**Context Effects in Language Comprehension**

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**Abstract**

# Context is essential for language comprehension. When we read sentences, context offers information about word meaning, part of speech and its representation in the world. Context has the effect of facilitating our recognition of words whose meaning is congruous with their preceding context. It has been classified according to the two stages of lexical processing, namely the context effect on access and the context effect on integration. The effects context exerts on these two stages have been proved by empirical studies. Researching on context effect helps us better understand the language comprehension system. Specifically, it provides evidence for whether the language processing system is modular or interactive.

# *Keywords:* context effect, word recognition, lexical processing, language comprehension system

**Context Effects in Language Comprehension**

**Introduction**

Context effects in lexical processing have long been under the spotlight in cognitive linguistics. Understanding word meaning depends on context. As indicated by Zhang (1998), context can eliminate vagueness, ambiguity and generality in language. In terms of its effect on vagueness and ambiguity, Saeed concludes context can either fossilize word meaning by forming groups of words such as idioms and collocations, or diversify word meaning by influencing words to match their meaning with the context (2022). The viewpoint that context exerts effects on our perception of word meaning is widely accepted.

## Evidence for Context Effect

The recognition of a word is facilitated when it’s compatible with its context, which is proved by experiment data such as a decrease in the reading time of a word (West & Stanovich, 1978), a lowered visual duration threshold for a word (Tulving & Gold, 1963), and a faster naming when preceded by congruous contexts (Stanovich & West, 1979). Moreover, in Nation and Snowling’s (1998) study on children’s reading ability with respect to their comprehending and decoding skills, they found dyslexic children, who are impoverished in decoding ability, have better performance in reading tasks than children with poor reading comprehension skills, as the former benefit more from the context. Furthermore, context effects on reading have also been confirmed in readers’ eye movements. In a study conducted by Ehrlich and Rayner (1981), they found the fixation duration on the target word was shorter when it is contextually predictable, indicating the shorter recognition time of words with appropriate context.

The phenomenon that the word recognition is facilitated when the word is immediately preceded by a semantically related word is called semantic priming effects. A possible reason for this phenomenon is that the priming effect is generated by the shared features between objects. For instance, in the phrase “boys and girls”, since “boys” and “girls” share the feature of describing gender, thus when the meaning of “boys” is accessed, the meaning of “girls” is also activated. This explanation is based on the assumption that the meaning of a word is not a specifically linguistic representation, but rather a general conceptual one (Tanenhaus & Lucas, 1987). Another possible explanation for the semantic priming effect describes this process as strictly intra-lexical (Fodor, 1983). By this explanation, Groups of words that appear in high frequency have formed connections between the lexical nodes that represent those words. For example, because “salt” and “pepper” usually appear together, when “salt” is activated, the recognition threshold of “pepper” will be lowered, generating a facilitating effect.

**The Classification of Context Effect**

Context effect has been categorized according to the stages of the lexical processing process, which is generally argued to include at least two stages. The first stage involves using sensory input to make contact with the candidate lexical representation. The activated lexical candidates involve Information such as a word’s pronunciation, spelling, syntactic category and meaning which is then available for the language processing system. This stage is generally held to be word recognition (Tanenhaus & Lucas, 1987). The second stage involves the selection, elaboration and integration of information made available in the first stage with context (Cairns et al., 1981). The contextual effect is divided in the light of these two lexical processing stages into context effect on access and context effect on integration. Studies have been conducted to uncover the influence of context on each stage of lexical processing.

