

M. Krifka

‘Quantification and Information Structure’

семинар Лаборатории по формальным моделям в лингвистике

28 сентября и 5 октября 2018 г.

А. Сорокина

- **Квантификация** - установление отношения между двумя множествами.
- (1) a. Every black die is loaded.
b. Some black die is loaded.
c. Most black dice are loaded.



- **Квантификация** - установление отношения между двумя множествами.

- (1) a. Every black die is loaded. $[[\text{black die}]] \subseteq [[\text{loaded}]]$
b. Some black die is loaded. $[[\text{black die}]] \cap [[\text{loaded}]] \neq \emptyset$
c. Most black dice are loaded. $\#([[\text{black die}]]) \cap [[\text{loaded}]] > \frac{1}{2} \#([[\text{black die}]])$



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nuclear scope



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some, every, most, many – D(eterminer)-quantification

always, generic sentences, modal operators – A(dverbial)-quantification



Фокусное выделение при Λ -квантификации:

- (2) a. A black die is LOADED.
b. A BLACK die is loaded.

- (3) a. Always, a black die is LOADED
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Londoners most often go to BRIGHTON

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- frequency adverbials: LONDONERS most often go to Brighton
Londoners most often go to BRIGHTON
- generic sentences: TYPHOONS arise in the Pacific
Typhoons arise in the PACIFIC

Conservativity – при D-квантификации, рестриктор \approx топик (тема),
nuclear scope \approx комментарий (фокус, рема)

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D-квантификация – синтаксически

$[[_{DP} D NP] VP]$, NP - рестриктор, VP - nuclear scope

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$[[_{DP}D NP] VP]$, NP - рестриктор, VP - nuclear scope

A-квантификация – с помощью просодических средств, скрэмблинг и проч.

Information Structure in A-Quantification

[Rooth 1985]: фокусное значение $[[\alpha]]^f$ - множество всех возможных релевантных значений, такого же типа, что и $[[\alpha]]$

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(4) $\llbracket \text{Mary takes JOHN}_F \text{ to the movies} \rrbracket = \{s \mid \text{Mary takes John to the movies in } s\}$

(5) $\llbracket \text{Mary takes JOHN}_F \text{ to the movies} \rrbracket^f = \{\{s \mid \text{Mary takes } x \text{ to the movies in } s\} \mid x \in \text{PERSON}\}$

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(6) Mary always takes JOHN_F to the movies.

‘Every situation in which Mary takes someone to the movies, it is John.’

(7) MARY_F always takes John to the movies.

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$\{s \mid \exists x \in \text{PERSON}[x \text{ takes J. to the m. in } s]\} \subseteq \{s \mid \text{Mary takes J. to the m. in } s\}$

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(9) $\llbracket \text{When Mary feels lonely} \llbracket \text{she always takes JOHN}_F \text{ to the movies} \rrbracket \sim C \rrbracket \llbracket \rrbracket$

true iff $\cup \llbracket C \rrbracket \subseteq \llbracket \text{Mary takes JOHN}_F \text{ to the movies} \rrbracket$,

provided $\llbracket C \rrbracket \subseteq \llbracket \text{Mary feels lonely} \rrbracket$, $\llbracket C \rrbracket \subseteq \llbracket \text{Mary takes JOHN}_F \text{ to the movies} \rrbracket^f$

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(10) $\llbracket \text{Who does Mary take to the movies, John, Bill, or Sam?} \rrbracket$

$$= \{ \{s \mid \text{M. takes } x \text{ to the movies}\} \mid x \in \text{PERSON}, x = \text{John} \vee x = \text{Bill} \vee x = \text{Sam} \}$$

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– *отрицание, either, possibility modals, verb of appearance, belief operators*

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In fact, she doesn't study anything at Northwestern!

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2. **free association** - задействуют свободную переменную (множество событий/ситуаций)
– *quantificational adverbs, some quantificational determiners, generics, superlatives, counterfactuals, emotive factive verbs*

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3. **conventionalized association** - чувствительность к фокусу – часть лексического значения
– *exclusives, additives, scalar additives, intensifiers, particularizers*

The Requantification Problem

(12) A cowboy always chews TOBACCO

$$\{s \mid \exists y \exists x[\text{cowboy}(x) \wedge x \text{ chews } y \text{ in } s]\}$$
$$\subseteq \{s \mid \exists x[\text{cowboy}(x) \wedge x \text{ chews tobacco in } s]\}$$

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Решение 1 (Von Fintel 1994)

Считать, что происходит квантификация не ситуаций, а **минимальных** ситуаций.

