Day 4.5: Politeness in Gale-Stewart Games

Eric McCready[1] Nicholas Asher[2]

Aoyama Gakuin University
mccready@cl.aoyama.ac.jp

CNRS-IRIT
Nicholas.Asher@irit.fr

August 14, 2015

Introduction

Politeness: ubiquitous, but not well-understood in formal linguistics.

- Most formal research limited to lexical properties.

How does politeness fit into the cooperativity picture?

- Gricean maxims?
- A fifth maxim (Politeness)??
- In general, what to say about *non informative* content?
- Likely to find different patterns from other kinds of discourse.

Here restrict attention to politeness and formality.

Today: discourse-level politeness.

1. Nature of the 'discourse level'
2. State distinctions we aim to model: formal vs informal, polite vs impolite, 1P vs 2P pronouns
3. Review our model of politeness (Asher and McCready, 2012)
   - Gale-Stewart games
   - Complexity classes of discourse politeness strategies
4. Ground the analysis in a model of honorific meaning

Domain

A common lexical strategy for indicating politeness/formality: pronouns.

- Asher and McCready (2012) explore the simplest possible case, European languages such as French, Spanish or German.
- Here we find 2 types of 2P pronouns, formal and informal.
- Today: Japanese. Many 1P and 2P pronouns with different levels of formality.
- 1P pronouns (in descending order): *watakushi*, *watashi*, *boku*, and *ore*
- 2P pronouns, again in descending order of formality, *anata, anta, kimi, omae, teme,* and *kisama*.
- Last two 2P pronouns not just informal but genuinely impolite.

Combinations

1P and 2P pronouns often 'match' in register, but they can differ, yielding complex pragmatic effects.

- Formal 1P pronoun like *watakushi* with informal 2P pronoun such as *omae* gives a cold/hostile impression.
- We call it the 'VIP dialect' (Very Important Professor).
- Or: informal 1P pronoun with a formal 2P pronoun; impression of someone relaxed yet who wishes to be perceived as being polite.
- The typical case here is *ore* together with *anata*.
- We call this the 'Courtship Dialect'.

Gale-Stewart Games

AMP (Asher and McCready, 2012; McCready et al., 2013) analyze discourse-level politeness via Gale-Stewart games Gale and Stewart (1953).

- Two players, 1 and 2, who each play one element of a given set V in their turn.
- Winning (for P1) requires that the resulting concatenation be in a given set.
- AMP: $A = \{P, I\}$, $\sim$ pronominal features.

Games consist of:

- A countable vocabulary of politeness expressions V,
  - which we can partition into V_1 and V_2 (the politeness expressions for players 1 and 2).
- We set $V_1 = V_2 = \{P, I\}$.
- A strategy for player p is a function which maps each play prefix into a suitable element from V_i.

Winning politeness?

Who wins a politeness game? Two views:

1. Strategic politeness: politeness used as a facilitator for other goals
2. Cooperative politeness: politeness used to acknowledge and possibly modify social relations

We take the latter view:

- As we did with ME games we generalize to the non-0 sum case where 0,1 both have winning conditions if one does.

(A few counterexamples to be mentioned)

Winning conditions, Σ_1

We now consider the complexity hierarchy of winning conditions.

- Σ_1 winning conditions can be characterized by unions of basic open sets.

In conversational models: a (determinate) Σ_1 WC is one in which an agent can achieve her goal by introducing a particular move (type).

- $\rho \models \Diamond P/I$
- For politeness: where introducing $(P|I)$ is sufficient.

Example 1: initial P/I move used to signal social intent/relationship.

Π_1 conditions

Next: Π_1 conditions, complements of Σ_1 conditions and equivalent to *safety*.

- Π_1 conditions correspond to conditions which are complements of conditions of rank Σ_1.

(1) $\rho \models \Box C$

(2) ie. stay in a particular vocabulary and do not move out of it

Example from AMP: a sequence $\{P, I, P, I, \ldots\}$, so where player 1 always plays P and player 2 always plays I.

- Eg. interaction between boss and employee.

Σ_2 conditions

Next, Σ_2 conditions, countable unions of Π_1 sets.

