The Neurological Basis for the "Narrative Self" or Self-Concept

1. Introduction

The "narrative self" refers to the sense of self that emerges from the integration of autobiographical memories, personal traits, and life stories into a coherent identity over time. Neuroscientific research has identified a distributed network of brain regions—most notably the **default mode network (DMN)**, medial prefrontal cortex (mPFC), and medial temporal lobe structures—as central to the construction and maintenance of the narrative self and self-concept (Menon, 2023; Gibson, 2024; Young & Saver, 2001; Koban et al., 2021; Levorsen et al., 2023; Frewen et al., 2020; Fingelkurts et al., 2020; Tisserand et al., 2023; Gallagher, 2000; Martinelli et al., 2013). These regions support self-referential thought, autobiographical memory, and the integration of personal meaning, allowing individuals to reflect on their past, imagine their future, and maintain a sense of continuity and coherence. The narrative self is distinct from the "minimal" or "experiential" self, which is rooted in immediate, embodied experience and is associated with networks such as the insula and salience network (Gibson, 2024; Tisserand et al., 2023). Disruptions to these neural systems can lead to profound alterations in self-concept, as seen in neuropsychiatric and neurodegenerative disorders (Young & Saver, 2001; Tisserand et al., 2023; Tisserand et al., 2020). This review synthesizes current research on the neural underpinnings of the narrative self and self-concept.

2. Methods

A comprehensive search was conducted across over 170 million research papers in Consensus, including Semantic Scholar, PubMed, and other databases. The search strategy targeted foundational theories, neural mechanisms, developmental and clinical studies, and meta-analyses on the narrative self and self-concept. In total, 1016 papers were identified, 748 were screened, 552 were deemed eligible, and the top 50 most relevant papers were included in this review.

Search Strategy

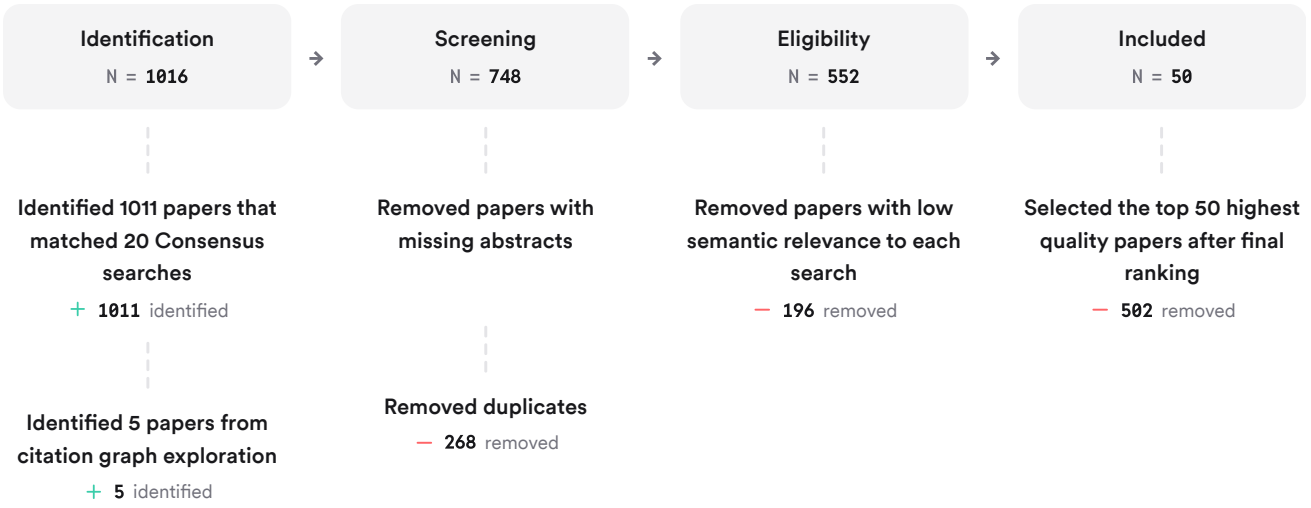

FIGURE 1 Flow of papers through the search and selection process.

Eight unique search groups were used, spanning foundational, mechanistic, developmental, clinical, and interdisciplinary perspectives.

