

Introduction

Lexical categorization refers to the grouping of objects using a common name (e.g., many containers may be called 'bottle'). Lexical categories for common objects often vary between languages. In some cases, objects which share a common name in one language may be distinguished by different names in another.



Pictured on the left is an example of this naming difference between Chinese and English. Such differences are common between languages and have been described for English, Chinese, Spanish, Russian, French, and Dutch.

This incongruity poses a special challenge to **bilinguals**, who must manage conflicting input from two different naming systems. Under extreme conditions of second language (L2) immersion, some late-onset bilinguals have been observed to transfer L2 semantic patterns back into their first language in verb use. This change is one example of **first-language lexical attrition**.



Question & Hypothesis

Q: Although changes in a bilingual's first language lexicon typically require many years to appear, can subtle effects of second language categorization patterns on the first language be detected in reaction times to an L1 object naming task?

H: We expect that after brief, intensive L2 training, RTs in L1 object naming will be significantly faster for objects that are categorized similarly in the L2 than for objects that are categorized differently.

References

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Snodgrass, J. G., & Vanderwart, M. (1980). A standardized set of 260 pictures: norms for name agreement, image agreement, familiarity, and visual complexity. *Journal of experimental psychology*, 6(2), 174-215.

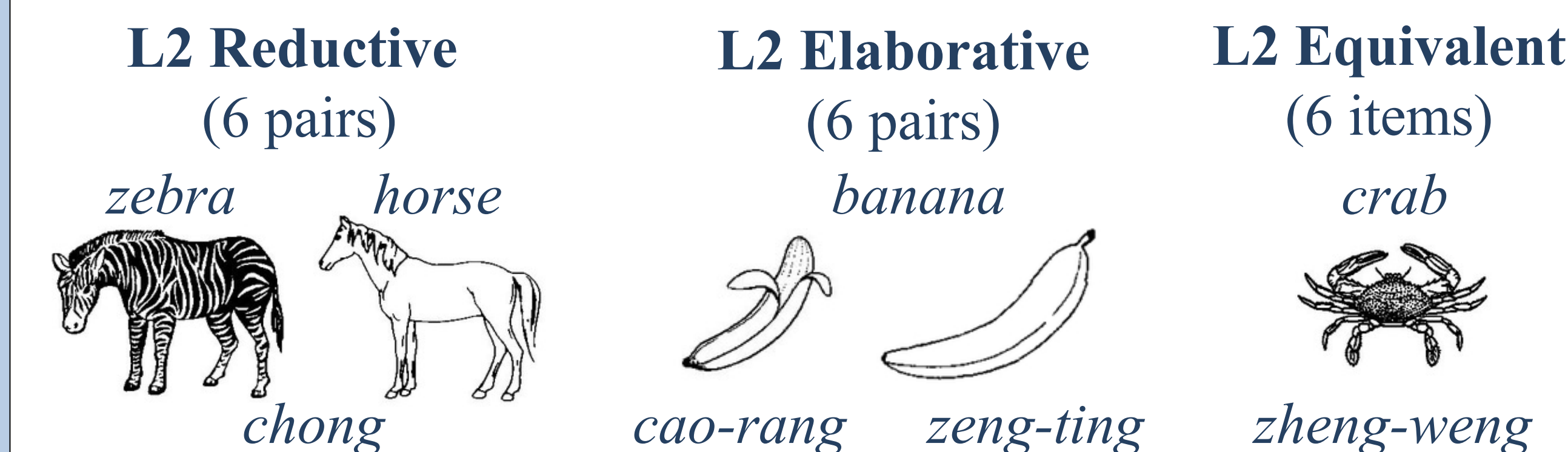
Szekely, A., Jacobsen, T., D'Amico, S., Devescovi, A., Andonova, E., Herron, D., Lu, C. C., Pechmann, T., Pleh, C., Wicha, N., Federmeier, K., Gerdjikova, I., Gutierrez, G., Hung, D., Hsu, J., Iyer, G., Kohnert, K., Mehotecheva, T., Orozco-Figueroa, A., Tzeng, A., Tzeng, O., Arevalo, A., Vargha, A., Butler, A. C., Buffington, R., & Bates, E. (2004). A new on-line resource for psycholinguistic studies. *Journal of Memory and Language*, 51(2), 247-250.

