Memory

ORAL PRESENTATION

8155
Emotional residue after COVID-19: The link between early maladaptive schemas and emotional memory

Gizem Ceviker (1), Kubra Nur Cetin (2), Anıl Canpolat (2), Busra Iplikci (3), Basak Sahin-Acar (1) *1. Middle East Technical University, Turkey; 2. Uludag University, Turkey; 3. Akdeniz University, Turkey*

The current study examined the association between negatively charged and shared autobiographical memory characteristics of mother-child conversations about the COVID-19 pandemic, early maladaptive schemas (EMS) of mothers and perceived schemas (PS) of their own mothers. To explore this association; transcriptions of the recorded-conversations held between mothers (M_{age} = 34.64 SD = 4.46) and their children between the ages of 48–60 months (M_{age} = 55.12, SD = 4.84) during the first 3 months of the pandemic were analyzed as a first and qualitative step of this study. In the second and quantitative step, the predictive power of EMS of mothers and PS on the negatively-charged memory characteristics of the shared conversation was analyzed. Sixty-seven mother-child pairs participated via Zoom-meetings. Researchers asked mothers and children to reminisce emotionally negative shared-memories from the beginning of COVID-19 Pandemic for 5 minutes. All conversations were recorded, transcribed verbatim and coded. After, all mothers filled the Young Schema Questionnaire-Short Form 3 (YSQ-S3) and Young Parenting Inventory (YPI) on Qualtrics. A simple linear regression showed that the usage of negative emotion words by mothers during a conversation with their children was significantly predicted by mothers' EMS and PS ($F(3,58) = 4.115$, $p = .010$, with an R^2 of .13).

6834
The effects of exercise intensity on priming and explicit memory in active and sedentary individuals

Soledad Ballesteros (1), Cristina Perez (1) *1. UNED, Spain*

Recent reviews have shown the crucial relationship of physical activity and cognition, little research has been conducted on implicit and explicit memory for words with positive and negative emotional valence performed under moderate (50% of VO2 max.) or intense (80% of VO2 max.) physical exercise. In the present study, we investigated the effect of physical activity on verbal implicit assessed with an emotional repetition priming task while explicit memory was assessed with free recall and recognition tasks. Physically active and sedentary participants were randomly assigned to a moderate physical exercise condition or to a condition consisting of performing the tasks under intense exercise performed on a stationary bicycle. The results revealed significant priming effect in all groups, independently of the affective valence of the prime and the target. The physically active groups were faster than the sedentary ones. In addition, all groups showed shorter RTs for positive emotional words. Explicit memory tasks showed that the physically active groups remembered more words than the sedentary groups. Both, active and sedentary participants recalled more words while performing exercise of a moderate intensity. Finally, in all groups, positive emotional words were both remembered and recognized better than negative emotional words. These results did not reveal differences between active and sedentary groups in affective priming but exercise enhance long-term explicit memory and RTs.

5997
"Picture this": The impact of taking photographs on memory

Alexia Karain (1), Lena Pateraki (1), Eleni Orfanidou (1) *1. Deree, The American College of Greece, Greece*

Objective: Through the advancement of technology, people increasingly rely on photographs for several daily activities. Studies have shown that media devices can both positively and negatively impact several cognitive processes. The aim of this study was to examine the effects of photo-taking on memory and explore whether it serves as an external memory storage or as a distraction to the individual. Methods: The study comprised of 120 undergraduate college students who were presented with 15 paintings, either on paper or on screen. Participants were randomized into one of four groups; paper (control), on-screen, photo-taking, secondary task. Following the presentation, participants completed a recognition memory task, in order to assess the number of items they remembered. Results: Results showed a significantly better memory in individuals who only observed the paintings than those who were asked to take a photograph of the paintings. Similarly, individuals in the control group had a significantly better memory performance than those who completed a secondary task while observing the paintings (attentional disengagement). In contrast, there were no differences between those who observed the paintings in paper and those who observed them on-screen. Conclusions: The findings suggested that the usage of media devices impact one's memory, by serving as a distraction to the individual and resulting in poorer memory of the photographed stimulus. The present study elucidated further the counterintuitive effect that photo-taking has on memory and provided complimentary evidence in the current literature. It is clear that photo-taking alters one's perception, attention and memory of the surrounding environment, which is a crucial phenomenon with real world applications to be considered by future studies.

5853
Mnemonic benefits of survival processing in the context of directed forgetting

Filiz Sayar *Suleyman Demirel University, Turkey*

Recently, researchers have shown an increased attention to functional properties of memory systems. The literature on cognitive evolution suggests that human memory evolved as a result of selection pressures to process survival-related information and to solve adaptive problems. A considerable amount of research found that processing items for survival relevance creates a robust survival memory advantage. Besides, there is some evidence that survival processing (SP) can also increase tendency to misremembering. The current study explored whether SP advantage would appear in context of directed forgetting (DF) and whether SP would increase misremembering in this context. With this aim, a total of 165 undergraduates participated in this study in the classroom settings. In Experiment 1, according to standard SP paradigm of Nairne et al. (2007), participants rated words for their relevance to survival, moving and pleasantness conditions. Next, a free recall test was given after a digit distractor task. In Experiment 2, participants were asked to complete two tasks simultaneously in the item method DF: they were given a recall (R) or forget (F) instruction after each word were presented and at the same time they rated the words in terms of survival, moving and pleasantness. Following a digit distractor task, a free recall test was performed for all the words. This study showed that SP produces superior retrieval relative to other encoding tasks and improves recollection of F words, as well. At least in the item method, SP effect was found for both intentional and unintentional recall. As expected, misremembering was observed mostly in survival condition, moving and pleasantness, respectively. The findings suggest that survival context not only restrains intentional inhibition and forgetting but also increases recall of irrelevant information. All these results were discussed with respect to the adaptive system of survival processing and theoretical accounts of directed forgetting.

5622
Spatial attention to working memory in analogy to perceptual attention: Harmony but not uniformity

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Sizhu Han (1), Yixuan Ku (2), Klaus Oberauer (3) *1. East China Normal University, China; Sun Yat-sen University, China; 3. University of Zurich, Switzerland*

In the perceptual domain, it is well accepted that there are two kinds of covert spatial attention system: endogenous and exogenous. However, whether these two kinds of attention to working memory differ in a similar way to perceptual attention remains unclear. The present study addressed this issue through 5 experiments using the retro-cue paradigm on more than two hundred participants. Results: revealed that attentional processes to working memory versus perception are very similar in that: (1) exogenous retro-cues are more effective than endogenous retro-cues when signal-to-noise ratio is low (Experiments 1 and 2); and that (2) exogenous retro-cues become effective quickly within the first 100 ms at low load (Experiment 5). However, unlike exogenous cues in perception, (1) exogenous retro-cues cannot capture attention to memory representations when they are uninformative (Experiment 3); and (2) the attention effect can increase with confidence ratings (Experiment 4). Taken together, our findings suggest that exogenous retro-cues need voluntary control to exert effects on memory although they could rapidly attract attention to a spatial location.

