The Role of Momentary Dissociation in the Sensory Cortex: A Neurophysiological Review and its Implications for Maladaptive Daydreaming

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Financial support: The article was supported by the project of the Ministry of Health of the Czech Republic MH-CZ-DRO VFN64165 and by the Cooperation Program, Research Area Neuroscience

Conflict of interest: None declared

Maladaptive daydreaming has been recently identified as a mental disorder and significantly relates to high levels of attentional absorption. As a form of spontaneous and self-generated mental process, daydreaming can lead to the disintegration of attention from the immediate external environment. In extreme cases, patients may develop maladaptive daydreaming comorbid with dissociation, experiencing excessive and compulsive immersion into vivid and intricate fantasized daydreams, leading to intense emotional involvement and kinesthetic movements. The examination of dissociative alterations frequently occurs within the framework of complex cognitive processes. While dissociation may be a neurological and psychological dysfunction of integration, transient dissociative occurrences such as momentary dissociation may signify a dynamic interplay between attentional division and orientation within the sensory cortex. Furthermore, previous studies have recorded the interactivity of stimuli-driven attention with the positive-deflected wave 3 and the active suppression of distractor positivity related to the posterior-contralateral negative-deflected wave 2. In this context, during auditory and visual mismatch negativity related to the negative-deflected wave 1, the sensory cortex can interact with attentional orientation. Additionally, distractor positivity during task-relevant stimuli may play a crucial role in predicting momentary dissociation since sensory cortices share cerebral correlates with attentional fluctuations during mental imagery. The investigation of the associated attentional orientation can be extended to mindfulness. This article aims to review the neurophysiology of dissociative states, which may help develop a resolution for dissociative psychopathology.

Keywords: Attention • Cerebral Cortex • Dissociative Disorders • Orientation • Fantasy

Full-text PDF: https://www.medscimonit.com/abstract/index/idArt/944209
Introduction

Daydreaming appears to be a habitual cognitive phenomenon characterized by hundreds of mental activity episodes per day [1]. Although related research is limited [1], daydreaming has been correlated with mind-wandering, which is a similar phenomenon in which spontaneous thoughts are unrelated to present tasks and immediate sensory perceptions [2]. Pathological interactions may be evident when imaginations and thoughts start to disrupt the daily lives of daydreamers [3]. In this context, maladaptive daydreaming may manifest as an excessive and compulsive immersion in vivid and intricate fantasized daydream plots, leading to intense emotional involvement, which may be accompanied by dissociative psychopathology [4-8].

Maladaptive daydreaming has recently been identified as a mental disorder and is significantly associated with high levels of attentional absorption [3,8-12]. Ross et al [10] further reported that highly traumatized and dissociative inpatients displayed higher levels of maladaptive daydreaming than inpatients with other disorders. Patients who suffer from maladaptive daydreaming can suffer detrimental social and psychological consequences due to the excessive time consumption, subsequent guilt and psychological distress, and challenges in managing dependency on the behavior’s repetition [3,11,12]. Risk factors such as traumatic childhood experiences and childhood sexual abuse may significantly contribute to shared psychopathology [13-15]. Children who display kinesthetic movements such as hand flapping and pacing as a secondary response to maladaptive daydreaming may have attention deficits but can display strengths in memory or verbal expression [9]. Furthermore, Bigelsen and Schupak’s [3] study highlights significant kinesthetic movements such as spinning, rocking, twirling, running, and swinging in addition to pacing within an adult population that reported excessive daydreams.

