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Modeling complex interactive speech events
Matthew R. Sorenson
Automated Language Processing Systems

In looking at language as it is used by patients and staff in an institutional context, we encounter complex, interactive speech events. That is, there are conventionalized sequences of speech events, some embedded within others, and constructed by different speakers taking turns. We would like to find a useful way to model these sequences. After examining a range of analytical tools available to linguists, it appears that Augmented Transition Networks are useful for representing the facts, as well as in accounting for accommodation, and co-occurrence restrictions.

the setting and methods

Hundreds of instances of address forms, greetings, requests, and interventions were gathered in a locked ward of a state mental hospital. The requests were uttered by professional staff, direct care staff, and patients during the normal routine of the day on all shifts. They were recorded on paper by me as they occurred, as I was working at different points in time as a therapist-technician, recreational therapist, direct care worker, or volunteer, over a period of two years. This was part of a research project aimed at describing the major linguistic resources and ways of speaking of the hospital speech community. Methods were ethnographic, including participant observation and interviews.

data

The most common form of address is first name only. The notable exception is when the psychiatrist is addressed, and then title plus last name is normal. In addressing patients, staff members may emphasize their institutional authority by using first plus last name. Nicknames are used by staff in a few cases of established intimacy with particular patients. If staff is addressing an institutionally defined group of patients, then the group name may be used in place of personal names.

Patients do not use last names in addressing other patients or staff, except in the case of the psychiatrist.

If the name of the addressee is unknown, staff members will tend to ask for the name, but patients will likely not use any form of address. In many cases some impersonal address form can be used when a name is not known (sir, ma'am, etc).

Greetings include the use of an address form as a component. However the range of choices for address form within a personal greeting is constrained by the familiarity that is assumed by the event itself. That is, you don't greet someone you don't know, and you don't greet groups. So the address form in this context is likely to be first name only.

Preceding the address form is some sort of exclamation, ranging in formality from a staff-like "hello" to a patient-like "hey". Following the exclamation and the address form is an optional elaboration, which may be an inquiry, or a word of praise if the speaker is staff,

or may be an expression of self-praise if the speaker is a patient. Either staff or patient can elaborate on the greeting with a request.

The greeting may be capped off with an expression of status or group membership. Patients may offer a hug, or put a hand on the shoulder of the addressee. Staff members may shake hands, or issue a prompt that refers to either an understood or an already issued request.

requests

Requests have been considered in terms of politeness. Craig, Tracy, and Spisak (1986) recently reviewed accounts of requests based on the ideas of Brown and Levinson (1978) about the centrality of politeness. They concluded that although a variety of politeness strategies can be observed, there are too many other significant aspects of requests that cannot be explained in terms of politeness alone.

Ervin-Tripp (1976) described five types of requests that differed in their degree of indirectness. Her discussion of these requests focussed on three functions of sociolinguistic alternations:

- 1) they assert features of social relationships,
- 2) they carry connotative meaning through association with other 'metaphorical equivalence systems', and
- 3) they can interact with boundary-markers and situation-identifiers.

Labov and Fanshel (1977) discussed the relation between direct vs. indirect requests, and mitigated vs. aggravated requests in a therapeutic setting. A set of interpretive rules were proposed, including a rule of requests, a rule of indirect requests, a rule of embedded requests, and a rule of repeated requests. They suggested that linguists should be looking at the connections between utterances in discourse, and that these connections are not simply linguistic but should be seen in terms of a sequence of actions.

So, an account of requests should include directness, politeness, and mitigation as a minimum, but these are mechanisms for bigger interactional purposes, including statements of social identity, and the marking of situations or boundaries. Variation in requests can assume meaning by co-varying in form with the identity alignments of interactants.

Requests in the institution have four basic components. The first is the core request, which is followed by an address form, followed by an optional expression of politeness. Finally there is an expression of power optionally given by staff, which may consist of either some kind of evaluation of the situation or addressee, or else a warning about the possible consequences of not cooperating with the request.

Two institutional kinds of requests are roundup and redirection.

Roundup occurs when a staff member makes a request for a group of patients to start some routine activity. The activity is announced and the patients are addressed either as an impersonal group, or by a sequence of individual address forms. Typically the core request is very abbreviated or just implied.

If a patient's behavior conflicts with institutional standards staff members may remind them to do what they are supposed to do. This mild verbal intervention to correct patient behavior is called "redirection".

