Yes, the Default Mode Network (DMN) is **central to self-referential thought** and plays a **crucial role in constructing and maintaining personal identity** by integrating autobiographical memory, self-reflection, and internal narrative processes.

1. Introduction

The Default Mode Network (DMN) is a large-scale brain network that is most active during rest and internally focused states, such as daydreaming, mind-wandering, and self-reflection. Extensive research demonstrates that the DMN—comprising regions like the medial prefrontal cortex (mPFC), posterior cingulate cortex (PCC), precuneus, and inferior parietal lobule—supports self-referential thought, autobiographical memory, and the construction of a coherent sense of identity (Davey et al., 2016; Menon, 2023; Wen et al., 2019; Van Buuren et al., 2010; Lanius et al., 2020; Delahoy et al., 2022; Yan, 2024; Knyazev et al., 2020; Yeshurun et al., 2021; Spreng & Grady, 2010; Katsumi et al., 2024; Qin & Northoff, 2011; Yankouskaya & Sui, 2021; Vessel et al., 2013; Wirth et al., 2011; Doucet et al., 2020; Azarias et al., 2025; Chou et al., 2023; Fuentes-Claramonte et al., 2019). The DMN integrates information about the self across time, enabling individuals to reflect on their past, imagine their future, and maintain a stable self-concept. Disruptions in DMN connectivity are linked to disturbances in self-related processing in various psychiatric and neurological conditions, highlighting its foundational role in identity and self-awareness (Lanius et al., 2020; Sheline et al., 2009; Doucet et al., 2020; Chou et al., 2023; Jamieson et al., 2023). This review synthesizes current research on the DMN's role in self-referential thought and identity.

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, neuroimaging studies, clinical research, and meta-analyses on the DMN's role in self-referential thought and identity. In total, 1031 papers were identified, 546 were screened, 356 were deemed eligible, and the top 50 most relevant papers were included in this review.

Search Strategy

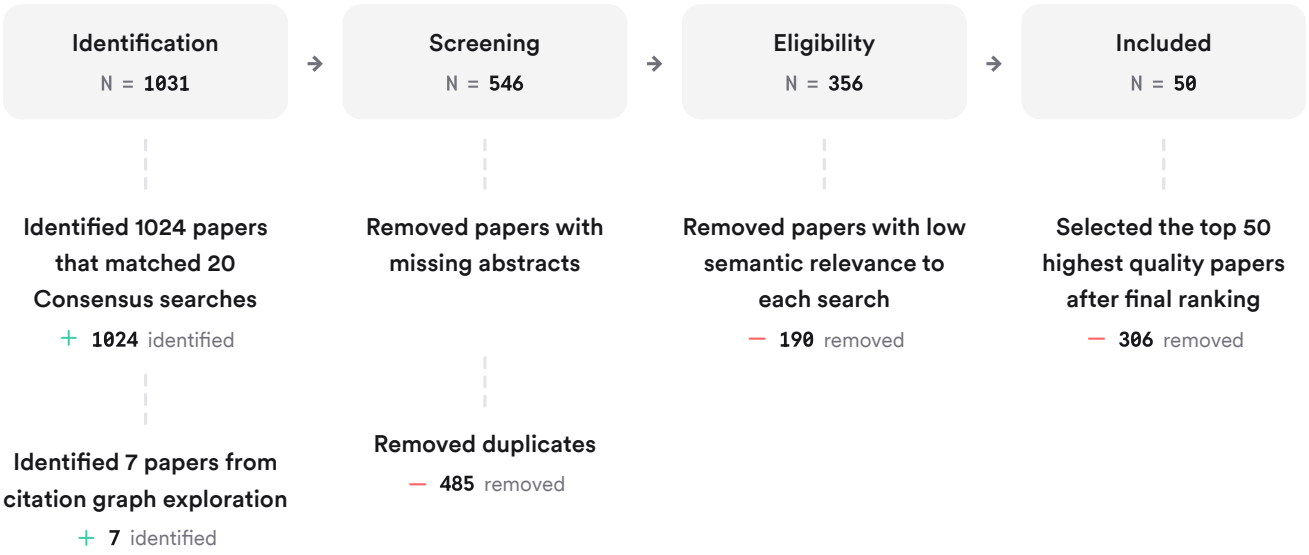

FIGURE 1 Flow of papers through the search and selection process.