Moreover, homogeneous light and sound experiments that evoke similar electrical potentials as daydreaming [16] suggested that altered visual potentials may be dominant, followed by altered auditory potentials, in a healthy population [17]. In one such daydreaming experiment, Miskovic et al [18] additionally recorded a mild dissociation of spatial disorientation, even though no prior risk factors were evident. To date, maladaptive daydreaming has not been distinguished in the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-5) [19] or the International Statistical Classification of Diseases (11th revision; ICD-11) [20]. However, it may be considered a dissociative experience [19,21-23]. In addition, dissociative states might manifest with distinctive attentional patterns disrupting memory [41]. These findings highlight attention as a significant cognitive marker of dissociation [42]. Moreover, patients with trauma-related dissociative symptoms may exhibit impulsive hyperactivity alongside attention deficits [26,43]. To emphasize the intricate relationship between dissociation, attentional processes, and cognitive functioning, Nijenhuis and van der Hart [30] further linked the components as core features of trauma.

Evidence from attention deficits and dissociation-related disorders comorbid with maladaptive daydreaming further shows significant interactions among anxiety, depression, trauma, and obsessive-compulsive tendencies [10,22,24-28]. In extreme cases, dissociation, identified as a division within one’s personality [29,30] can restructure into a dissociative disorder that could implicate identity complications [19-20]. Marcussen-Clavertz et al [31] found unresolved attachment and detachment in addition to dissociative compartmentalization within the personality. Subsequently, separation from the self, identified as depersonalization, may also interact with trauma [29,32-38].

In a more recent review, Scalabrini et al [39] suggested that dissociation could be a neurological and psychological dysfunction of integration. Although the diagnoses are debated [29,30], the internal division may be ascribed to sensory attention and absorption within a context or away from reality [40], thus triggering maladaptive mind-wandering imageries. In addition, dissociative states might manifest with distinctive attentional patterns disrupting memory [41]. These findings highlight attention as a significant cognitive marker of dissociation [42]. Moreover, patients with trauma-related dissociative symptoms may exhibit impulsive hyperactivity alongside attention deficits [26,43]. To emphasize the intricate relationship between dissociation, attentional processes, and cognitive functioning, Nijenhuis and van der Hart [30] further linked the components as core features of trauma.
While dissociation can progress to abnormalities [19-20], momentary dissociation, as explored further, may reflect a dynamic interaction between attentional division and orientation in the sensory cortex of both pathological and nonpathological individuals. Figure 1 illustrates momentary dissociation as the neural dynamics within the spectrum of maladaptive daydreaming and attentional orientation below a healthy threshold. Furthermore, dissociation may directly correlate with attention and valence stimuli, suggesting an inverse link to mindfulness [44,45].

**Mindfulness**

In the study of altered states of consciousness, *mindfulness* may manifest through focused attention on an object or open monitoring of nonspecific focus during spontaneous thoughts [44-46]. Investigating the neural dynamics associated with the default mode network (DMN) – a brain network related to task-unrelated spontaneous cognition [46-48] – may help elucidate how dissociation can be restructured to achieve attentional orientation. A decrease in the DMN may correlate with an increase in present-moment awareness, often referred to as mindfulness [46,49,50]. Moreover, the DMN plays an equal role in mind-wandering episodes.

Interactively, Herscu et al [51] found an active role of mindfulness in managing maladaptive daydreaming symptomatology. Furthermore, Vancappel et al [44,45] consider the mediating role between dissociative states and mindfulness to be attentional switching. In this process, the orientation to positive, negative, or neutral experiences may interact with the self-regulation of attention. Mindfulness meditation may reduce mind-wandering through decreased activation in the posterior cingulate cortex, temporal gyri, and uncus [49]. Long-term sensory effects suggest accelerated improvements in bottom-up attentional control [52]. Moreover, Srinivasan and Baijal [53] recorded enhanced automatic short-lived responses called mismatch negativity (MMN) in the auditory cortex when a secondary task was not present following mindfulness meditation training. Additionally, audiovisual alterations appear to influence each other [54]. Therefore, they may further occur [55] and disrupt independently exhibiting disorientation [56] or strengthen the sensory cortices in the case of mindfulness [49,52]. In conjunction, mindfulness practices linked to heightened self-awareness may help individuals draw the neural connections of conscious processes [57]. Further examining attention in the sensory cortex may elucidate the inverse interactions between mindfulness and dissociation [44,45]. The integrated neural dynamics of attentional fluctuations can therefore inform the therapeutic interventions needed for individuals with maladaptive daydreaming.