- Example: a conversation which begins in a formal mode, continues indefinitely, switches to informal at some point and remains there.
- As the conversational participants become 'closer,' their formality decreases.
- This corresponds to a union of sets of the form $P^i \cup I^j$ for some $i, j \prec \omega$;
- Since P^i and I^j are Π_1 as we have just seen, the winning condition corresponding to this kind of interaction is Σ_2.

Very common in politeness: most cases we will discuss are either Σ_2 or Π_1.

Too simple!!

Discourse moves aren't just *P* or *I*.

- Required: a more articulated set of types *A* from which the players can draw.
- Basic idea: two dimensions for pronominal meanings.
  - Formal moves vs polite ones
  - 1P/2P politeness in pronominals
- Then: use this vocabulary for a more extensive look at winning strategies.

Even this is too simple, but some interesting distinctions can be drawn.

P/I vs F/N

One can be formal yet impolite, and informal but not in any sense rude.

- Our model: two binary features.
  - F(ormal) and N(ot formal) for formality,
  - P(olite) and I(mpolite) for politeness.
- F/N used to model lexical content.
- P/I involves content, which can be genuinely rude, or not.
- We leave the characterization of politeness/rudeness vague.

Thus, each move combines P/I and F/N, giving:

FP	formal and polite
FI	formal and impolite
NP	informal and polite
NI	informal and impolite

Figure: Formality versus Politeness

1P vs 2P

We distinguish F/N in 1P and 2P pronouns.

- Gives rise to various 'politeness profiles' like the VIP dialect.
- Two binary features to distinguish 1P/2P politeness;
- so giving $1F/1N$ and $2F/2N$ and their possible combinations.

$1F2F$	formal speech
$1F2I$	VIP dialect
$1I2F$	courtship dialect
$1I2I$	informal speech

Figure: First and Second Person Pronominals and Formality

Σ_1 conditions again

Simple, so only two types of case: status marking and signals of behavior.

- Natural way to indicate status: use particular pronoun combinations.
- Example: single use of VIP dialect (= $1F2I$ in our framework).
- Arguably, consistently sticking to this strategy isn't required.
- Often a single move like this is enough to show relative status.
- $\rho \models \Diamond(1F2I, 1)$

Similarly for courtship dialect:

- to indicate metaphorical lowering, a single instance of $1N2F$ is enough.
- $\rho \models \Diamond(1N2F, 1)$ (for player 1).

Other possible realization: demonstrations of supposed status.

- Suppose speaker wants to indicate that she is being formal, for politeness,
- or being informal, to demonstrate independence.

Perhaps not too plausible, as speakers are usually consistent in their register choice.

- $\rho \models \Diamond(NX, 1)$ (win for player 1 if she makes a move with an informal pronoun)
- $\rho \models \Diamond(FX, 1)$

Π_1 conditions

Π_1 in politeness:

- Amounts to the requirement that a speaker exhibit consistent politeness behavior.
- Such strategies are very common.

Example: $\rho \models \Box FP$ so each element of the sequence is a move which is both formal and polite.

- 'Standard' polite behavior.
- 'Standard' informal, friendly discourse.

More generally: $\rho \models \Box XP$,so either formal or informal language is available if interaction remains polite.

Related: Π_1 pronominals

Suppose that consistent use of pronominals results in a winning strategy.

- Then a whole set of Π_1 conditions arises.

$$\begin{aligned} \rho \models \Box 1F2F &\sim \text{formal speech} \\ \rho \models \Box 1F2N &\sim \text{VIP dialect} \\ \rho \models \Box 1N2F &\sim \text{courtship dialect} \\ \rho \models \Box 1N2N &\sim \text{informal speech} \end{aligned}$$

Different statuses

- Similarly, the earlier $\{P, I, P, I, \ldots\}$ remains Π_1, but translated to $\{FX, NX, FX, NX \ldots\}$ in new framework.
- Consider sequence $\{1F2F, 1F2N, 1F2F, 1F2N, \ldots\}$, where player 1 is unfailingly polite and player 2 uses the VIP dialect.
- $\rho \models \Box[(P,0) \wedge (I,1)]$
- Could be winning for player 1 if he needs something from player 2 badly enough to be willing to grovel for it.

Ultimately, sequence can be winning if it assists the player to achieve his objective.