The two-process theory put forward by Posner and Synder (2004) reveals the context effect on access. It suggests linguistic context affects word perception through two processes that act independently and differ in the utilization of attentional capacity, both of which are during the first stage of lexical processing. Shortly, The automatic spreading activation happens because when stimulus information activates a memory location, some of the activation automatically spreads to semantically related memory locations that are nearby. This process is automatic and does not utilize attentional capacity, and doesn’t affect the retrieval of information from memory locations unrelated to those activated by the context. Therefore this process causes a contextual facilitation effect without causing an inhibitory effect when a word is incongruous with the context. In contrast, the conscious-attention mechanism utilizes attentional capacity to respond to the preceding context by directing the limited-capacity processor to the memory location of the expected stimulus, and because of the shift of the limited-capacity processor to a location some distance away in the memory network, this process inhibits the retrieval of information from inactivated memory locations (Neely, 1977). The two-process theory nicely explains the experiment results of Stanovich and West (1979), in which they observed both contextual facilitation effect and inhibitory effect for fourth-grade and sixth-grade subjects and contextual facilitation effect for adult subjects. In particular, The lack of inhibitory effect in adult subjects might be because the recognition process is so fast that it occurs before the slower acting conscious-attention mechanism process can have an effect. In addition, other studies of contextual effect using the lexical decision task have also provided support for the two-process theory of Posner and Synder (Fischler, 1977; Tweedy et al., 1977).

Electrophysiological measures, which don’t require behavioral responses, provide a means of researching context effect on access and integration without the overt interference of the decision or response process. The ERP component N400, which is originally described as a negative shift in the ERP waveform occurring nearly 400 ms post-stimulus onset, responds differently to words according to their congruity to their contexts. Specifically, the amplitude of N400 of a word incongruous with its context is much higher than that of a word congruous with its context. By analyzing the data of the amplitude of N400, researchers found accounts for the context effect on different stages of lexical processing. On one view, Brown and Hagoort (1983) argue that N400 amplitude is an index of processes of semantic integration. While Kutas and Federmeier (2000) claim that the reduced N400 amplitudes reflect facilitated access to lexical information. Hybrid hypotheses argue that the N400 reflects a summation of several narrower component processes, indicating both context effect on access and integration (Pylkkänen & Marantz, 2003).

### Significance of Researching on Context Effect

The research on the context effect helps find out how our brain processes language. The language comprehension system has been of great research value and many researchers have made predictions about the way our brain processes information. Some claim the language processing to be modular while others argue it to be interactive. Although linguists generally agree that language can be described regarding several subsystems, such as morphology, syntax, and phonology, there has been considerable debate over whether the language processing process is as modular as the language. Specifically, The modular hypothesis demonstrates language processing system consists of a set of independent modules corresponding to the subsystems of language (Fodor, 1983), while the interactive models, on the contrary, suggest that information from different domains is shared throughout the language comprehension system (Marslen-Wilson & Welsh, 1978).

In a study by Gennari et al. (2007), researchers used fMRI to examine the context-dependent combinatorial processes, which refers to the process that a word is disambiguated by its context while its context’s meaning is also context-dependent in varying degrees. They found evidence for the interactive theory of language comprehension system, that processing context-dependent meaning may involve interactions between the frontier and posterior area. Furthermore, The evidence for interactive models has also been elicited in a study by Sereno et al. (2003). The researchers analyzed the electrophysiological response to the lexical access influenced by prior context and found the result more compatible with an interactive account than a modular account. Besides, there is also a viewpoint indicating language processing system has both interactive and modular properties (Tanenhaus & Lucas, 1987).

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**References**

Brown, C., & Hagoort, P. (1993). The Processing Nature of the N400: Evidence from Masked Priming. *Journal of Cognitive Neuroscience*, *5*(1), 34–44. https://doi.org/10.1162/jocn.1993.5.1.34

Cairns, H. S., Cowart, W., & Jablon, A. D. (1981). Effects of prior context upon the integration of lexical information during sentence processing. *Journal of Verbal Learning and Verbal Behavior*, *20*(4), 445–453. https://doi.org/10.1016/s0022-5371(81)90551-x

Ehrlich, S. F., & Rayner, K. (1981). Contextual effects on word perception and eye movements during reading. *Journal of Verbal Learning and Verbal Behavior*, *20*(6), 641–655. https://doi.org/10.1016/s0022-5371(81)90220-6

Fischler, I. (1977). Associative facilitation without expectancy in a lexical decision task. *Journal of Experimental Psychology: Human Perception and Performance*, *3*(1), 18–26. https://doi.org/10.1037/0096-1523.3.1.18

Fodor, J. A. (1983). *The Modularity of Mind: An Essay on Faculty Psychology*. A Bradford Book / MIT Press.