**Theoretical Framework**

In the context of neurodiversity, dissociation may reflect a deviation from one’s immediate experience [29,30,40], while mindfulness can help cultivate the capacity to sustain awareness in the present moment [58]. Some researchers argue that mindfulness may be well suited for dissociation-related interventions by helping individuals build awareness of the dissociation process and offering a tool for staying in the present [44,45,58,59]. Therefore, we integrated electroencephalography (EEG) data, which were previously used to examine attentional awareness. Furthermore, we interchangeably refer to attentional orientation as awareness, self-awareness, attentional awareness, or mindfulness, as they are overlapping phenomena [44-46,49,50,58,59].

Previously, the positive-deflected wave 3 (P3) originating from temporal-parietal activity [60,61], posterior-contralateral negative-deflected wave 2 (N2pc) [62], audiovisual negative-deflected wave 1 (N1), and the associated MMN [52-53] have been utilized to examine mindfulness in addition to some dissociative characteristics of the DMN [46]. To the best of our knowledge, no comprehensive theory exists that directly integrates these cerebral activities with momentary dissociation. Based on the comorbidity between maladaptive daydreaming, attention, and dissociation [8-10], Table 1 infers that these event-related...
Table 1. Neurophysiological biomarkers of momentary dissociation in the cerebral cortex.

<table>
<thead>
<tr>
<th>Event-related potentials</th>
<th>DMN attentional activity</th>
<th>Attentional modulation</th>
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<tbody>
<tr>
<td>P3</td>
<td>Temporal-parietal activity</td>
<td>Sustained attention</td>
</tr>
<tr>
<td>N2pc</td>
<td>Posterior-contralateral activity related distractor positivity (P2c)</td>
<td>Selective attention and altered cognitive processing</td>
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<tr>
<td>N1</td>
<td>Short-lived audiovisual mismatch negativity (MMN)</td>
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P3 – positive-deflected wave 3; N2pc – negative-deflected posterior-contralateral wave 2; N1 – negative-deflected wave 1; DMN – default mode network.

Potentials (ERPs) may be significant biomarkers of momentary dissociation in the sensory cortex during attentional orientation. Dissociative exploration frequently occurs within the framework of broader theories related to complex cognitive processes [9,10,63]. Preliminary research has examined the potential connections among these phenomena in the context of altered states of consciousness [16,34,46,64-68]. Here, attentional processes may play a crucial role in modulating mind-wandering, dissociation, and maladaptive daydreaming [68-71].

The processes represented by the neural markers of P3, N2pc-related distractor positivity (P2c) interactions, and N1-related MMN can serve as indicators of how attention may be allocated during dissociative states. At this juncture, P3 has been used as an indicator of task-relevant neural responses and sustained attention [72-74]. Additionally, N2pc has been associated with the study of selective attention given to objects [75-78]. In congruence, the P2c response examined in the inhibitory processes of attention and distraction from an object may simultaneously highlight altered cognitive processing [79-81]. Furthermore, the N1-related MMN may signal unexpected or deviant stimuli, shifting attention automatically [82-84].

Taken together, these cerebral processes may provoke momentary dissociation or vice versa. Although momentary dissociation and mind-wandering are separate phenomena, they may interact with the same cerebral activities in the sensory cortex. Episodes of mind-wandering can occur during momentary dissociation, as altered states of consciousness often involve complex interactions among various brain regions [39,85]. In essence, the cerebral locations involved in momentary dissociation and mind-wandering may not be the same. However, shared neural activities can interact and modify attentional awareness during daydreaming.

