

Definitions & necessary/sufficient conditions

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Definitions: their parts 1

- **Definiendum** = the thing to be defined
- **definiens** = the expression doing the defining
 - **genus proximum**: the name of (usually the closest) superordinate category of the definiendum
 - **differentiae specificae**: the characteristics that set the definiendum apart from the genus proximum and other subordinates of the genus proximum, based on
 - (individually) necessary conditions
 - (jointly) sufficient conditions
- entities are either within the set of elements characterized by individually necessary and jointly sufficient criteria or not

Definitions: their parts 2

- The **ambiguity of *if***
 - if someone is a natural born citizen, he can become President of the United States
 - if it rains, the streets get wet
 - if someone is a natural born citizen, ...
 - only if / *whenever someone is a natural born cit can she ...
 - if it rains, the streets get wet
 - *only if / whenever it rains do the streets get wet
- conditions
 - **(individually) necessary: *only if***
 - a condition on the sense of an expression which a thing must meet in order to qualify as being correctly described by that expression
 - **(jointly) sufficient: *whenever***
 - a set of conditions on the sense of an expression which, if they are met by a thing, are enough in themselves to guarantee that the expression correctly describes that thing

Conditions and their properties

- Properties of necessary and sufficient conditions
 - **binary** vs. ***n*-ary**
 - many scholars use +/- binary features: ±human, ±animate ...
 - others allow for more levels (order of movement:
run=121212, *walk*=121212, *hop*=111 or 222, *crawl*=1324, ...)
 - **universal**:
 - some scholars assume that the semantic features used in definitions should be cross-linguistically universal – others do not
 - semantically **primitive**
 - some scholars require that the semantic features used in definitions must not be reducible to simpler recurrent semantic features
 - all **equally important**
 - some scholars assume that all semantic features used in definitions are equally relevant to the definition – others don't
 - often, scholars use **redundancy rules**: +human → +animate

Definitions: examples 1

- The definition of *bachelor*
 - necessary condition (genus proximum): male
 - sufficient conditions: male? no
 - + necessary condition: adult
 - sufficient conditions: adult male? no
 - + necessary condition: unmarried
 - sufficient conditions: unmarried adult male? no
 - + necessary condition: never been married before
 - sufficient conditions: unmarried adult male who has never been married before? yes

Definitions: examples 2

- The definition of (first degree) *murder* (v.)
 - necessary condition (genus proximum): action
 - sufficient conditions: action? no
 - necessary condition: deliberate
 - sufficient conditions: deliberate action? no
 - necessary condition: by means of which you kill someone
 - sufficient conditions: deliberate action by means of which you kill someone? no
 - necessary condition: unlawfully
 - sufficient conditions: deliberate unlawful action by means of which you kill someone? no
 - necessary condition: with malice and premeditation
 - sufficient conditions: premeditated, deliberate, malicious, and unlawful action by means of which you kill someone? yes

Definitions: examples 3

- Define the following terms
 - *driver's licence*
 - **genus proximum**
 - a **document**
 - **differentiae specificae**
 - **legally/officially issued by the DMV**
 - **which shows which kinds of vehicles you are allowed to drive**
 - *square* (n.)
 - a **four-sided, equally-sided plane figure** containing **right angles**
 - *sleep* (n.)
 - a **natural state** of **rest** in which your **eyes are closed** and in which your **conscious mind and body are largely inactive**, usually for several hours at night

Advantages of this approach

- It matches our intuitive understanding
 - that things come in **well-defined kinds**
 - that there is **one right taxonomy of things**
 - of what definitions look like (as opposed to examples)
 - **speech errors** suggest that semantic features are mentally represented
 - substitutions
 - *bridge of the neck* (intended: *nose*)
 - *when my tongues bled* (intended: *gum*)
 - *he came too late* (intended: *early*)
 - *Mary was early* (intended: *young*)
 - *the lady with the volkswagen* (intended: *Dachshund*)
 - *that's a horse of another race* (intended: *color*)
 - *he has to pay her rent* (intended: *alimony*)
 - blends
 - *canimal* (*camel* and *animal*)
 - *aggranoying* (*aggravating* and *annoying*)
 - *complify* (*complicate* and *simplify*)
 - it allows for an **economic characterization of lexical relations**

