

LETTER TO THE EDITOR

On the Influence of Negative Emotion on Conflict Processing in Ecological Environment

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According to the environmental impact, the conflict between competitive responses is monitored and conflict adaptation is triggered. There is no consensus on the impact of negative emotions on conflict adaptation effect (CAE). It is found that the relationship between emotion and conflict adaptation is affected by the correlation of conflict tasks of emotional stimulus under environmental impact and whether the control task itself stimulates or reacts to conflict. This study found that there was an interaction between task relevance of emotional stimuli and types of conflict tasks under environmental impact. Once conflict control occurs in the subsequent response phase, unrelated negative emotions may have disappeared. This may explain why unrelated emotional stimuli have no effect on CAE.

I Introduction

Albina A. Nesterova, Nigina S. Babieva, Aleksandr V. Greenenko, Irina E. Sokolovskaya, Natalia A. Krasheninnikova, Inna V. Merenkova published “The Eco-Psychological Approach: Designing Parent Education and Support Programs in an Inclusive School” on Issue 107, Pages: 737-742, Article No: e107089, Year: 2019, in the article, The article is devoted to the problem of increasing the effectiveness of a psychologist’s educational activities with parents in an inclusive school (Nesterova et al. 2019). It has been proposed to use the guidelines of the eco-psychological approach for designing programs for work with students’ parents. The main point of these guidelines is the organization of the subject-generating interaction in the educational environment. The author presents the experience of designing and implementing the work program of the parent club, taking account of the main provisions and principles of the eco-psychological approach, aimed at developing students’ adaptation resources.

Initially, because of the small stimulus-response set and the lack of a stable CAE in Flanker task, the researchers interpreted the result as a potential negative priming effect masking the generation of CAE (Wendt and Lunarodriguez 2009). But on the basis of improving the task set, CAE was stably observed. Manifested feedback in Flanker task by adding reward and punishment. They proved the existence of CAE, and found that there were significant CAE under both neutral and negative conditions. Van's research not only proved Flanker task’s availability of observing conflict adaptation, but also supported the idea that emotion and cognition need to be combined to induce adaptive behavior. Some researchers believed that CAE in Simon task was fit for both Conflict Monitoring Theory and Feature Repetition (Hommel et al. 2004), because stable CAEs were capable of observing in both completely and partially changing of the stimulus- response (Wühr and Ansorge 2005). Emotional images

or reward-punishment were used to investigate CAEs' changes in Simon conflict. used emotional word-inducing technical to explore the effects of emotional valence and arousal on conflict adaptation, found no post-conflict adjustments in Simon task (Chen et al. 2017). Researches with Flanker paradigm had come to the conclusion that negative emotion could improve post-conflict adaptation behavior, while those with Simon task could not. Above conclusion indicates emotion's task-relevance may have interaction with the type of conflict task, then affect the influence of emotion on conflict adaptation. Therefore, not only are we interested in the interaction between task relevance of emotional stimulation and type of conflict task, but also how both of them impact on the relationship between emotion and CAE (Aykut and Isik 2018).

II Emotional Picture Flanker Task

Participants were tested on PCs individually in a testing room. Stimulus presentation was controlled by a professional software timer. Prime and target words were written in Times New Roman bold, 36 pt. E-prime Pictures were 6 cm (height) × 8 cm (width) denoting a visual angle of 6.8° × 9.1° at a constant viewing distance of approximately 60cm. The experiment was run on a Dell Computer and programmed in E-Prime (Psychology Software Tools, Pittsburgh, PA). Targets appeared at the center of the screen on white background.

With negative valence (Mvalence = 2.80 [0.43] and Marousal =5.37 [0.72]) and another half with neural valence (Mvalence =5.06 [0.12] and Marousal =3.24 [0.81]) . Thus valence and arousal varied significantly, $F(1, 39)$ valence = 1038.84, P valence <.001; $F(1, 39)$ arousal = 156.50, P arousal <.001. Pictures were presented in full size (1024 × 768 px) on the computer screen.

Prime stimuli were the Chinese two-character words chosen from the Modern Chinese Emotional Word System (CAWS) (Wang et al. 2008), including 40 negative words (20 adjectives, 20 nouns), and 40 neutral words(of which 20 Adjectives, 20 nouns) , shown in Table 1. The valence, arousal and dominance varied significantly, $F(1, 39)$ valence = 2688.49, P valence <.001; $F(1, 39)$ arousal =102.54, P arousal <.001; $F(1, 39)$ dominance =823.23, P dmoinance <.001.