P3 and Attentional Orientation during Mind-Wandering

The P3 component, which peaks at approximately 300 ms after stimulus, is commonly believed to reflect working memory updating [86-89] and simultaneous attentional processing [90-92]. Previous studies utilizing stimuli-evoked ERPs [93-94] have consistently demonstrated a typical pattern of decreased P3 amplitude during mind-wandering episodes compared to on-task periods [95-98]. A reduction in the P3 amplitude during mind-wandering may suggest a withdrawal of executive control resources from the current task, redirecting attention towards task-unrelated thoughts [99,100].

However, Wong et al [89] revealed an unexpected pattern in the P3 amplitude during mind-wandering switch trials where P3 amplitudes were greater than those in the on-task switch trials. This finding contradicts the typical P3 attenuation observed during mind-wandering episodes. The increased P3 amplitude during higher-order switch trials suggested the involvement of executive control processes in both mind-wandering and task switching, supporting the idea of a connection between attentional switching and mind-wandering [89]. Furthermore, the impact of mind-wandering on the P3 response may not be related to changes in motor activity or general arousal [98]. In efforts to sustain attention, the mind naturally fluctuates during cognitive analysis when applied to events in the external environment. Since mind-wandering correlates with daydreaming and leads to dissociative experiences [1], the P3 potentials may extend to momentary dissociation. Decreased P3 activity may further correlate with mindfulness [101], and Roydeva and Reinders [102] highlighted the P3 response as a biomarker for pathological dissociation.

Mindfulness meditation studies revealed enhanced executive functioning and attention through P3 modulation in the temporal-parietal regions [101,103,104]. In contrast, the auditory P3 (P3a) may be independent of attentional orientation and unaffected by task difficulty [98]. Furthermore, the automatically elicited P3a does not rely on the overall capacity of the brain [105]. The difficulty level of the task in their study did not impact the MMN or P3a, suggesting that P3a is not influenced by task demands. These findings are relevant to dissociation as they demonstrate momentary changes in P3 even during states of dissociation when attention and task demands are compromised.
**Distractor Positivity (P₀) Interactions during Daydreaming**

In cases where task demands are not compromised, P₀ onset may signal a decrease in attentional priority after posterior-contralateral N2 (N2pc) onset [79]. Interactively, P₀ arises from visual processes when salient distractors capture attention. This ERP has been typically observed as a positive deflection in the EEG signal over posterior scalp regions [79,106]. P₀ may further indicate the suppression of distractors [107] or target processing during distractor suppression [108].

Moreover, P₀ potentials have been examined in relation to the N2pc, which may actively affect visual attention, to understand how active suppression affects attentional movement [106]. The data revealed that when active suppression is employed, it can hinder and redirect attention. Sawaki et al [106,107,109] confirmed that P₀ reflects a mechanism of active suppression controlled by top-down processes. The demonstrations highlight the shift from attention captured by a distractor which may be actively engaged in redirecting attention towards a target. Qiu et al [110] highlighted the reliance of the N2pc component on visual awareness, emphasizing the relationship between early attentional processes, visual awareness, and working memory maintenance.

According to Feldmann-Wüstefeld et al [111], the P₀ response after N2pc reflects the influence of attentional movement, not only through an observer’s intention or valence stimuli but also through selection bias, known as the learning experience. Additionally, Talsma et al [112] found that positive distractor words elicited automatic attentional engagement during the early stages of processing, as evidenced by modulations in the anterior N1 component. Thus, the interplay between P₀ and N2pc and between P₀ and anterior N1 sheds light on the mechanisms involved in reorienting momentary dissociation. A better understanding of the roles of N2pc and N1 could help elucidate the mechanism of distractor positivity.

**Role of N2pc in Attentional Orientation**

The N2pc has been characterized by a negative deflection in the EEG signal over posterior scalp regions contralateral to the attended target [79]. Electrophysiological evidence from Brissone and Jolicœur [113] demonstrated visuospatial tracking of the N2pc during multilevel processing, further revealing sensory cortex interference. According to a top-down approach, an increase in N2pc may provoke the suppression of distractors in visual attentional processing [114]. Moreover, the pineal gland could play a significant role in modulating attention deficits via a bottom-up approach [115-117].

