

Filling and revising a gap in Chinese: What does it tell us about semantic and syntactic processing?

Shukhan Ng & Nicole Y. Y. Wicha (University of Texas, San Antonio)

shukhan.ng@utsa.edu

Gap-filler dependency; Self-paced reading; Sentence completion; Chinese

In processing a gap-filler dependency, the gap is received before its filler. Gaps are structural positions that have little semantic content until linked to fillers. Thus, gap-filler processing may involve the dual goals of building a phrase and completing its meaning. This could cause conflicts of following structural rules or supplying semantic content for the gap. Will the parser violate structural principles to provide a filler for an identified gap? How high is the cost of gap reinterpretation? The present study investigated processing of ambiguous Chinese constructions containing a subject gap, as in (1). The fragment can be analyzed as a right-branching subject clause (SC), where the gap is not filled, or a noun phrase containing a pre-nominal relative clause (RC), where *friend* is the filler. The right-branching structure is overwhelmingly preferred when the clause-initial verb *wait* is received (Ng & Fodor, 2011). Here we determined if Chinese speakers adopt the RC analysis at *friend*. This revision would violate several structural principles (e.g., Minimal Attachment and Minimal Revisions), and would show a preference for filling the gap early despite the greater structural complexity of the RC.

Native Mandarin speakers were tested on a sentence completion task and two self-paced reading tasks. Sentence completion results (n=20) confirm that SC is preferred up to the first noun, i.e., *guest* in (1). However, fragments like (1) were equally likely to be continued as SC or RC. The word-by-word reading (n=36) employed sentences like (2a,b), which differ only in the second noun (*friend* vs. *reply*). At that point, an animate noun makes both analyses possible but an inanimate noun allows only the right-branching analysis. Crucially, if the RC analysis is adopted with *friend* as the head noun, the appearance of the second *de* would force structural revision and *host* would become the head noun. Results showed that the second *de* and *host* in (2a) were read significantly slower than those in (2b), suggesting that at *friend* in (2a), the RC analysis was adopted and the subsequent appearance of *de* caused reanalysis. The second reading task (n=36) employed sentences like (1) and (3). (3) is ambiguous between a noun-complement clause (NCC) and a SC. NCCs have a structure like regular RCs, but the noun after *de* cannot be the filler for any gap in the clause. Each sentence was divided into two parts. The first part could be ambiguous; the second part disambiguated the structure. Reanalysis cost was derived from the reading-time difference of the second part between the ambiguous conditions like (1) and (3) and their unambiguous counterparts. Results showed that the reanalysis cost for (1) was significantly larger than that for (3). This suggests that revising a construction with gap reinterpretation (RC and SC) is more costly than revising one without gap reinterpretation (NCC and SC).

Overall, the parser will sacrifice structural economy for gap-filler completion. Moreover, gap reinterpretation is costly. Further implications are that the parser may take priority in completing the meaning of a phrase, and revising the established semantic relations among arguments is difficult.

- (1) e Dengdai keren de pengyou... (*de*: adnominal marker)
 wait guest de friend
 a. SC: 'Waiting for the guest's friend...' ([S [S [NP e][VP wait [NP guest de friend]]] [VP ...]])
 b. RC: 'The friend who waited for the guest...' ([S [NP [CP [S [NP e][VP wait guest]]] [C de]] [N friend_i]] [VP...]])
- (2) a. [[e_i Dengdai keren de pengyou] de zhuren_i] hen jiaoji.
 wait guest de friend de host very anxious ([RC [e_i wait guest de friend]] de host_i)
 'The host who waited for the guest's friend was very anxious.'
 b. [[e_i Dengdai keren de dafu] de zhuren_i] hen jiaoji.
 wait guest de reply de host very anxious ([RC [e_i wait guest de reply]] de host_i)
 'The host who waited for the guest's reply was very anxious.'
- (3) Part I: e Fucong WangTao de zhishi...
 obey WangTao de instruction
 a. NCC: 'The instruction that (someone) obey WangTao...'
 ([S [NP [CP [S [NP e][VP obey WangTao]]] [C de]] [N instruction]] [VP...]])
 b. SC: 'To obey WangTao's instruction ...' ([S [S [NP e][VP obey [NP WangTao de instruction]]] [VP ...]])
 Part II: NCC: ...was already dispatched. / SC: ... can reduce your mistake.