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# Emotion Experience in Aphantasia: Insights from Autobiographical Memory, Prospection and Mental Simulation

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**Abstract:**

Mental imagery functions as an emotional amplifier by supporting perceptually vivid simulations in memory and prospection. Aphantasia, characterized by absent or severely reduced visual imagery, has relevantly been associated with attenuated emotional experience during autobiographical recall, future thinking, and engagement with narrated events. However, the neural mechanisms underlying these affective differences and how they relate to broader theories of episodic construction remain underexplored. This review synthesizes evidence demonstrating an attenuation of embodied emotion in aphantasia alongside preserved emotional appraisal. It also examines the phenomenological differences in remembering and imagining episodic events. Situating these findings within theories of episodic reconstruction, this review explores possible implications of imagery absence in aphantasia for empathy, evaluative conditioning, motivation, adaptive decision-making and emotion regulation. A key direction for future theorizing is to account for the embodied and appraisal components of emotional experience in aphantasia and their significance across prospective and retrospective autobiographical events at both behavioral and neural levels.

**Keywords:** Aphantasia, Mental imagery, Autobiographical memory, Imagination, Emotional amplification

## 1. Introduction

Mental imagery involves the ability to reinstate sensory experiences in one's mind without accompanying external stimuli [1]. It supports a wide array of cognitive and emotional functions, encompassing memory, prospective thinking, empathy, decision-making, and emotional regulation [1]. In particular, mental imagery is thought to play an amplifying role by placing the individual within an emotionally arousing mental scene that approximates real events [2,3]. Given the extensive variability in imagery capacity across the population, congenital aphantasia—characterized by greatly diminished or absent vol-

untary visual imagery—has attracted interest as a natural model for exploring imagery's role in affective experience through its absence [4,5].

Past research on aphantasia has converged on a profile of selectively attenuated emotional experiences in domains requiring episodic reconstruction. Individuals with aphantasia show reduced physiological response to imagined or narrated events [5-7]. They also report lower emotional arousal when recalling autobiographical memories or imagining future and atemporal events [8-10]. Emotional experience in aphantasia varies asymmetrically across temporal dimensions, exhibiting greater attenuation in prospective imagery than in retrospective memory [8]. It also varies across sensory modalities, where individuals show differential engagement depending on the availability of non-visual imagery [6,11]. Notably, individuals with aphantasia appear unaffected in their ability to discriminate emotions, assess the personal relevance of events, and infer the mental states of others [7,8,10,11].

Contemporary studies on the emotional experience of aphantasia are fragmented in their conclusions. Specifically, the field lacks a cohesive framework that clarifies how imagery deficits, and more broadly, disruptions in episodic reconstruction might exert a domain-general impact on emotional experience. This review serves as a preliminary step toward addressing this question. It will synthesize and evaluate emotional functioning in aphantasia across (i) immediate emotional engagement with narratives and cross-modal stimuli, and (ii) retrospective and prospective autobiographical events. In assessing these findings, it will further consider whether aphantasia reflects a dissociation between emotional simulation, the immersive, embodied aspect of affect, and emotional appraisal, the capacity for emotion discrimination, reward processing and evaluation of personal significance. Ultimately, this review aims to clarify how aphantasia informs the mechanisms linking imagery to emotion, identify methodological limitations in the existing literature, and offer future directions for studying the cognitive-affective consequences of attenuated episodic reconstruction.

# 2. Emotional Processing without Mental Imagery

## 2.1 Evidence from Narrative and Musical Engagement

### 2.1.1 Narrative engagement

Aphantasia research has drawn on emotional amplification theory to investigate how imagery enables the projection of oneself into fictional events, supports empathic understanding, and contributes more broadly to everyday emotional experience and regulation [6-8]. Using narrative engagement and cross-modal stimuli, past literature has derived converging evidence for diminished emotional responses in non-visual contexts [5-8].

