LOCALITY EFFECTS AND PREDICTABILITY IN SENTENCE CONSTRUCTION: AN INVESTIGATION OF *BA* SENTENCES AND SVO SENTENCES IN MANDARIN CHINESE

Yu Fang[1]   **Haitao Liu**[2,3]

[1] *Tongji University, Shanghai*   [2] *Zhejiang University, Hangzhou*
[3] *Guangdong University of Foreign Studies, Guangzhou*

ABSTRACT

This study investigated the relationship between two critical cognitive factors in constructing alternative *ba* sentences and SVO sentences in Mandarin Chinese: locality effects that predict a processing advantage for sentences where distances between syntactically related words are minimized, and predictability that predicts heavy processing difficulty for a word when its possibility of occurrence is low. Locality effects were measured by dependency distance and predictability was quantified by *n*-gram surprisal and Dependency Grammar (DG) surprisal. The results showed that locality effects and predictability co-exist in sentence construction: (a) there is a competitive relationship between dependency distance and *n*-gram surprisal in constructing naturally occurring *ba* sentences and the corresponding SVO sentences; (b) the competition between dependency distance and *n*-gram surprisal was also found in constructing *ba* sentences and SVO sentences respectively; (c) there is a competitive relationship between dependency distance and *n*-gram surprisal as well as a competitive relationship between dependency

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distance and DG surprisal in constructing naturally occurring *ba* sentences and *ba* sentences converted from SVO sentences. It is worth noting that, in some cases, dependency distance and DG surprisal cooperate with each other. These findings have important implications for theories of language production and cognition.

KEYWORDS

Locality effects   **P**redictability   **C**ompetitive relationship   **L**anguage production   **P**rocessing difficulty

1. INTRODUCTION

Factors affecting language processing difficulties have been greatly concerned in research of both cognitive science and linguistics. One frequently mentioned factor is locality (Gibson 1998, 2000), which suggests the increased cost of integrating two syntactically related words when their distance is long. The locality effects have been explained by memory-based accounts, according to which, a word becomes less accessible in memory due to activation decay or interference from similar items (Gibson 2000; Lewis, Vasishth, and Van Dyke 2006; Van Dyke and McElree 2006). However, non-local dependencies (or long-distance dependencies) are not always difficult to process (Liu, Xu and Liang 2017), because there exist other factors overriding locality effects, such as predictability (Hale 2001; Levy 2008). Predictability, or expectation, refers to people's constant predictions about upcoming elements and expectation-based accounts argue that high predictability reduces processing difficulties. During language comprehension, predictability maximization sometimes occurs in non-locality cases (Konieczny 2000; Levy 2008; Smith and Levy 2013), which indicates that locality and predictability maximization cannot be achieved at the same time. In other words, locality effects may compete with predictability in language comprehension. The present study will test whether the competition exists in language production. To be specific, we will explore the relationship between the two factors at the sentence level, in constructing SVO sentences and sentences with the *ba* construction in Mandarin Chinese.

There has been a long tradition to posit syntactic distance as an

局域效应与预测性在句式构建中的关系探究：
以把字句和主动宾句为例

方昱 [1]   **刘海涛** [2, 3]
[1] 同济大学 [2] 浙江大学 [3] 广东外语外贸大学

摘要

本文基于普通话中能相互变换的把字句及主动宾句，探讨局域效应与预测性两个认知因素在句式构建中的关系。局域效应指出有句法关系的词之间的距离越小，句子越容易处理；预测性则指出单词出现的可能性越小，处理难度越大。本文以依存距离衡量局域效应，以 n 元惊异值和依存句法惊异值衡量预测性。研究结果显示，在句式构建过程中，局域效应与预测性共存：(1) 依存距离与 n 元惊异值在构建把字句与同义主动宾句时存在竞争关系；(2) 这种竞争关系也分别出现在把字句及主动宾句的构建过程中；(3) 依存距离与 n 元惊异值以及依存距离与依存句法惊异值在构建自然出现的把字句与由主动宾句转换得到的把字句时也有竞争关系。值得一提的是，依存距离与依存句法惊异值在某些情况下存在合作关系。这些发现对语言产出和认知理论具有重要意义。

关键词

局域效应　**预**测性　**竞**争关系　**语**言产出　**处**理难度