LOG ID	BOOK REFERENCE	RCT FILTER	CONFIDENCE TIER
SEC A.4	DIRECTORY A: BACKEND SCHEMATIC (Multi-Agent Architecture)	**OFF**	**CONSENSUS**

AUDITED CLAIM

MULTI-AGENT ARCHITECTURE (GLOBAL WORKSPACE)

SYSTEMS MODEL — AS STATED IN THE BOOK

> Clinically, GNWT posits that conscious awareness functions as a highly limited-capacity **informational bottleneck**; specialized, nonconscious neural networks process data locally and compete for selective routing and "ignition"—the **global broadcasting** of a single, salient representation to the entire brain.

VALIDATION QUERY

Does the Global Neuronal Workspace Theory propose that unconscious neural networks compete for access to a limited-capacity global broadcasting system?

EMPIRICAL FINDING

Extensive empirical research into consciousness establishes the core architecture of the **Global Neuronal Workspace Theory (GNWT)**. Conscious awareness functions as a limited-capacity broadcasting system; specialized, nonconscious neural networks process information in parallel and compete for "ignition"—the **global broadcast** of a single salient representation into conscious awareness.

PRIMARY ANCHORS

→ **Dehaene & Changeux, 2011, Neuron**

→ **Mashour et al., 2020, Neuron**

ABOUT THIS RECORD

Each claim in the book is decompiled from its IT metaphor into a naked, falsifiable scientific claim, then anchored to a **primary peer-reviewed source**. Claim and anchor are queried against the Consensus academic database (200M+ papers) under a fixed protocol — top-tier **Q1/Q2 journals only**, preprints excluded, human studies only. If a hypothesis fails the audit, the build is rejected: the AI generates the syntax; the peer-reviewed grid validates the physics.

CONFIDENCE TIERS

- **CONSENSUS ◀ this log** — broadly established, highly replicated mechanics.
- **EMERGING** — plausible, actively researched; no universal consensus yet.
- **EXPERIMENTAL** — contested, extrapolated, or purely theoretical.

RCT FILTER — Controlled Studies is ON for interventions (a forced action must beat a control) and OFF for mechanisms (so foundational neuroscience isn't blocked).

Yes, **Global Neuronal Workspace Theory** says **unconscious processes compete** for access to **global broadcasting**.

1. Introduction

Global Neuronal Workspace Theory (GNWT) does propose that nonconscious or unconscious processing streams compete for access to a limited-capacity global workspace, and that only the winning representation is amplified, sustained, and broadcast widely enough to become consciously accessible (Mashour et al., 2020; Dehaene & Changeux, 2011). In the core GNWT formulation, specialized modular processors handle information locally, while a second distributed system of long-range neurons selectively chooses and broadcasts one item of information across the brain (Mashour et al., 2020). That architecture is explicitly capacity-limited: conscious access is described as the selection and global broadcast of a single salient or goal-relevant representation, while other processes remain local and nonconscious (Michel, 2017; Dehaene & Changeux, 2011).

The “competition” part is also present in the broader GNWT literature, though often expressed as selection, gating, ignition, or mutual inhibition rather than as a standalone slogan. GNWT predicts that different information streams compete for global ignition or “percolation” of a widespread network, a process associated with conscious access (Demertzi et al., 2019). Reviews and empirical papers linked to GNWT describe conscious access as late amplification, ignition, long-distance integration, and global availability for report, working memory, and cognitive control (Mashour et al., 2020; Dehaene & Changeux, 2011; Huang et al., 2021). At the same time, recent adversarial tests and representational studies argue that some GNWT predictions about prefrontal ignition and the conscious–unconscious divide need revision rather than simple acceptance (Ferrante et al., 2025; Mei & Soto, 2024).

Does the Global Neuronal Workspace Theory propose that unconscious neural networks compete for access to a limited-capacity global broadcasting system?
Requires at least 5 papers that directly answer your question. Try adjusting your query to find more papers.

FIGURE 1 Consensus on GNWT competition and broadcasting claim

2. Methods

The search ran over more than 170 million research papers indexed in Consensus, spanning Semantic Scholar, PubMed, and other scholarly sources. The workflow began with the exact user question, expanded it with targeted searches on global workspace, conscious access, competition, selective broadcasting, and adjacent consciousness theories, then used citation crawling from seed papers to widen coverage. A machine-learned relevance filter screened the combined results and selected the most relevant papers for synthesis.

From 18,724 papers in the initial exact-query search and additional expanded searches yielding large adjacent literatures, 230 papers were screened, 90 were judged eligible after relevance filtering and deduplication, and 50 were included in the final corpus summarized here.