5620
Phenomenal characteristics of autobiographical memories in social anxiety

Fateme Askari (1); Mostafa Mohamadi (2), Ali Zia Tohidi (3) *1. Iran; 2. University of Lausanne, Switzerland; 3. University of Tehran, Iran*

Individuals with social anxiety selectively retrieve negative information about themselves and their performance that is consistent with their negative perceptions of the situation. Socially anxious individuals ruminate about past social events. While entering a social situation they automatically recall memories about Stressful situation but after the event, they tend to recall these memories and ruminate about them voluntarily. Finding in this area is mixed that's why in the field of autobiographical memory, recent researches have begun to highlight new ways. in the present study, given that the phenomenological characteristics of autobiographical memory is one of the main characteristics of this type of memory and hasn't been investigated in many researches, so we also investigate phenomenological characteristics of autobiographical memory. Also in Iran, most studies examine autobiographical memory in anxiety disorders or PTSD, utilized cue words and they didn't consider phenomenological features. The sample included 47 participants, comprising 17 participants with considerable symptoms of social anxiety and 30 without considerable symptoms, with mean age of 24.8. Measures were SPIN and Memory Characteristics Questionnaire. Participants were asked to describe the events they experienced and then answer questions about it. The main findings indicated that non-anxious participants had more clear sensorial details than socially anxious. We also didn't find any difference in contextual details in socially anxious and control group. We found no significant difference in self and other referential information between groups but there was more clear information about self and others in negative events. We couldn't find any significant difference in perspective scores in either one of four situations. But about anxiety that participants there was a difference. Our findings indicated that socially anxious individuals report anxiety in social events, even in positive ones.

5597
Emergent pattern of resilience and its import for creativity

Mimansa Khanduri *University of Delhi, India*

"If your heart is broken, make art with the pieces."—Shane Koyczan Resilience is a concept studied extensively in psychology. It is described by Masten (2001) as "ordinary magic" where a number of protective factors stemming from personal, familial, and societal sources are found to be contributing to its development. It is the ability to bounce back from a post-crisis state to a pre-crisis state and has found its application across domains. One domain to be considered is creative expression. Previous studies conducted by Metzel and Morrell (2008) have integrated the role of personal creativity in processes of resilience. On the way to establish oneself as an artist, people encounter many obstacles and hence resilience becomes an important factor in creative achievement. Objective: The present study aims to understand the process of creative expression and the role of resilience in this process. Method: the study was carried out on a sample of 20 participants (10 males and 10 females) that were involved in different creative fields such as writing, singing and photography. The participants belonged to the age group of 19–24 years and were undergraduate students from Delhi-NCR region. A semi structured interview consisting of 12 questions was used to look into the challenges, importance, role and sources of resilience, and opinions about resilience. Thematic analysis was carried out to understand the sources and effects of resilience. Results and conclusion: The results indicated that the participants faced challenges from various domains such as "social realm" and "personal competencies". Resilience stemmed from various sources such as personal, and social factors and was important in overcoming these challenges but can produce a negative effect too. Moreover, there seems to be a bidirectional relationship between creativity and resilience on the road to creative achievement.

5593
Age related differences in prospective memory monitoring: An eye tracking study

Aslı Yörük (1), Banu Cangöz (1) *1. Hacettepe University, Turkey*

Objective: In this study, we examined the effect of PM target and environmental cue relationship on the PM performance, strategic monitoring and cue-driven monitoring in young and older adults. Method: The study consisted of 2 experiments. In Experiment 1, a total of 57 healthy volunteer young participants (48 females, 9 males) aged 18–25 years; In Experiment 2, 24 young people (16 females, 8 males) aged between 18 and 25 years and 24 elderly (5 females, 19 males) over 65 years of age were involved. We employed the eye tracking paradigm to examine prospective memory and strategic monitoring. Throughout the experiments, both eye-tracking (total number of focuses on the PM target area and the total number of focuses on the PM target area after the environmental cue) and behavioral (percentage of correct response in PM tasks, number of correct responses in ongoing task) measurements were taken. Result: According to the results of Experiment 1, it was experimentally demonstrated that PM tasks designed within the scope of this study successfully measured the PM and strategic monitoring through both behavioral and eye-tracking measurements. Experiment 2, age was found to have a significant effect on event-based PM and strategic monitoring, but no difference was found between young and elderly adults in cue-driven monitoring. Besides, the presence of cues related to the PM target increased strategic monitoring and the number of cue-driven monitoring. However, the presence of the target-related cue did not result in the expected increase in the correct percentage of event-based PM. Conclusion: Similarly to previous studies that measured strategic monitoring indirectly, our results showed that there are age-related deficit in strategic monitoring. However, there are no differences between older and younger adults in terms of environmental cues' utilization.

5592
Spatial memory performance in a virtual reality task is modulated by visuospatial working memory

Joaquín Castillo Escamilla (1), Jose Javier Fernandez Castro (2), Juan José Ortells Pareja (2), Juan José Ortells Rodríguez (2), José Manuel Cimadevilla Redondo (2) *1. Spain; 2. University of Almería, Spain*

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Traditionally, the medial temporal lobe has been considered as a key brain region for spatial memory. Nevertheless, executive functions play an important role in a complex behaviors like spatial navigation. Thus, it is not surprising that different studies showed the relationship between frontal and temporal lobe functions at the behavioral and electrophysiological level, with temporal lobe dynamics modulating working memory (WM) functions. Nevertheless, a lack of precise and ecologically valid tasks difficulted this approach. Objective: The main goal of this study is to clarify the relation between WM—a frontal lobe function—and spatial memory performance in a virtual reality task that depends on a network that includes the medial temporal lobe. Method: Forty eight females took part in this study. Two subgroups ($n = 12$), were formed according to their WM performance (high and low) in a place switching location task. Spatial performance was measured using a virtual reality based test, the Boxes Room task. Results: Results indicated that participants with high WM capacity committed less mistakes in the spatial memory task than the low WM group. Nevertheless, both groups improved their performance in the different blocks of trials of the Boxes Room task, showing that they could learn spatial layouts independently of their WM capacity. Conclusion: These findings support the link between spatial capabilities and WM, and how virtual reality paradigm can be useful to identify these differences.