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Ситуации - части возможных миров (более мелкие объекты, оперировать которыми удобнее, чем целыми мирами); structured entities consisting of relations and individuals standing in those relations.

Минимальная ситуация s , в которой верно p - такая, что нет ситуации s_0 , $s_0 \leq s$, для которой верно p .

The Requantification Problem

Но почему доступна интерпретация, где коты разные?

(13) Always, if a cat is hungry, a cat cries.

- ‘If a cat x is hungry, then there is a distinct cat y such that y cries’.
- ‘If a cat x is hungry, x cries’.

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Считать, что квантифицируются **события** (\leftarrow (neo-)Davidsonian semantics)

Участники пропозиции - аргументы одного события, т.е. они имеют уникальные роли.

$\exists e[\text{chew}(e) \wedge \text{AGENT}(e)=\text{cowboy} \wedge \text{THEME}(e)=\text{tobacco}, e]$ ‘A cowboy chew(ed) tobacco’

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В примере с кошками события два – being hungry и crying

(однако кошка в двух событиях всё ещё может быть одной и той же!)

The Requantification Problem

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b. When Alan talks to a student, he always PRAISES a student.

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→ Неопределенные DP интерпретируются как кореферентные.

The Requantification Problem: givenness

Решение 3 (Chierchia 1995, Krifka 2001)

На интерпретацию выражений с Λ -квантификацией влияет не фокус, а (в некотором смысле) данность.

(15) [A cowboy]_G always smokes TOBACCO.

$\{s \mid \exists y \exists x[\text{cowboy}(x) \wedge x \text{ smokes } y \text{ in } s]\} \subseteq \{s \mid \exists x[\text{cowboy}(x) \wedge x \text{ smokes tobacco in } s]\}$

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Non-novel indefinites

Вызывают **аккомодацию** контекста, в котором даны.

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Квант(ификат)ор *always*: к какому бы референту, являющемуся ковбоем, мы бы не отнесли высказывание, оно будет истинным.

Аргументы за “данность” non-novel indefinites

- given

(16) The fact that a (given) phenomenon is successfully predicted by a theory does not prove the theory to be correct.

Аргументы за “данность” non-novel indefinites

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(16) The fact that a (given) phenomenon is successfully predicted by a theory does not prove the theory to be correct.

- маркирование non-novels как топика в языках, где для топика есть специальный показатель

(17) taitei, midori no me o shita inu wa rikou de aru
usually green GEN eye ACC did dog TOP intelligent DECL is
'Usually, a green-eyed dog is intelligent.'

Аргументы за “данность” non-novel indefinites

- скрэмблинг

(18)a. weil [_{IP} doch gewöhnlich [_{VP} KINDER auf der Straße spielen]]

because PART usually children on the street play

‘because there usually are children playing on the street’

b. weil [_{IP} Kinder doch gewöhnlich [_{VP} t_i auf der STRASSE spielen]]

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- катафора

(19) If a VEGETARIAN owns it, he usually takes good CARE of [a donkey]_G.

D-quantification

(20) Every ship passed through the lock at NIGHT.

‘Every ship passing through the lock occurred night.’

(21) Most tickets were sold at checker FOUR.

‘Most tickets that were sold were sold at checker four.’

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Рестриктор задается NP-аргументом квантора и фокусом в scope.

(22) $\text{MOST}(\llbracket \text{tickets} \rrbracket \cap \cup \llbracket \text{were sold at checker FOUR}_F \rrbracket^f, \llbracket \text{were sold at checker four} \rrbracket)$
 $= \text{MOST}(\{x \mid x \text{ is a ticket}\} \cap \{x \mid x \text{ was sold at some checker}\},$
 $\{x \mid x \text{ was sold at checker four}\})$

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 $\{x \mid x \text{ was sold at checker four}\})$

D-quantification

(23) Ludwig washed most cars with X-polish_F.

‘Most cars that Ludwig washed he washed with X-Polish’

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1*X-Polish

50*Y-Polish

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‘Most cars that Ludwig washed he washed with X-Polish’



1*X-Polish

50*Y-Polish

→ не просто квантификация машин

D-quantification

(23) Ludwig washed most cars with X-polish_F.

‘Most cars that Ludwig washed he washed with X-Polish’



50*X-Polish



1*Y-Polish

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→ не просто квантификация событий “мытья”

[Eckardt 1999]: such sentences suggest a one-to-one mapping between entities and events.

→ чувствительность к фокусу - свойство квантификации (A или D) над событиями или ситуациями.