Task-related N2pc and task-unrelated surround attenuation may further involve different neural processes [118]. The N2pc reflects competition between distractors, while surround attenuation enhances the ability to focus attention. These processes are interconnected in top-down attentional selection, where the N2pc represents the chosen item and surround attenuation determines successful representation in the visual cortex [119]. The linkage between the N2pc and surround attenuation during top-down attentional selection implies that these processes work together to prioritize and select relevant mental representations or daydreams. Additionally, the N2pc may emerge solely with conscious cue awareness, further recording attentional redirection without awareness [120]. In this context, Giattino et al [120] indicated that N2pc may enhance neural sensory processing and improve subsequent stimulus detection behavior.

Overall, N2pc studies record conscious awareness modulation during visual processing [110]. Using the attentional blink paradigm, Zivony et al [121] challenged the notion that the absence of N2pc indicates no shift in attention. Contrary to the findings of previous research, they believed the attentional blink paradigm may not impact attentional capture; rather, it could suppress and delay the associated N2pc. In their study, the N2pc did not reflect attentional shifting but instead exhibited transient enhancement through the spatial focus of attention. Consequently, the task provoked a higher level of mental processing – the visual identification of cues.

**Role of N1 in Momentary Mismatch Negativity (MMN)**

The largest visual and auditory ERP – N1 – may spontaneously engage with the MMN during attentional processes [122]. Although the N1 potential and the MMN may be 2 distinct stimuli-driven ERPs, they interact with distractor-related (P₀) sensory processes [123]. At a cerebral level, the N1 represents the detection of simple changes [124], while the MMN reflects the detection of deviances based on sensory memory [83,124]. Both ERPs respond differently to stimuli and are specific to the sensory areas where they are evoked. Here, the N1 potentials recurring between 80 and 120 ms [125] may reflect attentional selection and enhancement of relevant stimuli [83,126].

On the other hand, MMN potentials detect and automatically orient attention to unexpected stimuli [83,126]. The MMN peaks between 150 and 250 ms from the onset of change or deviance, respectively, as a negative deflection in the ERP [127,128]. When the MMN reflects the brain’s ability to detect and encode violations of regular auditory patterns [129], N1 may generate MMN responses since the attentional resources allocated to the stimuli can modulate the MMN amplitude [130].
Furthermore, the MMN synchronizes with temporal and frontal cortical sources and the auditory cortex [83,127]. Interestingly, auditory and visual MMN may be found when the left inferior frontal gyrus is activated [131-133]. These findings highlight how momentary dissociation can reflexively interact with attentional awareness through the N1/MMN [53]. In the case of mindfulness, internalized attention may correlate with an increase in MMN, suggesting an active interaction of dissociation [46]. Moreover, the frontal MMN may not necessarily increase during meditation, but instead accelerate at the end when the mind can openly monitor the experience [53].

Repeated stimulation of the sensory cortex may decrease auditory cortex responsiveness, elucidating the importance of MMN activity during the suppression of the N1 component. This supposition, supported by Rosburg et al [133], suggested that repeated events play a role in shaping MMN responses. Significantly, MMN potentials can lead to high-level attentional switching transmitted through fronto-central P3a channels [123,134]. As observed in this review, disruptions in sensory processing mechanisms, such as reduced N1 or MMN amplitudes, may be associated with altered attentional processes. Hence, MMN interactions warrant further exploration of the neural processes linked to daydreaming experiences [131] and mindfulness [46].

### Cerebral Interactivity and Sensorial Dynamics in Dissociative Processes

In this review, we highlight the cerebral interactivity between dissociative experiences, such as daydreaming and mindfulness. Both may significantly interact with attentional orientation [44,45]. Individuals may further be immersed in an inner world while still being able to differentiate it from reality [1,6,8-10,135]. Moreover, the dynamic nature of attentional fluctuations recording distractibility may be visible at as low as 3-5 Hz [136], highlighting an altered consciousness phenomenon [46]. These disruptions are similar to fluctuations in attentional processing of external stimuli and internal memory representations over a specific time period. Additionally, they may interact with the functional connectivity of the DMN [46-48].

