

**NANYANG
TECHNOLOGICAL
UNIVERSITY**

East and West, West and East -
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Constraints of Language on Thinking and Behaviour

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Edward Sapir



Language is the most massive and inclusive art we know, a mountainous and anonymous work of unconscious generations.

— *Edward Sapir* —

Edward Sapir (1884–1939) was an American anthropologist-linguist, who is widely considered to be one of the most important figures in the early development of the discipline of linguistics.

https://en.wikipedia.org/wiki/Edward_Sapir

Benjamin Lee Whorf



Language shapes the way we think,
and determines what we can think
about.

— *Benjamin Lee Whorf* —

Benjamin Lee Whorf (1897 –1941) was an American linguist and fire prevention engineer. Whorf is widely known as an advocate for the idea that because of linguistic differences in grammar and usage, speakers of different languages conceptualize and experience the world differently.

Language, Thought, and Reality: Selected Writings of Benjamin Lee Whorf. John B. Carroll (Ed.). The MIT Press. 1956

This study shows that the forms of a person's thoughts are controlled by inexorable laws of pattern of which he is unconscious. These patterns are the unperceived intricate systematizations of his own ... every language is a vast pattern-system, different from others, in which are culturally ordained the forms and categories by which the personality not only communicates, but also analyzes nature, notices or neglects types of relationship and phenomena, channels his reasoning, and builds the house of his consciousness.

(whorf, 1956. p. 252)

In simpler terms, language could, to some extent and in some way, determine the nature of our thinking.

Sapir-Whorf hypothesis

The strong version

(known as **linguistic determinism**):

All human thoughts and actions are bound by the constraints of language.

The weaker version

(known as **linguistic relativism**):

Language shapes our thinking and behaviour only to a limited extent.

- “...there is no evidence for the strong version of the hypothesis – that language imposes upon its speakers a particular way of thinking about the world” (Wason & Johnson-Laird, 1977:411)
 - Psycholinguistic studies indeed showed that some lexical terms, such as **basic colour terms**, could be universal (Newman, 1954; Berlin & Kay, 1969; Heider, 1972; Kay & McDaniel, 1978; Lucy & Shweder, 1979)
- However, the effort to disprove Whorf's weak version empirically has not been successful.

Sapir-Whorf hypothesis

A summary of Sapir-Whorf hypothesis:

- (1) Languages vary in their semantic partitioning of **the world**;
- (2) the structure of one's language influences the manner in which one perceives and understands **the world**;
- (3) therefore, speakers of different languages will perceive **the world** differently.

(Gentner & Goldin-Meadow, 2003:4)

Gentner, D. & Goldin-Meadow, S. (2003). Whither Whorf? In Gentner & Goldin-Meadow (Eds.) *Language in Mind*. MIT Press.

Word, Meaning, and Concept

What is “word meaning”?

- What does it mean when you say you know the meaning of a word?
E.g.,
 - What does it mean when you say you know a word, such as “bird” “blue”, or “happy” ?
- How do we conceive of a word meaning?

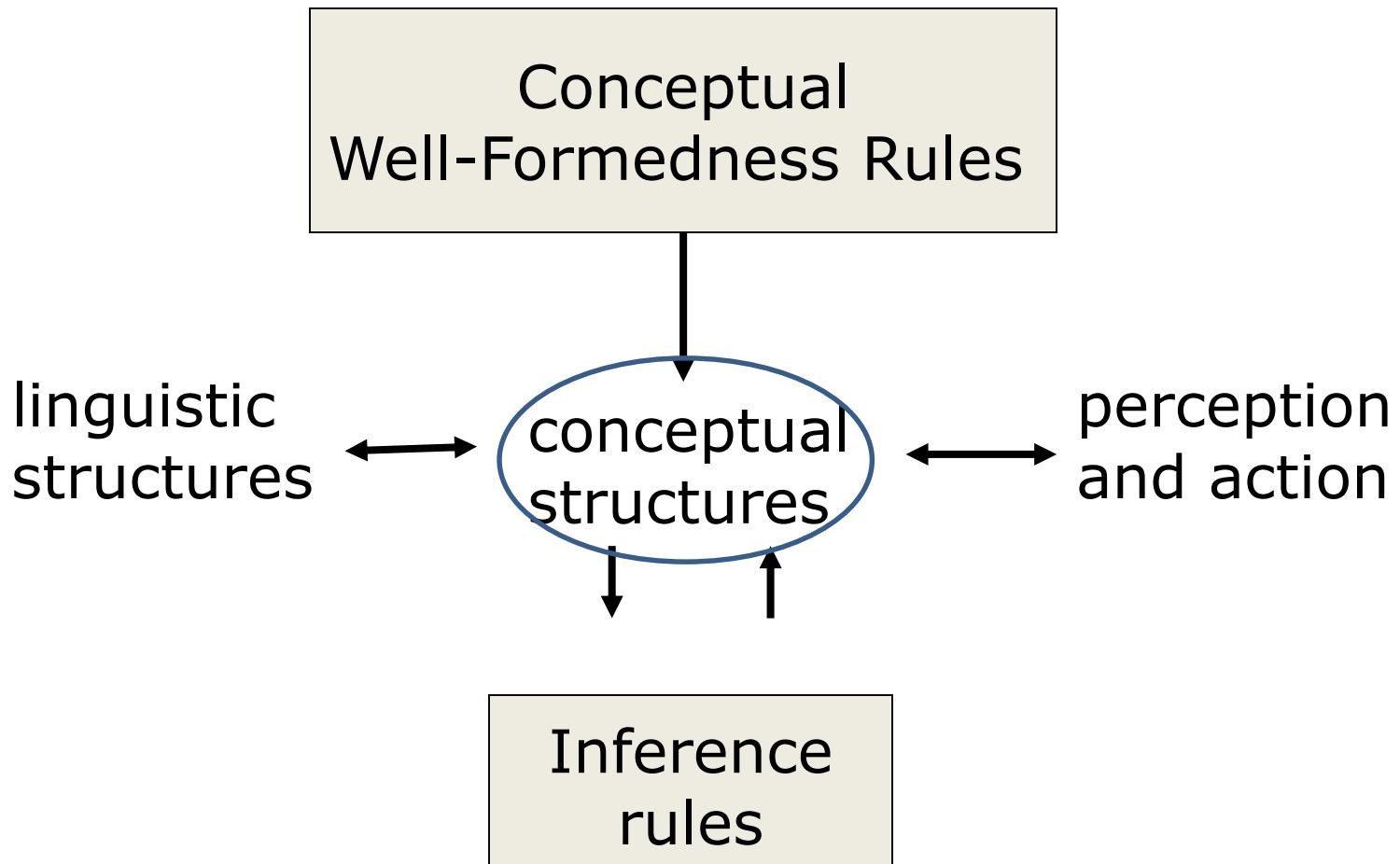
What is “word meaning”?

- something that is conveyed or signified, or sensed in a symbolic sign.
- a fragment of **conceptual structure** that is linked in long-term memory with a phonological structure and a syntactic structure.

The words one knows consist of **stored concepts** linked with **stored elements of linguistic expression**.

