Classifiers in Mandarin Chinese

- Sortal classifiers mark noun classes broadly based on inherent properties of the noun (e.g., shape, natural kind, function).
- A classifier is required after a demonstrative or numeral.
- Mandarin has between 50 and 70 frequently used sortal classifiers (Li, 2013).

We know

- Chinese speakers use classifiers to identify and facilitate processing of a referent in a visual scene. (Huettig et al., 2010; Klein et al., 2012)
- Findings by Tsang & Chambers (2011) suggest that this facilitation is due primarily to grammatical (form-class) constraints, with semantics acting as a secondary cue whose effects are apparent only when non-prototypical class members are involved.
- By contrast, ERP studies report N400 (and no P600) effects for mismatching classifier-noun pairs, which has been taken to indicate that "combinatorial processing of classifier-noun sequences (...) is primarily semantically based." (Qian & Garnsey, 2016, p.780; Chou et al., 2016)

We ask

- Can we replicate Tsang & Chambers’ (2011, Experiment 3) findings from Cantonese in Mandarin Chinese?
- Can we detect effects prior to the onset of the noun?
- Will the weighting of grammatical (form-class) vs semantic information be different for L2 learners of Chinese? (future analysis)

Method

Participants
- 24 native speakers of Mandarin Chinese (M = 26 years, range: 19-39)

Materials
- VWP, 3 AOs: Target, Competitor, Distractor
- Target = non-prototypical member of classifier class (e.g., yī tiáo gǒu ‘a long/narrow dog’)
- 3 conditions, differ in nature of Competitor:
  - G-S+: Competitor is from different classifier class; has no semantic features of target class
  - G-S: Competitor is from different classifier class; has some semantic features of target class
  - G+*: Competitor is from same classifier class; prototypical member of class
- 4 items/condition (Latin square) = 12 experimental items; 24 fillers
- Three shape classifiers: tiáo (tiáo), shéngzi (zhăng)
- Target and competitor nouns are the same as in Tsang & Chambers where possible (29/48); all appear >50 times in SUBTLEX-Ch corpus (Cai & Brysbaert, 2010)

Analysis
Linear mixed-effect regression (lmerTest); weighted empirical logits aggregated across subjects and over items during critical region (Barr, 2008); Condition as single fixed effect (treatment-coded)

(i) empirical logit of looks to Target vs Competitor
(ii) empirical logit of looks to Competitor vs Distractor

Results

Looks to Target vs Competitor
- Fewer looks to Target in G+S+ vs G+S- (t1 = -3.61, p < .001, t2 = -4.02, p < .001) and G+S+ vs G-S- (t1 = -2.53, p = .01, t2 = -3.30, p = .002)
- No difference between G+S- and G-S- (t1 = 1.02, p = .31, t2 = 0.78, p = .44)

Looks to Competitor vs Distractor
- More looks to Competitor in G+S+ vs G-S+ (t1 = 2.03, p < .05, t2 = 1.77, p = .09) and G+S+ vs G-S- (t1 = 2.09, p < .04, t2 = 2.22, p = .04)
- No difference between G+S- and G-S- (t1 = 1.02, p = .31, t2 = 0.78, p = .44)

Additional analysis
- Within G+S+ condition, greater likelihood to look at Competitor than Target during critical region (t1 = 2.82, p = .03, t2 = 4.36, p = .001; one-sample t-test)

Summary & Conclusions

- Native Mandarin listeners use noun-class information on the classifier to predict an upcoming noun before its acoustic onset.
- No evidence of activation of nouns that share shape-semantic features with the classifier but do not belong to its class (* Tsang & Chambers, 2011)
- Semantics matter within a noun class: Listeners are more likely to (predictively) look at prototypical than non-prototypical candidates.

Next step: Look at L2 learners of Mandarin
We predict stronger role of semantics in L2 vs L1 processing.