- In this sense, even humiliation can yield victory.

Σ_2 conditions

Recall earlier example of Σ_2 condition: a conversation that moves from a sequence of *P*-moves to a sequence of *I*-moves at some point.

- Σ_2 condition involves one or more such transitions, since such conditions consist of unions of Π_1-characterizable winning conditions.
- In present framework, we have:
- $\rho \models (FX)$ until $(IX) \wedge (IX) \rightarrow \Box(IX)$
- We can also have less specified conditions of the form $\rho \models \Diamond\Box(IX)$: no requirement placed on sequence preceding IX in the game.

Such sequences are Σ_2, because transition between sequence types induced by the winning condition.

Recovery strategies

Consider a case of correction.

- Impolite discourse move is made, and then all is polite thereafter.
- The common case of acknowledging an error in register.
- A similar kind of case can be seen for the case of formality:
- It is easy to get the timing wrong for the shift to the use of informal speech.
- Speakers often must hastily revert to a more formal speech pattern.
- This corresponds to the winning condition $\rho \models \Diamond NX \wedge$ since (NX, FX)

Honorific semantics

The strategies discussed above are intuitive but . . .

- incomplete.
- Lacking: a semantics for honorifics/formality/politeness
- Without one, hard to see *why* these strategies are reasonable.

Basic idea: add 'politeness registers' to discourse contexts (McCready, 2015).

Semantics for honorifics

Iwasaki and Ingkaphirom Horie (1995): politeness behavior operates along three dimensions.

1. psychological distance: the perceived interpersonal closeness of the discourse participants,
2. social distance: determined by the societal roles of the participants,
3. formality: determined by the situation of utterance together with the purposes and topic of the conversation.

I will thus take the domain associated with the semantics of honorifics to be a 3-tuple of intervals of the form [0,1].

(3) **Politeness domains.**
$\mathcal{D}_{\varepsilon} =_{df} \langle P, S, F \rangle, X \subseteq [0,1]$ for $X \in \{P, S, F\}$.

Follows Potts (2007) in using real-numbered intervals.

Appropriateness

Honorific expressions:

- Pronouns, some Thai particles, honorific morphology . . .

Denote subintervals of $\mathcal{C}$, higher intervals for more formal expressions, and lower intervals for less formal ones.

- Thus, context determines whether a given expression is appropriate or not.

Auxiliary:

- *min* and *max* are functions picking out the lower and upper bounds of intervals $[i, j]$, respectively.
- $min(\mathcal{C}) =_{df} \frac{min(\pi_1(\mathcal{C}))+min(\pi_2(\mathcal{C}))+min(\pi_3(\mathcal{C}))}{3}$
- $max(\mathcal{C})$ is the corresponding function for the upper bounds of the intervals in $\mathcal{C}$

Then:

(4) **Appropriateness for honorifics**.

$$\text{Utter(DS) in } \mathcal{C} = \begin{cases} \surd \text{ if } \mathit{Hon}(\mathit{DS}) \cap [\mathit{min}(\mathcal{C}), \mathit{max}(\mathcal{C})] \neq \emptyset \\ \times \text{ else} \end{cases}$$

The above says that an utterance of a given sentence is honorific-appropriate if its honorific level is compatible with the global register.

- Honorific levels themselves determined by 'averaging' levels of all expressions with honorific content.

Proposals for change

But honorifics themselves can work to change the context.

- Speakers can introduce informal pronouns or the like to shift $\mathcal{R}$ downward.
- The current semantics does not capture this effect and must be extended.

Basic idea: honorifics both check the context and propose a shift in the direction of their own level.

- This register shift should be tied to the current formality of the context.
- In particular, the context shouldn't jump around willy-nilly; shifts should respect the current state.

These effects can be captured by (5).

- $\mathcal{C}[(S)]_H$ signifies 'honorific update' of the current register with the honorific content of a sentence.
- $\mathcal{C}'$ is the register arrived at after such update.