Method

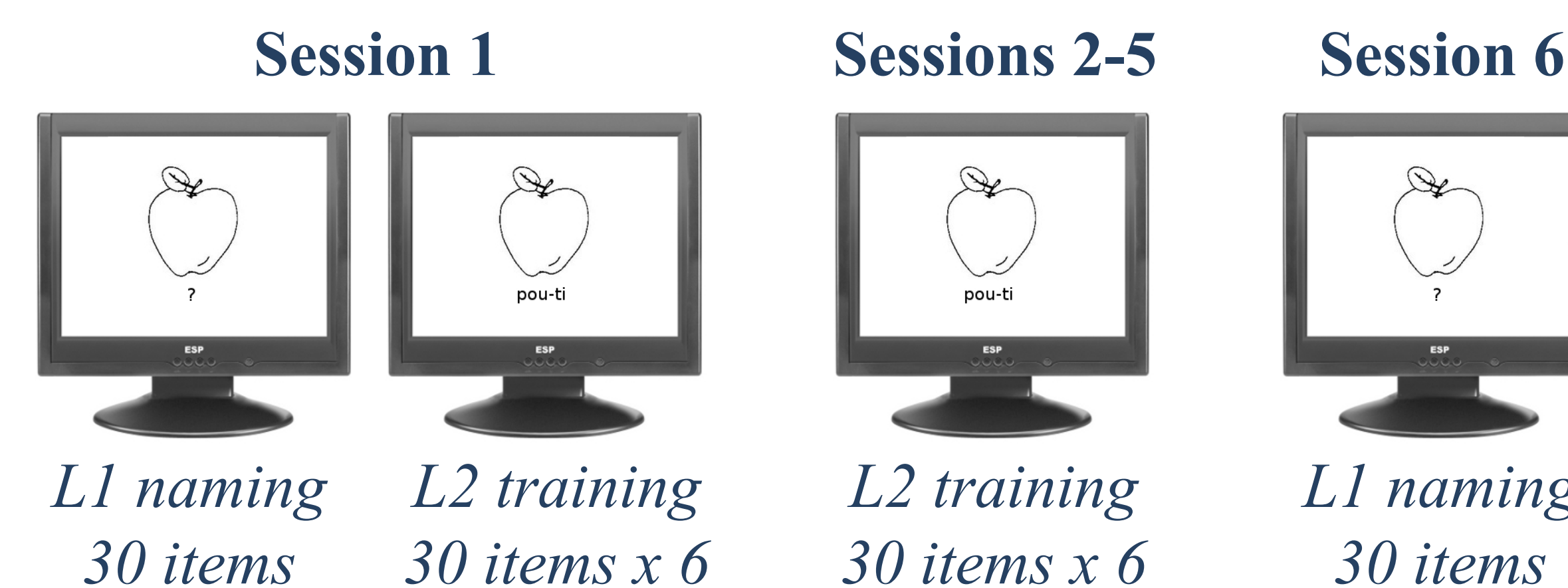
Participants: 10 (7F, 3M) psychology undergraduates, ages 18-20 years (mean 18.71), English monolinguals

Stimuli: 30 line-drawings of common objects were selected from the International Picture-Naming Project database and Snodgrass & Vanderwart's normed naming set. All pictures had >80% (English) dominant name agreement (>85% for incongruent trials).

A second language (pseudo-Chinese, L2) was synthesized to create three conditions of category (in)congruity between L1 and L2:



Procedure: Participants named 30 common objects in English (L1) as quickly as possible in two tests: before and after 5 training sessions in the L2 over approximately two weeks.



L2 training consisted of participants repeating names out loud while viewing picture-name pairs. Each item was viewed three times in sequences of 3, 5, 6, 10, or 30 items (respectively for each session) followed by a quiz with feedback. This procedure was performed twice per session, totaling approximately 24 minutes.

