What Is a Cup?

Effects of immersion, language, and learner variables on lexical category convergence

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Introduction

Lexical Categorization

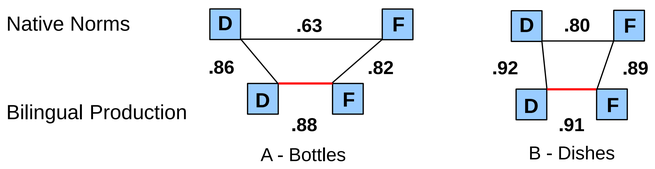
- Lexical categorization refers to the grouping of objects under a common name, such as the diverse set of objects called 'cup'.
- These categories are not universal between languages, which often group objects differently.

Ex: Chinese and English. The middle object (at right) belongs to different lexical categories in the two languages.

Images credit: Ameel et al, 2005

Categorization in Balanced, Simultaneous Bilinguals

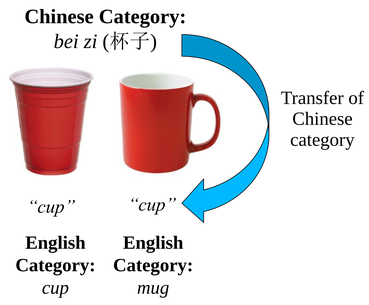
- Categorization incongruities between languages pose a particular challenge to bilinguals who must manage two separate, conflicting naming systems
- Previous research by Ameel and colleagues (2005) has demonstrated that some bilinguals resolve this naming conflict by creating new systems for each language which compromise between the differences.



Category correlations for Dutch-French bilinguals (Ameel et al, 2005). Figure A depicts category correlations for bottle-like artifacts, Figure B for dish-like artifacts. In both figures, the top row corresponds to agreement among native monolinguals of each language. Bottom row depicts the correlation within bilinguals of each language, and the middle values indicate correlation of bilinguals' categories to native monolinguals of that language.

Categorization in Language Learners

- Language learners often rely on transfer of first language information to fill in gaps in second language knowledge (MacWhinney, 2005, 2012)
- Semantic transfer of incongruent categories may result in non-native-like naming in the second language (see figure at right)



Goal & Questions

Goal: Quantify the interaction between languages and the trajectory of bilingual lexico-semantic development in learners of a second language.

- What linguistic experiences predict learners' success at acquiring native-like L2 categorization patterns?
- What properties of languages predict learners' tendency to produce native-like L2 categorization patterns?

PENNSTATE Brain, Language, and Computation Lab — The Center for Language Science

Method

Participants

Undergraduate and graduate students recruited at Penn State University (USA) and Beijing Normal University (China)

Sample	Age	AOEE	LOR	English Prof	Yrs Study
PSU	18 – 29 y M = 21 y	5 – 15 y M = 9 y	0 – 18 y M = 2.6 y	2.8 – 7.0 M = 5.1 / 7	5-17 M = 12
BNU	18 – 26 y M = 23 y	5 – 15 y M = 12 y	~	1.3 – 5.5 M = 4.0 / 7	8-18 M = 11

Task

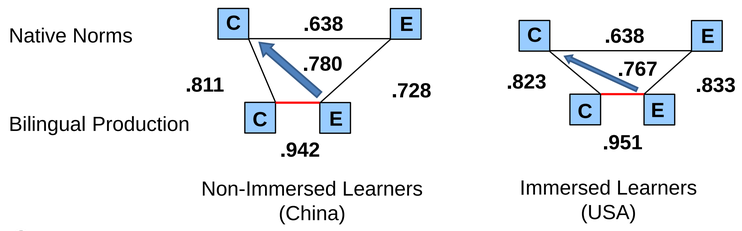
Participants name 67 randomly-sorted photographs of serving vessels (plates, cups, bowls, etc) in Chinese and in English (order counter-balanced).

Naming patterns are compared between participants and norms (produced category named vs. normed naming data), and as groups (bilinguals vs. norms).

Results (Group)

Group Differences

Two sub-samples are defined for comparison:
- Non-immersed Learners (China, n=26)
- Immersed Learners (USA, n=34)



Convergence:
- Bilinguals showed much greater convergence between languages than between monolinguals of English and Chinese
- Convergence is maintained as relative reliance on each language shifts

Transfer:
- Non-immersed bilinguals (in China) are significantly more reliant on Chinese patterns for both English and Chinese production
- Immersed bilinguals approach a balanced representation between languages

References

Ameel, E., Storms, G., Malt, B. C., & Sloman, S. A. (2005). How bilinguals solve the naming problem. *Journal of Memory and Language*, *53*(1), 60-80.

MacWhinney, B. (2005). A unified model of language acquisition. In J. F. Kroll & A. M. B. De Groot (Eds.), Handbook of Bilingualism: Psycholinguistic Approaches (p. 49). Oxford University Press, USA.

MacWhinney, B. (2012). The logic of the Unified Model. In S. Gass & A. Mackey (Eds.), Handbook of Second Language Acquisition. New York: Routledge. Routledge.

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Results (Indiv.)

Step 1: Learner Variables

We regress participants' individual native-likeness scores in English over four properties of their language histories:
- Age of earliest L2 (English) exposure
- Immersion (# years in L2 environment)
- Years of studying L2 (English)
- Frequency of (self-reported) code-switching (CS Freq)

L2 (English) Native-likeness: Mean 0.40 (scale 0-1); Adjusted R^2 = 0.24

Predictor	Beta	*p*
AOEE	0.002	0.74
Immersion (USA)	0.01	0.04
Years of Study	0.006	0.41
CS Frequency	0.18	0.04
Years Study x CS Freq	-0.008	0.06
AOEE x CS Freq	-0.008	0.06

The main effect of AOEE is not significant but does vary with language use (code-switching).

Code-switching has differing effects for different levels of learner (interacts with Years of Study).

Step 2: Language Variables

A binomial logistic regression predicts naming accuracy (producing dominant native-like name in English) on a trial by trial basis for all participants, after controlling for language history differences observed above.
- % participants in norming sample who produced dominant name (Agreement)
- Number of alternate names produced by norming sample (# Competitors)

P(Dominant Name): Mean 0.43
Nagelkerke R^2, Learner variables only: 0.04
Nagelkerke R^2, Language & Learner variables: 0.21

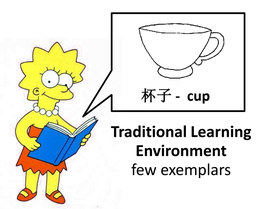
Predictor	Beta	*p*
Chinese Norm Agreement	-2.38	<0.01
English Norm Agreement	2.89	<0.01
# Chinese Competitors	-0.242	<0.01
# English Competitors	-0.073	0.01
English Agreement x Immersion	0.319	<0.01
# English Competitors x Immersion	0.02	0.11

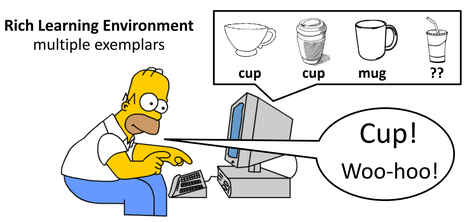
Native category patterns in L1 and L2 both compete in learners' L2 categorization.

Influence of L2 native categories is boosted with increased duration of immersion in L2 environment.

Discussion

- Native speakers' level of agreement about object names is highly predictive of L2 learners' success in acquiring native-like categorization patterns
- Native-like L2 categories are more effectively learned in an immersive environment
- Individual differences in language history interact with language use behavior, showing no single factor as determinant of L2 acquisition.
- L2 instruction should be sensitive to category differences (e.g., richer environments):





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