

# An experimental test of the temporal sequence principle in Chinese

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## Introduction

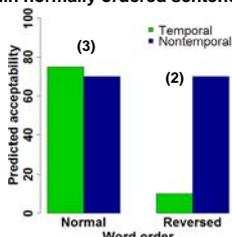
- **Linguistic functionalism** claims that grammatical structure is caused by language use
- The **temporal sequence principle** is a prominent functionalist hypothesis claiming that Chinese word order follows temporal order in the world (Tai, 1985)
- We tested this principle by systematically varying word/world order relationships and examining the effects on native speaker acceptability judgments
- Our results suggest that temporal sequence is at best only a minor influence on word order in Chinese; constructions mostly have their own fixed orders

## The temporal sequence principle

- Tai (1985, p. 50):  
The relative word order between two syntactic units is determined by the temporal order of the states which they represent in the conceptual world.
- Thus in many Chinese constructions, the referent of the **earlier syntactic unit** occurs before the **later unit**, which is why they may not be reversed in the syntax:
  - **Coverb** Ta **zai chufang-li** zuofan.  
he be-in kitchen-in cook  
"He cooked in the kitchen"  
\* ta zuofan **zai chufang-li**
  - **Adverbial** Ta **bing-le** san tian le.  
he sick-perf three day part  
"He has been sick for three days."  
\* ta san tian **bing-le**
  - **Resultative** Ta **pao-lei** le.  
he run-tired part  
"He is tired from running."  
\* ta lei-**pao** le
  - **Serial verb** Zhangsan **shanglou** **shuijiao**.  
Zhangsan go-upstairs sleep  
"Zhangsan went upstairs to sleep."  
\* Zhangsan **shuijiao** **shanglou**
  - **Temporal connective**  
Ni **gei-le** **wo** **qian** **cai** **neng** **zou**.  
you give-perf I money then can go  
"You can't leave until you give me the money."  
\* Ni **cai** **neng** **zou** **gei-le** **wo** **qian**

## Predictions

- (1) Speakers should sense that **word order and temporal order correspond in all constructions**
- (2) If word order follows only from temporal order, **word order should be free when temporal order is**
- (3) Temporality should **always improve acceptability even within normally ordered sentences**



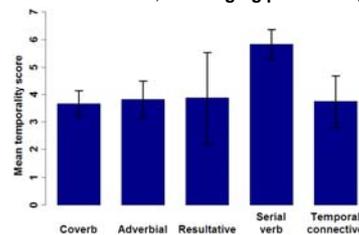
## Experiment 1: Methods

20 naive Chinese speakers rated 120 normally ordered sentences (half from Tai, 1985) on perceived **association of word order and temporal order**:

1 = least associated 7 = most associated

## Experiment 1: Results

- Temporal scores weren't high, and varied within and across constructions, **challenging prediction (1)**:

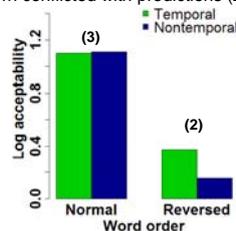


## Experiment 2: Methods

- Goal: Test effect of **temporality on acceptability**
- **120 sentence pairs**: normal order and reversed
  - Classified as **temporal vs. nontemporal** based on median of scores from Experiment 1
- **30 naive Chinese speakers**
- Acceptability judged using open-ended **magnitude estimation** paradigm (Bard et al., 1996)
- Data analyzed with linear mixed effects modeling (Baayen, 2008)

## Experiment 2: Results

- The pattern conflicted with predictions (2) and (3):



- **Contra (2)**, reversing word order in nontemporal sentences greatly reduced acceptability
- **Contra (3)**, sentences with normal order were slightly but significantly worse when they were temporal
- The only pattern robust across all five constructions was a **general preference for normal word order**

## The role of temporal fixedness

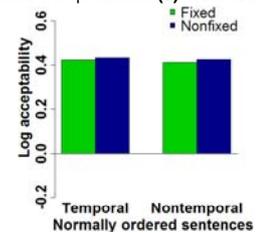
- Word order may be reversible if event order is too
- Serial verb** Zhangsan **kaihui** **xiexin**.  
(reversible) Zhangsan has-meeting write-letter  
"Zhangsan has meetings and writes letters."  
Zhangsan **xiexin** **kaihui**. (also acceptable)

## Experiment 3: Methods

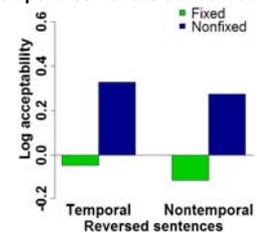
- Goal: Test for effect of temporality on judgments, **taking into account temporal fixedness of events**
- **50 sentence pairs**: normal order and reversed
  - Revised to reduce syntactic violations in reversals
  - Pretested normally ordered sentences on 20 naive Chinese speakers for **temporality** and **temporal fixedness** (fixed vs. nonfixed)
- **26 naive Chinese speakers**
- Acceptability judged using **magnitude estimation**

## Experiment 3: Results

- The pattern for normally ordered sentences again conflicted with prediction (3): **no effects at all**



- The pattern for reversed sentences again conflicted with prediction (2): **reversing nonfixed, nontemporal sentences still hurt acceptability**



- The **preference for normal order** was again the only pattern robust across all five constructions

## Conclusions

- Contrary to the temporal sequence principle, **Chinese word order mostly ignores event order**
- The principle is restricted to a subset of cases:
  - For **temporal sentences that describe fixed-order events**, reversing word order reduces acceptability

## References

- Baayen. (2008). *Analyzing linguistic data*. Cambridge.  
Bard, Robertson, & Sorace. (1996). Magnitude estimation of linguistic acceptability. *Language*, 72 (1), 32-68.  
Tai. (1985). Temporal sequence and Chinese word order. In J. Haiman (Ed.) *Iconicity in syntax* (pp. 49-72). John Benjamins.

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