Introduction Advantages: folk theory, speech errors, economy
 Definitions: their parts Disadvantages: scope and unintuitive
 Definitions: some examples Disadvantages: information, features, circularity
 Advantages and disadvantages Other, more fundamental problems

Advantages of this approach



"Soccer's just like hockey only without the ice, the skates, the sticks, the puck and the cool masks and helmets."

	+human		+equine	
	+male	-male	+male	-male
+mature	man	woman	stallion	mare
-mature	boy	girl	colt	filly

Disadvantages of this approach

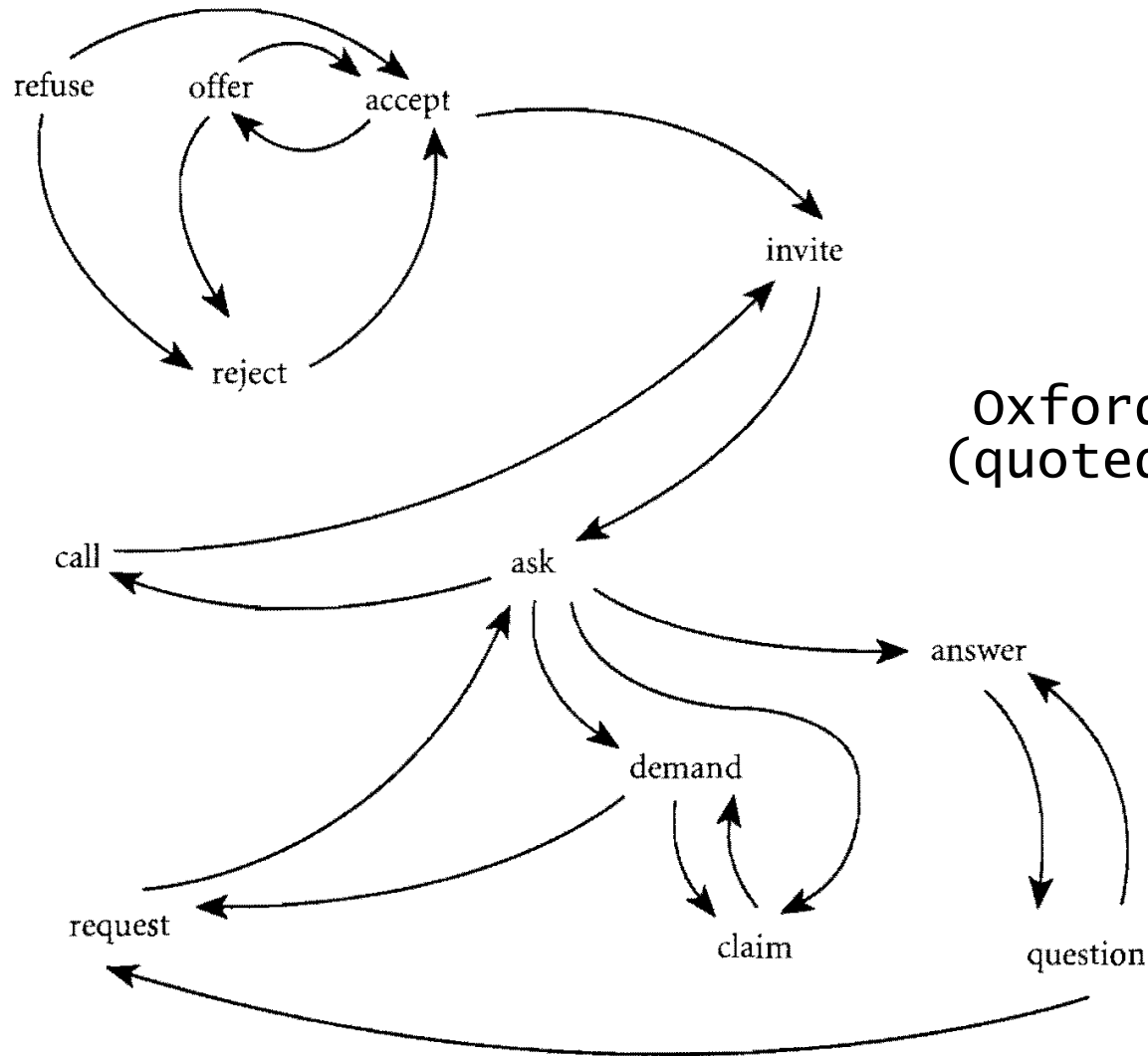
- Such definitions are often **too abstract/vague**
 - what would a definition of *cell* look like that covered both the 'organism' and 'prison cell' senses?
 - *cashier* = 'person in charge of cash'
 - but: who said different senses can't be distinguished?
- such definitions are often **too narrow**
 - bank robber demands cash, but the Macquarie Dictionary defines *demand* as 'ask for with authority or claim as a right'
- such definitions are often **obscure/counterintuitive**
 - *human* = 'featherless biped', *triangle* = 'three-sided polygon'
 - but: this approach doesn't rule out a difference between folk-theoretical and expert definitions
 - but: didn't we say this approach matches our intuitive understanding ...?