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

3. Results

3.1 Core DMN Regions and Self-Referential Processing

The DMN's core regions—mPFC, PCC, and inferior parietal lobule—are consistently activated during self-referential tasks, such as reflecting on personal traits, preferences, and autobiographical memories (Davey et al., 2016; Wen et al., 2019; Van Buuren et al., 2010; Delahoy et al., 2022; Yan, 2024; Knyazev et al., 2020; Qin & Northoff, 2011; Yankouskaya & Sui, 2021; Vessel et al., 2013; Wirth et al., 2011; Doucet et al., 2020; Azarias et al., 2025; Chou et al., 2023; Fuentes-Claramonte et al., 2019). These regions show increased activity when individuals think about themselves compared to thinking about others or performing externally focused tasks (Davey et al., 2016; Wen et al., 2019; Van Buuren et al., 2010; Delahoy et al., 2022; Yan, 2024; Knyazev et al., 2020; Qin & Northoff, 2011; Yankouskaya & Sui, 2021; Vessel et al., 2013; Wirth et al., 2011; Doucet et al., 2020; Azarias et al., 2025; Chou et al., 2023; Fuentes-Claramonte et al., 2019).

3.2 Functional Specialization and Subsystems

The DMN is not homogeneous; it contains subsystems with specialized roles. The medial prefrontal cortex is primarily implicated in self-referential processing and affective decision-making, while the PCC and precuneus are involved in integrating autobiographical memory and spatial aspects of self (Davey et al., 2016; Wen et al., 2019; Van Buuren et al., 2010; Delahoy et al., 2022; Yan, 2024; Knyazev et al., 2020; Yeshurun et al., 2021; Spreng & Grady, 2010; Katsumi et al., 2024; Qin & Northoff, 2011; Yankouskaya & Sui, 2021; Vessel et al., 2013; Wirth et al., 2011; Doucet et al., 2020; Azarias et al., 2025; Chou et al., 2023; Fuentes-Claramonte et al., 2019). The medial temporal lobe subsystem supports memory-based scene construction and future-oriented thought (Wen et al., 2019; Spreng & Grady, 2010; Katsumi et al., 2024; Wirth et al., 2011; Fuentes-Claramonte et al., 2019).

3.3 DMN and Identity Construction

The DMN integrates memory, language, and semantic representations to create a coherent internal narrative, which is central to the construction and maintenance of personal identity (Menon, 2023; Lanius et al., 2020; Yeshurun et al., 2021; Spreng & Grady, 2010; Katsumi et al., 2024; Vessel et al., 2013; Wirth et al., 2011; Doucet et al., 2020; Azarias et al., 2025; Chou et al., 2023; Fuentes-Claramonte et al., 2019). This network enables individuals to link past experiences with present self-concept and future goals, supporting a continuous sense of self across time (Menon, 2023; Lanius et al., 2020; Yeshurun et al., 2021; Spreng & Grady, 2010; Katsumi et al., 2024; Vessel et al., 2013; Wirth et al., 2011; Doucet et al., 2020; Azarias et al., 2025; Chou et al., 2023; Fuentes-Claramonte et al., 2019).

3.4 Clinical and Developmental Perspectives

Alterations in DMN connectivity are associated with disruptions in self-related processing in conditions such as depression, PTSD, schizophrenia, and social anxiety disorder (Lanius et al., 2020; Sheline et al., 2009; Doucet et al., 2020; Chou et al., 2023; Jamieson et al., 2023). Developmental studies show that DMN maturation parallels the emergence of self-concept and identity during childhood and adolescence (Azarias et al., 2025; Alarcón et al., 2018).