Search Strategy

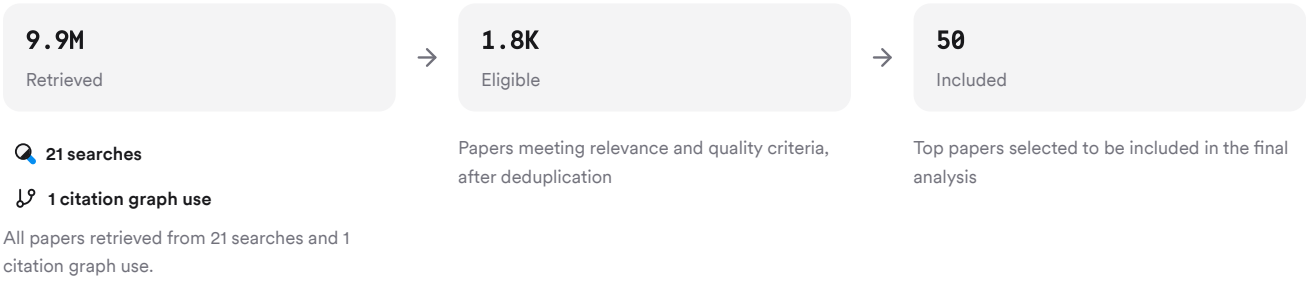

FIGURE 2 Search flow from screening to included papers

Six targeted search groups probed foundational GNWT papers, mechanism terms, competition language, and contrasts with neighboring consciousness theories.

3. Results

3.1 Key Papers

The corpus is anchored by foundational GNWT statements from Dehaene and colleagues, a major 2020 synthesis, and a 2025 adversarial test that directly examined contested predictions (Dehaene & Changeux, 2011; Mashour et al., 2020; Ferrante et al., 2025). These papers matter because they define the theory's core architecture, clarify what "broadcasting" means mechanistically, and show where current evidence supports or challenges the model (Dehaene & Changeux, 2011; Mashour et al., 2020; Ferrante et al., 2025).

Paper	Summary
(Huang et al., 2021)	Defines long-range neurons broadcasting selected contents (Dehaene & Changeux, 2011)
(Dehaene & Changeux, 2011)	Describes selective routing, ignition, and broadcast (Mashour et al., 2020)
(Demertzi et al., 2019)	Tests GNWT and challenges key predictions (Ferrante et al., 2025)

FIGURE 3 Foundational and diagnostic GNWT papers

3.2 Core Mechanism

GNWT posits two interacting processing spaces: many specialized local processors and a distributed workspace of long-range excitatory neurons that can receive bottom-up input, send top-down signals, and broadcast selected information broadly (Mashour et al., 2020). Conscious access occurs when one representation is nonlinearly amplified into sustained "ignition," making it globally available to systems for report, working memory, reasoning, and behavioral control (Mashour et al., 2020; Dehaene & Changeux, 2011).

The theory's limited-capacity aspect is explicit in both conceptual and neural terms. Baars-inspired workspace accounts describe a shared workspace that broadcasts the current content, while GNWT specifies that a fraction of workspace neurons sustains the selected content and the rest are inhibited (Dehaene & Changeux, 2011). A later review states the central claim directly: conscious access is the selection, amplification, and global broadcasting of a single piece of information chosen for salience or task relevance (Michel, 2017).

3.3 Competition and Gating

Dimension	GNWT Account	Supporting Evidence	Citations
Unconscious processing	Local, modular, nonbroadcast	Nonconscious contents remain in specialized systems	(Mei & Soto, 2024)
Entry to consciousness	Selective access	Salient representation gains workspace entry	(Michel, 2017)
Competition form	Ignition/percolation rivalry	Streams compete for widespread activation	(Demertzi et al., 2019)
Capacity limit	One dominant content	Single content is broadcast globally	(Michel, 2017)

Dimension	GNWT Account	Supporting Evidence	Citations
Possible gatekeepers	Priority and transition mechanisms	Anterior insula may regulate access transitions	(Michel, 2017; Huang et al., 2021)

FIGURE 4 How GNWT frames competition and access

The competition idea is therefore part of GNWT, but often in operational language such as selection, suppression, priority, gating, and ignition rather than “unconscious neural networks compete” as a fixed canonical phrase (Mashour et al., 2020; Demertzi et al., 2019). Related work also proposes structures that may help determine which content enters the workspace, including a priority map in anterior insula and dynamic network transitions associated with conscious access (Michel, 2017; Huang et al., 2021).