Disadvantages of this approach

- More information than is useful
 - such definitions (esp. scientific ones) contain **more information than one may want to attribute** to speakers:
salt = 'NaCl'
 - **superfluous components and disjunctions**: *weapon* = an instrument of offensive or defensive combat; something to fight with (Longman Dict., 1978)
- **speakers rarely can define** things properly
 - but they usually recognize definitions
- what if **a feature is not realized**
 - is a non-striped zebra not still a zebra?
 - is a non-herbivore zebra (that eats a few insects) not still a zebra?
 - is a three-legged zebra not still a zebra?
- such definitions are often **circular**
 - look up *claim*, → *demand*, look up *demand*, → *claim*

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Disadvantages of this approach



Oxford Paperback Dictionary
(quoted from Goddard 1998:29)

Disadvantages of this approach

- Other, more fundamental problems
 - if we use binary features
 - do we classify something as +male or as -female?
 - when does something count as +warm? (68 degrees? 86? ...)
 - do we use something as +horse (or +equine) to define *horse*?
 - maybe not everything can be defined by means of necessary and sufficient conditions
 - *furniture* or *game*

bridge pro football
 solitaire

golf Simon says
 roulette

chess spin the bottle football

simulation games simulation games war games
 (for fun) (for instruction)

Disadvantages of this approach

- Other, more fundamental problems
 - if we use binary features ...
 - maybe not everything can be defined by means of necessary and sufficient conditions ...
 - presupposes that we know what we want to define (the problems of **ambiguity** and **vagueness**; recall *cell*)
 - **do so test**: *Duffy discovered a mole, and so did Clark*
 - both D. and C. discovered a rodent living underground: ok
 - both D. and C. discovered a long-term dormant spy: ok
 - unacceptable if D. discovered a rodent and C. a spy
 - do meanings/senses enter into the same **sense relations**
 - hyponymy: mole_{rodent} = animal vs. mole_{spy} = human
 - antonymy, synonymy, ...
 - what about writer_♂ vs. writer_♀? *writer* is unspecified for sex

Disadvantages of this approach

- Note: not all disadvantages are of the same kind
 - some have to do with proficiency of definition writers
 - too abstract definitions
 - too narrow definitions
 - some have to do with the purpose of dictionaries
 - obscure and counterintuitive definitions
 - too informative definitions, too space-saving definitions
 - circular definitions
 - some may point to problems inherent in the approach
 - unrealized features
 - binary features
 - necessary and sufficient conditions
 - ambiguity and vagueness