In vivo studies of the human medial temporal lobe have demonstrated the responses of specific neurons to conscious visual perceptions [137]. Interactions between neuronal activity and subjective visual experience within this sensorial brain region may be evident. This connection can be further explored in attentional paradigms, shedding light on how the brain selects and prioritizes sensory information for conscious awareness. Additionally, research on neurons in the inferior temporal cortex of monkeys implicates continuous activity when exposed to sensory cues that trigger memory [138]. As a result, they may actively suppress non-targets and respond to the target stimulus. The object selection and attentional foveation dynamics highlight the ability to prioritize specific targets while suppressing distractions. Taken together, these studies offer valuable insights into attentional orientation and dissociation processes occurring in the cortices relevant to neurodiverse interactions and comparative psychology.

Furthermore, individuals may continue to daydream as long as a task does not require full attention during mind-wandering episodes [139]. Moreover, memories related to the task at hand can trigger a lack of interest in the task. Understanding the neural processes involved in daydreaming can provide insights into potential abnormalities in object selection and attentional foveation dynamics associated with momentary dissociation. The interplay of cerebral activities with the DMN [46,47-49] and the pineal gland [115-117] further highlights the significance of the sensory cortex in dissociative psychopathology.

### Implications

Allied professionals, such as psychologists and therapists, can use the integrative framework elucidated here to develop holistically effective treatment strategies. EEG data may be combined with transcranial stimulation, functional magnetic resonance imaging (fMRI), single-photon emission computed tomography (SPECT), and magnetoencephalography (MEG), among other methods, to obtain a multimodal understanding of the sensory cortex [46]. While the cerebral activation of attentional orientation has been the primary focus of this review, these neural processes may additionally represent naturally evoked altered states of consciousness, memory processing, motivational activation within executive functioning, and overall sensory perception.

Subsequently, daydreaming may frequently serve as an escape mechanism and manifest as maladaptive coping strategies, particularly in response to distressing emotions, past trauma, or day-to-day stressors [4,5]. Disorientation can lead to diminished productivity, hinder academic or occupational performance, and disrupt relationships when excessive cognitive disengagement takes precedence over responsibilities and social interactions [1,6]. At this intersection, the neural dynamics of momentary dissociation and attentional orientation could aid interventions for maladaptive daydreaming. Furthermore, integrated mindfulness training may imply enhanced self-organization [52].

The discussed ERPs allow for a detailed examination of the cerebral responses associated with self-awareness, offering a better understanding of how the cognitive system responds to internal and external stimuli [50]. Through an integrative...
approach, individuals can cultivate present-moment awareness when working with clinicians holistically. Mindfulness practices in conjunction with attentional orientation observed through the proposed ERPs can be devised to address both dissociation and AD/HD, thereby expanding treatment options.

**Future Directions**

Scientific studies on attentional orientation and dissociation provide an entry point in visual consciousness research [137]. While off-task states were previously associated with internally directed processes such as spontaneous recollections, irrelevant stimuli, such as external noise, can also induce immersive mind-wandering imageries [140]. In addition to mind-wandering, maladaptive daydreaming has often been overlooked as a clinical condition that can impair daily functioning. Hence, this research warrants a comprehensive, scientific, and clinical focus [9].

Previously, Eimer and Kiss [141] observed the influence of task requirements on attentional capture by salient visual objects. Although they did not directly address momentary dissociation, they emphasized the importance of cognitive processes and attentional regulation directed toward understanding dissociative alterations. However, multimodal research is needed to examine cerebral integrations. Moreover, extreme dissociative absorption may interact with the disintegration and splitting of awareness comorbid with the psychopathology of anxiety, depression, distress, obsessive-compulsive, and psychoticism symptoms [6]. How these mental processes further shape dissociative traits may be an important implication for dissociation and related disorders.

