How do function words influence syntactic priming in sentence production? Evidence from tense and aspect markers in Mandarin Chinese

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Unlike in languages such as English, aspect and tense markers in Mandarin Chinese are represented in the form of individual function words instead of affixes that are attached to the verbs. As an analytic language, Mandarin Chinese expresses grammatical relations through word order and function words [1], yet their role in syntactic encoding during sentence production remains unclear. Pickering and Branigan's study [2] found that tense and aspect of verbs did not influence syntactic priming in English language production. In a series of four syntactic priming experiments, this study investigated whether Mandarin aspect ("*-zhe, -le, -guo, -zai,* and *-zhengzai*") and tense markers ("*-jiang*") influence syntactic priming from active (SVO sentences, S+V+O) versus passive (Bei sentences, O+Bei+S+V) primes on speakers' sentence production.

All experiments followed a 2 (syntactic structure) × 2 (tense/aspect marker) within-participants design, manipulating the syntax, tense and aspect of the prime and examining how this affected syntactic priming of passives. We used a sentence production paradigm in which participants first read a prime sentence and then recalled it verbally, and then orally produced a target sentence using three given cue words (the subject noun, verb, and object noun). In Experiment 1 (N=40), we compared primes with the imperfective aspect marker "*-zhe*" and the perfective aspect marker "*-le*" (see Table 1 for examples). Experiment 2 (N=40) examined the effect of the imperfective aspect marker "*-guo*" in comparison with perfective "*-le*". Experiment 3 (N=40) tested the pre-verbal, stress-bearing imperfective markers "*-zai*" and "*-zhengzai*", which are believed to have different processing profiles than post-verbal markers "*-zhe, -le, -guo*" [3]. Experiment 4 (N=40) compared primes with "*-zai*" (aspect) with "*-jiang*" (tense) to determine whether tense markers modulate structural choice differently from aspect markers.

In all experiments, the results consistently showed a significant syntactic priming effect (more passives produced after passive primes compared to active primes; *p*s < .028), but aspect and tense markers had no significant influence on the production of passives (*p*s > .844; see Figure 1~4). There was no significant interaction, regardless of the perfectiveness, marker position (pre- vs. post-verbal), stress properties, or grammatical category (aspect vs. tense; *p*s > .879). These findings suggest that these function words, unlike major lexical and syntactic elements, do not directly modulate syntactic structure selection during sentence production, consistent with previous findings for English [2].

This null result has important theoretical implications: it provides cross-linguistic evidence on the theory that combinatorial information locates at the lemma stratum of verbs (Pickering & Branigan, 1998). It also indicates that the representation of grammatical markers is independent from the combinatorial processes that govern syntactic structure choice.

Reference

[1] Li, Charles N., and Sandra A. Thompson. Mandarin Chinese: A functional reference grammar. *Univ of California Press*, 1989.

[2] Chen L, He X, Durrleman S. Aspectual Production in Preschool Mandarin-speaking Children with Developmental Language Disorder[J]. *Journal of Child Language*, 2025: 1-32.

[3] Pickering M J, Branigan H P. The representation of verbs: Evidence from syntactic priming in language production[J]. *Journal of Memory and language*, 1998, 39(4): 633-651.