Many and few

(24) Many SCANDINAVIANS_F won the Nobel prize in literature.

‘Many winners of the Nobel prize in literature were Scandinavians’

(25) Few COOKS_F applied.

‘Few applicants were cooks.’

Many and few

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(26) Few [INCOMPETENT_F cooks] applied.

‘Few of the applicants that were cooks were incompetent.’

(27) Most INCOMPETENT_F cooks applied.

Not: ‘Most of the applicants that were cooks were incompetent’

Many and few

Что особенного в many и few?

Many and few

Что особенного в many и few?

- [Herburger 1997]: это **weak quantifiers** (по [Milsark 1974])
 - допустимы в экзистенциальных конструкциях (there-sentences)
(28) a. There are many unstable governments.
b. #There are most democratic governments.

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 - допустимы в экзистенциальных конструкциях (there-sentences)
(28) a. There are many unstable governments.
b. #There are most democratic governments.
 - intersective & symmetric
$$[[D \alpha] \beta] = [[\alpha] \cap [\beta]]$$
$$[[D \alpha] \beta] = [[D \beta] \alpha]$$
Most dogs are carried \neq Most carried things are dogs
Many dogs are carried = Many carried things are dogs

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 $[[D \alpha] \beta] = [[D \beta] \alpha]$
Most dogs are carried \neq Most carried things are dogs
Many dogs are carried = Many carried things are dogs

→ синтаксическая позиция D не говорит нам однозначно где рестриктор, а где scope.

Many and few

- (29) a. [few [incompetent cooks]] [x applied]
b. [few [[x incompetent cooks] [x applied]]]

Many and few

(29) a. [few [incompetent cooks]] [x applied]

b. [few [[x incompetent cooks] [x applied]]] - **unary** reading of a quantifier

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! употребление слабых квант(ификат)оров в there-sentences возможно благодаря свойству интерсективности (и следующего из него unary-прочтения).

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Не ясно, где рестриктор → большая роль фокусного выделения.

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- (30) \llbracket [few [INCOMPETENT_F cooks applied]] \rrbracket
 $=$ FEW(\cup \llbracket INCOMPETENT_F cooks applied \rrbracket^f , \llbracket INCOMPETENT_F cooks applied \rrbracket)
 $=$ FEW({x | x is a competent or incompetent cook \wedge x applied},
 {x | x is an incompetent cook \wedge x applied})

Many and few

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$$\begin{aligned} (30) & \llbracket \text{few} [\text{INCOMPETENT}_{\text{F}} \text{ cooks applied}] \rrbracket \\ & = \text{FEW}(\cup \llbracket \text{INCOMPETENT}_{\text{F}} \text{ cooks applied} \rrbracket^f, \llbracket \text{INCOMPETENT}_{\text{F}} \text{ cooks applied} \rrbracket) \\ & = \text{FEW}(\{x \mid x \text{ is a competent or incompetent cook} \wedge x \text{ applied}\}, \\ & \quad \{x \mid x \text{ is an incompetent cook} \wedge x \text{ applied}\}) \end{aligned}$$

— фокус внутри именного компонента квантификатора

Many and few

фокус внутри глагольной группы

(31) \llbracket [few [competent cooks applied $LATE_F$]] \rrbracket

= FEW({x | x is a competent cook \wedge x applied at some time or other}
{x | x is a competent cook \wedge x applied late})

Many and few

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$$\begin{aligned} (31) \quad & \llbracket [\text{few} [\text{competent cooks applied LATE}_F]] \rrbracket \\ & = \text{FEW}(\{x \mid x \text{ is a competent cook} \wedge x \text{ applied at some time or other} \} \\ & \quad \{x \mid x \text{ is a competent cook} \wedge x \text{ applied late} \}) \end{aligned}$$

multiple focus: в компоненте квантификатора и в глагольной группе

$$\begin{aligned} (32) \quad & \llbracket [\text{few} [\text{COMPETENT}_F \text{ cooks applied LATE}_F]] \rrbracket \\ & = \text{FEW}(\{x \mid x \text{ is a competent or incompetent cook} \wedge x \text{ applied some time or other} \} \\ & \quad \{x \mid x \text{ is a competent cook} \wedge x \text{ applied late} \}) \end{aligned}$$

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Но! Мы же считаем, что синтаксически, few - именной детерминатор.

Many and few

фокус внутри глагольной группы

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Но! Мы же считаем, что синтаксически, *few* - именной детерминатор.