(Jackendoff, 1992:55)

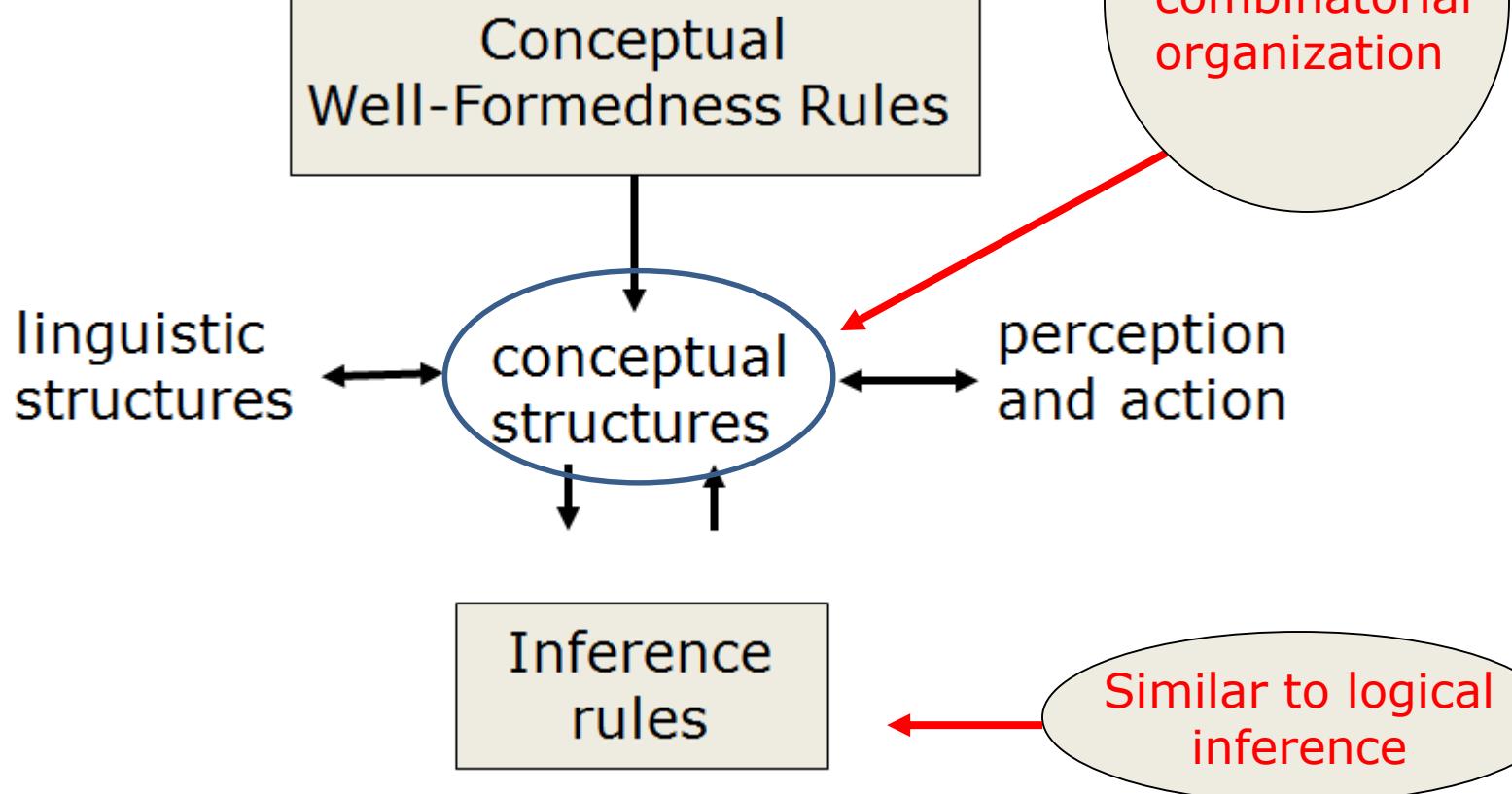
Within a cognitive theory,



(Jackendoff, 1992:55)

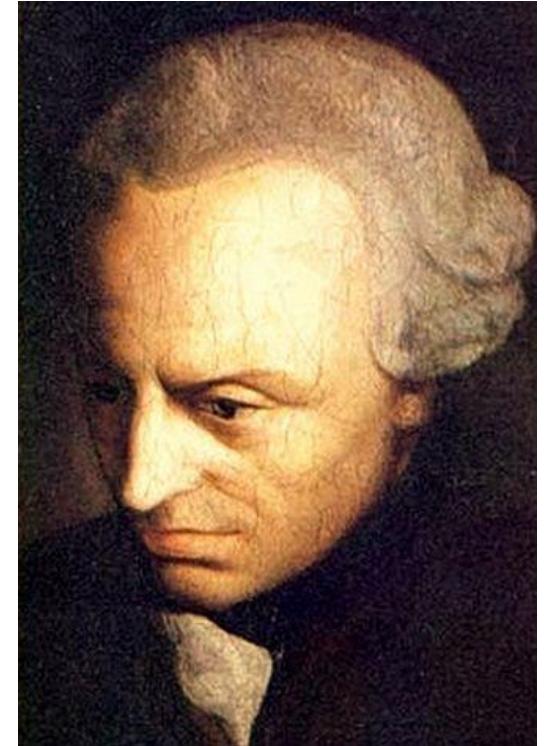
the resources available
in the brain for forming
concepts

the brain's
combinatorial
organization



Where do the *Conceptual Well-Formedness Rules* come from?

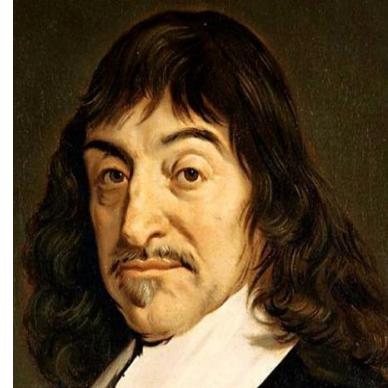
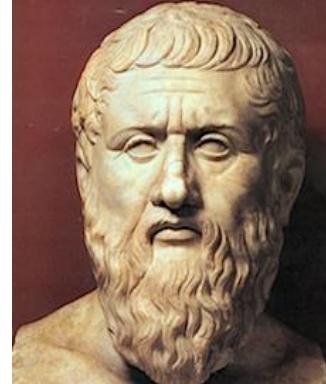
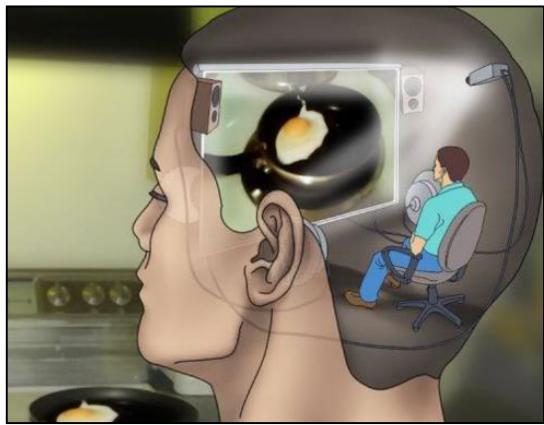
- According to Kant, Fodor, and Jackendoff, they can not be learned: **they are the foundation on which learning is based.**



Immanuel Kant (1724-1804)

(Jackendoff, 1992; Fodor 1975; Kant, 1895/2005):

- Conceptual Well-Formedness Rules encompass the space of possibilities provided by
 - sense-data
 - the combination of elements of that space by the principle of association.



According to philosophers, such as Plato, Descartes, and Locke, sensible ideas (sense-data) are immediate impressions upon the eye, which reacts for subjective viewing.



- All serious research on lexical organization confirms common sense in suggesting that **word meanings** are composite – they are built up from some set of **conceptual primitives** and **principles of combination**.

(Jackendoff, 1994:134)

Overton, Willis F., & Palermo, David S. (1994). (Eds.) *The Nature and Ontogenesis of Meaning*. Lawrence Erlbaum Associates.

Back to the question:

How do we conceive of a word meaning?

Piaget's hypothesis:

Children acquire their repertoire of concepts in a certain order, starting with **basic sensorimotor concepts** and gradually progressing from them to more abstract domains, eventually arriving at the most abstract concepts of pure logic.

(Piaget, 1954a)

Back to the question:

How do we conceive of a word meaning?

Vygotsky's explanation of word meaning:

Word meanings are dynamic rather than static formations. They change as the child develops; **they change also with the various ways in which thought functions.**

If word meanings change in their inner nature, then **the relation of thought to word also changes.**

(Vygotsky 1996: 217)

Concept

- “From the point of view of psychology, **the meaning of every word is a generalization or a concept**. And since generalizations and concepts are undeniably acts of thought, **we may regard meaning as a phenomenon of thinking.**”

(Vygotsky, 1996: 212)

Sapir-Whorf hypothesis

Back to the summary of Sapir-Whorf hypothesis:

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(Gentner & Goldin-Meadow, 2003:4)

Specific Whorfian Question 1

- Does the language we acquire influence where we make our category distinctions?
 - Language as Category Maker?