A seminal study by Wicken and colleagues examined emotional arousal among aphantasics in response to narrated distressing scenarios and fear-inducing pictures, providing the first physiological evidence that the absence of visual imagery reduces emotional arousal to narrated events [5]. These findings were replicated by Monzel et al., with additional evidence of lower self-reported sympathy in aphantasia during a verbal sympathy task [7]. Building on this paradigm, Abdelrahman et al. compared aphantasics' narrative engagement during film-based versus audio-only stories [6]. Complementing the aphantasic profile of diminished emotional engagement and physiological arousal during narrative reading, the study also identified physiological arousal in controls during verbal conditions, indicating an imagery-related cognitive effort not previously observed [6].

### 2.1.2 Musical experience and cross-modal imagery

In populations with intact imagery, music often elicits spontaneous visual imagery [8]. Music-evoked imagery not only facilitates emotional engagement but also serves adaptive roles in mood regulation and cueing emotional reminiscence [8]. Research on musical experience indicates that, in addition to the lack of concurrent visual imagery, aphantasic listeners report weaker emotional arousal while maintaining typical levels of music liking and intact discrimination of emotional themes [8]. A broader survey of daily musical engagement has found that aphantasics are less likely to utilize music for reminiscence and other emotion-related functions [8]. Aphantasic participants with the complete absence of visual imagery (VVIQ = 16) have exhibited additional deficits in evaluative conditioning, offering that visual imagery may play a more pervasive role in shaping emotional associations [8].

## 2.2 Emotion-amplification and empathy

The present findings indicate several functional roles of imagery in amplifying emotion. Since imagery enables affective self-projection into narratives and alternative perspectives, its absence undermines aphantasics' empathic abilities in non-perceptual contexts [6-7]. Additional links have been drawn between aphantasia and alexithymia to explain diminished emotional response in perception-based tasks [7]. Aphantasics have shown a greater tendency toward externally oriented thinking and greater difficulty in articulating emotional experiences. These alexithymia-like traits suggest reduced attention to

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internal emotional states, which may in turn explain why aphantasics tend to report feeling less emotional during visual, affect-eliciting scenarios [7]. Despite trait-level similarities, the link between aphantasia and alexithymia is debated. Individuals with aphantasia retain the ability to recognize and report emotions [7,8,10], a function typically compromised in alexithymia. Relevantly, these results outline a dissociative profile characterized by impaired emotional simulation and preserved emotional appraisal in aphantasia [6].

## 2.3 The Emotional Relevance of Multimodal Imagery

Mental imagery is inherently multimodal, with stimuli from one sensory modality readily provoking imagery across modalities [12]. While individuals with aphantasia can engage affectively through spontaneous non-visual imagery [6,11], previous research has demonstrated considerable individual variability in multi-sensory imagery strength, overlap with global imagery deficit (Dyskinesia), and deficits in auditory imagery (Anauralia) [6,11,13-15]. This heterogeneity likely has introduced discordant noise in visual imagery studies. It may also partly account for the substantial variability in emotional intensity reported among aphantasics in narrative engagement tasks [6]. Since limited research has explicitly modeled this heterogeneity, future studies are encouraged to assess imagery strength systematically across modalities and evaluate the contribution of non-visual imagery to embodied emotional experiences.

## 2.4 Associative Processing, Binding and Evaluative Conditioning

Diminished evaluative conditioning in individuals with pure aphantasia reinforces the significance of visual imagery in associative processing [11]. Prior research has demonstrated that voluntary visual imagery facilitates associative learning of emotional content, and that the strength of episodic memory correlates with the transfer of affective valence in evaluative conditioning [16,17]. From a broader theoretical perspective, evaluative conditioning has been suggested to involve reconstructing and binding disparate elements into a coherent representation [18]. Although there is no explicit study testing evaluative conditioning, findings on aphantasia performance in associative memory tasks support this binding account. During encoding, individuals with aphantasia have reported forming fewer links between stimuli, suggesting diminished stimulus-driven imagery in binding associated elements [19]. This pattern likewise supports a role for visual imagery in facilitating perceived connections between stimuli [19]. Consequently, diminished evaluative conditioning in pure aphantasia may reflect a deficit in the conscious, imagery-driven integration of emotional and neutral stimuli. Future work should examine this possibility, as associative memory and emotion in aphantasia remain largely unexplored in the current literature.