4349

A qualitative examination of the failed July 15th coup in Turkey as an example of flashbulb memories

Merve Merve Çavuşşoğlu (1), Muharrem E. Kuşdil (1) *1. Bursa Uludag University, Turkey*

Although it has long been assumed that flashbulb memories serve some basic psychological functions, some researchers have recently suggested that they may also have various social functions. They have asserted that events (positive or negative) that affect society as a whole might trigger the social identities of individuals and shape their collective memories. For researchers who prefer an individualistic approach, however, even flashbulb memories of social events should be evaluated as autobiographical memories. The present study aimed to investigate the failed July 15th coup in Turkey in 2016 as an example of negative flashbulb memories by using both quantitative and qualitative methods. Three hundred and fifty-one participants responded to an online survey that included questions measuring the quality of their memories of the failed coup as flashbulb memories. Participants also wrote down seven attributes that came to their minds when they remembered the time that this event took place and sorted them in relation to their relative importance. By using the participants' ratings to the quality scales, the indexes of quality for different aspects of flashbulb memories (vividness, consequentiality, etc.) were calculated. Results showed that, although they were somewhat heterogeneous, participants' memories of this event had the basic characteristics that would be necessary to consider them as flashbulb memories in general. Next, a qualitative analysis was realized by using IRaMuTeQ 0.7 to examine the social representational nature of participants' memories of the failed coup. Results of the prototype and similarity analyses of attributes showed that memories of this event bear the basic structure of a social representation by exhibiting some clear sets of core and peripheral elements. Findings will be discussed in relation to the relevance of Moscovici's social representation theory to the arguments on considering flashbulb memories as one of the basic sources of collective memories.

4223

The perceptual characteristics of an image increase detailed false recollection

Daisuke Shimane (1), Yuji Itoh (1) *1. Keio University, Japan*

Person sometimes recall inaccurate events with detailed recollection. The detailed recollection associated with such false memory (i.e., false recollection) could cause social problems because they could distort our memory judgment. In the previous studies, basic experiments have been conducted focusing on the occurrence process of the false recollection produced when the lists of stimuli was presented. Specifically, Doss, Bluestone, and Gallo (2016) demonstrated that the false recollection was more likely to be recalled when the lists were presented in images than in words. According to their interpretation, the participants in the image condition were affected by both semantic associative activation and perceptual similarity of presented lists, while the participants in the word condition were affected by only semantic associative activation. However, this interpretation was only inferred by the result of difference between image and word. The cause of such difference has not been experimentally confirmed. Therefore, the purpose of this study was to investigate whether the perceptual similarity of the image lists contributed to the difference of the false recollection rate between image and word. Concretely, we determined the false recollection rate using lists of perceptually dissimilar images. The result showed that the false recollection rate was higher in the image condition than in the word condition even when the participants in the image condition were presented the lists of perceptually dissimilar images. This result indicated that such difference between image and word could not be explained by only perceptual similarity of the list.

2216

ERP effects of cross-modal priming by emotional vocal expression on the memory of emotional faces

Huiyan Lin (1), Huiyan Lin (1), Jiafeng Liang (2) *1. Guangdong University of Finance, China; 2. Guangdong University of Education, China*

Previous studies have shown that emotional primes, as elicited by visual stimuli, influence event-related potential (ERP) responses during the encoding of emotional faces. Behavioural studies also investigated effects of visually emotional primes on subsequent recognition of emotional faces. However, little is known about the effects of emotional primes, when the priming stimuli are input from other sensory modalities (e.g., an auditory modality). There might be no studies investigating neural mechanisms underlying effects of emotional primes on recognition of emotional faces. Therefore, the present study aimed to investigate whether emotional auditory primes, as elicited by vocal expression, influence ERP responses during face encoding and recognition. To this end, participants in the present study were asked to memorize angry and neutral faces. The faces were primed by angry or neutral vocal expression. Subsequently, there was an old/new recognition task, in which only faces were presented. In the encoding phase, all faces elicited larger N170 and smaller N400 responses, when they were primed by an angry vocal expression than by a neutral vocal expression. For angry faces, late positive potential (LPP) was enhanced in the angry voice condition. In the subsequent recognition phase, preceding angry vocal expression resulted in larger N170 and smaller LPP responses to angry faces and larger FN400 responses to neutral faces. Therefore, the findings suggest that emotional primes with regard to emotional vocal expression influences neural responses during face encoding and recognition.

1760

Self-reference increases suggestibility to false memories

Jianqin Wang (1), Henry Otgaar (2), Melanie Sauerland (3), Lawrence Patihis (4) *1. Fudan University, China; 2. KU Leuven, Belgium; 3. Maastricht University, Netherlands; 4. University of Mississippi, United States of America*

Introduction: The self plays an important role in episodic memory (Conway, 2005; Tulving, 2002). Research has shown that encoding information related to oneself facilitates true memory (Symons & Johnson, 1997). However, it is unknown whether self-relevance would affect people's false memories. This is important because eyewitnesses are either victims who encoded the crime relevant to themselves (i.e., self-relevant), or bystanders who have

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observed the crime from a third-person perspective (i.e., other-relevant). This study examined whether self-relevance would impact witness' proneness to false memories induced by misleading information. Method: Based on power analysis, we tested 68 participants in Maastricht University, the Netherlands. We used a typical misinformation paradigm (Okado & Stark, 2005) in which participants acted as either victims or bystanders in a slideshow of a non-violent crime. Specifically, participants' own images were photoshopped as the victim in a crime to evoke their sense of self-relevance (e.g., Cunningham et al., 2014). After watching the crime, participants received misleading questions about the crime and then their memories for the crime were tested. Results and Conclusion: For false memories, the self-victim group had significantly more false memories ($M = 2.74$, 95%CI [2.23, 3.74]) than the other-bystander group ($M = 1.76$, 95%CI [1.24, 2.29]), $t(33) = 3.41$, $p = .002$, Cohen's $d = 0.66$. While for overall correct memories, the self-victim group ($M = 5.59$, 95%CI [4.99, 6.19]) did not differ from the other-bystander group ($M = 5.79$, 95%CI [5.32, 6.27]), $t(33) = 0.57$, $p = .57$, Cohen's $d = 0.13$. In conclusion, we found that people who view themselves as a victim in a crime tend to be more prone to misinformation than those who witness an other-related crime. The results suggest that self-relevance can enhance suggestibility to false memories. The study has implications in the legal arena.