Requests are responded to, sometimes verbally, and in the institution, very often with refusals. When a redirection doesn't work the staff may decide to initiate an intervention.

Interventions are the most complex and most distinctively institutional speech events at the hospital. They include long sequences of address forms, requests, refusals, warnings, negotiations, instructions, and documentation. An intervention is a clearly coherent, structured, and repeatable speech event in the hospital. It is constructed by the cooperation of multiple speakers, who take on multiple roles, taking turns in adding parts to the whole event.

The whole process, including both verbal and non-verbal structures, is conventionally structured and must be learned over a period of months by new members in the community, both staff members and patients. Inept newcomers will be coached in the proper sequence, and in their proper role, by peers and authorities.

Interventions are very difficult to handle. A lot of things can go wrong, and the experience is very stressful. Among the staff there is a huge range of skills, and only the most experienced employees have a consistent and confident grasp on the whole process. Among the patients also, there are those who have been in the hospital long enough that they understand how to manipulate the structure of the event to their own ends, gaining face among peers for resistance to authority without getting seriously 'busted'.

We have spoken here of ways in which patients talk in opposition to ways in which staff members talk. It must be noted that this is an ideal opposition and the quality of an utterance can range between the extremes. There are occasions when patients see a need to talk like staff, and they can perform that way. Staff talk can likewise approach the patient style if there is a need to establish informality or solidarity with a patient.

These differences in style also will be found between individuals. Two people with the same social role, or same job, can make consistently distinctive choices that result in personal style.

representation

In order to represent these complex, interactive speech events we need a formalism that:

- 1) shows the variables and options that are choosable by speakers,
- 2) shows the whole structure of the speech event (not just features),
- 3) makes reference to meaningful categories of social identity,
- 4) relates linguistic choices to these meaningful social categories,
- 5) handles recursive generation of embeddings and repetitions,
- 6) allows for turns between multiple speakers,

- 7) is useful for modelling both speaker and hearer, and
- 8) allows for dynamic adjustments in strategy and style.

That is a tall order. Where are we to find such a beast?

It is not uncommon for sociolinguistics to be equated with the use of the variable rule. The variable rule has some obvious applications, but also has some clear drawbacks as a model of sociolinguistic processes.

First of all, the connections between variables is not made clear. Rules can be written for each socially significant phonological marker, but to make sense out of sets or systems of variables is impossible without going beyond the rule formalism.

Discourse phenomena are not amenable to variable rule analysis. In particular, the cooperative interaction of multiple speakers in building of complex speech events is beyond the realm of the variable rule.

Speech act theory was supposed to allow linguists to examine the non-propositional meaning (illocutionary force) of utterances that are not well understood from a truth-conditional viewpoint. The prospect of describing utterances in terms of their use, and in terms of the intentions of speakers had to be appealing to sociolinguists. But the major proponents of speech act theory never looked at real language in context. The data was limited to single sentences, by single speakers. How speech acts are combined, sequenced, or embedded by speakers was not examined. Reference was never made to how the social categories or the social processes in a speech community molded their use.

What a speech act was and what speech act theory claimed was never satisfactorily formalized. The whole program was left sputtering in the early, taxonomic, stages of formalization.

Theorists could never eliminate the persistent ambiguity in the assignment of illocutionary force to an utterance. It is difficult to tell how a sentence is being used, even in cases where there is an overt performative verb (Gazdar 1981). The lack of a predictable function between form and force was frustrating to those who were reluctant to look at the social-interactive context of the utterance.

Here we have spoken of speech events, not speech acts, avoiding the suggestion of a one to one correspondence between sentences and intended illocutionary actions. In our data, the illocutionary force of one particular utterance is determined by its participation in the conventional sequence of which it is a contributing part.

Script theory posits a cluster of expectations organized into an abstract type of experienced event. These expectations include what is likely to happen, in what sequence, who the typical actors are, as well as (perhaps defaulted) values, or slots, for time, location, purpose, etc.

The notion of scripts, especially if applied to speech events, begins to approach the kind of model we need. We can see a whole complex event, made up of a sequence of choices,

with multiple speakers, and a way to access information about the context. Script theory could be elaborated to describe the embedding of events. That is, one slot in a script can be a script itself.