Gentner, D. & Goldin-Meadow, S. (2003). Whither Whorf? In Gentner & Goldin-Meadow (Eds.) *Language in Mind*. MIT Press.

Semantic partitioning of the world in the written system?

Ex. 1.1:

An example of semantic radicals in Chinese and affixes in English



Female



女 女 女 中 女

women

- The gender-specific formation of Chinese characters with the semantic radical 女 to refer to
 - 1) female characters, or
 - 2) female characters as being pretty, fragile, sexual, or evil.
- In this case, the Chinese language reflected a **classification of individuals in the world**.
- Then, are such radicals likely to constrain the perception of the speakers of Chinese?

娘

媚

婢

婊

奸

女

Female

姐

sister

妈

mother

奶

grand-mother

姑

aunt

女

Female

姓

surname

妙

wonderful;
clever; fine

如

as; like

The semantic radical 女 in monosyllabic characters in Chinese

Female	Female: positive features	Female: Negative features
<ul style="list-style-type: none">她 tā妳 nǐ姐 jiě妹 mèi媽 mā奶 nǎi姥 lǎo妈 mā姨 yí娘 niàng	<ul style="list-style-type: none">好 hǎo妙 miào娇 jiāo妖 yāo妍 yán婷 fēng妩 wǔ姣 jiāo祚 zhu媯 yú	<ul style="list-style-type: none">奸 jiān妖 yāo姘 pīn婢 bì娼 chāng婊 biǎo嫖 piáo姘 pīn奴 nú淫 yín嬾 lǎn

The semantic radical 女 in monosyllabic characters in Chinese

Female

Female: positive
features

Female: Negative
features

- Then, are speakers of Chinese likely to unconsciously associate the actions depicted by such words with females?
 - A type of gender-specific semantic partitioning of the world?

The concept of 借 Jiè in Chinese

‘borrow’ and ‘lend’ in English

Chinese ‘jie’ 借 vs. English ‘borrow’ and ‘lend’

Ex. 1.2:

Chinese

1. 他借了一本书。
2. 他借来了一本书。
3. 他借出去了一本书。
4. 他借给她了一本书。
5. 书（被）借走了。
6. 书(被) 借来了。

English

1. He **borrowed** a book.
2. He has **borrowed** the book.
3. He has **lent** a book.
4. He **lent** her a book.
5. The book was **borrowed**.
6. The book was **lent**.

Chinese 'jie' 借 vs. English 'borrow' and 'lend'

借来 borrow



借

借走 lend

1. 借 borrow

2. 借来 borrow come



3. 借出去 borrow exit

4. 借给 borrow give

5. 借走 borrow go



Chinese ‘jie’ 借 vs. English ‘borrow’ and ‘lend’

Question:

Could this difference between the two languages indicate that speakers of English habitually think of “borrow” and “lend” as two physical actions with distinctively opposite directions, whereas speakers of Chinese tend not to do so?

1. 借 borrow

2. 借来 borrow come



chuān 穿 and *dài* 戴 in Chinese

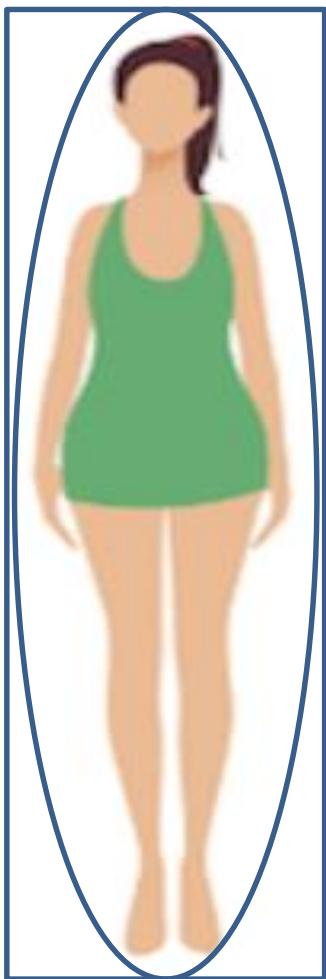
‘put on’ and ‘wear’ in English

Ex. 1.3:

English

 = **wear**

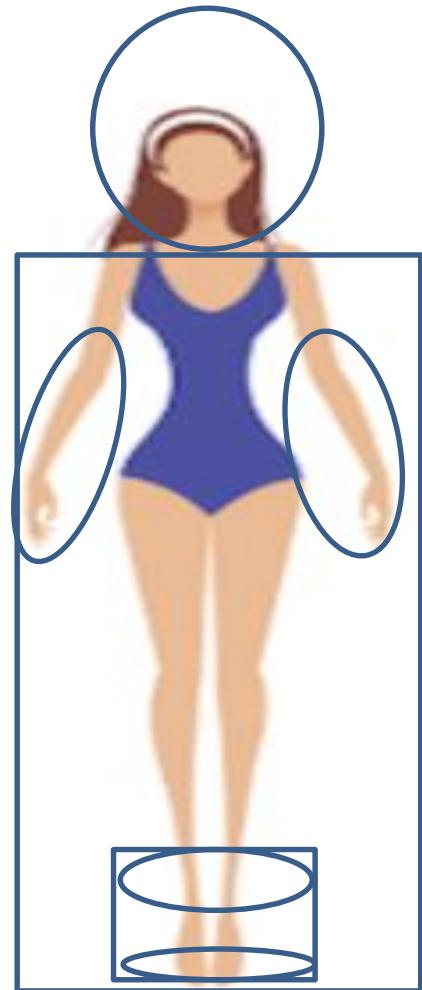
 = **put on**



Chinese

 = 戴

 = 穿



- “If semantics varies crosslinguistically, then one cannot maintain that conceptual structure is universal and that semantic structure reflects conceptual structure”.

(Gentner & Goldin-Meadow, 2003:7)

Sapir-Whorf hypothesis

Back to the summary of Sapir-Whorf hypothesis:

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(Gentner & Goldin-Meadow, 2003:4)

Specific Whorfian Question 2

- Do grammatical characteristics of a language shape speakers' perceptions of the world?
 - Language as Lens?

Gentner, D. & Goldin-Meadow, S. (2003). Whither Whorf? In Gentner & Goldin-Meadow (Eds.) *Language in Mind*. MIT Press.

My own studies suggest, to me, that language, for all its kingly role, is in some sense a superficial embroidery upon **deeper processes of consciousness**, which are necessary before any communication, signaling, or symbolism whatsoever can occur . . .

(Whorf, 1956: 239)

A study of Swedish speakers' learning of Chinese noun classifiers

Gao, 2010

Control group:

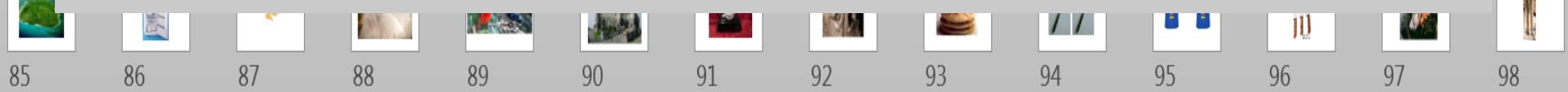
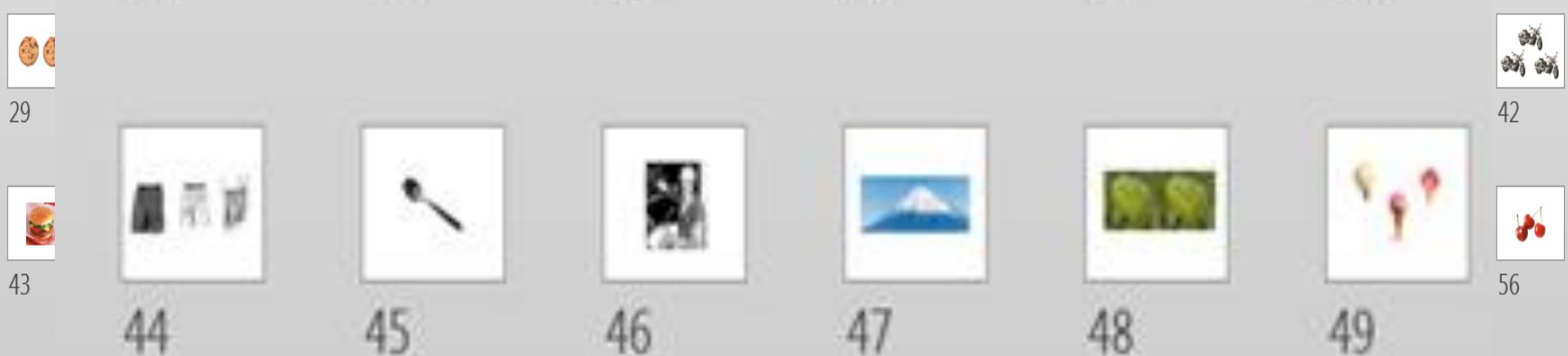
- Thirty Chinese–Swedish bilingual children (11 boys and 19 girls; age range: 6–15; mean age: 9.06) from Lund and Stockholm in Sweden