Independent of visual imagery, rare auditory imagery may be more prevalent in females than in males, who experience more immersive visual imagery during daydreaming [142,143]. However, research is needed to verify the relevance of these findings. Thus far, the electrical signatures of daydreaming and attentional orientation reported in this review may help predict the underlying mechanisms of momentary dissociation in the sensory cortex. In this context, daydreamers do not experience delusions, thinking disorders, or limited emotional expression [6]. Instead, they may occasionally report audiovisual alterations [2,17,144-146] and their fantastical thoughts may be complex, creative, and willful, similar to dissociative disorders [6].

**Conclusions**

By understanding the P3, P0, and MMN interactions, we may be able to integrate into the inner worlds of daydreamers to better understand dissociative characteristics. While the mind naturally wanders [98], active P0 suppression can inhibit and disengage visual attention [106] from conscious cue awareness during N2pc activation in the visual cortex [120]. The associated distractor positivity ERP sheds light on the termination of attention [106]. Furthermore, attentional deficits found in daydreaming and mind-wandering comorbid with dissociation [8-10] correlate with a reduction in P3 amplitude [99,100]. Finally, auditory and visual mismatch negativity and the associated N1 suppression interact with the sensory cortex, specifically, the auditory cortex [83,127]. Moreover, the sensory cortex shares neural correlates with mental imagery and perception [56]. Mindfulness studies highlight how the brain can reflexively prioritize sensory input for conscious awareness, potentially mitigating maladaptive daydreaming [51,58]. All of these components in combination can evoke spontaneous self-awareness along with audiovisual imagery, as evident in the daydreaming literature.

**Acknowledgments**

This project was performed at the Centre for Neuropsychiatric Research of Traumatic Stress Related Projects SVV and PROGRES at Charles University, First Faculty of Medicine. The article was supported by the project of the Ministry of Health of the Czech Republic MH-CZ-DRO VFN64165 and by the Cooperation Program, Research Area Neuroscience. Additionally, we thank Dr. Marc Wittmann from the Institute for Frontier Areas of Psychology and Mental Health for his comments on the manuscript.

**Declaration of Figure’s Authenticity**

All figures submitted have been created by the authors, who confirm that the images are original with no duplication and have not been previously published in whole or in part.

**References:**

29. Dell PF. An excellent definition of structural dissociation and a dogmatic rejection of all other models. J Trauma Dissociation. 2011;12(4):461-64
36. Šar V. Parallel-different structures of internal world and external reality: Disassociating and re-accepting the self in the aftermath of trauma-generated dissociation. Front Psychol. 2017;8:216


64. da Silva MRD, Gonçalves OF, Branco D, Postma M. Revisiting consciousness: Distinct affect-related anticipatory attentional templates and attention mind wandering with EGG. Conscious Cogn. 2022;101:103332


69. Greve M, Was CA. Mind wandering proves as a source of mind wandering depends on attention control demands. Conscious Cogn. 2022;103:103355


76. Kerzel D, Cong SH. Biased competition between targets and distractors reduces attentional suppression: Evidence from the positivity posterior contralateral and distractor positivity. J Cogn Neurosci. 2022;34(9):1563-75

82. Caluus A, Deltenre P, Hoonhorst I, et al. MMN and P300 are both modulated by the featureless nature of deviant stimuli. Clin Neurophysiol. 2015;126(9):1727-34


89. Wong YS, Pat N, Machado L. Commonalities between mind wandering and task-set switching: An event-related potential study. Neuropsychologia. 2023;185:108585


110. Kerzel D, Cong SH. Biased competition between targets and distractors reduces attentional suppression: Evidence from the positivity posterior contralateral and distractor positivity. J Cogn Neurosci. 2022;34(9):1563-75
122. Rosburg T, Boutros NN, Ford JM. Reduced auditory evoked potential component N100 in schizophrenia—a critical review. Psychiatry Res. 2008;161(3):259-74