



## Brief article

# Emphasizing the only character: Emphasis, attention and contrast

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## ABSTRACT

In conversations, pragmatic information such as emphasis is important for identifying the speaker's/writer's intention. The present research examines the cognitive processes involved in emphasis processing. Participants read short discourses that introduced one or two character(s), with the character being emphasized or non-emphasized in subsequent texts. Eye movements showed that: (1) early processing of the emphasized word was facilitated, which may have been due to increased attention allocation, whereas (2) late integration of the emphasized character was inhibited when the discourse involved only this character. These results indicate that it is necessary to include other characters as contrastive characters to facilitate the integration of an emphasized character, and support the existence of a relationship between Emphasis and Contrast computation. Taken together, our findings indicate that both attention allocation and contrast computation are involved in emphasis processing, and support the incremental nature of sentence processing and the importance of contrast in discourse comprehension.

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## 1. Introduction

In everyday utterances, people emphasize the things they view as important. For example, in the sentence “It was Cong Yan who bought the tickets”, the name “Cong Yan” is emphasized using the cleft-structure “it was... who...” because the speaker/writer considers this information to be important. For a conversation to be successful, the reader/listener needs to extract pragmatic information (e.g., emphasis) based on semantic and syntactic analyses (Grice, 1975). However, what cognitive processes are

involved in emphasis processing? The present study focused on this issue.

There are at least two possible cognitive processes related to emphasis processing. First, emphasis may modulate the reader's/listener's attentional allocation (Sanford & Sturt, 2002). Evidence supporting this view comes from several psycholinguistic studies. For example, several eye-tracking studies show that emphasized words are processed more quickly than non-emphasized words (i.e., emphasis facilitation effect, e.g., Birch & Rayner, 2010; Chen, Li, & Yang, 2012; Morris & Folk, 1998), indicating that more attention is allocated to emphasized words than to non-emphasized words. In addition, recent electrophysiological research has found that the P2 component, which is often interpreted as an indicator of attention allocation, is associated with emphasis processing (Chen, Wang, & Yang, 2014). However, this result is controversial since other eye-tracking studies (Ward & Sturt, 2007) and electrophysiological studies (Cowles, Kluender, Kutas, &

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Polinsky, 2007; Stolterfoht, Friederici, Alter, & Steube, 2007) did not find similar effects.

The second process related to emphasis processing is “contrast”. Emphasis, referred to as “focus” in the linguistic literature, is viewed as implying a contrast between the emphasized element and its alternative (Halliday, 1967; Umbach, 2004). Contrastive information can be computed rapidly during sentence processing (Altmann & Steedman, 1988; Ni, Crain, & Shankweiler, 1996; Paterson et al., 2007). For example, Altmann and Steedman (1988) found that given the context “He saw that there was a safe with a new lock and a safe with an old lock”, the target sentence “He opened the safe with...” was expected to be followed by the modifier “new/old lock” to distinguish the two safes. This indicated that the contrast between the two safes had been established and affected the reader’s anticipation immediately. Following their study, Ni et al. (1996) reported that the garden path effect can be eliminated by placing the focus-particle “only” at the beginning of the sentence, because “only” establishes a contrastive relationship which indicates the correct interpretation of the ambiguous verb. This supported the idea that focus implies contrast because “only” is used to mark focus (see also Filik, Paterson, & Liversedge, 2005, 2009; Liversedge, Paterson, & Claves, 2002; Paterson, Liversedge, & Underwood, 1999; Sauermann, Filik, & Paterson, 2013; Sedivy, 2002). Similar evidence comes from Paterson et al. (2007), which showed that processing difficulty increases when the contrastive implications of “only” and “but” conflict with each other. However, the particles “only” and “but” used in these studies actually marks contrast rather than emphasis, whereas the relationship between Emphasis and Contrast has not been confirmed. Recent electrophysiological studies have also shown different effects of cleft-structure and focus-particle “only” on sentence processing (Drenhaus, Zimmermann, & Vasishth, 2011). Thus, further evidence is needed to examine whether emphasis implies contrast. Furthermore, in visual attention studies, contrast, such as brightness contrast or color contrast, is viewed as an effective tool to arouse attention (e.g., Itti & Koch, 2001). Thus, it remains to be determined whether there is a relationship between attention and contrast or they are independent of each other in discourse comprehension.

To address these issues, we investigated the processing of one-sentence mini-discourses (Table 1) by Chinese readers. Emphasis was indicated by the Chinese focus-particle “*shi*”, which plays the same role as the cleft-structure in English for marking emphasis (Chen et al., 2012; Fang, 1995), and is a singular word similar to “only” in form. It was adopted because in English the cleft-structure is different from the focus-particle “only” both in pragmatic functions (i.e., marking emphasis or contrast) and surface forms (i.e., syntactic structure or adverb), and thus any differences observed between them are hard to explain. In the present experiment, contrast was manipulated by introducing one or two character(s) in the context. Two characters would create contrast whereas one character would not (Altmann & Steedman, 1988).

We hypothesized that: (1) if emphasis modulates attentional allocation, emphasis processing should be facilitated, with emphasized names being processed more quickly than non-emphasized names; (2) if emphasis implies contrast, contrastive characters should be necessary for the emphasized character to construct a meaningful situation model, resulting in increased processing difficulty and time for emphasized words in the absence of contrastive characters; and (3) if attention allocation and contrast computation are different aspects of the same process, these effects should influence the same measures in a similar manner; on the other hand, if they are distinct cognitive processes, the effects may occur independently on different measures or show different patterns in the same measure.

## 2. Method

### 2.1. Participants

32 Chinese university students with normal or corrected vision (mean = 23 years, range = 19–26 years; 16 males), all of whom were native speakers of Chinese.

### 2.2. Materials

The two factors Contrast (with vs. without a contrastive character) and Emphasis (emphasis vs. non-emphasis) were manipulated through orthography.

**Table 1**

An example of the experimental materials.<sup>a</sup>

Condition	Sentences
With a contrastive character  Emphasis	周珍 和 袁聪 来到 公园 后 是  袁聪  买了 门票。 Zhen Zhou and Cong Yan arrived at the park after <i>shi</i> <b>Cong Yan</b> bought the tickets After Zhen Zhou and Cong Yan arrived at the park it was   <b>Cong Yan</b>   who bought the tickets.
With a contrastive character  Non-emphasis	周珍 和 袁聪 来到 公园 后  袁聪  买了 门票。 Zhen Zhou and Cong Yan arrived at the park after <b>Cong Yan</b> bought the tickets After Zhen Zhou and Cong Yan arrived at the park   <b>Cong Yan</b>   bought the tickets.
Without a contrastive character  Emphasis	袁聪 来到 公园 后 是  袁聪  买了 门票。 Cong Yan arrived at the park after <i>shi</i> <b>Cong Yan</b> bought the tickets After Cong Yan arrived at the park it was   <b>Cong Yan</b>   who bought the tickets.
Without a contrastive character  Non-emphasis	袁聪 来到 公园 后  袁聪  买了 门票。 Cong Yan arrived at the park after <b>Cong Yan</b> bought the tickets After Cong Yan arrived at the park   <b>Cong Yan</b>   bought the tickets.

<sup>a</sup> Note: Target words are in bold. Focus-particles are in italics. Vertical lines indicate the regions of analysis. The bold, italics, vertical lines, and spaces are shown for illustration purposes only.

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