However, we also want to model the way speakers make linguistic choices in relation to their ongoing evaluation of the context of interaction, including reference to social categories, and allowing for adjustments in style.

In syntax, a transition network model (Woods 1970) has been argued for over a system of rules because of its perspecuity, generative power, efficiency of implementation, efficiency of representation, its ability to express regularities, its suitability for prediction and experimentation, and the fact that it may function as both parser and generator (as model for both speaker and hearer).

This formalism is general and powerful and can serve to represent much of what we have already talked about, including the sequenced, defaulted, contextualized sets of expectations offered by scripts.

A transition network is a sequence of states connected by directed arcs. The system progresses from a start state, which may be associated with a string to be parsed, and moves over a network of arcs to a final state. If the string is completely parsed (or a valid string is completely generated) at the final state, then the output of the network is acceptable.

A minimally complex type of transition network that might account for the facts observed in requests is a Recursive Transition Network (RTN). This formalism allows for a node in a network to refer to an embedded network.

The Augmented Transition Network (ATN) has the following augmentations over the RTN:

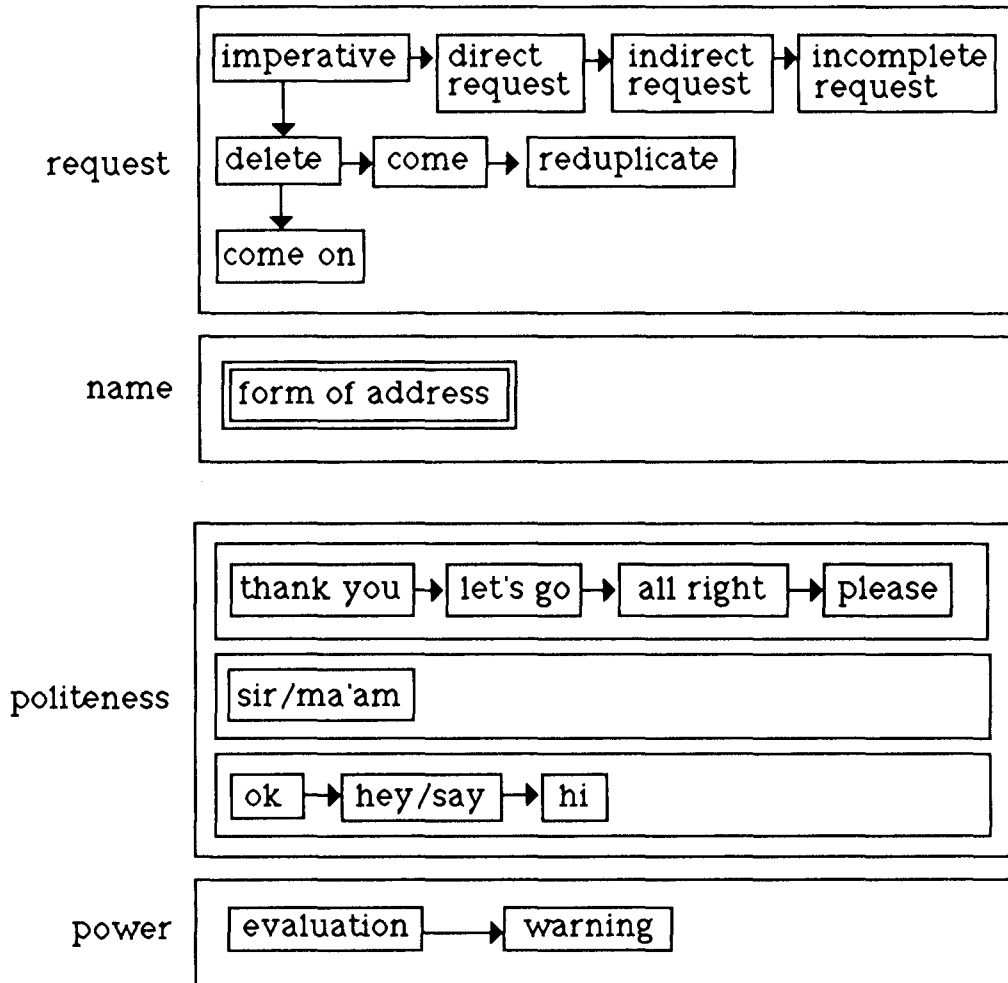
- 1) registers (for accumulated information),
- 2) tests (on an arc as part of the decision to take it),
- 3) actions (to be implemented on the registers after taking an arc).