Table 1. Chinese emotional words parameter

Type	Mvalence (SD)	Marousal (SD)	Mdominance (SD)
Negative	2.33 (0.21)	6.67 (0.42)	2.64 (0.30)
Neural	4.96 (0.24)	4.70 (1.16)	5.11 (0.46)

The Emotional Picture Flanker Task was identical to the Emotional Word Flanker Task except for two changes. First, The emotion inducing stimulus were negative or neural IAPS-pictures. The emotional pictures were present after '+' fixation trials. Affective responses elicited by the interspersed picture presentations should consequently have overlapped with conflict processing in time. Second, the target and flanker stimulus were changed into letters (E, H, K, N). participants were instructed to press 1 if the middle word was E , 2 if it was H, 9 if it was K and 0 if it was N. Target was in the middle of the five letter and rest of them were flanker stimulus. This yielded a block of 160 trials with almost an equal number of C, and I trials.

Following most conflict adaptation studies, we focused on RT data, with additional analyses of the error rate. Practice trials, first trials after each break, and trials with RTs exceeding three SD were excluded F or the RT analysis, erroneous responses were discarded. Also, for the error rate analysis, the first trial of each run and trials

following an error were excluded to avoid interfering effects of errors on the affective judgment task (Aarts et al. 2012). After exclusion of these trials, mean RTs and error rates were computed for each condition. The CAE was defined as the difference between the congruency effect after previously congruent trials (cI-cC) and the congruency effect after previously incongruent trials (iI-iC). Due to our focused interest in conflict adaptation, we only conducted follow-up analysis related to the interaction of previous-trial congruency by current-trial congruency.

III Discussion

In this study, we investigated interactions between emotional valence, task relevance of emotion, and CAE in stimulus conflict task. Different paradigms induced negative or neural emotion. Increased reaction time under task relevant condition indicated that CAE increased when a negative, task-relevant emotional word was shown as the main conflict-inducing stimuli. While decreased CAE was also found by following a negative, task-irrelevant emotional picture. Our findings revealed that task-relevant negative emotion enlarged conflict adaptation effect in stimulus conflict task. In the contrast, task-irrelevant negative emotion hindered conflict adaptation effect in Flanker task, which also confirmed Kanskep's (2011a) conclusion.

When emotional stimuli were related to conflict tasks, some studies have proved that conflict itself was an aversion signal, that is, conflict itself was negative, according to conflict monitoring theory. The studies that came to this conclusion used either Stroop or Flanker tasks. So these studies have come to the conclusion that the assessment of stimulus conflict was negative. Negative emotion further strengthened the negative emotion induced by conflict task itself. Therefore, it further strengthened the processing process of conflict task itself. As a result, CAE was strengthened. From the perspective of limited cognitive resources, it was also explained that emotions had a corresponding reduction effect on conflict adaptation when emotions were not related to conflict tasks. The different results of emotional arousal caused by the correlation between the emotional stimulus and the task may be due to the allocation and utilization of cognitive resources. When the emotional stimuli were presented in a form unrelated to the task, that is, between tasks, the individual not only responded to the target stimuli according to the instructions, but also paid attention to and processed the emotional information after the task. Competing for part of the processing resources of the individual led to hindering the subsequent conflict task. When the emotional stimulus was embedded in the cognitive task, the emotion itself act as the target stimulus and was related to the task. Individuals could process the emotional stimulus at the same time, and did not need to use additional cognitive resources. Emotion was able to promote the generation of CAE when related. Emotion hindered the generation of CAE when emotional stimulus was not related to task.

But in the above studies, conflict control belonged to stimulus conflict. Previous studies have shown that stimulus conflict occurred in the early stage of cognitive control, and response conflict occurred relatively late. There was an obvious difference between the two on the time course. Does this affect the effect of emotion on conflict adaptation? Is it possible to get similar results from Simon task? In order to further investigate whether the influence of the emotional stimulus on conflict adaption effect existed in response control task, Study 2 researched negative emotion in the Simon task.

We found conflict adaptation effect in error rate data [$F(1, 31) = 10.17, p < .001, \eta^2 = .35$]. All main effects and interactions were null ($ps > .05$).