1221
Predicting pre-schoolers' pointing accuracy: A path integration study in macro environments

Gülten Ünal (1), Emine Yücel (2), Eva Neidhardt (3) *1. Ankara Yildirim Beyazit University, Turkey; 2. Selçuk University, Turkey; 3. University of Koblenz-Landau, Germany*

The ability to think about objects in a space and the ability to represent the spatial order in mind are important aspects of everyday cognition. The current study was held to probe preschoolers' spatial orientation abilities in real macro environments. 76 3-to-7 year-old children from Turkey and 22 3-to-6 year-old children from Germany were recruited. Each child took a walk on a predetermined route around the kindergarten and in each stop, the child were asked to point the direction of the kindergarten. Additionally, spatial ability components were tested: 2D mental rotation and spatial working memory. Turkish parents were also reached to learn the children's age, children's commuting facility to school, and home-school distance. Other questions were about the perceived security of the kindergarten district and the children's navigational ability in unknown places. The German group was as good as the older Turkish group in terms of their pointing accuracy. As children cover a longer distance, they become confused, and their path integration performance weakens. Thus, the children showed better performance on the first half of the path than on the second half. Children's age, their being a boy (vs. a girl), spatial working memory, home-school distance, and the parental estimation of children's navigational ability were found to be the critical predictors of pointing accuracy. Although the cultural contributions of the present study are not well established, it could be a good starting point to question the environmental qualities of different cities (traffic stress, tall buildings, nature, etc.) wherein children socialize.

59
Retrospective, current and future perceptions of society among young and old Japanese adults

David Anderson (1), Winston Massam (1), Hiroyuki Shimizu (2) *1. University of British Columbia, Canada; 2. Kobe Gakuin University, Japan*

This study investigated Japanese citizens' retrospective, current, and future perceptions of the attributes of Japanese society. A 22-item questionnaire was inductively developed and later administered to $n = 571$ Japanese adults to assess perception of Japanese society across three time frames: (1) Past [Shōwa 30–45, 1955–1970], (2) Present [at the time of data collection, 2017], and (3) Future [10-year later, 2027]. An exploratory factor analysis (EFA) yielded three distinct factors: Self-attribution within society (i.e., the innate social characteristics of people), State of society (i.e., the characteristics of the collective society), and Human social virtues of the society (i.e., the moral condition of society). These factors were later studied within and across time frames by participant age (young and old) and significant differences explored by means of analysis of variance (ANOVA) with Bonferroni multiple comparisons of the effects. Multiple statistically significant outcomes were explored and interpreted through Carstensen's socioemotional selectivity theory (SST), as well as the historic social context of Japanese society in the past and the present day. The outcomes demonstrate distinct and contrasting perceptual differences that exist between young and old Japanese across time frames. Old Japanese generally perceive the attributes of Japanese society be much better in the past compared to the present, and hold pessimistic views of the future. In contrast, Young Japanese hold more diverse and complex views about attributes of Japanese society across time frames.

POSTER PRESENTATION

7485
Age-related differences in the remembered intentional status of everyday prospective memory tasks

Taisuke Morita *Tokyo University of Science, Japan*

Prospective memory (PM) tasks refer to the tasks in which we need to remember and execute planned activities in an appropriate situation in the future. One of the critical elements of successful PM tasks is remembering the intentional status of PM tasks. Intentional status refers to information concerning one's decision to perform a PM task. Previous studies have examined age-related differences in cognitive processes underlying PM. However, it has not been examined in-depth whether there are any age-related differences in remembered intentional status of PM tasks. Thus, this study examined the age-related differences in remembered intentional status of real-life PM tasks. A sample of 407 adults (aged 20–69 years old) participated in this study. The participants were asked to report a plan that they had intended to perform during the seven days from the experimental session. The participants were asked to answer a 7-item questionnaire about the intentional status of the plan. Additionally, they were asked to answer questions regarding task properties such as task importance and length of the interval between the experimental session and the time of plan execution. As a result, neither task importance nor interval length was significantly correlated with the age of the participants. In contrast, there was a significant correlation between the strength of the intentional status of plans and the age of the participants. These results were discussed in terms of the mechanisms underlying age-related changes in PM in everyday situations.

7178
Dissociation of detrimental and beneficial effects of part-list cuing on college students' memory

Yufei Zhao (1), Tuanli Liu (1) *1. Xinyang Normal University, China*

According to the multi-mechanisms account proposed by Lehmer and Bauml, retrieval cues can trigger both detrimental and beneficial mechanisms. Therefore, this study combines the listwise directed forgetting paradigm with the part-list cuing effect paradigm to test the multi-mechanisms account. There are five behavioral experiments. In Experiment 1, 48 unrelated Chinese double-character words were selected to form four groups of words, each of which contained 12 words. The items were exposed for 4 seconds each. We adopted 2(instruction: remember, forget) $\times 2$ (cuing: no-part-list cuing, part-list cuing) mixed factorial design. The results showed that part-list cues had no significant detrimental or beneficial effect on memory retrieval. The research design and methodology were consistent with John and Aslan's 2018 study. We found that the present material presentation time is easy

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to establish semantic connection. Therefore, Experiment 2 shortened the time to 3 seconds and kept the rest unchanged. The results are the same as Experiment 1.We suspected that the existence of part-list cuing effects might be influenced by the length of word list and the presentation time of words, Experiment 3 adopted a 2 (recall mode: free recall, cue recall) ×2(presentation time: 3 seconds, 4 seconds) ×4 (word length: 4, 12, 20, 28) mixed factorial design. The results showed that there was a part-list cuing effect at 20 and 28 in 3 seconds. In order to reduce the degree of confusion between learning words, Experiment 4 used two groups of 20 words from experiment 3, changed the experimental design to a complete between-subject design. The results showed that under the condition of remembering, there was a part-list cuing impairment effect, while under the condition of forgetting, part-list cues improved memory retrieval. To test the stability of the experimental results, Experiments 5 further simplified the experimental process, the subjects learned only one set of words. The results were the same as those of Experiment 4.The results of this study show that there are boundary conditions for the detrimental effects and beneficial effects of part-list cuing. The results of this study do some supplement to the multi-mechanism hypothesis of part-list cuing effect.

