



*N. Klein Sellea, B. Verschuereb,  
M. Kindt, E. Meijer,  
T. Naharia, G. Ben-Shakhar,  
“Memory Detection: The Effects  
of Emotional Stimuli”,  
Biological Psychology 2017,  
129, pp. 25–35*

There is a common assumption that highly emotional events tend to be remembered more clearly and with more details because of its strong impact on the individual. If so, this assumption should affect the Concealed Information Test (CIT) – a type of Recognition (polygraph) test thus produce increased psychophysical responses during the CIT. The CIT aims to detect the presence of crime-related information in memory “In a CIT used for a murder case, the polygraph examiner might assess whether or not the examinee reacts physiologically to the murder weapon as compared to a series of possible weapons which investigators are certain were not used in the crime.” [1]

In order to examine the likelihood of the assumption two experiments were carried out to examine whether and how emotional stimuli influence concealed information detection.

In the first experiment 136 participants (91 women), age range 18 to 32 were exposed to a fabricated police case-file concerning a hypothetical murder. The case-file

contained a description of the crime, and a set of four pictures: two face pictures (i.e., face of victim 1 and face of victim 2 and two scene pictures (i.e., crime scene and location of murder weapon), which differed in arousal level and emotional force impact. One of the face pictures and one of the scene pictures were neutral and the other two pictures were either negative arousing or negative non-arousing, depending on the experimental condition. These pictures later served as crime-related items in the CIT and were chosen from five different sets of pictures, such that each set served as the crime-related set for 20% of the participants. The four other sets of pictures served as control items in the CIT. An experimenter familiarized participants with the case-file and instructed them to visualize the situation and imagine that they themselves were the murderer. Then, all participants were requested to take a few minutes to carefully go over the case-file and memorize the pictures. When ready, participants were assigned to 4 groups: arousing immediate group who were showed arousing images and were CIT tested immediately, non-arousing group who were not showed with arousing images and were CIT tested immediately, arousing delayed group that took the CIT test after one week and non-arousing delayed group that took the CIT test after one week.

The CIT test results were subject to a one-way ANOVA comparing the motivational level in the four groups (arousing immediate vs. non-arousing immediate vs. arousing delayed vs. non-arousing delayed) yielded no statistically significant effect. In all conditions, participants reported high motivation during the experiment. Further, there was no significant difference between conditions in the number of subjects who reported using countermeasures.

In the second experiment 39 participants (29 women), age range 19 to 20, were exposed to a double amount of pictures (from 4 in the first experiment to 8 in the second experiment) that were displayed for a short time of 10 seconds thus not giving them enough time to memorize the pictures thoroughly. All participants were subject to the CIT a week later.

Analysis of this experiment showed that all three rating-types revealed a significant main effect of arousal indicating that the negative arousing pictures were considered more negative, more arousing and more significant than the neutral pictures. Further, a significant main effect of item type was revealed for the significance and arousal ratings indicating that the crime-related pictures were considered more significant and arousing than the control items. Finally, the arousal ratings revealed a significant Item indicating that the arousal difference between crime-related and control pictures was smaller when these pictures were negative arousing compared to when they were neutral. All other effects were not statistically significant.

Applied implications of the two experiments findings support practitioners' intuition and provide preliminary evidence that emotional stimuli do not deteriorate and may in fact improve CIT detection efficiency.

## Reference

[1] Krapohl D., Handler M., Strum S. (2012), *Terminology Reference for the Science of Psychophysiological Detection of Deception*.

Tuvya T. Amsel