Experiment group:

- Thirty Swedish students learning Chinese as their major or minor at Lund University and Stockholm University (21 males and 9 females; age range: 21–30; mean age: 25.7)

Chinese classifier phrase			
Numeral	Classifier	Noun	English equivalent
—yì	本 běn	书 shù	a book
—yí	个 gè	书架 shūjià	a bookshelf
—yí	串 chuàn	钥匙 yào shi	a bunch of keys
—yì	把 bǎ	椅子 yǐ zi	a chair
—yì	台 tái	电脑 diànnǎo	a computer
—yì	本 běn	字典 zìdiǎn	a dictionary
—yí	扇 shàn, 道 dào, 个 gè	门 mén	a door
—yí	个 gè, 只 zhī	抽屉 chōu tì	a drawer
—yí	个 gè	玻璃杯 bólíbei	a glass
—yì	只 zhī	手 shǒu	a hand
—yì	把 bǎ	钥匙 yào shi	a key
—yì	盏 zhǎn	灯 dēng	a lamp
—yì	条 tiáo	腿 tuǐ	a leg
—yì	封 fēng	信 xìn	a letter
—yì	张 zhāng	报纸 bào zhǐ	a newspaper
—yí	个 gè	鼻子 bífú	a nose
—yì	双 shuāng	鞋 xié	a pair of shoes
—yì	条 tiáo	裤子 kù zi	a pair of trousers
—yì	张 zhāng	纸 zhǐ	a paper
—yí	只 zhī, 管 guǎn	钢笔 gāng bì	a pen
—yí	个 gè	书包 shū bāo	a schoolbag
—yì	把 bǎ	剪刀 jiǎn dāo	a scissors
—yì	只 zhī	鞋 xié	a shoe
—yí	件 jiàn	毛衣 máo yi	a sweater
—yì	张 zhāng, 个 gè	桌子 zhuō zi	a table
—yí	部 bù	电话 diànhuà	a telephone
—yì	棵 kè	树 shù	a tree
—yí	块 kuài, 个 gè, 只 zhī	手表 shǒu bǎi	a watch
—yí	扇 shàn, 个 gè	窗户 chuāng hu	a window
—yì	双 shuāng	手 shǒu	both hands

Table 1. Nouns and classifier phrases tested as learning outcome.



Chinese classifier use by Swedish learners of Chinese and Swedish-Chinese bilingual children

Participants	Correct usage %	Improper usage %	Incorrect usage %	Failure %
Bilingual children	52.8 (475/900)	22.3 (201/900)	13.0 (117/900)	11.9 (107/900)
Low level – adults – 1st session	34.0 (102/300)	23.0 (69/300)	23.3 (70/300)	19.6 (59/300)
Medium level – adults – 1st session	38.0 (113/300)	12.3 (37/300)	35.0/35.3 (105/300)	15.0 (45/300)
High level – adults – 1st session	61.7 (185/300)	11.0 (33/300)	21.3 (64/300)	6.0 (18/300)
Average – 1st session – adults	44.7 (402/900)	15.4 (139/900)	26.0 (234/900)	13.9 (125/900)
Average – 3rd session – adults	71.7 (645/900)	8.1 (73/900)	15.2 (137/900)	5.0 (45/900)
Average for adults – all three sessions	58.1	11.6	20.8	9.5

Table 2. Bilingual children's classifier production compared with adults' learning results (raw figures in parentheses).

Children's performance compared with that of the adults in the first session

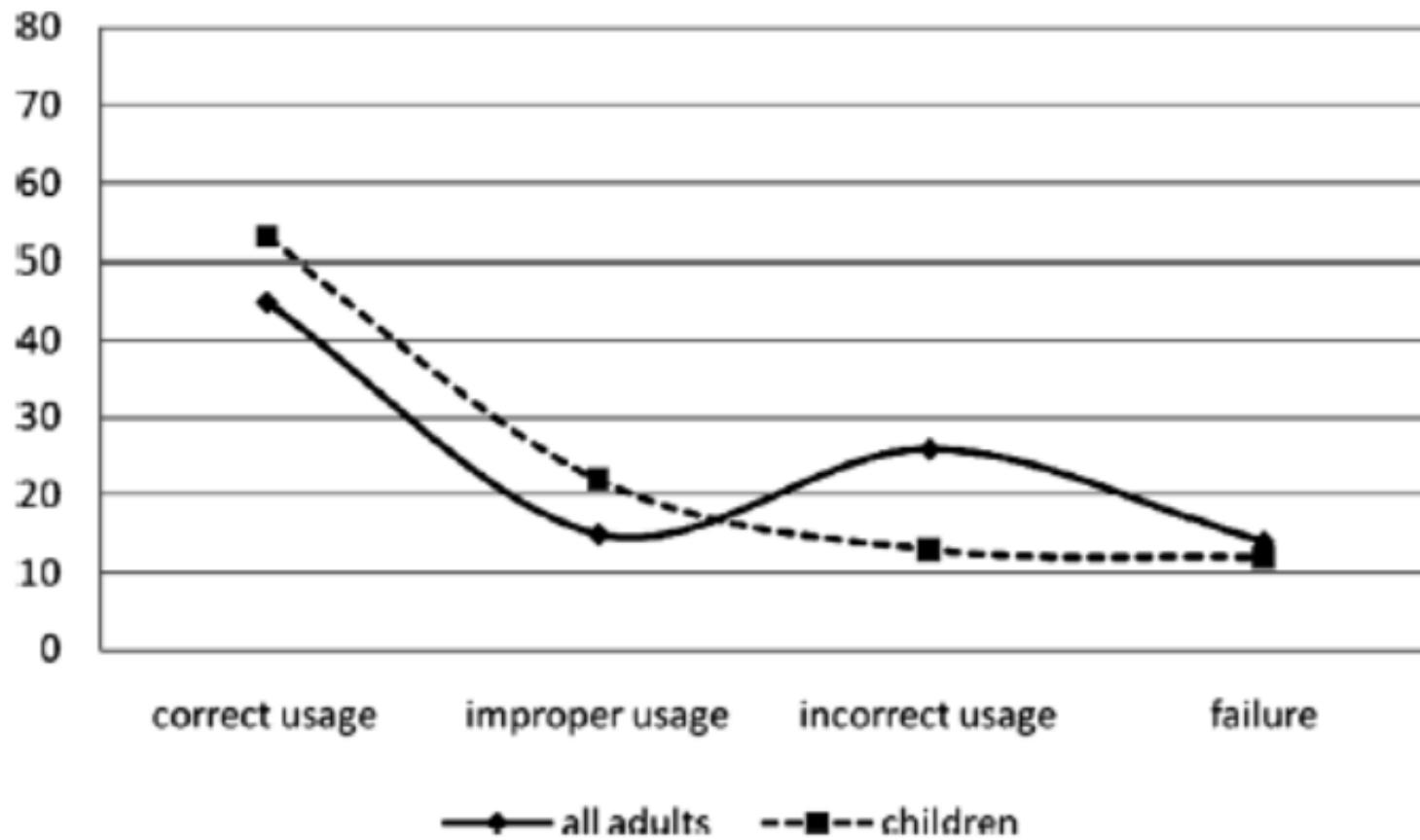


Figure 1. Children's performance compared with all adults' in the first test session.