Альтернативная схема, syntax free [Büring 1996]:

[... F ...] is true iff F, rather / to a higher degree than an alternative A, make [... X ...] true.

Many and few

[... F ...] is true iff F, rather / to a higher degree than an alternative A, make [... X ...] true.

(33) [[many INCOMPETENT_F cooks] applied] is true iff incompetent, rather than / to a higher degree than competent, makes [many X cooks applied] true.

Many and few

[... F ...] is true iff F, rather / to a higher degree than an alternative A, make [... X ...] true.

(33) [[many INCOMPETENT_F cooks] applied] is true iff incompetent, rather than / to a higher degree than competent, makes [many X cooks applied] true.

Проблема: другие интерсективные квантификаторы так себя не ведут:

(34) Three INCOMPETENT_F cooks applied.

Many and few

Что особенного в many и few?

Many and few

Что особенного в many и few?

- [Larppin 1988]: это **компаративные** квантификаторы.

Они чувствительны к фокусным альтернативам.

Many and few

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Они чувствительны к фокусным альтернативам.

Сравнение со стандартным значением на шкале сравнения \sim шкала сравнения

\sim класс сравниваемых объектов \sim рестриктор квантификатора

\sim фокусные альтернативы

(35) Few / many / *three COOKS_F applied, as compared to sommeliers or pastry chefs.

Many and few

Что особенного в many и few?

- [Lappin 1988]: это **компаративные** квантификаторы.

Они чувствительны к фокусным альтернативам.

Сравнение со стандартным значением на шкале сравнения \sim шкала сравнения

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\sim фокусные альтернативы

(36) Few COOKS_F applied (as compared to sommeliers or pastry chefs).

$$\begin{aligned} \#(\llbracket \text{COOK}_F \rrbracket \cap \llbracket \text{applied} \rrbracket) &<< [\#(\llbracket \text{COOK}_F \rrbracket) / \#(\cup \llbracket \text{COOK}_F \rrbracket^f)] \\ &\times \#(\cup \llbracket \text{COOK}_F \rrbracket^f \cap \llbracket \text{applied} \rrbracket) \end{aligned}$$

Many and few

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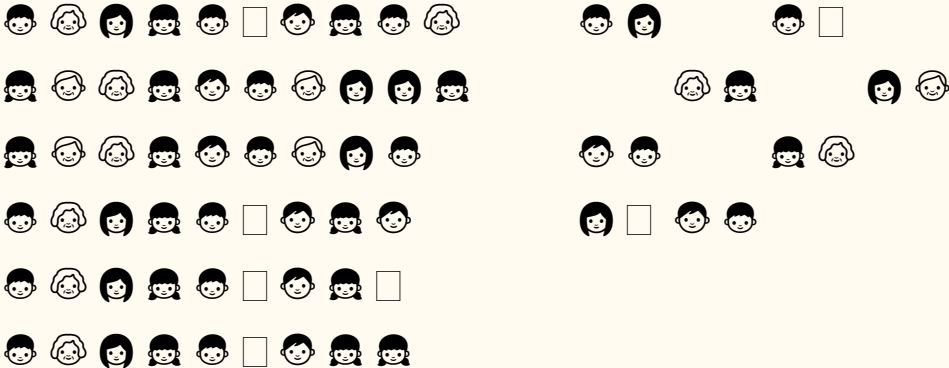
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Many and few

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$$\#(\llbracket \text{COOK}_F \rrbracket \cap \llbracket \text{applied} \rrbracket) \ll \left[\#(\llbracket \text{COOK}_F \rrbracket) / \#(\cup \llbracket \text{COOK}_F \rrbracket^f) \right] \times \#(\cup \llbracket \text{COOK}_F \rrbracket^f \cap \llbracket \text{applied} \rrbracket)$$

$\cup \llbracket \text{COOK}_F \rrbracket^f$ - 80% cooks, 10% sommeliers, 10% pastry chefs

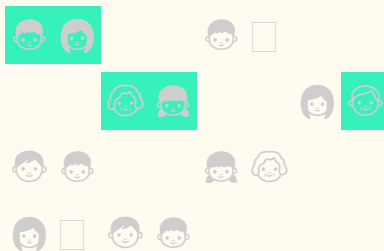
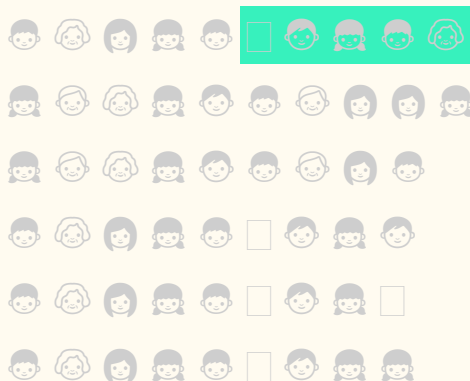