Results

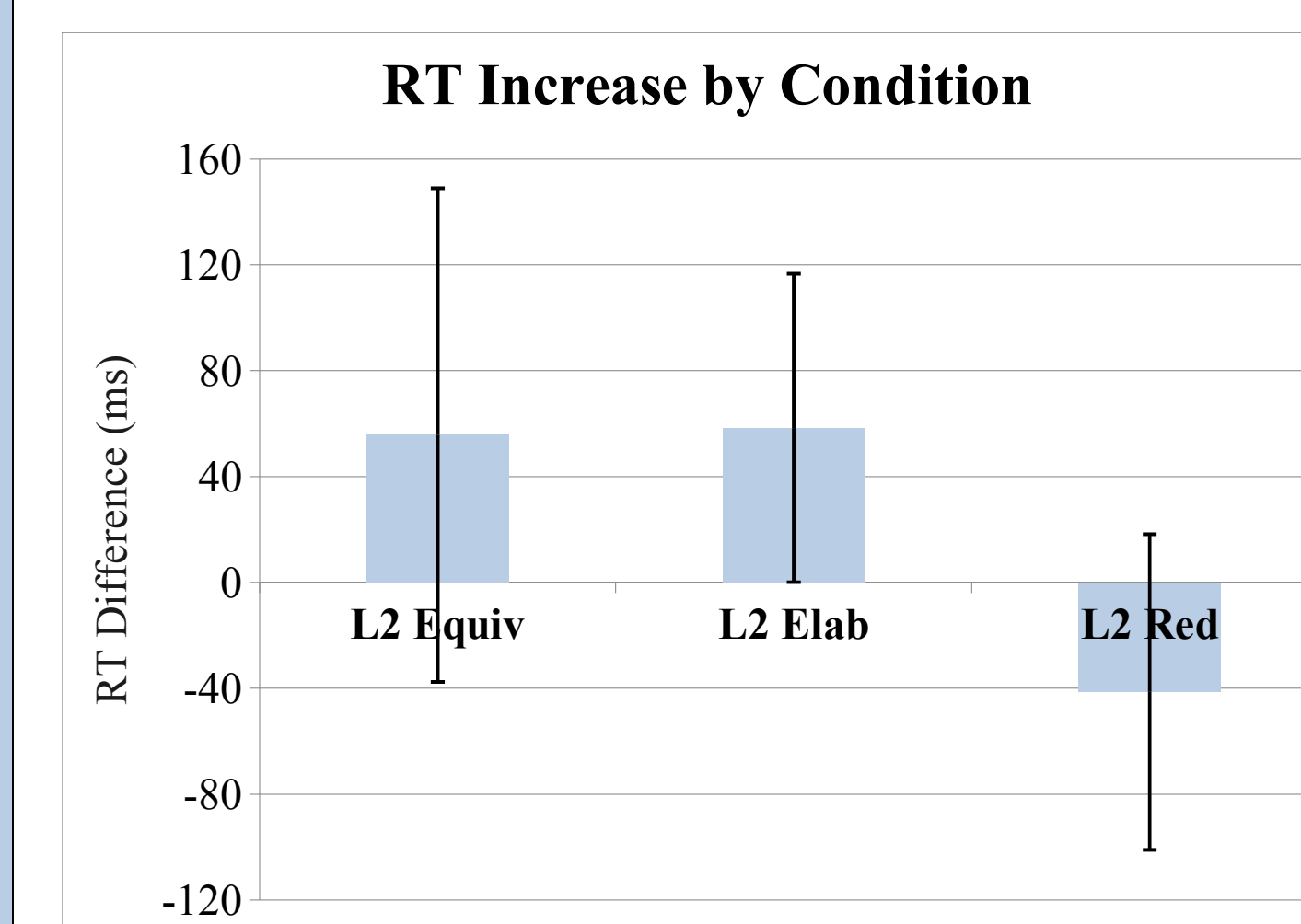
Data Preparation: RTs for each item in the first L1 naming task were subtracted from the second task (within-subject):

$$RTDiff = RTSes6 - RTSes1$$

- Non-dominant names given in Session 1 disqualified items from analysis.
- RT differences were correlated with several properties of the L1 words, L2 words, and pictures to rule out possible confounds.

	L1 Syllables	L1 Letters	L2 Syllables	L2 Letters	L1 Ln Freq	Visual Complexity	Age of Acquisition
Pearson R with RTDiff	-0.049 p=0.428	-0.054 p=0.390	0.048 p=0.438	0.080 p=0.197	-0.015 p=0.807	-0.078 p=0.262	0.043 p=0.491

Results



ANOVA was performed to find the fixed-effect of L2 translation condition across subjects (overall $F=3.269$, $p=0.040$). Condition was a marginally significant factor ($F=2.706$, $p=0.093$).

Means and 2 s.e. are pictured above for each condition. Pairwise comparisons revealed a significant difference between L2 Elaborative and L2 Reductive conditions ($p<0.05$).

Errors: Although the number of naming errors did not vary significantly between the Session 1 and Session 6 English tasks ($p=0.181$, matched pairs t -test), several interesting naming errors occurred in the Session 6:

- | | |
|---------------------------------------|-------------------------------------|
| L2 Reductive Condition | L2 Elaborative Condition |
| • Desk - "table", 4 subjects | • Brush - "comb", 3 subjects |
| • Telescope - "binoculars", 2 | • Banana - "peeled banana", 3 |
| • Zebra - "horse", 1 | • Arrow(1) - "bow and arrow", 1 |
| • Motorcycle - "bike" or "bicycle", 2 | • Arrow(2) - "left", 1 |
| | • Camel - "camel with two humps", 2 |

Discussion

- The changes in RT before and after L2 training were not as predicted, but the significant effect of the L2 Reductive condition supports non-selective activation accounts of bilingualism.
- While L2 training in the Elaborative condition required subjects to recognize new underlying category structures, Reductive condition training primarily activated existing L1 lexical representations, facilitating their later retrieval in the English task.

→ L1 naming errors in Session 6 suggest that some degree of L2 transfer occurred in the L1 task. This observation suggests that the conceptual stores for L1 are shared with additional languages and are subject to interference or even reorganization by L2.

This research is funded by NSF Grant OISE-0968369 to Ping Li and by a University Graduate Fellowship to Benjamin Zinszer.

Thanks to Melissa Jalloh for assistance with data collection & coding.