Adult learners' progress over three months

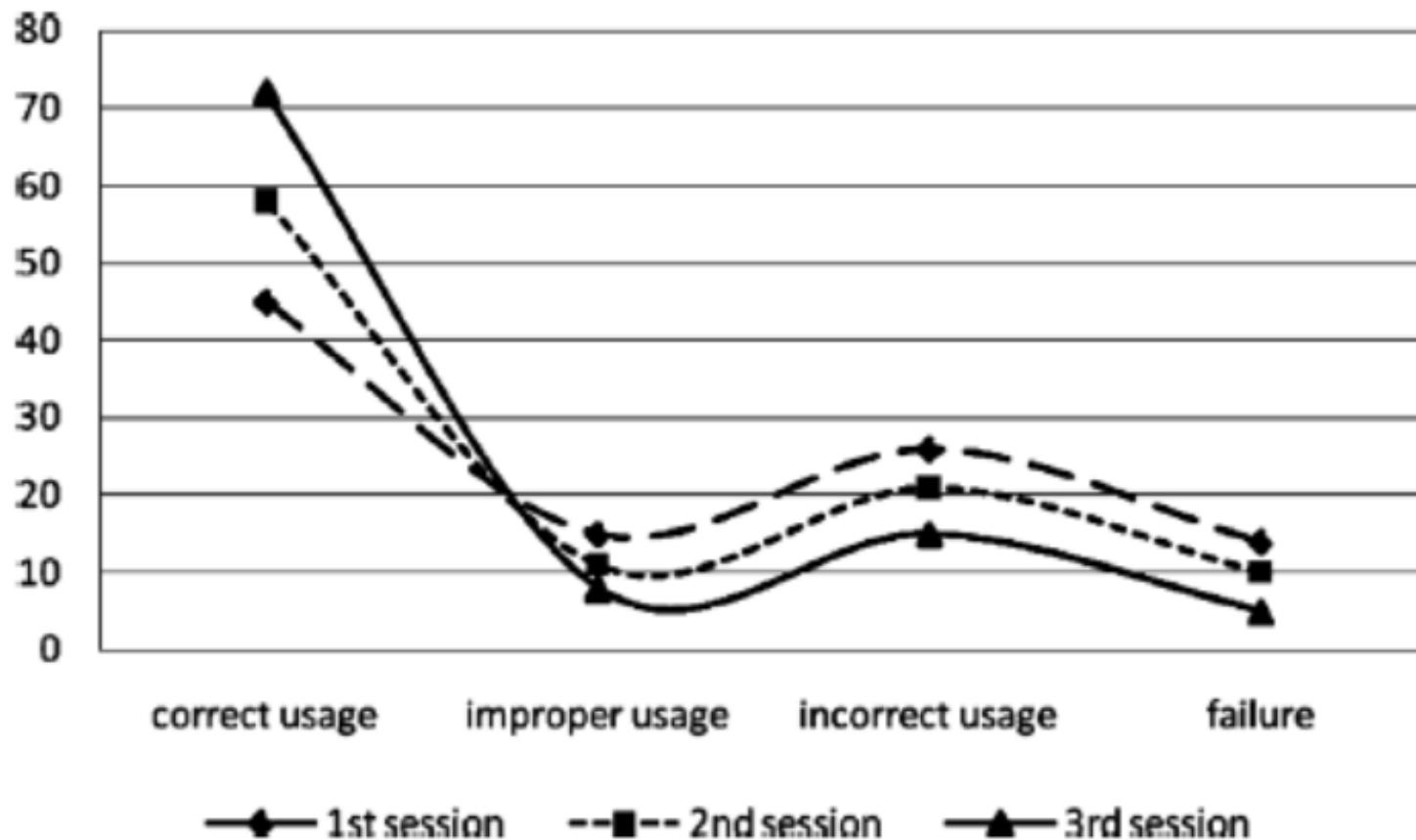


Figure 4. All adults' improvement over three test sessions.

Bilingual children's reasoning

		Classifier(s)	
Associated noun items	Correct classifier(s)	used incorrectly	Children's reasoning for their incorrect classifier use.
letter	封 fēng	张 zhang	A letter is flat like a piece of paper.
newspaper	张 zhang	页 ye	It is just one page.
		片 piàn	A newspaper is a page that is thin and flat.
		篇 piān	A newspaper contains articles.
		版 bǎn	It is one page of the newspaper.
both hands	双 shuāng	对 duì	Two hands are a pair.

What does the study tell us about the difference between the bilingual children and the adult learners?

- The children used a cognitive bottom-up approach where they connected the classifiers with **ontological categories**;
 - that is, they did not formulate any preconceived rules to follow but instead judged a noun item by its **perceptual features** and then made a match to the embedded semantic meanings of a classifier.
- The adults used a top-down learning approach for synthesizing noun referents and forming them into a cohesive whole.

Language structure is like a **lattice** or screen through which we see the world of our experience. (Carroll, 1956:315-317)



Humboldt's (1836) view of language

- Language as the formative organ of thought.
- Thought and language are inseparable.

(see Gumperz and Levinson 1996a; Lucy 1996, for reviews)

Sapir-Whorf hypothesis

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(Gentner & Goldin-Meadow, 2003:4)

Specific Whorfian Question 3

- Does language augment our capacity for reasoning and representation?
 - Language as Toolkit?

Gentner, D. & Goldin-Meadow, S. (2003). Whither Whorf? In Gentner & Goldin-Meadow (Eds.) *Language in Mind*. MIT Press.

Recent studies on ‘throw’ action verbs

- Gao, H. H., Wang, H. S., & Nicoladis, E. (2016). The delineation of throw verbs in Chinese: A behavioral and perceptive approach. *Journal of Cognitive Science*. 17-1: 95-131.
- Wang, H., & Gao, H. H. (2016). Cross-linguistic categorization of throwing events: A behavioral approach. *Cognitive Linguistic Studies*, Vol. 3, No. 2.
- Gao, H. H., & Wang, H. (2013, July 10-13). Bilingual and monolingual children’s mapping of visual perceptions of actions to the semantics of action verbs in Chinese. *The 9th International Symposium on Bilingualism (ISB9)*, Singapore.
- Wang, H., & Gao, H. H. (2013, July 10-13). Lexical semantic boundaries of throwing action verbs in English and Chinese monolingual and bilinguals. *The 9th International Symposium on Bilingualism (ISB9)*, Singapore.

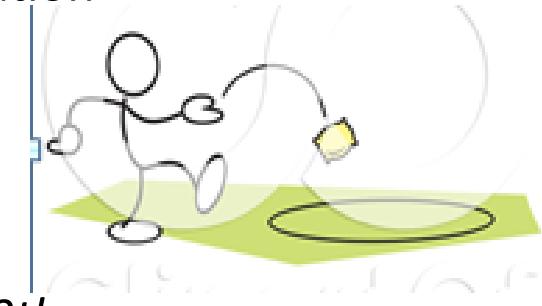


Table 6: The frequency of actions with different values of three binomial variables

	Vertical Direction		Horizontal Direction		Initial Arm Shape	
	Upward	Downward	Forward	Sidewise	Straight	Bent
<i>rēng</i>	40	19	41	18	37	22
<i>diū</i>	48	12	38	22	47	13
<i>pāo</i>	60	0	59	1	29	31
<i>tóu</i>	58	2	60	0	1	59
<i>shuāi</i>	0	59	47	12	0	59
<i>shuǎi</i>	25	34	14	45	12	47

Research Methods

- Perceptual Approach
- Behavioural approach

Methods

Target words:

- 6 ‘throw’ verbs in Chinese
- 6 ‘throw’ verbs in English
- 6 ‘throw’ verbs in German

Participants:

- Native monolingual Mandarin speakers
- Native English speakers
- Native German speakers
- Chinese-English bilingual children

Methods

Perceptual Experiment: setting

- Participant
 - sits in front of a computer screen
 - watches a video recording of a series of different throwing actions
- 2 cameras in the front and aside

Perceptual Experiment: instructions

- Part 1: Please use a verb to describe each of the actions you see.
- Part 2: Please match the actions you see with the words on the cards.