6358
Study on Kaigokan as autobiographical memory focusing on the directive function

Junko Kuze (1), Hideko Fujiwara (1), Naomi Mizutani (1), Keiko Niwa (1), Keiko Takeda (1) *1. Nihon Fukushi University, Japan*

Introduction: The perspective of care, KAIGOKAN, is very important for care workers. For the university students in care work course, episodes related to KAIGOKAN might work as the directive autobiographical memory; therefore, the aim of this study is to examine episodes of students in 3 different courses. Objectives and Methods: Analysis objectives were 57 freshmen (15 in care work course, 42 in other courses), and their open-ended description of episodes related to KAIGOKAN were analyzed. These episodes were divided into 5 categories; episodes of person, episodes of place, episodes of event, others, and no episodes. The procedure of this study was approved by the Ethical committee of Nihon Fukushi University (19–04). Results: The numbers of episodes tend to be different (24 episodes from care work course students, 44 from other course students: $t(14.4) = 2.01$, $p = .06$). Care work course students described episodes of place more, whereas other course students described episodes of person more. All the episodes of care work course students occurred before university, while 20% of other course students occurred at university. Conclusion: Students' episodes are different in terms of their major, and episodes of care work course students function as directive autobiographical memory. Funding: This work was supported by JSPS KAKENHI Grant Number JP19K02741.

6266
Is digit superiority indispensable in terms of short term memory span?

Dilara Doğan (1), Şengül Erdoğan (1), Banu Cangöz (1) *1. Hacettepe University, Turkey*

Objective: It is known that familiar items in STM span measurement have a positive effect on performance and that digits have superiority with regard to STM span. Even though studies have been carried out before on the perception of color names in different languages the number of studies examining the impact of the frequency of use for the color names in a specific language on cognitive functions (perception, memory etc.) is limited. The aim of this study is to examine the effect of familiar stimuli (digits, colors, name of digits, name of colors and words) on STM span using the set of stimuli in three different experiments. Methods: In order to measure STM capacity, memory span task was used including the digit, word and color span lists and stimuli for the lists were prepared by researchers. Ninety participants participated in the study that consisted of three different experiments (digit name and word for Experiment I; digit name, word and color name for Experiment II; digit name, digit, color name and color for Experiment III). Results: Results of Experiment I revealed that there was a significant difference between the digit name and word with regard to span size and total span (Experiment I, span size ($t(32) = 2.81$, $p < .05$) and total span ($t(32) = 6.17$, $p < .001$). In Experiment II and III, the main effect of familiar stimulus type on total span and span size was significant and also the difference ($p < .001$) between all types of stimuli was significant (Experiment II, digit name > word = color name; Experiment III, digit > digit name > color name > color). Conclusions: The common result obtained from all three experiments is that digits are superior with regard to STM span than familiar stimuli types such as word, color name, color.

5499
Third-person perspective in the retrieval of landscapes in autobiographical memory

Keiko Makino *Japan*

The author of a book on aesthetics argues that when we retrieve autobiographical memory, we sometimes become spectators of our own experiences. This metaphor resembles the concept of the third-person perspective in psychological studies on autobiographical memory. However, most previous studies on the third-person perspective have focused on events, not on surrounding landscapes. The present study aimed to exploratively investigate relationships between narrative perspective and landscape types in autobiographical memories. Sixty-three undergraduate students were asked to retrieve four types of landscapes in their autobiographical memory: a mundane landscape, nostalgic landscape, exotic landscape, and landscape in dreams. They were asked to write a brief description of each landscape and choose a narrative perspective from among three options: first-person perspective, third-person perspective, and "don't know." They were also asked to rate the emotional intensity during the retrieval and the vividness of each landscape. The results showed that nostalgic landscapes induce the third-person perspective more often and induce more intense emotions than mundane landscapes. However, nostalgic landscapes were less vivid than mundane landscapes. These characteristics of nostalgic landscapes and those in landscape dreams were found to be similar to each other. Exotic landscapes did not show distinct characteristics. However, content analysis of the descriptions provided by participants indicated that exotic landscapes more often concerned actual place names and less frequently concerned houses and traffic, which was the opposite of mundane landscapes. These findings suggest the importance of the third-person perspective and related variables in the explanation of aesthetic aspects of autobiographical memory.

4484
When handwritten characters improve memory: An examination of moderators of the disfluency effect

Yuki Nishida (1), Masasi Hattori (1), Takeshi Kobayashi (2), Ryota Koba (2) *1. Ritsumeikan university, Japan; 2. Mitsubishi Pencil Co., Ltd., Japan*

Previous research has shown that contents written in difficult-to-read characters are more likely to remain in memory (Diemand-Yauman et al., 2011). A possible explanation for this phenomenon, known as disfluency effect, is that difficult-to-read characters lead to deeper processing and improved memory performance (levels of processing hypothesis; Alter et al., 2007). However, the mechanism remains unknown. An assumption was made that if disfluency effect was caused by the difference in levels of processing, the effect would not be observed under positive mood. Positive mood spreads attention and reduces the performance of task that require deep processing levels (Rowe et al., 2007). Therefore, positive mood would lead to prioritized processing for easy-to-read characters and improved memory (i.e., a so-called fluency effect). An experiment was conducted on 30 high-school

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students, who were given Japanese handwritten words to memorize. Half of the words were written with a dark-ink pen, and the other half with a light-ink pen. The fluency was manipulated by the ink depth of written characters (dark or light). The dark characters were expected to be more fluent than the light characters. After memorizing, participants reported the words in free recall. Results showed that the recall rate for dark words condition was significantly higher than that for light words condition. In the questionnaire after the experiment, the dark characters were evaluated highly in terms of readability and judgement of learning. The results showed an opposite effect of the disfluency effect. However, the effects of mood induction were not observed. In the positive mood condition, the memory performance of dark words was higher than light words, but not significantly. The results do not support the levels of processing hypothesis. Therefore, it is necessary to clarify when disfluency and fluency can be advantageous, and also to further examine the mechanism of disfluency effects.

4284
Does the revelation effect occur for everyone multiple times?

Hiroshi Miura *Kyorin University Japan*

The revelation effect occurs when recognition test probes are more likely to be judged "old" if they are preceded by a cognitive task. It is unclear whether the revelation effect occurs for the same individual multiple times, and occurs for everyone. Although two studies examined the relation between the revelation effect and aging, the results were inconsistent; Prull et al. (1998) showed the revelation effect did not occur for the older adults, but Thapar and Sniezek (2008) showed the effect did occur. Therefore, in our study, adults in their 20s, 30s, 40s, and 50s (12 persons each) participated in the experiment, and were assigned the recognition task three times that has been commonly used in the researches of the revelation effect. The result showed that the same degree of the revelation effect occurred in the first, second, and third times. Furthermore, the revelation effect occurred both in the young group (20s and 30s) and in the middle-aged group (40s and 50s). The degree of the revelation effect in the young group was greater than that in the middle-aged group. These results suggest that the revelation effect is a robust phenomenon, which occurs for a wide range of generations multiple times. The result that the degree of the effect differed between the young and the middle-aged group suggests individual differences in the revelation effect. Further research in other individual differences in the revelation effect is expected.