## 2.5 Limitations, Methodological Constraints and Future Direction

The methodologies employed in contemporary studies have constrained more comprehensive analysis of imagery's amplification role. Wicken et al. introduced physiological measures of emotional arousal (e.g., skin conductance) to address earlier reliance on self-reported affect [5]. However, these measures are not specific to emotion and can also reflect other cognitive, motor, and external influences, such as mental effort during imagery generation [6]. Due to the use of brief, decontextualized, and predominately distress-inducing stimuli, visual-verbal-imagery paradigms have also suffered from low ecological validity, while leaving the amplifying role of imagery in positive emotions unexplored [5]. Alternative challenges emerge when studies use complex, naturalistic narratives, as narrative processing recruits other functions such as working memory for tracking the spatiotemporal unfolding of events [6]. These confounding processes influence emotional engagement independently of imagery and have remained difficult to isolate in ecological designs.

Moreover, research on imagery and empathy in aphantasia has not distinguished between facets of empathy. Beyond affective empathy, imagination facilitates perspective-taking and adaptive emotional understanding, components of cognitive empathy mediated by imagery vividness [20,21]. Studies using questionnaire-based trait measures have associated aphantasia with autism spectrum disorder through shared deficits in imagery and social skills, raising questions about the role of imagery in personality, social functioning, and theory of mind (ToM) [22-24]. However, direct assessments of ToM performance indicate that aphantasics remain unaffected [25]. This finding aligns with task-based evidence from emotional face recognition paradigms: although aphantasics do not benefit from imagery-based facilitation of emotion recognition, they compensate using alternative strategies to achieve comparable discrimination accuracy [7]. Given these mixed findings, it is unclear what social-affective implications are attributable to imagery deficit, or to the experience of aphantasia. Future research should directly compare the impact of deficient imagery vividness on affective versus cognitive empathy and situate aphantasia to explore its broader social-affective relevance.

# 3. Aphantasic Emotion across Temporality

## 3.1 Episodic Reconstruction and Affective Retrieval

Parallel to evidence from immediate imagery-inducing contexts, findings indicate significant attenuation in how individuals with aphantasia experience emotionally charged past and possible future events. This dual effect is attributed to how autobiographical memory and imagination rely on a shared network that coordinates hippocampal and sensory cortical regions to assemble spatially coherent, perceptually rich scenes [9,26].

There have been theoretical attempts to characterize aphantasia presentation beyond voluntary visual imagery in terms of a cluster of affected and spared functions [27]. Building on the original Constructive Episodic Simulation Hypothesis (CESH), Blomkvist proposed CESH+, a model that specifies a role of the hippocampus in indexing modality-specific elements of an episode upon request [27,28]. The model further proposes distinct episodic retrieval processes, each dedicated to a particular sensory modality [27]. Remembering and imagining are thus thought to draw on the same system but differ in which indices and retrieval processes are engaged, and in how retrieved elements are recombined [27]. Crucially, CESH+ includes a distinct affective retrieval process dedicated to the emotional components of an episodic representation [27]. This hypothesis may therefore provide a theoretical basis for explaining how disruptions in multiple retrieval processes, rather than visual imagery alone, can lead to a selectively impoverished emotional experience in aphantasia.

## 3.2 Autobiographical Memory and Future Thinking in Aphantasia

### 3.2.1 Emotion in autobiographical interview

Autobiographical interview studies demonstrate unequivocal evidence of impoverished autobiographical recall and future event simulation in aphantasia. Aphantasic participants have consistently reported fewer episodic details, described fewer emotional details, and demonstrated reduced confidence in recollections [8,9,22]. Even though they rated their experience as less emotional, aphantasics do not show attenuation in their judgment and ratings of an event's personal significance [8]. This suggests that imagery-induced attunement to autobiographical vividness and emotional arousal may not extend to self-referential appraisal.

