

Time-of-day optimality effects on eyewitness memory performance

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Valorisation

Relevance

It is difficult to find an area of our life that is not affected by our body clock. From oscillations on a molecular level to fluctuations in complex cognition, the circadian clock plays an important role in almost all areas of our functioning. Synchronising important activities with these cycles can result in improved productivity. Mismatch with our internal rhythms, on the contrary, can lead to undesirable effects, such as declines in performance. It is important to take into account these fluctuations when planning highly demanding activities. The eyewitness memory domain represents an area in which optimal performance is critical. It is important to identify factors that could potentially worsen the memory for the crime and the people involved. This information can be taken into account when assessing the probative value of evidence that witnesses provide. Time of day could be among such factors; therefore, it is important to know whether memory for events and people involved can be worse at hours of the day that are misaligned with our internal body rhythms. We also aim to create conditions for witnesses to provide as accurate and complete testimony as possible. From this point of view, it is important to know if the beneficial influence of peak performance hours can be used to provide additional retrieval support in witnesses. It is also critical to know whether there are hours of the day when obtaining information from witnesses would be least efficient and refrain from scheduling eyewitness interviews and identification procedures during these periods. Therefore, the current thesis is relevant as it extends the existing chronobiological research to the applied eyewitness memory field.

Target Population and Products

A wide array of factors can affect how well we remember events we witnessed. These factors should be taken into account when assessing the evidential value of information provided by eyewitnesses. Law enforcement agencies can also benefit from knowledge about these factors in improving the protocols for obtaining evidence from eyewitnesses. One of the aims of the eyewitness memory field, and, by extension, this thesis, is to help policy makers and legal practitioners navigate in the ocean of factors that can potentially affect memory functioning and identify those that are most relevant to real-life eyewitnesses. This thesis investigates of the role of time of day as one of the factors that can be relevant to the eyewitness memory domain. Daily fluctuations in memory performance are common: our memory is often best during hours of the day that coincide with circadian peaks in arousal. This thesis shows that young healthy witnesses are not subject to such classical 24-hour variations in memory performance. These findings can be informative to lawyers, police, judges and juries to determine whether time of day can affect the probative value of a piece of evidence obtained from an eyewitness. I also found no evidence suggesting the need in the change of policy in terms of the time of day when witness interviews are conducted or when lineup identifications are administered. This knowledge can guide policy makers to prioritize the necessary changes in protocols for obtaining evidence from witnesses.

Innovation

The aim of this thesis was to investigate variations in eyewitness memory performance across the day caused by the circadian rhythm. To the best of my knowledge, this is the first published comprehensive attempt to study the effect of our body clock on the memory of witnesses. Specifically, the current thesis presents the very first published attempts to study circadian variations in identification performance using the so-called eyewitness identification paradigm. This set of methodologies is designed to reproduce the conditions real-life eyewitnesses encounter in psychological laboratory. The eyewitness memory paradigm greatly differs from methodologies of previous research into the circadian effects on memory performance in the stimuli type, encoding and retrieval instructions. I believe these factors account for the fact that non-optimal testing did not affect performance of our mock witnesses in the same way as in previously conducted experiments using the verbal learning paradigm, in which participants study words, sentences and short stories. Further, this thesis is the first to examine time-of-day effects on postdictors of eyewitness identification accuracy, such as confidence and decision times. The results in terms of confidence are especially interesting as they show that witnesses may take into account the fact that their memory performance can be lower at certain hours of the day. Importantly, the effect of circadian variations on face recognition performance in arousal has not been studied before. Processing of faces is a highly specialized cognitive function and differs in many aspects from processing of non-facial stimuli. It is important to understand whether time-of-day affects our memory for faces differently compared to other types of information.

Implementation and Knowledge Dissemination

The findings of this dissertation were made accessible through different channels. All of the experiments comprising this thesis have been presented at international conferences on psychology and law and applied cognition in Belgium, Finland and the USA. The studies in Chapters 2, 3 and 4 are under review to be published in academic journals. Publication of this research is important to communicate the findings to researchers who are seeking to understand how chronobiological phenomena translate into applied settings such as the eyewitness memory domain. The current findings have also been mentioned in lectures to psychology students and to fellow researchers via social media (e.g. Twitter).