3688
People misevaluate their own facial attractiveness

Kyoko Hine (1), Hikaru Okubo (2) *1. Toyohashi University of Technology, Japan; 2. Tokyo Denki University, Japan*

Everyone cares about their own facial attractiveness. However, it is unclear whether people accurately evaluate their facial attractiveness. It is reported that eye size is usually associated with facial attractiveness (e.g., Horvath et al., 1987). Therefore, if people accurately evaluate their own facial attractiveness, it is expected that people correctly remember their own eye size. Here, we examined how accurately people remember their eye size. In the experiment, 24 participants were required to adjust the eye size to the actual size for participants' and celebrity facial photos: participants digitally adjusted the eye sizes by clicking a mouse. Also, previous studies insisted that the presence of hair on a facial photo affected facial memory (Toseeb et al., 2012). Therefore, we prepared two types of facial photos; with-hair and without-hair. The difference between the adjusted size and the actual size was calculated, and a two-way analysis of variance (ANOVA) was conducted on the difference of the size with the facial type (own and celebrity) and the hair (with-hair and without-hair) as the within-subject factors. As a result, there was a significant interaction between the facial type and the hair ($F(1, 23) = 12.63$, $p = .00$). For the with-hair condition, the difference between the adjusted size and the actual size for their own face was larger than that for the celebrity face ($F(1, 46) = 3.49$, $p = .06$). On the other hand, for the without-hair condition, the difference for the own face was significantly smaller than that for the celebrity face ($F(1,46) = 4.05$, $p = .05$). These results suggest that people could not correctly evaluate their own facial attractiveness on a facial photo with hair, and our own eye size memory is affected by the presence of hair.

3610
Relationship between voluntary/involuntary positive autobiographical memory and EEG power spectra

Junya Hashimoto (1), Ryota Kobayashi (1), Shiho Kashihara (1), Ryosuke Hiramoto (1) *1. Hiroshima University, Japan*

The retrieval of positive autobiographical memories (PAMs) improves negative mood. This phenomenon is known as the mood repair effect. Although the number of memories retrieved is a factor for the mood repair effect, the neural electrical activity underlying voluntary and involuntary memory retrieval remains unclear. Using electroencephalography (EEG), this study examined the neural activity associated with retrieval of voluntary and involuntary PAMs when in a negative mood. Seventy-three undergraduate and graduate students participated in this study, and 47 participants were included in analyses. After negative mood induction, participants carried out a voluntary or involuntary memory retrieval task. EEG data were collected from 63-channels and were recorded during 5 minutes of eyes-closed baseline periods before the negative mood induction and during the memory tasks. We analyzed EEG power spectra subtracted baseline data from the task using eLoreta. In the voluntary memory condition, we found a marginally significant positive correlation between the number of retrieved PAMs and the alpha band (8–13 Hz) in the right inferior frontal gyrus (IFG; rho = .69, adjusted $p < .10$). Thus, the higher the alpha power in the IFG during the voluntary memory task relative to baseline, the higher the number of voluntary PAMs retrieved. On the other hand, in the involuntary memory condition, we found a significant negative correlation between the number of retrieved PAMs and the alpha band in the right middle occipital gyrus (MOG; rho = −.74, adjusted $p < .05$). Individuals with lower alpha activity in the MOG during the memory task, compared to baseline, had a higher number of involuntary PAMs. Our results suggest that the number of involuntary PAMs retrieved is related to the degree of readiness of the visual cortex to process external stimuli as the retrieval cue, unlike the case of voluntary memory retrieval.

2425
Attention does not necessarily affect the concreteness effect during semantic encoding

Chenhao Hu *Tsinghua University, China*

Concreteness effect is a superior cognitive processing of concrete words (e.g., cat, flower, etc.) compared to abstract words (e.g., effect, serial, etc.) in memory tasks. It is assumed to be a consequence of richer semantic representations in standard short-term memory (STM) tasks, with immediate serial recall of concrete words. However, little is known about whether concreteness effect works when different amount of attention participating in the encoding processes. The present study directly tested concreteness effect on semantic encoding in STM by introducing a concurrent attention-demanding task. This design partially referred to Campoy et al. (2015) and modified for stronger evidence. Participants ($N = 101$) were divided into two groups and instructed to click a target at a random pace or steady pace respectively throughout the entire screen-list presentation of concrete and abstract words. Presumably, random-tapping condition occupied more attention than steady-tapping condition. Results showed significant better performance for concrete words than abstract words in both random-tapping and steady-tapping conditions, suggesting that amount of attention during the semantic encoding has no influence on the concreteness effect. And results were solid in serial-recall, free-recall and cued-recall

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conditions. The experiment yields strong evidence against strategic hypothesis that semantic encoding in STM is a consequence of controlled, attention-demanding mechanisms. Instead, it is potentially an automatic semantic encoding processing. The present study suggests an implication to create concrete semantic meaning for a better STM, and possibly benefits long-term memory.

2352
Inhibitory spillover effect: Experimental urinary urgency produces inhibition of unwanted thoughts

Hakan Çetinkaya (1), Turan Gunduz (1), Hasan Gunduz (2) *1. Ankara University, Turkey; 2. Hacettepe University, Turkey*

Recent neuropsychological studies of the Inhibitory Spillover Effect have suggested that an intentional inhibition in one brain area may exert its inhibitory effects in seemingly unrelated areas through a common inhibitory network. Although the ISE has been subjected to close empirical scrutiny over the last decade, little is known about the diffusive effects of physiological inhibition on the affective thought processes. The present study aimed to investigate the spillover effects of urinary urgency-induced inhibition on mitigating unwanted thoughts by using a three-phase Think/No-Think task. The sample consisted of 24 college students. A total of 35 cue-scene pairs containing 30 critical pairs and 5 fillers were used in T/NT task. The scene pictures were emotionally negative pictures. Each cue was embedded in its paired scene and functioned as a reminder. A bogus water taste evaluation procedure was carried out to create differential bladder pressures in low and high urination urgency groups. A one-way repeated measure ANOVA yielded significant differences among T/NT conditions ($F(1.6, 46) = 14.81$, $p < .001$). All the pairwise comparisons among T/NT conditions revealed statistically significant results: (MD (NT-T) = 1.59, SE = .36, $p < .001$; MD (NT-Baseline) = −.66, SE = .24, $p = .033$; MD (Baseline-T) = .93, SE = .27, $p = .007$). Included inhibition and incitement as dependent variables, a statistically significant MANOVA effect (Pillais' Trace = .35, $F(2, 21) = 5.55$, $p < .01$) indicated that the urinary urgency had a significant effect on T/NT performance. The follow up ANOVA indicated that the urinary urgency effect was significant on inhibition ($F(1, 22) = 10.43$, $p = .004$), but not on incitement ($F(1, 22) = 1.15$, $p = .295$). Therefore, participants with high bladder pressure showed stronger inhibition performances ($M = 1.36$, SD = 1.15) than those with low pressure ($M = .06$, SD = .82) in NT condition. However, in T condition, the difference between incitement performances of high ($M = 1.13$, SD = 1.58) and low ($M = .69$, SD = .96) urinary urgency groups was not significant. Findings and their implications are discussed within the cognitive and clinical perspectives, and recommendations made for the future research.