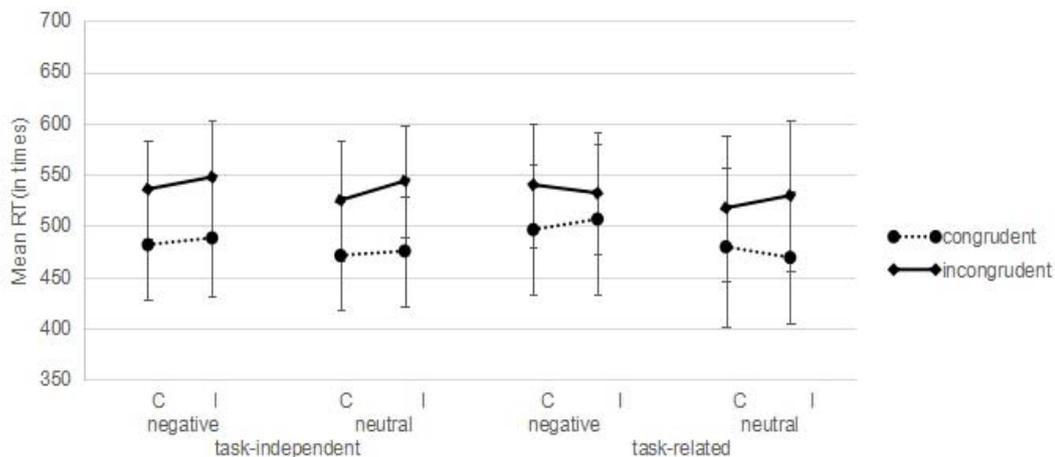


Figure 1. The average RTs of negative and neutral emotional stimuli in Flanker tasks under task-relevant and task-irrelevant conditions

IV Negative Emotion on Response Conflict Task

Simon task is different from Stroop and Flanker tasks because its conflict occurs between the irrelevant stimulus feature and the relevant response feature. In contrast, the Stroop and Flanker tasks induce a conflict between task-relevant and task-irrelevant stimulus features. The Stroop task is associated with the inhibition of prepotent responses. In contrast, the Flanker task is associated with the resistance to distractor interference. Based on the results of study 1, this experiment changed the Simon task to explore the specific mechanism of the impact of emotional stimulation task and emotional valence on conflict adaptive effects. The experimental results verified the hypothesis that negative emotions promoted conflict adaptive effects when emotional stimuli were related to tasks. When tasks were not related, although there were CAEs in Simon tasks, under both negative emotions and neutral emotions conditions. There was no significant difference in quantity, which means that emotional valence had no effect on the conflict adaptation effect under this condition, which was consistent with the findings of. When the target stimuli in the Simon mission were emotional, negative emotions promoted post-conflict behavior adjustments compared to neutral emotions. This result proved to some extent that the task relevance of emotional stimuli were task-generic in the process of emotional influence on CAE.

But it is also a typical experimental paradigm for suppressing control. Why can't it reach a completely consistent conclusion on the impact of conflict adaptation effects? The reason may be that although the two experimental paradigms are cognitive control tasks that can cause conflicts, the types of conflicts between the two are different. Because of the time course of stimulus conflict and response conflict, and the short-term, slightly changed emotional state used in this experiment, it was more in line with the time-limitation of CAE, so when the response conflict occurred in a relatively latter phrase, emotional stimulus not related to the task induced emotion. It was very likely that emotions have weakened or even disappeared, resulting in the loss of emotional impact on control processing in Simon task, so that emotions had no effect on conflict adaptation.

V Limitations

Firstly, different paradigms were used to construct conflict conditions. However, for Flanker task, participants needed to press four keys, while for Simon task, participants only needed to react with two keys. Therefore, there

was out of control over the difficulty of the task and working memory capacity.

Secondly, although we explored conflict adaptation effects in different kinds of conflict control tasks, it only took into account the effects in Flanker and Simon tasks, while other control tasks such as Go/nogo and Stroop had not been studied and confirmed. If the effect of emotion on conflict adaptation effects was similar between different tasks, the future research should examine more conflict control paradigms more comprehensively.

VI Conclusion

In Flanker task, negative emotions can affect conflict adaptation effect. Task-relevant negative emotions promoted conflict adaptation effect, while task-irrelevant negative emotions hindered conflict adaptation effect. In spatial Simon task, task-relevant negative emotions can promote conflict adaptation, while task-irrelevant negative emotions had no effect on conflict adaptation compared with neutral emotions.

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