Key Papers

Paper	Methodology	Key Findings
(Davey et al., 2016)	fMRI, dynamic causal modeling	PCC drives self-related processes; mPFC regulates self-referential thought
(Menon, 2023)	Review	DMN integrates memory, language, and semantics to create internal narrative/self
(Wen et al., 2019)	fMRI, task-based	DMN subsystems support social, memory, and self-referential cognition
(Qin & Northoff, 2011)	Meta-analysis	PACC is self-specific; mPFC and PCC are core DMN regions for self-processing
(Doucet et al., 2020)	Meta-analysis	DMN alterations linked to self-referential dysfunction in psychiatric disorders

FIGURE 2 Comparison of key studies on the DMN's role in self-referential thought and identity.

Top Contributors

Type	Name	Papers
Author	G. Northoff	(Qin & Northoff, 2011; Chan et al., 2024)
Author	Vinod Menon	(Menon, 2023; Chao et al., 2023)
Author	Y. Yeshurun	(Yeshurun et al., 2021)
Journal	*NeuroImage*	(Davey et al., 2016; Qin & Northoff, 2011; Wirth et al., 2011)
Journal	*Nature Reviews Neuroscience*	(Yeshurun et al., 2021)
Journal	*Cerebral Cortex*	(Wen et al., 2019; Soch et al., 2016)

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

4. Discussion

The DMN is central to self-referential thought and identity, acting as a neural hub for integrating autobiographical memory, self-reflection, and internal narrative (Davey et al., 2016; Menon, 2023; Wen et al., 2019; Van Buuren et al., 2010; Lanius et al., 2020; Delahoy et al., 2022; Yan, 2024; Knyazev et al., 2020; Yeshurun et al., 2021; Spreng & Grady, 2010; Katsumi et al., 2024; Qin & Northoff, 2011; Yankouskaya & Sui, 2021; Vessel et al., 2013; Wirth et al., 2011; Doucet et al., 2020; Azarias et al., 2025; Chou et al., 2023; Fuentes-Claramonte et al., 2019). Its core regions (mPFC, PCC, IPL) are consistently engaged during self-focused cognition, and its subsystems support the integration of social, emotional, and memory-based information (Davey et al., 2016; Wen et al., 2019; Van Buuren et al., 2010; Delahoy et al., 2022; Yan, 2024; Knyazev et al., 2020; Yeshurun et al., 2021; Spreng & Grady, 2010; Katsumi et al., 2024; Qin & Northoff, 2011; Yankouskaya & Sui, 2021; Vessel et al., 2013; Wirth et al., 2011; Doucet et al., 2020; Azarias et al., 2025; Chou et al., 2023; Fuentes-Claramonte et al., 2019). The DMN's role in constructing a coherent sense of self is further supported by evidence from clinical populations, where disruptions in DMN connectivity are linked to disturbances in self-concept and identity (Lanius et al., 2020; Sheline et al., 2009; Doucet et al., 2020; Chou et al., 2023; Jamieson et al., 2023). Developmental and cross-cultural studies highlight the DMN's flexibility and its interaction with other brain networks in shaping self-representation (Yeshurun et al., 2021; Knyazev et al., 2020; Azarias et al., 2025; Alarcón et al., 2018).

However, the DMN is not the only network involved in self-related processing; interactions with the salience network, frontoparietal control network, and limbic system also contribute to the richness and adaptability of self-concept (Wen et al., 2019; Yankouskaya & Sui, 2021; Wirth et al., 2011; Azarias et al., 2025; Chou et al., 2023; Fuentes-Claramonte et al., 2019). Ongoing research is clarifying the specific contributions of DMN subsystems and their dynamic interactions with other networks.