Figure 1: The production of "BEI" sentences in Experiment 1

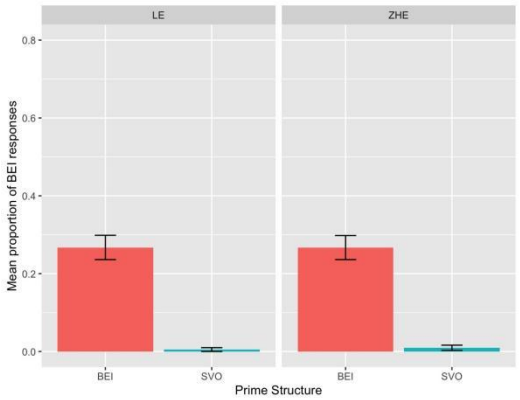

Figure 2: The production of "BEI" sentences in Experiment 2

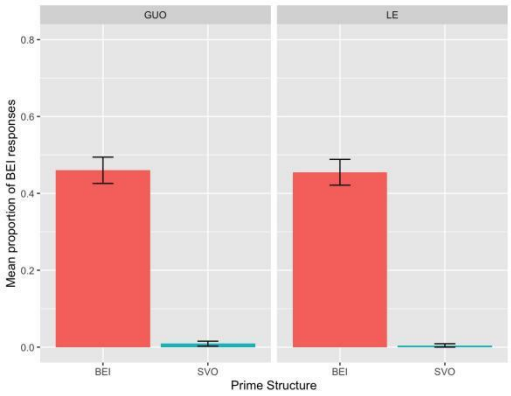

Figure 3: The production of "BEI" sentences in Experiment 3

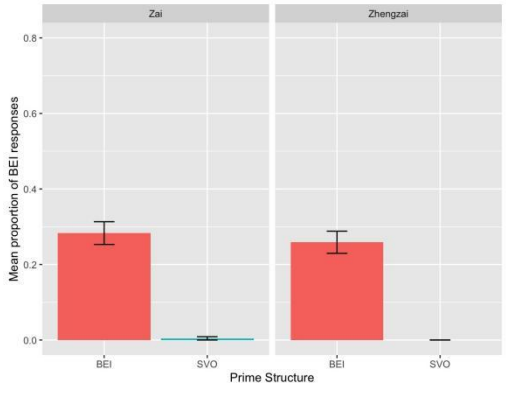

Figure 4: The production of "BEI" sentences in Experiment 4

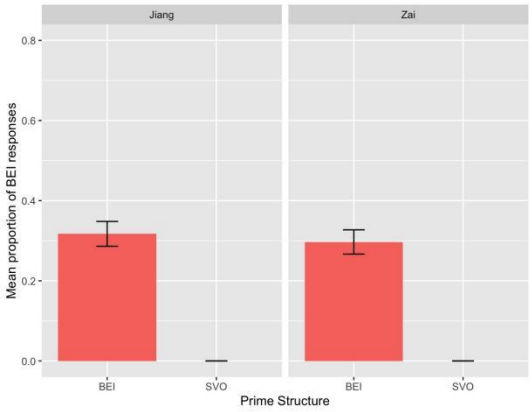

Table 1: Exemplar Priming Sentences and Cue words for Experiment 1; the examples for Experiment 2~4 were similar, only differing in the marker types

Examples for priming sentences							Examples of cue words for target sentences		
Syntactic structure	Aspect marker	Exemplar sentences					Noun 1	Noun 2	Verb
Active sentences	Le	小孩	吃	了		苹果。	奶奶	牛奶	喝
		Xiǎohái	chī	le		píngguǒ.	Nǎinai	Niúnai	hē
		Noun	Verb	Asp		Noun	Noun	Noun	Verb
		Child	eat	Asp		apple.	Grandmother	milk	drink
		The child ate an apple.							
	Zhe	小孩	吃	着		苹果。	奶奶	牛奶	喝
		Xiǎohái	chī	zhe		píngguǒ.	Nǎinai	Niúnai	hē
		Noun	Verb	Asp		Noun	Noun	Noun	Verb
		Child	eat	Asp		apple.	Grandmother	milk	drink
		The child is eating an apple.							
Passive sentences	Le	苹果	被	小孩	吃	了。	奶奶	牛奶	喝
		Píngguǒ	bèi	xiǎohái	chī	le.	Nǎinai	Niúnai	hē
		Noun	Bei	Noun	Verb	Asp	Noun	Noun	Verb
		Apple	by	child	eat	Asp.	Grandmother	milk	drink
		The apple was eaten by the child.							
	Zhe	苹果	被	小孩	吃	着。	奶奶	牛奶	喝
		Píngguǒ	bèi	xiǎohái	chī	zhe.	Nǎinai	Niúnai	hē
		Noun	Bei	Noun	Verb	Asp	Noun	Noun	Verb
		Apple	by	child	eat	Asp.	Grandmother	milk	drink
		The apple is being eaten by the child.							