>Castilian</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catalan</td>
<td>1,1</td>
<td>1,0</td>
</tr>
<tr>
<td>Castilian</td>
<td>0,1</td>
<td>0,0</td>
</tr>
</tbody>
</table>

1 equilibrium: Catalan

Switching to Catalan is always the best strategy.

- Beginning of a meaning-based model of the spread of Catalan in Barcelona.
Looking ahead…

Class 2
Phenomena with analyses in both sociolinguistics and semantics/pragmatics: discourse particles, politeness, and honorifics.

▶ Formal tools: Signalling games.

Classes 3 and 4
A formal semantics/pragmatics for sociophonetic variation. Style shifting and social stratification.

▶ Formal tools: Iterated Best Response models.

Class 5
Socio-semantic change.

▶ Formal tools: Evolutionary game theory.