(5) **Dynamic registers.**

$\mathcal{C}[(S)]_H = \mathcal{C}'$, where

$$\mathcal{C}' = \begin{cases} \mathcal{C} \text{ if } \mathcal{C} \subseteq \mathit{Hon}(DS) \\ \left[\frac{\mathit{min}(\mathcal{C})+\lambda\mathit{Hon}(DS)}{2}, \frac{\mathit{max}(\mathcal{C})+\lambda\mathit{Hon}(DS)}{2}\right] \text{ else} \end{cases}$$

Average of the honorific content of the current with the elements of the current context unless honorific content is less specific than the current context.

- λ a weighting parameter.

Some consequences

Speech levels can be derived via registers:

(6) a. High $\subseteq [.6, 1)$
b. Mid $\subseteq [.3, .7]$
c. Low $\subseteq [0, .4]$

Alternatively, two levels as I/F.

- Overlapping allows joint consistent use.
- Cf. claim of Iwasaki and Ingkaphirom Horie (1995): in Thai Mid+Low, High+Mid possible, Low+High impossible

For the particular case of pronoun combinations ($1F2F$ etc), we need only observe the honorific level of each term.

This proposal can account for changes in honorific use over the lifespan of a conversation or long-term social interaction.

- In many social situations, one tends to begin speaking formally and then move to informal speech.
- Present setting: a change in the parameters comprising $\mathcal{C}$.
- As the measure P of interpersonal distance decreases, $\mathcal{R}$ also does; given sufficiently low values for F and S, transition.

Close correspondence to Σ_2 strategies discussed above:

- shift from formal to informal speech.

Suppose that at play n in game g $\mathcal{R}$ is neither extremely formal $\subseteq F$ or informal $\subseteq I$.

- Then player at n can play either FX or NX.
- Which should be chosen? Either compatible with the semantics ...
- Intuitive:
  - If previous moves have been of $F(N)$, continue in $F(N)$ ($\square(F,1) = \Pi_1$);
  - or attempt to shift levels by playing $F(N)$ if previously $N(F)$ (Σ_2).

Result: underpinning of game analysis with semantics for honorification.

Formality and coherence

Is there a notion of coherence corresponding to previous one?

- There: incoherent iff contradiction derivable from previous plays of agent.
- But here we expect shifts in honorific level: no consistency-based definition available.

Better: score for *politeness*:

- Increment scores a la def. coherence/responsiveness:
  1. positively (+1) if $Hon(DS) \cap \mathcal{C} \neq \emptyset$
  2. negatively (-1) else.
- Ties to BADness and GOODness as before.

Alternative

Suggestion: no willy-nilly jumps between levels.

- But formality can vary from turn to turn.
- We might be in *N* but I shift to *F* when I ask you to lend me money.
- Need to make connections between formality and content.
- Note: possibly requires consideration of strategic politeness.

Already allow players to be engaged in several games simultaneously.

- Content game + politeness game

Conclusion

Next steps:

- Restriction on possible strategies: notion of admissible continuation
  - Some moves limit set of possible future moves.
  - For instance, a move of *FI* can be a conversation-killer.
  - Points to a need for more interaction between levels in the theory of politeness.
- In general, also need to consider relation between content and politeness:
  - Politeness can be used strategically to achieve speaker goals
  - by manipulating aspects of speaker behavior.
- Many interesting avenues for future work.

A bit of politeness

Thank you!

Asher, Nicholas and Eric McCready. 2012. Winning strategies in politeness. In A. Butler, ed., *Proceedings of LENLS9*, pages 87–97. JSAI.

Gale, D. and F. M. Stewart. 1953. Infinite games with perfect information. *Annals of Mathematical Studies* 28:245–266.

Iwasaki, Shoichi and Preeya Ingkaphirom Horie. 1995. Creating speech register in Thai conversation. *Language in Society* 29:519–554.

McCready, Eric. 2015. The semantics and pragmatics of honorification. Manuscript, AGU.

McCready, Eric, Nicholas Asher, and Soumya Paul. 2013. Winning strategies in politeness. In Y. Motomura, A. Butler, and D. Bekki, eds., *New Frontiers in Artificial Intelligence*, vol. 7856 of *Lecture Notes in Computer Science*, pages 87–95. Springer Berlin Heidelberg. ISBN 978-3-642-39930-5.

Potts, Christopher. 2007. The expressive dimension. *Theoretical Linguistics* 33:165–198.