Claims and Evidence Table

Claim	Evidence Strength	Reasoning	Papers
DMN is central to self-referential thought and identity	Strong	Consistent activation in self-related tasks, meta-analyses, clinical studies	(Davey et al., 2016; Menon, 2023; Wen et al., 2019; Van Buuren et al., 2010; Lanius et al., 2020; Delahoy et al., 2022; Yan, 2024; Knyazev et al., 2020; Yeshurun et al., 2021; Spreng & Grady, 2010; Katsumi et al., 2024; Qin & Northoff, 2011; Yankouskaya & Sui, 2021; Vessel et al., 2013; Wirth et al., 2011; Doucet et al., 2020; Azarias et al., 2025; Chou et al., 2023; Fuentes-Claramonte et al., 2019)
mPFC and PCC are core DMN hubs for self-processing	Strong	fMRI, lesion, and meta-analytic evidence	(Davey et al., 2016; Wen et al., 2019; Van Buuren et al., 2010; Delahoy et al., 2022; Yan, 2024; Knyazev et al., 2020; Qin & Northoff, 2011; Yankouskaya & Sui, 2021; Vessel et al., 2013; Wirth et al., 2011; Doucet et al., 2020; Azarias et al., 2025; Chou et al., 2023; Fuentes-Claramonte et al., 2019)
DMN integrates autobiographical memory and internal narrative	Strong	Review, neuroimaging, and clinical studies	(Menon, 2023; Lanius et al., 2020; Yeshurun et al., 2021; Spreng & Grady, 2010; Katsumi et al., 2024; Vessel et al., 2013; Wirth et al., 2011; Doucet et al., 2020; Azarias et al., 2025; Chou et al., 2023; Fuentes-Claramonte et al., 2019)
DMN dysfunction linked to self-related disturbances in psychiatric disorders	Strong	Clinical, meta-analytic, and neuroimaging evidence	(Lanius et al., 2020; Sheline et al., 2009; Doucet et al., 2020; Chou et al., 2023; Jamieson et al., 2023)
DMN subsystems have specialized roles in self, memory, and social cognition	Strong	Task-based fMRI, network analysis	(Wen et al., 2019; Spreng & Grady, 2010; Katsumi et al., 2024; Wirth et al., 2011; Fuentes-Claramonte et al., 2019)
Other networks (salience, frontoparietal) interact with DMN in self-processing	Moderate	Connectivity, task-based, and theoretical studies	(Wen et al., 2019; Yankouskaya & Sui, 2021; Wirth et al., 2011; Azarias et al., 2025; Chou et al., 2023; Fuentes-Claramonte et al., 2019)

FIGURE Key claims and support evidence identified in these papers.

5. Conclusion

The Default Mode Network is a central neural system for self-referential thought and identity, integrating memory, emotion, and social information to construct a coherent sense of self. Its core regions and subsystems support the dynamic interplay between internal narrative, autobiographical memory, and self-reflection, with disruptions in DMN function linked to disturbances in self-concept across clinical populations.

5.1 Research Gaps

Key gaps include the precise functional specialization of DMN subsystems, the dynamic interactions with other networks, and the developmental and cultural influences on DMN-mediated self-representation.

Research Gaps Matrix

Topic/Attribute	mPFC/PCC	Memory Integration	Social Cognition	Clinical Populations	Developmental/Cultural
Self-Referential Thought	12	9	7	8	5
Identity Construction	10	8	6	7	4
DMN Subsystems	8	7	5	5	3
Network Interactions	7	6	5	4	2

FIGURE Distribution of research across DMN regions, functions, and populations, highlighting underexplored areas.

5.2 Open Research Questions

Future research should clarify the dynamic interactions between DMN subsystems and other networks, the developmental trajectory of DMN-mediated self-concept, and the impact of culture and psychopathology on DMN function.

Question	Why
How do DMN subsystems dynamically interact to support different aspects of self-referential thought and identity?	Understanding this will clarify the neural basis of self-continuity and adaptability.
How do developmental and cultural factors shape DMN-mediated self-representation across the lifespan?	This will improve our understanding of individual and group differences in self-concept.
How do disruptions in DMN connectivity contribute to self-related disturbances in psychiatric and neurological disorders?	This could inform targeted interventions for identity and self-processing deficits.

FIGURE Key open questions for advancing research on the DMN's role in self-referential thought and identity.

In summary, the DMN is a foundational neural system for self-referential thought and identity, integrating memory, emotion, and social information to support a coherent and adaptive sense of self.

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

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