Methods

- Behavioral Experiment: **setting**
- Participant
 - stands still
 - Confirms the verbs they see and know on the cards
 - holds a novel object
- 2 cameras in the front and aside
- Behavioral Experiment: **instructions**
- 请V这个东西。
- Please V it.

Methods

Behavioral Experiment: procedure

Round 1

- Participant performs an action according to the instructions
 - Monolinguals: 6 instructions corresponding to 6 verbs
 - Bilinguals: 12 instructions corresponding to 12 verbs
- Random verb order

Round 2

- Same as Round 1

Native English speakers' performance on perceptual and behavioural tasks

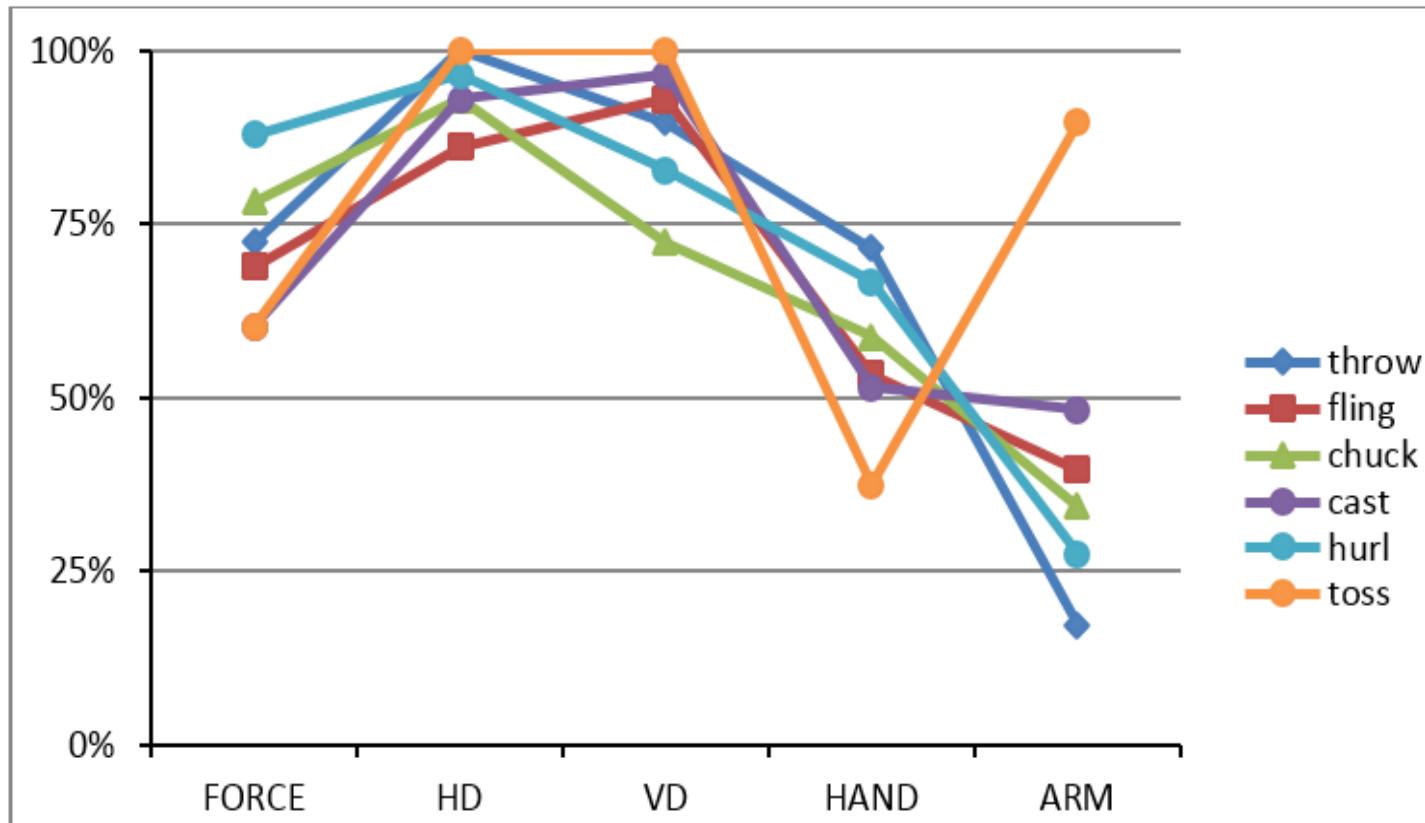
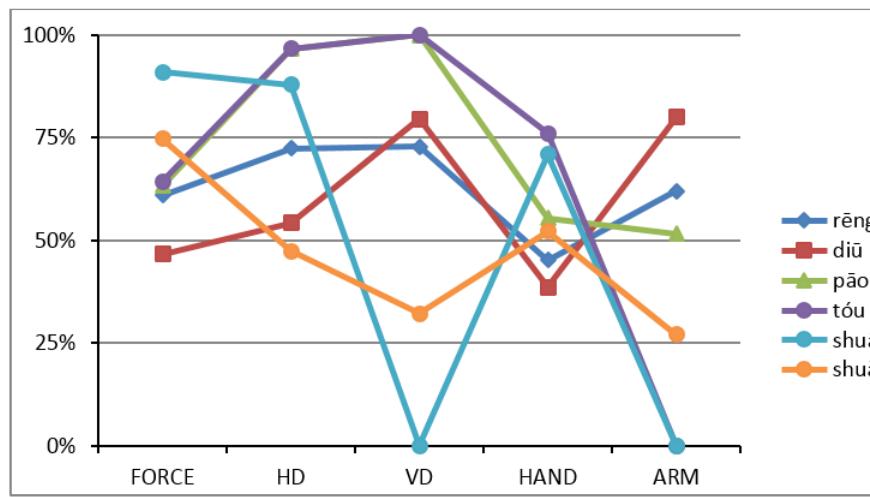


Figure 1: The semantic distribution of English 'throw' verbs on five action features

Crosslinguistic differences



Wang & Gao, 2016

Figure 2: The semantic distribution of Chinese ‘throw’ verbs on five action features

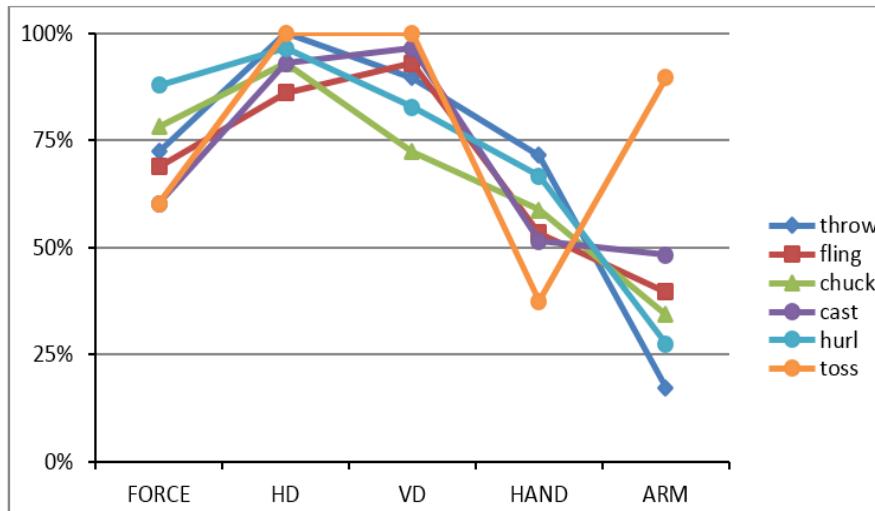


Figure 1: The semantic distribution of English ‘throw’ verbs on five action feature