### 3.2.2 Negative emotion in prospect and retrospect

More recent studies have focused on the emotional experience of aphantasia across prospective and retrospective negative events, examining whether the lack of visual imagery buffers individuals from its amplifying effect [10,29]. After exposure to a traumatic film, aphantasics reported fewer intrusive memories and described them as predominantly verbal rather than sensory-based [29]. In catastrophizing interviews, where participants are asked to imagine and elaborate on a possible catastrophic event in the future, aphantasics generated fewer catastrophic elaborations, reported a lower perceived threat, and demonstrated a better ability to terminate worrying episodes [10]. They also reported predominantly somatic and abstract manifestations of worry with minimal multisensory and verbal components [10].

## 3.3 Divergent Profile of Prospective and Retrospective Emotions

These results are consistent with scene-construction and emotional-amplification theory, as imagery supports the construction of perceptually rich scenes that facilitate emotional re-experiencing and immersive prospection [2,26]. Since episodic retrieval relies on synchronized hippocampal-sensory interactions, disruptions in functional connectivity in aphantasia result in compromised episodic reconstruction and a subsequent attenuation of emotional intensity in both memory and imagined conditions [9,27]. This effect is especially strong in prospection, which relies more heavily on imagery, whereas intact semantic scaffolding may aid in retrieving affective memories [8].

Aphantasia has demonstrated a primarily nonsensory profile in experiencing distressing mental events [10,29]. While intrusions are recalled verbally, prospective worrying is often described as a disembodied, non-verbal "sense of knowing" [10,29]. Diminished vividness has further been associated with lower perceived threat and emotional intensity in prospective worrying, although aphantasics are not spared from negative affect induced by intrusions [10,29]. The discrepancies observed across studies likely reflect differences in the perceived immediacy and intensity of intrusive traumatic memory versus worry induced by different designs. They may likewise reflect a prospective–retrospective asymmetry in how these processes recruit the episodic system—engaging different mnemonic indices, modality-specific retrieval processes, and forms of recombination within a shared neural architecture [27].

## 3.4 Conceptual-Perceptual Dissociation in Emotional Retrieval

Aligning with prior evidence in narrative and musical ex-

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periences, aphantasics retained the ability to discriminate and evaluate their emotional experiences in memory and imagined events. While aphantasics report diminished emotional intensity, evidence shows frequent emotional language use in autobiographical interviews [8]. This raises the question of whether aphantasics assess emotional autobiographical memories through reappraisal or a predominantly conceptualized form.

This speculation aligns with models of autobiographical retrieval that distinguish between perceptual and conceptual remembering, each supported by a distinct neural network [30]. Perceptual remembering has been proposed to depend on posterior hippocampal, medial temporal, and occipital networks that reconstruct embodied experiences [30]. Conceptual remembering alternatively engages an anterior hippocampal–dorsal medial network that supports schematic, evaluative, reward and value-based reconstruction, enabling emotional appraisal without the re-experiencing of affective attributes [30]. Notably, the hippocampal-dorsal medial network has also been implicated in supporting the initial structural scaffold for event reconstructions before perceptual details are retrieved [31]. A specific disruption of perceptual retrieval would therefore allow autobiographical construction at a semantic or propositional level.

Behavioural and neural evidence in aphantasia supports this interpretation: while fMRI evidence reveals an impaired hippocampal–occipital engagement during autobiographical retrieval, individuals with aphantasia maintain the ability to retrieve and describe autobiographical events [8,9]. Aphantasia may therefore reflect a visually dominant impairment in constructing embodied, emotion-arousing experiences, with preserved access to gist, evaluative, and semantic markers of emotional relevance. This view is consistent with scene-construction accounts in showing individuals with aphantasia can generate the structural framework of a scene but not the sensory elements that provide embodied experience [9,26]. It also complements CESH+, offering preliminary support for dissociating affective retrieval via distinct semantic and episodic pathways [27]. However, direct neurological evidence for Blomkvist's proposed affective retrieval process remains limited. Future studies should examine whether neural evidence supports a divergent affective retrieval pattern in aphantasia and its relevance to emotional amplification theory.