2278
Influence of positive and negative attention on visual working memory representation

Kaixuan Wang (1), Haomin Lian (1), Shouxin Li (1) *1. Shandong Normal University, China*

Previous studies found that priority projects cued by the positive attention in visual working memory (VWM) got better representation. But it remains unclear whether negative attention can affect the VWM representation identically to positive attention. Three experiments were conducted to explore the mechanisms by which these two attentions influence VWM representation. In experiment 1, we adopted target memory recognition paradigm with positive and negative attention cues pointed to a single project to explore their impact on VWM representation. In experiment 2, the cues were changed to point to 2 or 3 projects to examine the diversity in experiment 1 by ruling out differences in attention span. In experimental 3, the event-related potentials (ERPs) technology was combined to reveal the mechanisms of their different effects on VWM representation. Behavioral results showed that both positive and negative attention promoted the representation of high priority projects in VWM, but stronger promotion effect was observed under the positive attention than negative attention. ERPs results showed positive attention induced greater P2 at attention cue stage as well as N1 at memory stage respectively, compared with the negative attention or baseline conditions with no attention guidance. The corresponding P2 and N1 under negative attention conditions were also larger than that of baseline conditions. The conclusions are as follows: (1) both positive and negative attention can enhance VWM representation while the former is more effective; (2) the differences between two attention suggests that there are distinctions in the mechanisms, positive attention could modulate the allocation of VWM resources more efficiently to the cued projects than negative attention, and the priority items with adequate resource in VWM can be represented better.

2085
Indirect Spaced Repetition Software (ISRS) as a vocabulary learning tool

Louis Lafleur *Ritsumeikan University, Japan*

In the past decade, vocabulary flashcard learning software, notably Spaced Repetition Software (SRS), has tremendously gained popularity as it combines the benefits of flashcard study with new digital capabilities such as audio/image/video integration to enable a plethora of learning tasks. The following recommendations were implemented to create an SRS system specific to Second Language Vocabulary Acquisition (SLVA) principles: Nation (2001) has suggested "in-depth" learning of vocabulary to assure the correct "use" of the words in terms of output and points to the importance of mastering all three elements/features of word knowledge: (1) Meaning (2) Form (3) Use. Schmitt (2008) implied that different teaching approaches may be more beneficial for different stages of word (lexical feature) knowledge as some are mastered earlier than others; therefore, focusing on the form-meaning link at first and later enhancing contextual (use) may prove to be effective. In Indirect Spaced Repetition Software (ISRS) additional tasks/questions for the same word item are not incorporated as additional flashcards (which could possibly cause overlapping and subsequently reduce the "spacing effect") but under the same original digital flashcard which cycles task/question focus between meaning, form and use according to the reached interval. For this study, extensive testing of the prototype software was conducted by seven participants over a two-week period. In view of their feedback and results, some modifications of ISRS have been the removal of multiple-choice questions to eliminate statistical recall rate uncertainty (e.g., lucky guesses). An optional reduction in the total number of study/review intervals (33.3% cut) to permit the system to be utilized more efficiently within shorter time-frames such as a single academic semester.

1838
Memories related to religious beliefs: An aspect of the autobiographical self

Worawach Tungjitcharoen (1), Dorthe Berntsen (1) *1. Aarhus University, Denmark*

Research on autobiographical memory typically focuses on unspecified personally important episodic memories despite the fact that life has many aspects. Religious belief is one aspect of life that influences behavior, perception, and ultimately memory formation. Conversely, past memories provide justifications for the religious belief. This study aimed at investigating specially memory related to religious belief, and comparing it with life story and word-cued memory. A total of 435 participants from five religions were asked to generate seven life story memories, three memories in responses to cue words, and three memories that were central to their personal religious beliefs. They were also asked to rate the memories on their

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phenomenological characteristics, including age estimate, prevalence, importance, valence, intensity, vividness, retrieval frequency, and visual perspectives. The results showed that many characteristics of life story memories and belief-related memories were highly similar. However, belief-related memories were perceived as less prevalent and occurred at older ages than life story memories. Both life story memories and belief-related memories were markedly different from word-cued memories for all event characteristics. Between-group comparisons revealed that Muslims tended to rate event characteristics slightly higher than the other groups. Small, yet significant, interaction effects between religion and type of memory were found in some event characteristics. Besides, we found that the contents of belief-related memories differed considerably from those of life story memories. They were mainly about ritual participation, belief acquisition, and contemplation, whereas life story memories dealt with more cultural life script events. The finding suggests that religious belief, as one aspect of the self, is supported by a specific type of memories that, to some extent, behaves similarly to life story memories.

1804
Influences of aging on odor-evoked involuntary autobiographical memory and the subjective well-being

Yamamoto Kohsuke *Japan*

The present study examined how aging influenced odor-evoked involuntary autobiographical memories and subjective well-being. A diary method was selected based on a previous study. Two hundred young participants (100 females, $M = 24.86$ years old, SD = 2.63) and 200 elderly participants (100 females, $M = 63.65$ years old, SD = 2.86) were asked to record the contents of autobiographical memories in a diary, if a past event was recalled unintentionally, cued by odors in their daily life and complete the Odor-Evoked Autobiographical Memory Questionnaire (OEAMQ; Yamamoto & Sugiyama, 2017), including a subjective well-being scale. Results showed that the elderly participants rated higher than the young participants on some OEAMQ subscales: emotion, retrospective recollection, clarity, future action, and perceptual experiences. Significant correlations appeared between some factor scores of OEAMQ and the subjective well-being scale in both young and elderly participants. These results suggest that subjective well-being plays a significant role in odor-evoked autobiographical memory in elderly adults.