3. Results

3.1 The Default Mode Network (DMN) and Narrative Self

The DMN, comprising the medial prefrontal cortex, posterior cingulate cortex/precuneus, and angular gyrus, is consistently activated during self-referential thought, autobiographical memory retrieval, and mind-wandering (Menon, 2023; Gibson, 2024; Koban et al., 2021; Frewen et al., 2020; Simony et al., 2016; Li et al., 2025; Gotlieb et al., 2024). The DMN integrates memory, language, and semantic representations to create a coherent internal narrative, which is central to the construction of the narrative self (Menon, 2023; Gibson, 2024; Koban et al., 2021; Frewen et al., 2020; Simony et al., 2016; Li et al., 2025; Gotlieb et al., 2024). Disruptions in DMN connectivity are linked to disturbances in self-concept and narrative identity in conditions such as schizophrenia and dementia (Young & Saver, 2001; Tisserand et al., 2023; Tisserand et al., 2020).

3.2 Medial Prefrontal Cortex (mPFC) and Self-Concept

The mPFC is a key hub for self-referential processing, representing the importance and centrality of personal traits and experiences to one's self-concept (Levorsen et al., 2023; Romund et al., 2017; Martinelli et al., 2013). Activation in the mPFC is observed during self-appraisal, reflection on personal attributes, and the evaluation of self-relevant information (Levorsen et al., 2023; Romund et al., 2017; Martinelli et al., 2013). The mPFC also integrates social and emotional information, supporting the development of a coherent and positive self-concept, especially during adolescence (Van Der Cruijsen et al., 2023; Romund et al., 2017; Crone & Van Drunen, 2024; Crone et al., 2022).

3.3 Memory Systems and Narrative Construction

The medial temporal lobe, including the hippocampus, supports the encoding and retrieval of episodic and autobiographical memories, which are the building blocks of the narrative self (Young & Saver, 2001; Baldassano et al., 2016; Lee et al., 2020; Singer et al., 2013; Milivojevic et al., 2016; Martinelli et al., 2013). The interaction between the DMN and memory systems enables the organization of life events into a temporally extended narrative, providing continuity and meaning (Menon, 2023; Young & Saver, 2001; Baldassano et al., 2016; Lee et al., 2020; Singer et al., 2013; Milivojevic et al., 2016; Martinelli et al., 2013).

3.4 Additional Networks and Embodied Aspects

The insula and salience network contribute to the experiential or minimal self, grounding the narrative self in interoceptive and embodied processes (Gibson, 2024; Monti et al., 2021; Tisserand et al., 2023). The integration of bodily signals with autobiographical and conceptual information supports a unified sense of self across time and context (Gibson, 2024; Monti et al., 2021; Tisserand et al., 2023).

Key Papers

Paper	Methodology	Key Brain Regions/Networks	Main Findings
(Menon, 2023)	Review	DMN, mPFC, memory networks	DMN integrates memory, language, and semantics to create internal narrative/self
(Gibson, 2024)	Conceptual review	DMN, insula, salience network	Narrative self linked to DMN; experiential self to insula/SN
(Levorsen et al., 2023)	fMRI	mPFC	mPFC encodes self-importance of traits; central to self-concept
(Young & Saver, 2001)	Review, case studies	Amygdalo-hippocampal, peri-Sylvian, frontal cortex	Distributed network mediates narrative creation and self-identity
(Martinelli et al., 2013)	Meta-analysis	mPFC, hippocampus, posterior cingulate	Conceptual self recruits mPFC; episodic/semantic self recruit memory regions

FIGURE 2 Comparison of key studies on the neural basis of the narrative self and self-concept.

Top Contributors

Type	Name	Papers
Author	G. Northoff	(Smith et al., 2022; Frewen et al., 2020; Monti et al., 2021)
Author	E. Crone	(Van Der Cruijsen et al., 2023; Crone & Van Drunen, 2024; Crone et al., 2022)
Author	Richard Heersmink	(Heersmink, 2018; Heersmink, 2020; Heersmink, 2016; Heersmink, 2022)
Journal	*NeuroImage*	(Smith et al., 2022; Nguyen et al., 2019)
Journal	*Human Brain Mapping*	(Romund et al., 2017; Martinelli et al., 2013)
Journal	*Neuroscience & Biobehavioral Reviews*	(Frewen et al., 2020; Butterfield et al., 2023)

FIGURE 3 Authors & journals that appeared most frequently in the included papers.