ATN description of speech events

In the diagram below the decisions and alternatives that must be considered by speakers in making requests at TTC are modelled. The four possible components of a request are: the core request itself, the name of the person receiving the request, some expressions of politeness, and an expression of power. The generation of a complete request requires the combination of several networks, in the indicated order.

Each node represents a choice. A positive choice to implement the alternative indicated at any node must be followed by the decision associated with the node immediately below it. A negative choice NOT to implement a node must result in moving to the node immediately to the right. Options linked by arrows horizontally within a box are exclusively ordered in that at most one of them may be selected. The options listed vertically may co-occur.

The start node is always in the upper left corner of the box marking the boundary of the transition network that generates one component of the request. End nodes have no exiting arcs. Nodes marked with a doubled rectangle represent push points at which embedded networks are initiated.



elaborated	abbreviated
formal	informal
direct	indirect
staff talk	patient talk

The four components of the request are ATNs in themselves, and the model of the whole is a network of networks.

The strongest form of the core request is the imperative. If the context is clear, the imperative may be deleted. If deleted, it may be replaced by the placeholder phrase "come on". If not deleted the imperative may be emphasized by preposing "come" to it. Alternatively, the imperative may be reduplicated.

If the imperative is not chosen the next alternative is the direct request. If the direct request is not chosen, an indirect request may be used. Indirect requests make reference to preconditions for, or parts of, a request (Labov and Fanshel 1977, Searle 1975).

The most patient-like alternative is the incomplete request, which is syntactically deficient, but still interpretable. A simple grunt may serve as an incomplete request for a totally non-verbal patient.

This core component is obligatory for all requests. The other following components are common but optional. That is, the transition networks may be satisfied at the end node, without having generated an output string. However, the choices made are recorded in the registers of the ATN and that information may be available subsequently. In other words, not using someone's name, or not using politeness expressions may be meaningful.

An address form may be added to the core request. The unmarked form of address is the first name only and is the most commonly used in constructing requests. The address form may be preposed or postposed to the core request.

Then some expression of politeness may be added. "Thank you", "let's go", "all right", and "please" are placed at the end of the request. "Sir" or "ma'am" tend to be ordered at the end, but may also be ordered directly after the address form. "Ok", "hey", and "hi" occur at the beginning of the utterance, which is typical of these discourse boundary markers.

The final component of requests is an overt expression of power. Normally this is an indication that the speaker is staff. This expression may either be a statement of evaluation, or a warning. An evaluation may consist of either a positive or negative statement about the individual being addressed, or about the context out of which the request was generated. More extremely, a warning may be given about what is likely to happen if the request is not satisfied.

These networks are structured such that moving through the network to the right (with negative decisions), results in the generation of a request that is more informal, indirect, and abbreviated, characterizing patient talk. On the other hand, a path through the network dominated by positive decisions (moving vertically downward, staying to the left) will generate requests that are formal, direct, and elaborated, and will be recognized as typical of staff talk.

What is significant is not that patients are always on one end and staff on the other, but that the social and institutional meaning of a request is consistent depending on how it is put together. People do fall (or strategically place themselves) in the middle, but the way they think about each other's behavior shows that the opposition between the extremes is meaningful.

When staff or patients make requests, they may range anywhere in between the two extreme poles of staff and patient talk. Sometimes patients use more elaborated and formal requests so that they sound like staff. And sometimes the staff will make their requests incomplete, informal, and short so as to sound like a patient. When these things happen, it is noticed by everyone, it may be challenged, and it may be considered funny.

The social categories in this case are on bipolar continuum, inherent in almost every speech act. Social role is defined externally, but relative positions are negotiated within and between individuals in both groups by variation in the structuration of many different speech events.

A node in a network may consist of another network. This embedded structure may have its own set of tests, registers, and actions. It may even be produced by another speaker and that fact may be part of the test associated with the calling, or embedding, node.

co-occurrence and accommodation

Other observations could be explained as well using this representation. Co-occurrence patterns could be created by allowing an arc to act on the probabilities of transition. That is, if a speaker begins by aligning him/herself with the patient role, then that information can be registered, and similar alignment choices will be made at subsequent test points in the network.