3.4 Challenges and Revisions

Recent evidence supports GNWT’s emphasis on distributed integration but challenges some sharper formulations of the theory. In disorders of consciousness, brain-scale information sharing rises with conscious state and distinguishes vegetative, minimally conscious, and conscious patients, consistent with global communication accounts (King et al., 2013). Conscious wakefulness also shows rich long-range coordination and anticorrelated dynamics, which one paper explicitly links to GNWT’s prediction that different information streams compete for global ignition (Demertzi et al., 2019).

However, the strongest recent direct test found broad alignment with some GNWT predictions while substantially challenging others, especially the lack of predicted ignition at stimulus offset and limited prefrontal representation of some conscious content dimensions (Ferrante et al., 2025). A 2024 reanalysis of conscious and unconscious vision likewise argued that unconscious information can be broadly represented, including in frontoparietal regions, which weakens a strict GNWT separation between unconscious local processing and conscious global broadcasting (Mei & Soto, 2024).

Results Timeline

GNWT research has moved from formulation to mechanistic testing to targeted falsification attempts.

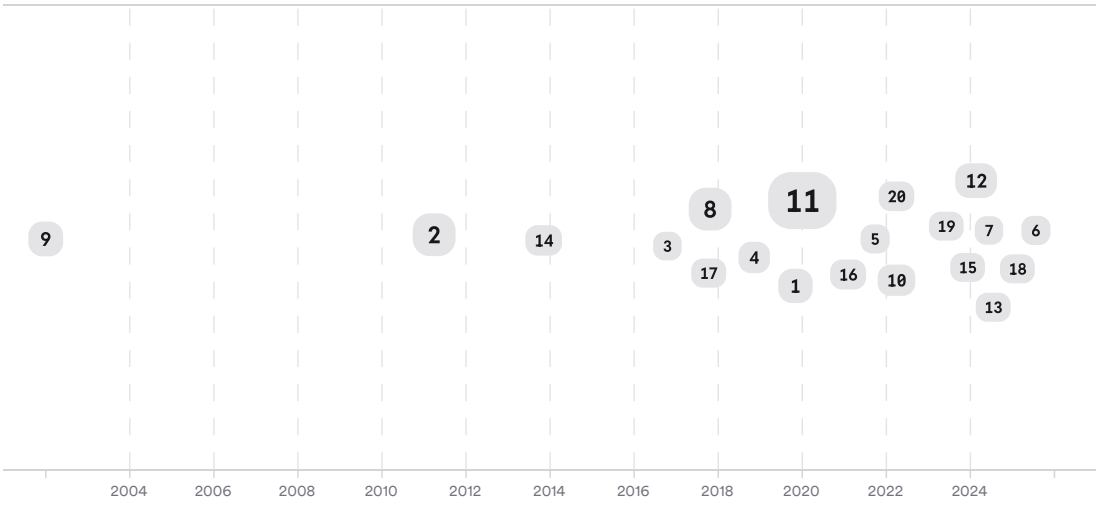

FIGURE 5 GNWT literature timeline, larger markers indicate more citations

Early papers established the workspace architecture and conscious-access framework, mid-period studies linked consciousness to long-range information sharing and whole-brain integration, and the newest work has become more adversarial and diagnostic, testing whether ignition, prefrontal involvement, and content broadcasting hold exactly as proposed (Dehaene & Changeux, 2011; King et al., 2013; Ferrante et al., 2025).

Top Contributors

Within this corpus, Dehaene, Changeux, and Mashour are the most visible recurring authors, and Neuron, Trends in Cognitive Sciences, and high-impact general neuroscience journals anchor much of the included literature (Mashour et al., 2020; Dehaene & Changeux, 2011; Ferrante et al., 2025).

Type	Name	Papers
Author	S. Dehaene	[a5c9ef9cbcba5284b17d2b25870812f7][c9c22cf09ae35f3691c016590c2e9f43] [81223a759e285f9c9e7669c2a63871ea][52f28a0c751557f39a37a2f51dcd16f8]
Author	J.-P. Changeux	[a5c9ef9cbcba5284b17d2b25870812f7][c9c22cf09ae35f3691c016590c2e9f43]
Author	G. Mashour	[a5c9ef9cbcba5284b17d2b25870812f7][0dc03e9b82875361b133165f8750a5ed]
Journal	*Neuron*	[a5c9ef9cbcba5284b17d2b25870812f7][c9c22cf09ae35f3691c016590c2e9f43]
Journal	*Trends in Cognitive Sciences*	[4a5ff1f1fa2352ed8240ac31713c223d][725634326dc45b63a0dfb4b5587b6c44] [3adc5a6ee8c55b55a6a6e7c7ad847aea]
Journal	*Science Advances*	[52f28a0c751557f39a37a2f51dcd16f8]

FIGURE 6 Authors and journals most frequent in corpus

4. Discussion

The answer to the user's literal question is yes: GNWT does propose that unconscious or nonconscious processing streams compete for access to a limited-capacity global broadcasting system. That conclusion rests on direct theory statements that describe a distributed workspace selecting and broadcasting one item of information, with conscious access defined as selection, amplification, and global availability (Mashour et al., 2020; Michel, 2017; Dehaene & Changeux, 2011). The theory is especially strong on the broadcasting and limited-capacity parts, because those are explicit in foundational texts (Dehaene & Changeux, 2011).