4. Discussion

The narrative self and self-concept are supported by a distributed neural network, with the DMN and mPFC playing central roles in integrating autobiographical memory, self-referential thought, and personal meaning (Menon, 2023; Gibson, 2024; Koban et al., 2021; Levorsen et al., 2023; Frewen et al., 2020; Simony et al., 2016; Li et al., 2025; Gotlieb et al., 2024; Martinelli et al., 2013). The mPFC encodes the importance of self-related information, while the DMN provides the infrastructure for constructing a temporally extended, coherent self-narrative (Menon, 2023; Gibson, 2024; Koban et al., 2021; Levorsen et al., 2023; Frewen et al., 2020; Simony et al., 2016; Li et al., 2025; Gotlieb et al., 2024; Martinelli et al., 2013). The medial temporal lobe and hippocampus supply the episodic content that populates the narrative self (Young & Saver, 2001; Baldassano et al., 2016; Lee et al., 2020; Singer et al., 2013; Milivojevic et al., 2016; Martinelli et al., 2013). The insula and salience network ground the self in bodily and affective experience, linking the narrative and minimal selves (Gibson, 2024; Monti et al., 2021; Tisserand et al., 2023).

Disruptions to these networks can fragment the narrative self, as seen in schizophrenia, dementia, and after focal brain injury (Young & Saver, 2001; Tisserand et al., 2023; Tisserand et al., 2020). Developmental studies show that the neural basis of self-concept evolves through adolescence, with increasing integration and coherence supported by mPFC and DMN maturation (Van Der Cruijsen et al., 2023; Crone & Van Drunen, 2024; Crone et al., 2022). The narrative self is also shaped by social, cultural, and environmental factors, which interact with neural systems to scaffold identity (Heersmink, 2018; Heersmink, 2020; Heersmink, 2016; Heersmink, 2022).

Claims and Evidence Table

Claim	Evidence Strength	Reasoning	Papers
The DMN is central to the narrative self and self-concept	Strong	Consistent activation during self-referential/narrative tasks	(Menon, 2023; Gibson, 2024; Koban et al., 2021; Frewen et al., 2020; Simony et al., 2016; Li et al., 2025; Gotlieb et al., 2024)
The mPFC encodes self-importance and supports self-appraisal	Strong	fMRI, meta-analyses, trait evaluation studies	(Levorsen et al., 2023; Romund et al., 2017; Martinelli et al., 2013)
Autobiographical memory systems (hippocampus, medial temporal lobe) provide narrative content	Strong	Memory retrieval, narrative construction, lesion studies	(Young & Saver, 2001; Baldassano et al., 2016; Lee et al., 2020; Singer et al., 2013; Milivojevic et al., 2016; Martinelli et al., 2013)
The insula and salience network support the embodied/minimal self	Moderate	Interoception, self-awareness, integration with narrative self	(Gibson, 2024; Monti et al., 2021; Tisserand et al., 2023)
Disruption of these networks impairs narrative self and identity	Moderate	Clinical, lesion, and neurodegenerative studies	(Young & Saver, 2001; Tisserand et al., 2023; Tisserand et al., 2020)
Self-concept development is linked to mPFC/DMN maturation in adolescence	Moderate	Longitudinal, developmental neuroimaging	(Van Der Cruijsen et al., 2023; Crone & Van Drunen, 2024; Crone et al., 2022)

FIGURE Key claims and support evidence identified in these papers.

5. Conclusion

The neurological basis of the narrative self and self-concept is rooted in the default mode network, medial prefrontal cortex, and memory systems, which together enable the integration of autobiographical memory, self-reflection, and personal meaning. These networks provide the infrastructure for constructing a coherent, temporally extended sense of self, while embodied and social processes further shape identity across the lifespan.

5.1 Research Gaps

Key gaps include the precise mechanisms linking narrative construction to neural dynamics, the interplay between narrative and minimal selves, and the impact of culture and technology on neural self-representation.

Research Gaps Matrix

Topic/Attribute	DMN/mPFC	Memory Systems	Embodied/Interoceptive	Developmental	Clinical/Disorder
Narrative Self	12	9	5	7	6
Minimal/Experiential Self	4	2	8	3	2
Self-Concept Development	6	4	2	10	3
Clinical Disruption	5	4	2	2	8

FIGURE Distribution of research across neural, developmental, embodied, and clinical attributes.