Similarly, the alignments of social identity taken by others can be noted in the registers of the generating ATN. As choices are made in the network the transition probabilities are changed, resulting in either accommodation or differentiation between speakers.

examples

Undoubtedly the most common speech act on the ward is the request. Patients ask for favors and information from the staff and vice versa. It is to a limited extent that we find patients and staff making requests of their peers (patients of patients, staff of staff). Following are descriptions and examples of various types of requests as they were observed in the institution. Names have been changed for confidentiality.

patient-to-patient requests

Example. 9/26/83 5:15 pm. Ward A dayroom. Gina H. (pt) was being bothered by Clark C. (pt), who was well into the amorous stage of his 52-day mood cycle.

GH "Go away!" [yelling at Clark]

GH "Go away!" [louder]

GH "He's bothering me! [looking at me (volunteer). I did nothing.]

GH "Go away!"

GH "He's botherin' me and botherin' me and they don't do nothin' about it!"

[She stomped away, angry at me for not intervening, in spite of the fact that she could have handled it herself. She considered me to be staff.]

Here is a series of requests, or perhaps a series constituting a request. Gina begins by issuing a bare imperative, with no name, no elaboration, and no comment. This first request is directed at the male patient who was bothering her. Then as she turns to one she considers staff, the request is indirect, referring to conditions that would indicate the need for intervention. She repeats the bare imperative towards the other patient, and then getting no satisfaction, she leaves with an angry evaluation of the situation, which in itself may be considered another indirect request.

Gina indicates she has no lack of status vis-à-vis her peer by the use of a very strong imperative. But the request is typically patient-like because of the lack of elaboration. There is no name, no politeness, and no evaluation or warning. She indicates her status relative to staff by the indirectness of the next request, although it too is still unelaborated. Her parting evaluation, however, would be seen in the hospital as very assertive and not very patient-like.

So we see that who the speaker is and who the hearer is can mold the decisions that go into the construction of a request. There is a consistently interpretable semantic association between speech event alternatives and social roles. The range of choices opens up a sociolinguistic space within which speakers navigate a course.

patient-to-staff requests

Patient to staff requests tend to be abbreviated, informal and indirect. Without satisfaction, the request is repeatable (usually in unaltered form).

Example. no date. During lunch in the dining room Louis B. (pt) called out to Doris A. (rec tech).

LB "Hey girl, gimme points f' puttin' my napkin in my lap?"

[No response.]

LB "Hey girl, gimme points f' puttin' my napkin in my lap?"

[No response, except that she looked at him.]

[She ignored him for about one minute, while he was quiet. Then she went over and punched his card.]

These patient initiated requests are abbreviated and tend to lack address forms, politeness forms, explanations, or emphatic phrases. For example, the name of the staff member that is being addressed may be deleted and the last name would rarely be included.

staff-to-patient requests

In the case of the staff-to-patient request the pattern is complementary to what was just described. Whereas patients are more abbreviated, informal and indirect, the requests of staff are more elaborated, formal and direct.

These requests tend to have fuller address forms, more politeness expressions, more explanations and more emphatic phrases. The utterance will also tend to be imperative or in overt second person.

Example. 11/9/83 5:30 pm. Ward A main hall. James A. (MHW) after dinner was over was rounding up patients to go take showers. He yelled down the hall from the dining room door to the nurse's station.

JA "John Hanson, brush your teeth. Let's get ready to take a shower."
[No verbal response from John. He got his toothbrush.]

This very routine request consisted of 1) a core imperative, 2) a full name, 3) an indication of politeness in the use of "let's", and 4) an evaluative prompt indicating what the situational context was for the request. All of these features, and the stringing of them all together, indicate that the request was coming from staff in a very institutional setting.

conclusion

We have described requests in the mental hospital. We have presented the request as a coherent sequence of choices between sociolinguistically significant variables. We have seen how social interaction is connected to the two major categories of social structure. Politeness, mitigation, and indirectness in requests can be embedded in the ATN representation. The networks can be seen in either qualitative or quantitative terms, and can be used to account for observed dynamics between speakers, like accommodation and co-occurrence.

Using an ATN for modelling the structure of a speech event is explicit and general. The facts are represented economically. It is not incompatible with quantitative measurements, since a probability could be assigned as a test to each arc in the network. This representation allows us to treat speech events as complex, interactive, and socially meaningful.

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