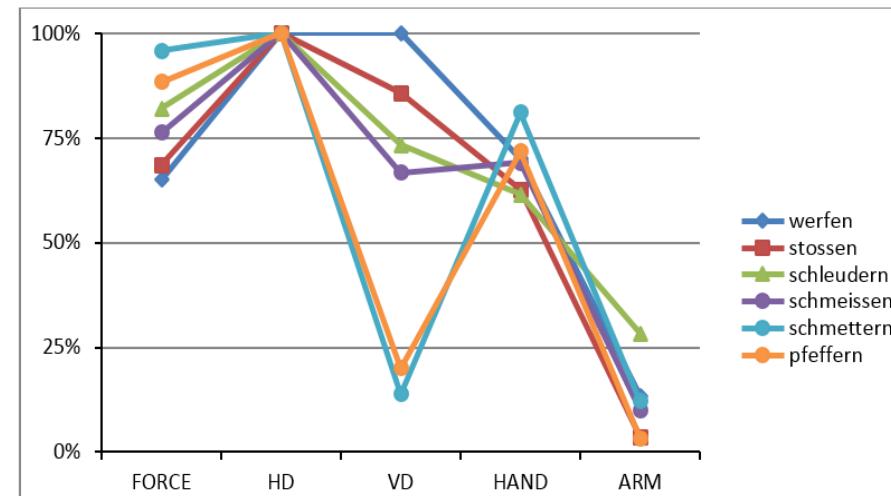
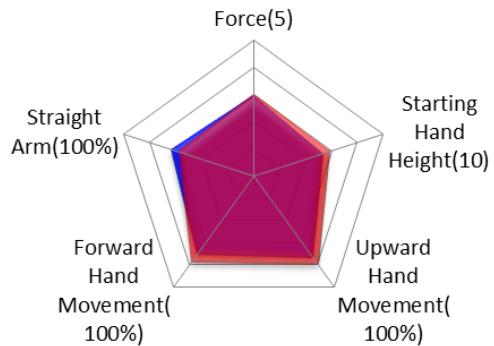


Figure 3: The semantic distribution of German ‘throw’ verbs on five action features

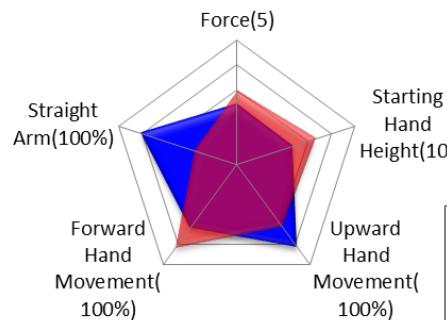
Monolingual and bilingual differences

in perception and lexical word use

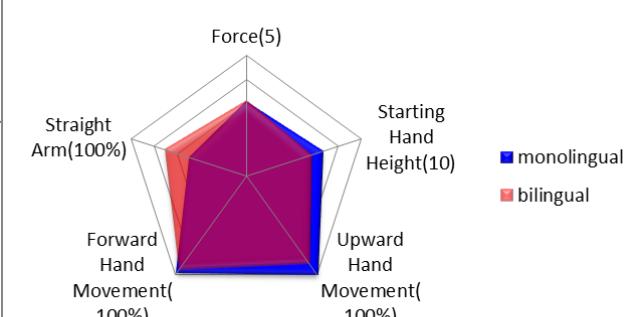
rēng



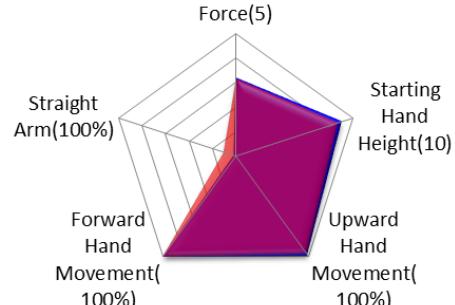
diū



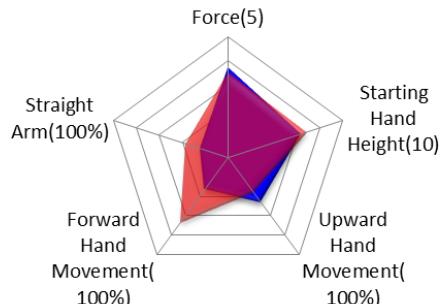
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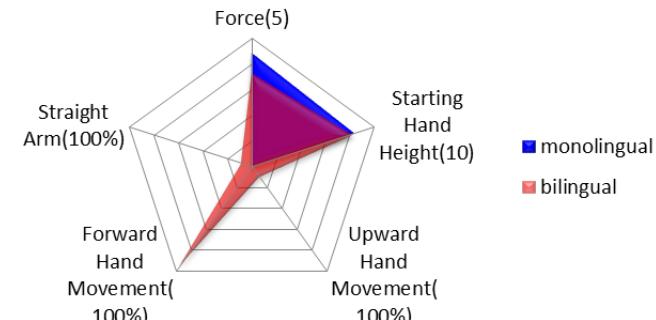
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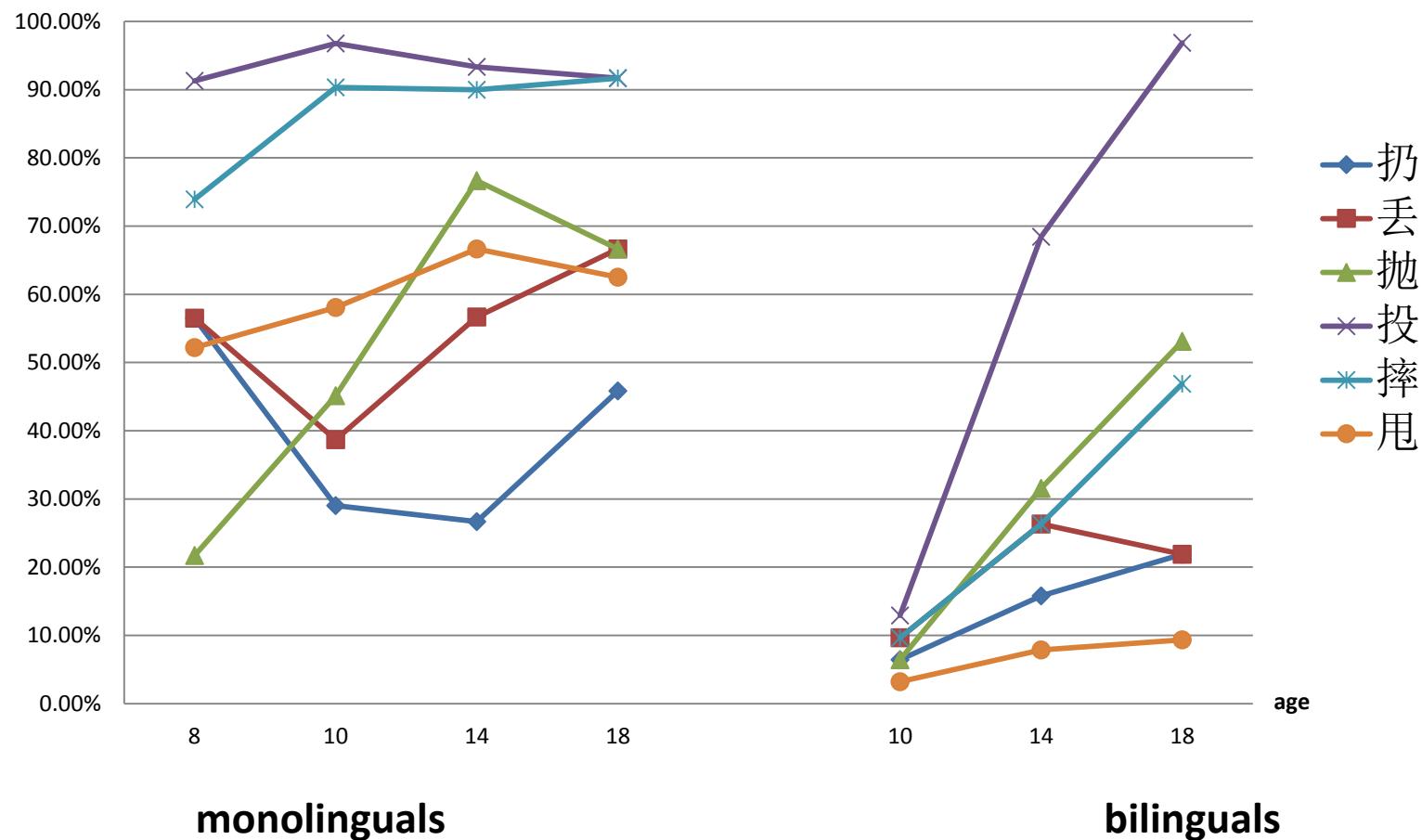
shuāi



shuāi



A verb-action matching task by monolingual and bilingual children



Further questions

Could we be convinced by the findings of the studies that the following are true ?