5.2 Open Research Questions

Future research should clarify the dynamic interactions between neural networks, memory, and embodiment in self-construction, and explore how social and technological changes reshape the narrative self.

Question	Why
How do dynamic interactions between the DMN, mPFC, and memory systems construct and update the narrative self in real time?	Understanding this will clarify the neural basis of self-continuity and identity change.
What are the neural mechanisms linking the narrative and minimal/embodied selves?	This will illuminate how immediate experience and autobiographical narrative are integrated.
How do culture, technology, and social context shape the neural representation of the narrative self?	This is crucial for understanding self-concept in a rapidly changing world.

FIGURE Key open questions for advancing research on the neural basis of the narrative self.

In summary, the narrative self and self-concept are constructed by a distributed neural network—anchored in the DMN, mPFC, and memory systems—that integrates autobiographical memory, self-reflection, and embodied experience into a coherent sense of identity.

These papers were sourced and synthesized using Consensus, an AI-powered search engine for research. Try it at https://consensus.app

References

Menon, V. (2023). 20 years of the default mode network: A review and synthesis. *Neuron*, 111, 2469-2487. https://doi.org/10.1016/j.neuron.2023.04.023

Gibson, J. (2024). Meditation and interoception: a conceptual framework for the narrative and experiential self. *Frontiers in Psychology*, 15. https://doi.org/10.3389/fpsyg.2024.1393969

Smith, D., Wolff, A., Wolman, A., Ignaszewski, J., & Northoff, G. (2022). Temporal continuity of self: Long autocorrelation windows mediate self-specificity. *NeuroImage*, 257. https://doi.org/10.1016/j.neuroimage.2022.119305

Van Der Cruijsen, R., Blankenstein, N., Spaans, J., Peters, S., & Crone, E. (2023). Longitudinal self-concept development in adolescence. *Social Cognitive and Affective Neuroscience*, 18. https://doi.org/10.1093/scan/nsac062

Young, K., & Saver, J. (2001). The Neurology of Narrative. *SubStance*, 30, 72 - 84. https://doi.org/10.1353/SUB.2001.0020

Baldassano, C., Chen, J., Zadbood, A., Pillow, J., Hasson, U., & Norman, K. (2016). Discovering Event Structure in Continuous Narrative Perception and Memory. *Neuron*, 95, 709-721.e5. https://doi.org/10.1016/j.neuron.2017.06.041

Koban, L., Gianaros, P., Kober, H., & Wager, T. (2021). The self in context: brain systems linking mental and physical health. *Nature Reviews Neuroscience*, 22, 309 - 322. https://doi.org/10.1038/s41583-021-00446-8

Heersmink, R. (2018). The narrative self, distributed memory, and evocative objects. *Philosophical Studies*, 175, 1829-1849. https://doi.org/10.1007/S11098-017-0935-0

Levorsen, M., Aoki, R., Matsumoto, K., Sedikides, C., & Izuma, K. (2023). The Self-Concept Is Represented in the Medial Prefrontal Cortex in Terms of Self-Importance. *The Journal of Neuroscience*, 43, 3675 - 3686. https://doi.org/10.1523/JNEUROSCI.2178-22.2023

Lee, H., Bellana, B., & Chen, J. (2020). What can narratives tell us about the neural bases of human memory?. *Current Opinion in Behavioral Sciences*, 32, 111-119. https://doi.org/10.31234/osf.io/tz2s9

Frewen, P., Schroeter, M., Riva, G., Cipresso, P., Fairfield, B., Padulo, C., Kemp, A., Palaniyappan, L., Owolabi, M., Kusi-Mensah, K., Polyakova, M., Fehertoi, N., D'Andrea, W., Lowe, L., & Northoff, G. (2020). Neuroimaging the consciousness of self: Review, and conceptual-methodological framework. *Neuroscience & Biobehavioral Reviews*, 112, 164-212. https://doi.org/10.1016/j.neubiorev.2020.01.023

Nguyen, M., Vanderwal, T., & Hasson, U. (2019). Shared understanding of narratives is correlated with shared neural responses. *NeuroImage*, 184, 161-170. https://doi.org/10.1016/j.neuroimage.2018.09.010

Butterfield, R., Grad-Freilich, M., & Silk, J. (2023). The role of neural self-referential processes underlying self-concept in adolescent depression: A comprehensive review and proposed neurobehavioral model. *Neuroscience & Biobehavioral Reviews*, 149. https://doi.org/10.1016/j.neubiorev.2023.105183