The "competition among unconscious neural networks" wording is also broadly faithful, but it compresses several GNWT mechanisms into one phrase. The literature more often describes competition through selective access, suppression, salience-based entry, ignition, or anticorrelated large-scale dynamics (Mashour et al., 2020; Demertzi et al., 2019). That matters because some empirical work now disputes whether unconscious processing is as locally confined, and whether prefrontal ignition carries all conscious content as strongly as classic GNWT implied (Mei & Soto, 2024; Ferrante et al., 2025).

The corpus is strongest where it addresses theory definition and broad signatures of conscious access, including long-range information sharing, ignition-like dynamics, and global availability across cognitive systems (King et al., 2013; Aru et al., 2020; Finc et al., 2017). It is weaker where it tries to pin down the exact neural gate, the role of prefrontal cortex versus other hubs, and whether unconscious contents are excluded from frontoparietal representation (Huang et al., 2021; Ferrante et al., 2025; Mei & Soto, 2024).

Claim	Evidence Strength	Reasoning	Papers
GNWT proposes global broadcasting of consciously accessed information	Strong	Repeated explicit statements in foundational and review papers	(Mashour et al., 2020; Dehaene & Changeux, 2011; Michel, 2017)

Claim	Evidence Strength	Reasoning	Papers
GNWT treats conscious access as limited-capacity selection of one dominant content	Strong	Theory papers explicitly describe single selected content and inhibition of alternatives	(Michel, 2017; Dehaene & Changeux, 2011)
GNWT includes competition among information streams for ignition/access	Moderate	Supported directly, but often phrased as selection or ignition rather than competition	(Demertzi et al., 2019; Mashour et al., 2020)
GNWT's strict separation between unconscious local processing and conscious global access is fully supported	Weak	Recent studies report distributed unconscious representations and theory challenges	(Mei & Soto, 2024; Ferrante et al., 2025)
Prefrontal ignition fully explains all dimensions of conscious content	Weak	Direct adversarial tests found limited prefrontal representation of some content dimensions	(Ferrante et al., 2025)

FIGURE 7 Key claims and supporting evidence in corpus

5. Conclusion

Across foundational theory papers, reviews, and newer empirical tests, GNWT clearly proposes a limited-capacity global broadcasting architecture for conscious access. In that architecture, nonconscious representations are processed locally, and one salient or goal-relevant representation wins selection, ignites a distributed network, and becomes globally available (Michel, 2017; Mashour et al., 2020). The main nuance is that current evidence supports the theory's broad broadcasting-and-selection idea more strongly than its stricter claims about where unconscious contents are represented and how universally prefrontal ignition tracks conscious content (Ferrante et al., 2025; Mei & Soto, 2024).

Research Gaps

The main open issue is not whether GNWT proposes competition and broadcasting, but how literally its canonical neural implementation should be taken. Recent studies point to gaps around unconscious frontoparietal representations, precise gating structures, and the maintenance of conscious content over time (Mei & Soto, 2024; Ferrante et al., 2025; Huang et al., 2021).

Topic/Outcome	Theory Definition	Direct Human Tests	Unconscious Representation	Neural Gate
Global broadcasting	10	7	4	3
Competition for access	8	5	3	2
Prefrontal ignition	7	5	2	2
Anterior insula gating	3	3	1	4

Open Research Questions

Future work is now focused on sharpening mechanistic tests rather than restating the basic theory.

Question	Why
Do unconscious representations in frontoparietal cortex contradict or simply refine GNWT?	This determines whether GNWT needs minor revision or a major rewrite of its conscious–unconscious boundary.
Which brain regions actually gate entry into the global workspace?	Competing candidates include prefrontal hubs, thalamocortical loops, and anterior insula transition mechanisms.
Is ignition necessary for all conscious content updates, including stimulus offset?	Recent adversarial evidence suggests some conscious updates occur without the predicted ignition signature.

So, yes: GNWT does propose competition among nonconscious processes for access to a limited-capacity global broadcasting system, but newer evidence suggests that some details of that proposal need revision rather than simple repetition.

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