A time window of 3 s in the aesthetic appreciation of poems

Chen Zhao,¹ Dongxue Zhang,¹ and Yan Bao¹,²

Abstract: We studied the effect of time windows of a few seconds on the aesthetic appreciation of poems. Both Chinese and German subjects rated traditional Chinese poetic verses more beautiful in a time window of approximately 3 s, irrespective of understanding the poetic content. This observation suggests a common temporal preference for poetry appreciation across a different language background.

Keywords: culture; emotion; poetry appreciation; time window

Temporal processing in neural systems is characterized by a time window of approximately 3 s. This temporal segmentation is reflected in cognitive processes like sensorimotor synchronization, intentional movements, temporal perception, verbal communication, attentional modulation, and on the neural level in the temporal modulation of cortical sensitivity (Wang, Lin, Zhou, Pöppel, & Bao, 2015; for an overview and mechanisms involved, see Bao et al., 2015; Pöppel & Bao, 2014). With respect to verbal communication, it is observed that spontaneous speech is also embedded in this time window, giving it a rhythmic structure (Vollrath, Kazenwadel, & Krüger, 1992). This temporal segmentation is also reflected in poetry observed in almost every culture. Specifically, the duration of a spoken verse typically lasts approximately 3 s (Turner & Pöppel, 1988). Apparently, poets of all cultures have an implicit knowledge of how to organize their poetic thoughts in time, and the reciting of poems is, thus, naturally embedded in a 3-s frame accordingly. Possibly, this temporal frame plays an important role in the aesthetic appreciation of poems. Therefore, the present study aims to investigate whether a temporal window of 3 s provides an optimal frame for the aesthetic appreciation of poems. Furthermore, whether this time window is modulated by emotional valence is also tested.

Thirteen Chinese and 13 German university students participated in this study, the latter without any knowledge of the Chinese language. They listened to recordings of unfamiliar traditional Chinese poetic sentences. Each sentence contained two verses with five Chinese characters per verse. The original recordings were pre-rated with respect to their poetic emotions (happy, sad, or neutral). Since poetry is rarely neutral, we selected for this study 30 sentences with two emotional types (half happy and half sad) as experimental material. All 15 sentences in each emotional type were modified using SONY Sound Forge into four high-quality versions of different poetic durations (i.e., each verse of the poetic sentence lasted for 1.5, 2, 3, or 4 s, respectively). The resulting 120 sentences were used twice each in random sequence, making a total of 240 trials arranged in eight blocks. Each trial started with a 300-ms pure tone followed by the recording of a poetic sentence. After a blank screen for 800 ms, the question “How beautiful does the sentence sound?” (in German or Chinese), and a bipolar 9-point Likert scale (1 = very ugly to 9 = very beautiful) appeared simultaneously and remained on the screen until the subject responded. The intertrial interval varied between 1 and 2 s. A practice session with neutral sentences of the same four duration levels was arranged before the main experiment to help the subjects become familiar with the task and set up a rating reference.

The data were subjected to a three-way (duration vs. culture vs. emotion) analysis of variance, which revealed a significant main effect only for poetic duration, \( F = 44.009, p < .001, \eta^2 = .857 \). Interactions were non-significant except the interaction between duration and culture, \( F = 7.913, p < .001, \eta^2 = .519 \), as shown in Figure 1. For German subjects, the adjacent difference between the 2- and 3-s duration levels was not significant, nor was the difference between the 1.5- and 4-s levels. However, the difference between the 1.5- and 2-s levels as well as the difference between the 3- and 4-s levels were both significant (\( p < .001 \) for both cases). For Chinese subjects, all rating differences were significant (\( p < .05 \) for all pairs) except the difference between the 2- and 4-s duration levels. The ratings of the two cultural groups were significantly different.

¹School of Psychological and Cognitive Sciences, Peking University, Beijing, China. ²Institute of Medical Psychology and Human Science Center, Ludwig-Maximilians-University, Munich, Germany

Correspondence: Professor Yan Bao, School of Psychological and Cognitive Sciences, Peking University, 5 Yiheyuan Road, Beijing 100871, China. Email: baoyan@pku.edu.cn

Received 23 March 2017. Accepted 7 August 2017.
from each other at all duration levels (p < .05 for all pairs) except the 2-s duration.

The aesthetic ratings of the two groups were highest for the 2- and 3-s durations. These results confirm an effect of an optimal time window on poetry appreciation. For both the Chinese subjects, who could understand the language, and the Germans, who could not, only when the duration of each verse fitted into a 2–3-s time window did the poetry sound most beautiful. This aesthetic preference suggests an optimal time window that creates a temporal frame for processing sensory information. Within this frame, information is integrated into a coherent percept, and the rhythm of information flow is appreciated.

Despite sharing a common time window, the two cultural groups differed significantly in the patterns of their poetry appreciation. For the Chinese subjects, the shortest duration verses were experienced as ugly, while the longest ones were acceptable. No such difference between the shortest and longest durations was found for the German subjects. Accordingly, the German subjects had only two stages of rating (1.5 and 4 s in the lower stage; 2 and 3 s in the higher stage), while the Chinese had three (1.5 s in the lower stage; 2 and 4 s in the middle stage; and 3 s in the higher stage), plus a larger rating range. These patterns suggest that Chinese subjects seem to be more sensitive in discriminating the aesthetic differences of poetry, presumably resulting from their comprehension of the language. Although all poems selected for this study were unfamiliar to the Chinese subjects, the Chinese subjects still might have benefited from the semantic processing of the Chinese poems, while for the German subjects, this was not possible. The common ground and the differences in poetry appreciation between Chinese and German subjects suggest that although poetry appreciation is modulated by culture, its temporal frame for appreciating the aesthetic value is independent of the specific poetic content. The time window of 3 s is not determined by the linguistic content, but is implemented by a pre-semantic neural process that provides an operational platform for information to be processed (Bao et al., 2015; Pöppel & Bao, 2014).

Intuitively, we expected an emotional modulation on poetry appreciation, but no such effect was observed between the happy and sad poems. This might be related to the unfamiliar material we deliberately selected. Even for the Chinese, who understood the language, the poetic content could not be fully grasped, thus weakening the extraction of poetic emotions.

The present study shows on the one hand that a psychological approach can help to better understand the cognitive processes underlying aesthetic appreciations, and on the other hand that aesthetic material, such as poems, can be used as experimental stimuli to study human cognition. Since only Chinese poems were used in this cross-cultural experiment, further studies are needed to check whether the observed poetic appreciation pattern can be replicated when Chinese and German participants are exposed to German poems.

Disclosure of conflict of interest: The authors declare that there are no conflicts of interest.

Acknowledgments: This study was supported by the National Training Program of Innovation for Undergraduates of China, and the National Natural Science Foundation of China (Projects 31371018 and 31771213).

References


学霸图书馆（www.xuebalib.com）是一个“整合众多图书馆数据库资源，提供一站式文献检索和下载服务”的24小时在线不限IP图书馆。

图书馆致力于便利、促进学习与科研，提供最强文献下载服务。

图书馆导航：
图书馆首页 文献云下载 图书馆入口 外文数据库大全 疑难文献辅助工具