Gennari, S. P., MacDonald, M. C., Postle, B. R., & Seidenberg, M. S. (2007). Context-dependent interpretation of words: Evidence for interactive neural processes. *NeuroImage*, *35*(3), 1278–1286. https://doi.org/10.1016/j.neuroimage.2007.01.015

Kutas, M., & Federmeier, K. D. (2000). Electrophysiology reveals semantic memory use in language comprehension. *Trends in Cognitive Sciences*, *4*(12), 463–470. https://doi.org/10.1016/s1364-6613(00)01560-6

Marslen-Wilson, W. D., & Welsh, A. (1978). Processing interactions and lexical access during word recognition in continuous speech. *Cognitive Psychology*, *10*(1), 29–63. https://doi.org/10.1016/0010-0285(78)90018-x

Nation, K., & Snowling, M. J. (1998). Individual Differences in Contextual Facilitation: Evidence from Dyslexia and Poor Reading Comprehension. *Child Development*, *69*(4), 996–1011. https://doi.org/10.1111/j.1467-8624.1998.tb06157.x

Neely, J. H. (1977). Semantic priming and retrieval from lexical memory: Roles of inhibitionless spreading activation and limited-capacity attention. *Journal of Experimental Psychology: General*, *106*(3), 226–254. https://doi.org/10.1037/0096-3445.106.3.226

Posner, M., & Synder, C. (2004). *Cognitive Psychology: Attention and cognitive control* (Vol. 12). Psychology Press.

Pylkkänen, L., & Marantz, A. (2003). Tracking the time course of word recognition with MEG. *Trends in Cognitive Sciences*, *7*(5), 187–189. https://doi.org/10.1016/s1364-6613(03)00092-5

Saeed, J., I. (2022). *Semantics (Introducing Linguistics)* (5th ed.). Wiley-Blackwell.

Sereno, S. C., Brewer, C. C., & O’Donnell, P. J. (2003). Context Effects in Word Recognition. *Psychological Science*, *14*(4), 328–333. https://doi.org/10.1111/1467-9280.14471

Stanovich, K. E., & West, R. F. (1979). Mechanisms of sentence context effects in reading: Automatic activation and conscious attention. *Memory & Cognition*, *7*(2), 77–85. https://doi.org/10.3758/bf03197588

Tanenhaus, M. K., & Lucas, M. M. (1987). Context effects in lexical processing. *Cognition*, *25*(1–2), 213–234. https://doi.org/10.1016/0010-0277(87)90010-2

Tulving, E., & Gold, C. (1963). Stimulus information and contextual information as determinants of tachistoscopic recognition of words. *Journal of Experimental Psychology*, *66*(4), 319–327. https://doi.org/10.1037/h0048802

Tweedy, J. R., Lapinski, R. H., & Schvaneveldt, R. W. (1977). Semantic-context effects on word recognition: Influence of varying the proportion of items presented in an appropriate context. *Memory & Cognition*, *5*(1), 84–89. https://doi.org/10.3758/bf03209197

West, R. F., & Stanovich, K. E. (1978). Automatic Contextual Facilitation in Readers of Three Ages. *Child Development*, *49*(3), 717. https://doi.org/10.2307/1128240

Zhang, Q. (1998). Fuzziness - vagueness - generality - ambiguity. *Journal of Pragmatics*, *29*(1), 13–31. https://doi.org/10.1016/s0378-2166(97)00014-3