1757
Increases of correct memories and spontaneous false memories due to eye movements after time delay

Sanne Houben (1), Henry Otgaar (1), Tom Smeets (2), Harald Merckelbach (1) *1. Maastricht University, Netherlands; 2. Tilburg University, Netherlands*

Objective: Eye Movement Desensitization and Reprocessing (EMDR) is an effective treatment for posttraumatic stress disorder because it has the potential to make traumatic memories less vivid and emotional. However, literature on possible adverse memory effects of EMDR is scarce. Method: Using the Deese/Roediger-McDermott (DRM) false memory paradigm, we examined the susceptibility to spontaneous false memories after performing eye movements, as used in EMDR. In Experiment 1, 72 undergraduates received word lists containing negative and neutral associated words and immediately after this, they were given a free recall and recognition test. In Experiment 2, 68 undergraduates underwent the free recall and recognition test 48 hours later. During the free recall phase in both experiments, participants either performed eye movements or not (control condition). Results: In Experiment 1, the two conditions did not differ statistically with regard to correct and false recall/recognition. In Experiment 2, correct memory rates were higher in the eye movement than in the control condition and this was accompanied by an increase in spontaneous false memories on both free recall and recognition. Conclusions: Although our experimental approach is far removed from clinical practice, our findings suggest that eye movements as used in EMDR might amplify both correct and false memory rates. When individuals retrieve more correct memories due to eye movements, more spreading activation will occur. As a result, the chance that associated, but not experienced, concepts will be activated increases and this will promote false memories. Therapists have to be aware of this memory effect.

1693
Study on the stability of the animacy advantage effect in memory

Peng Y. Shi (1), Wan Z. Dong (1), Li R. Bin (2) *1. School of Educational Science, China; 2. Henan University of Animal Husbandry and Economy, China*

Objective: Animacy advantage effect in memory refers to that people's memory system have a preference for the preservation of information related to survival. However, previous studies have been limited to textual information from western cultural backgrounds and subjects of the same age. This study aims to explore whether the animacy advantage effect in memory is stable among different types of experimental materials and subjects of different ages. Whether the non-evolutionary theory of "thematic processing advantage" and "difference in processing depth" can explain the cause of the animacy advantage effect of memory. Methods: Experiment 1 randomly selected 90 college students, and adopted 3 (material types: words, pictures, words + pictures) × 2 (information life correlation: life and non-life) hybrid experiment design. Experiment 2 randomly selected 90 subjects of different ages (8, 13 and 21), and adopted 2 (information life correlation: life and non-life) × 3 (age: 8, 13 and 21) two-factor mixed experiment. Result: (1) The experiment 1 showed that there were significant differences among various types of experimental material groups in correct recall rate and learning response of animacy information and inanimacy information; there was no significant difference in the effect size of animacy advantage and incorrect recall rate (the recall rate of "intrusion words"). (2) The experiment 2 showed that there were significant differences among different age groups in correct recall rate and learning response of animacy information and inanimacy information; there was no significant difference in the effect size of animacy advantage. Conclusion: (1) The animacy advantage effect of memory are stable in different types of experimental materials (words, pictures) and individuals of different ages (8−21 years old), and the effect size of animacy advantage is equal. (2) The non-evolutionary theory of "thematic processing advantage" and "difference in processing depth" can't be established.

1329
Familiarizing categories increases familiarity and decreases recollection of category exemplars

William E. Hockley (1), John R. Vokey (2) *1. Wilfrid Laurier University, Canada; 2. University of Lethbridge, Canada*

Familiarizing specific items presented in a study-test procedure and tested with yes-no recognition produces a concordant effect as both the hit rate and the false alarm rate are greater for familiarized items compared to non-familiarized items. We show that familiarizing semantic categories, but not the specific studied exemplars, produces a mirror effect as the hit rate decreases whereas the false alarm rate increases for exemplars from familiarized categories compared to non-familiarized categories. We argue that these results support a 2-factor account of the mirror effect: The increase in the false alarm rate is due to the increased familiarity of new exemplars from familiarized categories while the decrease in the hit rate is due to the reduced recollection of old exemplars from familiarized categories. More generally, we propose that concordant effects in yes-no recognition reflect the influence of a single factor whereas mirror effects are the result of two different factors.

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1242
Remembering with others in conversations: The key role of reactivation in shaping collective memory

Qianlin Guo (1), Jian Guan (1), Hang Fang (1), Yang Rong (1) *1. Nankai University, China*

Both individual memory and collective memory are unstable. Individuals not only recall the past events alone, but also share their past experiences with others. Here we use experimental manipulations to investigate how the level of reactivation in a memory conversation affects subsequent collective memory retrieval. In Experiment 1, Participants ($n = 48$) reactivated memories triggered by group conversations after reading a text describing a historical story. The subsequent free recall test results present that the memories highly reactivated by a group conversation were more convergent than those reactivated at a low level by a group conversation. In Experiment 2, we adopted the episodic counterfactual simulation paradigm. Participants ($n = 42$) reactivated memories triggered by an episodic counterfactual simulation during the memory conversation. On a subsequent free recall, participants were more likely to form convergent collective memories in episodic simulations rather than in a counterfactual lures situation. The findings suggest that the reactivating level during memory conversations might promote the convergence of collective memory.

183
Construal-level priming does not modulate performance in Deese–Roediger/McDermott false memory task

Chi-Shing Tse (1), Taoran Zeng (1), Xuan Gu (2) *1. The Chinese University of Hong Kong, Hong Kong; 2. Guangdong University of Finance and Economics, China*

Objective: Two experiments (total $N = 288$) were conducted to investigate how priming high vs. low construal level affects memory encoding of Deese/Roediger-McDermott (DRM) lists, and in turn modulates memory performance in free recall and recognition tests. Methods: Participants studied DRM lists, in each of which all items (e.g., bed, dream …) were associatively related with a single critical item (e.g., sleep). Immediately after studying each list, participants received a free recall test and after studying all lists, they performed an arithmetic distractor task and then a recognition test. Half of the critical items (and yoked associates) were studied and half were not, such that their hit rates, false alarm rates, and memory sensitivity were measured. Before studying the lists and after studying half of them, participants were primed with high or low construal level by identifying the global or local letter in composite letters in a Navon task (Experiment 1) or by choosing category (e.g., substance) or exemplar (e.g., cooper) to common objects (e.g., metal) in a two-alternative-forced-choice task (Experiment 2). Another group of participants who did not receive any priming task was included as baseline control. Results: The findings of false memory effect (higher false alarm rates for critical items than yoked associates) and lower memory sensitivity for critical items (vs. yoked associate) were replicated. However, there was no systematic construal-level effect on all memory measures, despite the sufficient sample sizes to ensure strong statistical power in two experiments. Conclusion: Construal-level priming does not modulate memory performance in the DRM task.

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