### 3.5 Prospection, Motivation, and Adaptive Decision Making

Placing aphantasia within this framework may expand understanding of imagery's role in prospection. Mental imagery enables individuals to simulate and "preview" possible future events, thereby guiding decision-making [32]. In particular, imagery supports affective forecasting: by eliciting emotional responses to imagined outcomes, it drives anticipation of reward and motivates future-oriented action [33-35]. Emerging evidence implies that adaptive functioning relevant to imagery may be compromised in aphantasia. Individuals with aphantasia engage in lower cognitive avoidance or manipulation of catastrophic thoughts, likely due to a reduced perception of threat [10]. Although they can still logically evaluate and anticipate future aversive events, their blunted sense of perceived severity points to a dissociation between conceptual appraisal and imagery-driven forecasting. In the absence of vivid imagery, prospection appears to exert less motivational force for adaptive behaviour change in aphantasia.

### 3.6 Emotional Regulation

The role of imagery and autobiographical memory in maladaptive emotion regulation has been extensively explored. As an emotional amplifier in psychological disorders, imagery involves the presentation of intrusive memories, catastrophic future simulations, and rumination [3,10,36]. Aphantasia studies have therefore questioned whether the absence of visual imagery might offer partial protection against maladaptive emotional thoughts and intrusions [10,29,37]. However, current findings indicate that aphantasics similarly suffer from distressing mental events, and that imagery deficits do not reduce susceptibility to psychological disorders [10,37,38]. Conversely, prior work suggests that aphantasics engage in fewer emotion regulation strategies associated with imagery [10,11].

Autobiographical memory is similarly tied to adaptive emotion regulation, as individuals retrieve and reframe past events to enhance mood and engage in reappraisal [36,39]. On a more fundamental level, autobiographical remembering anchors self-identity, life meaning, and social bonding [40]. Despite a lack of research on autobiographical emotion regulation in aphantasia, existing evidence indicates preservation of semantic self-knowledge and evaluative meaning for autobiographical events accompanied by attenuated emotional re-experience and reduced perceived event coherence [8]. Given this dissociated emotional profile in aphantasia, understanding how these individuals regulate emotion for directive, self-related, and social purposes in everyday and clinical contexts is of considerable interest for future research.

### 3.7 Limitations, Methodological Constraints and Future Direction

Several inconsistencies persist across existing studies on

the prospective and retrospective emotions associated with aphantasia. Earlier studies employing autobiographical interviews were not designed to distinguish emotional details from other sub-categories of episodic details, limiting straightforward interpretations [8,22]. Later autobiographical studies also disagree on the extent to which reports of emotional details are reduced in aphantasia, with divergent findings likely driven by methodological differences in experimental procedures [8,9].

Current versions of the autobiographical interview adopted in aphantasia research were not modified to assess emotional recall in terms of emotional intensity or valence. Given that aphantasia may retain conceptual memory of emotional events, future studies need to adjust scoring to reflect this distinction. Additionally, aphantasia has been reported as involving difficulties in verbalizing emotional thoughts, and showing the tendency to experience prospective, negative thoughts in predominantly somatic or non-verbal forms [7,10]. Because autobiographical interviews depend on verbal description, aphantasics may underreport unconventional phenomenologies. Future interview findings should be interpreted alongside self-rated emotional intensity. A comparison of the two would help differentiate whether observed reductions reflect diminished emotional experience or limitations in expression.

Moreover, limited research has explicitly examined emotionally charged prospective and retrospective experiences in aphantasia. At present, no firm conclusion can be drawn about whether the observed differences in Keogh et al. and Dance et al. reflect a general feature of the aphantasic experience across temporality. Future studies should therefore continue to contrast prospective and retrospective autobiographical performance in aphantasia. Attention should also extend beyond negative events to include the implications of positive and ambivalent experiences, such as nostalgia and optimistic future thinking. Given the functional role of imagery in emotion regulation and motivated behaviour, examining aphantasia in this respect may provide insight into the adaptive and mental health–relevant consequences of imagery absence.