- Languages delineate underlying classifications of experience, and different languages classify experience differently (Lim, 2003:54)
- Bilinguals see the world in a different way in different languages.

Language and Culture

Linguistic meaning, individual thought, and cultural pattern

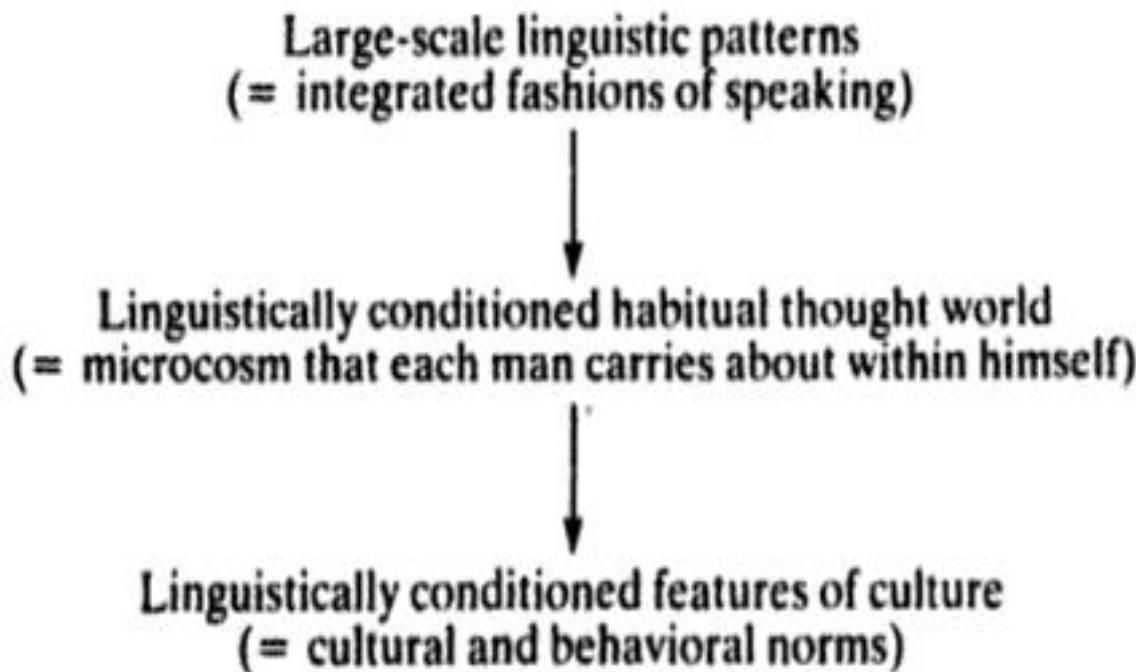


Figure 5 Structure of Whorf's argument linking language, the individual, and culture

Ways to begin a letter by Chinese-English bilinguals:

Ex. 2.2

English

1. Dear Teacher Chen
2. Dear President Chen
3. Dear Director Chen
4. Dear Mr Chen
5. Dear Parent
6. Dear Sir/Madam
7. Dear Professor Chen
8. Dear Chen Laoshi
9. Dear Friend
10. Dear Sister

Chinese

1. 尊敬的陈老师
2. 尊敬的陈校长
3. 尊敬的陈主任
4. 尊敬的陈先生
5. 尊敬的家长**同志**
6. 尊敬的/**亲爱的**女士或先生
7. 尊敬的/**亲爱的**陈教授
8. 尊敬的/**亲爱的**陈老师
9. **亲爱的朋友?**
10. **亲爱的姐姐/妹妹**

Similar ideas expressed in different ways with different associations:



Chinese

- 像蜜蜂一样勤奋 Xiàng mìfēng yīyàng qínfèn
as diligent as bees

English

- as busy as a bee

Swedish

- flitig som en myra
as diligent as an ant



Similar ideas expressed in different ways with different associations:

English:

When the **cat**'s away, the **mice** will play.

Swedish:

När **katten** är borta dansar **råttorna** på bordet.

When the **cat** is away, the **mice** dance on the table.

Chinese:

山中无老虎，猴子称大王。

Shānzhōng wú lǎohǔ, hóuzi chēng dàwáng

When there are no **tigers** in the mountains, **monkeys** will be kings.



Conclusions and Further Questions

- Language must be developed and acquired in a specific cultural environment.
- In language use, there is a link between expression and conception.
- Expression and conception are shaped by life experience.
- Life experience is itself shaped by language.

Further Questions:

- Is the link conventionally and culturally grounded?
- Does it evolves with history ?

Thank you!

Language and Culture

Helena Gao

Perception of inter-personal relations

- Asymmetric terms of address: Indicators of inter-personal relations

e.g.

- While speaking Chinese, asymmetric terms of address in Chinese create one type of mutual perception
 - “Mr. Wang” vs. “Wang Xiao Dong”
- While speaking English, we tend to call each other by first names.
 - The inter-personal relation has apparently changed with the change in language.
 - The relation has to match the language.

A continuum along which utterances may be ranked

- At the propositional end
 - largely novel combination of words and phrases
 - with relatively little predictability among the parts
- At the opposite end
- Utterances which are highly automatic
- e.g., songs, nursery rhymes, lines from jokes, plays and poems
- In between along this continuum
 - A wide heterogeneity of prefabs, swirling in our mental filing cabinet, ready to be “reached for”
 - E.g., “how are you doing?”, “what can I say?” Oh my God!” etc.
 - Also a whole range of expressions that we call clichés, hedges, proverbs, idioms, metaphors, similes, allusions, curses and swearings, maxims and epigrams, mottos, slogans, aphorisms, quotations from well-known sources, etc.

Neurolinguistic findings (Van Lanker, 1975)

- The propositional utterances appear to lateralize more to the left hemisphere
- Automatic speech shows more lateralization to the right hemisphere
- Finding consistent with the belief that
 - the left hemisphere is especially involved in making sequential decisions
 - propositional utterances are made up of longer sequences of decision units than automatic utterances.

Prefabricated or routine formulated *expressions*

- These routine formulated expressions have stronger influence on speakers' habitual thought and patterns of speaking.
- Cognitively, they are processed differently.
 - Speakers may reach for them more in the right hemisphere than in the left one.
 - Hughlings Jackson (1932) noted that automatic speech was in general better preserved in patients with left hemisphere damage.

Lexical semantics of mental lexicons

- E.g., A question, such as “What do you think of a peacock? Is it a big bird or a small bird?” can be normally answered in English in the following two ways:
 - (a) I think it is a big bird.
 - (b) I don’t think it is a big bird.

In Mandarin, possible answers differ:

- (c) 我不认为它是一个大鸟。
I think it not be one classifier big bird.
I don't think it is a big bird.
- (d) 我觉得它不是大鸟。
I feel it not be one classifier big bird.
I don't feel that it is a big bird.
- (e) 我想它不是大鸟。
I think/guess/imagine/anticipate/gather/infer it not be one classifier big bird.
I guess that it is not a big bird.

In Swedish, more possible answers:

- (f) Jag tror inte, att det är någon stor fågel. (*tror*: same as the English *think* in a)
- (g) Jag tycker inte, att det är någon stor fågel. (*tycker*: indicating an imaging aspect)
- (h) Jag anser inte, att det är någon stor fågel. (*anser*: indicating a conclusive reasoning aspect)
- (i) Jag skulle inte tro, att det är någon stor fågel. (*skulle inte tro*: indicating that the result of reasoning can be claimed to be true)
- (j) Jag har svårt att föreställa mig, att det är någon stor fågel. (*har svårt att föreställa mig*: expressing one's feeling of difficulty in visualizing or depicting a scene as an answer)
- (k) Såvitt jag förstår, är det inte någon stor fågel. (*såvitt jag förstår*: indicating one's own understanding, which might be different from others')

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