Fingelkurts, A., Fingelkurts, A., & Kallio-Tamminen, T. (2020). Selfhood triumvirate: From phenomenology to brain activity and back again. *Consciousness and Cognition*, 86. https://doi.org/10.1016/j.concog.2020.103031

Simony, E., Honey, C., Chen, J., Lositsky, O., Yeshurun, Y., Wiesel, A., & Hasson, U. (2016). Dynamic reconfiguration of the default mode network during narrative comprehension. *Nature Communications*, 7. https://doi.org/10.1038/ncomms12141

Heersmink, R. (2020). Narrative niche construction: memory ecologies and distributed narrative identities. *Biology & Philosophy*, 35. https://doi.org/10.1007/s10539-020-09770-2

Monti, A., Porciello, G., Panasiti, M., & Aglioti, S. (2021). The inside of me: interoceptive constraints on the concept of self in neuroscience and clinical psychology. *Psychological Research*, 86, 2468 - 2477. https://doi.org/10.1007/s00426-021-01477-7

Li, Y., Zhang, J., Li, X., & Zhang, Z. (2025). Uncovering narrative aging: an underlying neural mechanism compensated through spatial constructional ability. *Communications Biology*, 8. https://doi.org/10.1038/s42003-025-07501-5

Singer, J., Blagov, P., Berry, M., & Oost, K. (2013). Self-defining memories, scripts, and the life story: narrative identity in personality and psychotherapy.. *Journal of personality*, 81 6, 569-82. https://doi.org/10.1111/jopy.12005

Heersmink, R. (2016). Distributed selves: personal identity and extended memory systems. *Synthese*, 194, 3135 - 3151. https://doi.org/10.1007/s11229-016-1102-4

Romund, L., Golde, S., Lorenz, R., Raufelder, D., Pelz, P., Gleich, T., Heinz, A., & Beck, A. (2017). Neural correlates of the self-concept in adolescence—A focus on the significance of friends. *Human Brain Mapping*, 38. https://doi.org/10.1002/hbm.23433

Tisserand, A., Philippi, N., Botzung, A., & Blanc, F. (2023). Me, Myself and My Insula: An Oasis in the Forefront of Self-Consciousness. *Biology*, 12. https://doi.org/10.3390/biology12040599

Heersmink, R. (2022). Preserving Narrative Identity for Dementia Patients: Embodiment, Active Environments, and Distributed Memory. *Neuroethics*, 15. https://doi.org/10.1007/s12152-022-09479-x

Crone, E., & Van Drunen, L. (2024). Development of Self-Concept in Childhood and Adolescence: How Neuroscience Can Inform Theory and Vice Versa. *Human Development*, 68, 255 - 271. https://doi.org/10.1159/000539844

Tisserand, A., Noblet, V., Botzung, A., Blanc, F., & Philippi, N. (2020). Who am I with my Lewy bodies? A self-concept study. *Alzheimer's & Dementia*, 16. https://doi.org/10.1002/alz.042898

Milivojevic, B., Varadinov, M., Grabovetsky, A., Collin, S., & Doeller, C. (2016). Coding of Event Nodes and Narrative Context in the Hippocampus. *The Journal of Neuroscience*, 36, 12412 - 12424. https://doi.org/10.1523/JNEUROSCI.2889-15.2016

Gotlieb, R., Yang, X., & Immordino-Yang, M. (2024). Diverse adolescents' transcendent thinking predicts young adult psychosocial outcomes via brain network development. *Scientific Reports*, 14. https://doi.org/10.1038/s41598-024-56800-0

Crone, E., Green, K., Van De Groep, I., & Van Der Cruijsen, R. (2022). A Neurocognitive Model of Self-Concept Development in Adolescence. *Annual Review of Developmental Psychology*. https://doi.org/10.1146/annurev-devpsych-120920-023842

Gallagher, S. (2000). Philosophical conceptions of the self: implications for cognitive science. *Trends in Cognitive Sciences*, 4, 14-21. https://doi.org/10.1016/S1364-6613(99)01417-5

Martinelli, P., Sperduti, M., & Piolino, P. (2013). Neural substrates of the self-memory system: New insights from a meta-analysis. *Human Brain Mapping*, 34. https://doi.org/10.1002/hbm.22008