## 4. Directions for Theory Development

Past studies on aphantasia provide convincing evidence that mental imagery amplifies emotion and that its absence has both phenomenological and functional consequences. Across narrative, cross-modal, autobiographical, and prospective domains, converging evidence also reveals a dissociation between emotional simulation—the perceptual, immersive component of affect—and emotional appraisal, which encompasses schematic, reward-relevant and evaluative significance.

Beyond the immediate emotional consequences of absent visual imagery, current studies also reinforce its broader implications for cognitive-affective functioning. Autobiographical remembering draws on imagery to retrieve and re-experience emotional events and to support narrative coherence within remembered and simulated events [8]. Imagery further enables individuals to situate themselves within events, simulate others' internal states, and elicit empathetic responses [5-8]. It appears to facilitate associative binding and evaluative conditioning [11,19]. It also drives the emotional salience in anticipating potential threats and enables individuals to regulate their emotions in both maladaptive and adaptive ways [10,11]. Taken together, these observations suggest that aphantasia may be implicated in various emotional functions that typically support self-oriented and socially adaptive behavior. The mechanisms and extent to which aphantasics recruit alternative strategies to compensate for the lack of imagery simulation remain questions that warrant future attention.

To develop a broader mechanistic understanding of emotional experience in aphantasia, future research must explicitly connect the role of imagery in emotional amplification with broader theories of episodic reconstruction. The distinction between perceptual and conceptual remembering in autobiographical retrieval points to dissociated neural networks [29]. This dissociation supports the evaluative and re-experiential components of emotion in autobiographical experience, which are likely to be differentially affected in aphantasia. Complementing this view, CESH+ offers a framework that may explain how affective retrieval operates across temporal orientations, and why aphantasics show greater impairments in prospective emotional experiences. Furthermore, individual differences in multisensory imagery suggest that aphantasia exists along multiple dimensions of imagery ability, where non-visual modalities may partially compensate for absent visual simulation [6,11]. Therefore, a direction for future theory development is to integrate these heterogeneous imagery profiles to explain the perceptual, conceptual, modal, and temporal interplay within autobiographical emotional experience at both behavioral and neural levels. Future study designs should separate the perceptual and conceptual aspects of emotional experience; utilize multimodal imagery assessments to identify potential subtypes within aphantasia; integrate both prospective and retrospective viewpoints; and examine how emotional valence influences these relationships. By addressing these gaps, aphantasia will lead promising insight into the mechanisms linking imagery to emotion, as well as the neurodivergence through which humans construct, experience, and regulate emotion in autobiographical events.

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## 5. Conclusion

Aphantasia provides a unique perspective for understanding how mental imagery facilitates immersive emotional experience. Current literature indicates that individuals with aphantasia exhibit attenuated emotional arousal in imagery-dependent contexts, spanning autobiographical recall, prospection, and simulated events. Notably, this attenuation appears selective: contemporary findings align with episodic reconstruction theories that implicate two distinct neural networks for emotional appraisal and embodiment during autobiographical retrieval. Imagery-relevant attenuation in aphantasia therefore reflects a selective disruption of the perceptual reconstruction underlying embodied experience, while potentially sparing the conceptual networks that sustain appraisal for reward, schematic, and value-based meaning. This profile further raises questions about the impact of imagery absence on adaptive functioning, including empathy, associative learning, prospective motivation, and emotion regulation.

At the same time, current work remains insufficient to characterize how affective retrieval is coordinated at the neural level during remembering and imagining in individuals with aphantasia. It also remains unclear how heterogeneity in imagery ability within aphantasia maps onto differences in emotional experience across episodic events. Ultimately, advancing an affective theory of aphantasia will require more precise accounts of emotional phenomenology and the mechanisms linking episodic reconstruction and emotional amplification in aphantasic memory and prospection.

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