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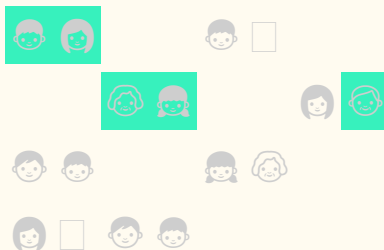
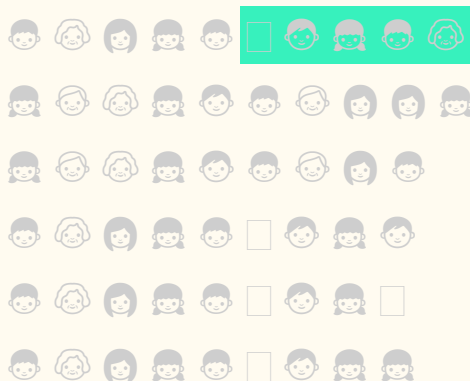
few COOKS_F applied
 $5 \ll 0.8 \times 10$

Many and few

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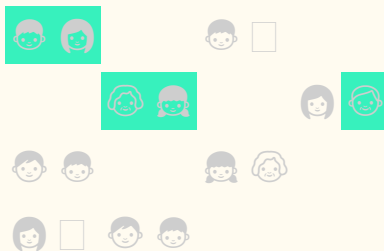
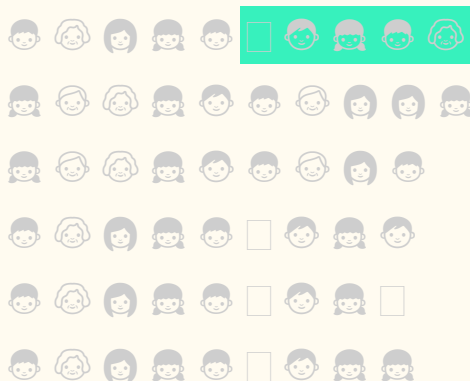
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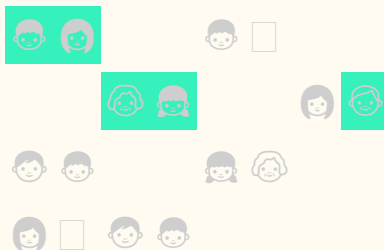
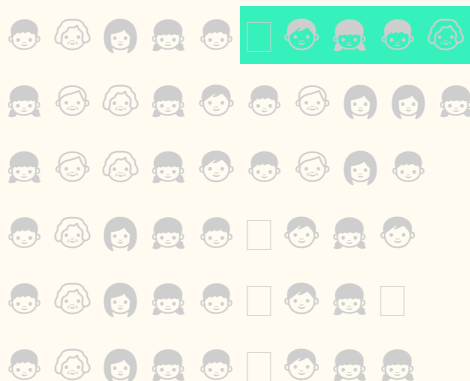
many SOMMELIERS_F applied
 $4 \gg 0.1 \times 10$

Many and few

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$\cup \llbracket \text{COOK}_F \rrbracket^f$ - 80% cooks, 10% sommeliers, 10% pastry chefs



few COOKS_F applied
 $5 \ll 0.8 \times 10$
 is true

many SOMMELIERS_F applied
 $4 \gg 0.1 \times 10$
 is true

Proportional Determiners

Не только (некоторые) интерсективные, но и **пропорциональные** (more than half, two thirds, 7 out of 10)

(37) Most recent class of NASA astronauts consists of 50% women.

(38) a. 60 Prozent (der) Frauen haben gewählt.

60 percent (of.the) women have voted

‘60 percent of the women have voted.’

b. 60 Prozent FRAUEN_F haben gewählt.

‘60 percent of the voters were women.’

Proportional Determiners

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60 percent (of.the) women have voted
'60 percent of the women have voted.'

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Proportional Determiners

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‘60 percent of the women have voted.’

b. 60 Prozent FRAUEN_F haben gewählt. $[_{DP} [_{DP} 60 \text{ Prozent}]] [_{NP} \text{Frauen}]]]$

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$[[_{DP} 60 \text{ Prozent}]][_{S} [_{NP} \text{FRAUEN}]_F [_{VP} \text{haben gewählt}]]]$.

‘60 percent of the men or women that voted were women’