Human Communication 1
Lecture 4
Simple Grammars

Keywords and phrases

…can match and produce responses, but inadequate for language in general. Consider the sentence:

The car hit the man.

Keywords that might be identified are

car　　hit　　man

But this could also match:

The car was hit by the man.
Did the car hit the man?
The car did not hit the man.
My car hit another man.
Your car was hit by which man?
The car hit her and the man.

The Structure of Insults…

Pattern-matching to keywords is not sufficient

Need to look at the overall structure

Consider a number of (not too insulting!) insults:

* Get lost you horrible person
* Jump in the lake you smelly idiot
* Naff off you big girl's blouse
* Go away you disreputable person
* Get lost you little twit

What is the structure of each of these?

What are the constituents of this structure.

Are there general patterns in the structure that relate to a number of insults?

The constituents

Different ways we might break up an insult:

Jump | in the | lake you | smelly idiot
Jump in | the lake | you smelly | idiot
Jump | in | the | lake | you | smelly | idiot
Jump in the lake | *you* | *smelly idiot*

Some may seem more sensible than others.

Take last example, it reflects:

1. a suggestion,
2. a reference to a person,
3. a description of the person.

All the example insults can be split this way

Generating New Insults

Having identified a pattern in the structures, we can derive rules that specify this pattern more generally.

These rules give descriptions of these insults and provide means of specifying other similar ones.

New insults have the same structure as these, and can be generated by the same rules, from the same constituents, e.g:

get lost you smelly twit
go away you big girl's blouse

These rules and constituents do not permit:

naff off you smelly little idiot

Generating New Insults

1. Start with (a slightly revised) 'insult' rule
2. Follow the rule to see what this is rewritten as:
- left side (LHS) rewritten as whatever on right (RHS)
   Insult => **Suggest** *you* **Sortof Name**.
3. If any part in capitals, look for another rule that has this as LHS and rewrite as RHS
   Suggest => *jump in the lake | get lost | go away*
   Anything in lower case is an actual word (or terminal), rather than a constituent of an insult
4. Keep rewriting using rules until only words are left
5. If more than one rule matches, choose one

This is process of **generation from grammar rules**.

Accepting or Parsing an Insult

1. Match each of the words to a RHS of a rule.
2. Replace words with whatever is on LHS of rule.
3. See if this itself forms a RHS
4. If so, replace it also.
5. Repeat until only LHS of top rule (Insult) left

If no words left over, you have been insulted!

If fail to match all RHSs or words left over:
- not been insulted
- word string is not an insult as defined by grammar

If was insult, each LHS noted and know what structure of insult is, have parsed the insult.

Grammar of Poems…

Let's take another example of a simple subset of English… limericks

1. Generate some example limericks
2. Work out the structure
3. Devise rules and a set of terminals

What other information do you need?

See what limericks your grammar will generate

Does your grammar parse your neighbour's limericks?

Here are some examples…

Some by Edward Lear…

There was an Old Man of Kilkenny,
Who never had more than a penny;
   He spent all that money,
   In onions and honey,
That wayward Old Man of Kilkenny.

There was a Young Lady of Norway,
Who casually sat on a doorway;
   When the door squeezed her flat,
   She exclaimed, 'What of that?'
This courageous Young Lady of Norway.

Some others…

There was a young man from Dealing
Who caught the bus for Ealing.
   It said on the door
   Don't spit on the floor
So he jumped up and spat on the ceiling

There once was an old man from Esser,
Whose knowledge grew lesser and lesser.
   It at last grew so small,
   He knew nothing at all,
And now he's a college professor

Guidelines..

Lines 1, 2, and 5 of Limericks have seven to ten syllables and rhyme with one another.

Lines 3 and 4 of Limericks have five to seven syllables and also rhyme with each other.

Breaking the rules…

There was a young lady from Ickenham
Who went on a bus-trip to Twickenham.
   She drank too much beer,
   Which made her feel queer,
So she took off her boots and was sick-in-'em.

There was an old man from Milan,
Whose limericks never would scan.
   When told this was so,
   He said, 'yes, I know.
'But I always try to get as many syllables into the last line as I possibly can.'