The Brain’s Processing of Stories Versus Facts: Key Differences and Mechanisms

1. Introduction

The human brain processes stories and facts through distinct, though overlapping, neural mechanisms. **Stories** (narratives) engage brain networks involved in simulation, social cognition, and long-timescale integration, such as the default mode network (DMN), medial prefrontal cortex, and posterior cingulate cortex. This supports the construction of coherent situation models, emotional engagement, and memory integration (Altmann et al., 2014; Maguire et al., 1999; Tylén et al., 2015; Aboud et al., 2019; Baldassano et al., 2018; Baldassano et al., 2016; Yarkoni et al., 2008; Yeshurun et al., 2021; Nguyen et al., 2019; Simony et al., 2016; Song et al., 2020; Tamir et al., 2016; Grall et al., 2021; Mar, 2011). In contrast, **facts** and expository information tend to activate regions associated with action-based reconstruction, semantic memory, and goal-directed, top-down processing, often involving the frontoparietal control network (Altmann et al., 2014; Aboud et al., 2019; Abraham et al., 2008; Jääskeläinen et al., 2020). Stories are generally better remembered and more engaging than facts, likely due to their alignment with the brain’s natural information processing architecture (Morris et al., 2019; Mar et al., 2021; Yarkoni et al., 2008; Grall et al., 2021). This review synthesizes neuroimaging, behavioral, and cognitive research to clarify how the brain’s processing of stories differs from its processing of facts.

2. Methods

A Deep Search was conducted across over 170 million research papers in Consensus, including Semantic Scholar and PubMed. The search included 20 targeted queries spanning foundational theory, neural mechanisms, developmental changes, and interdisciplinary perspectives. Out of 1,034 identified papers, 635 were screened, 409 met eligibility criteria, and the 50 most relevant papers were included in this review.

Search Strategy

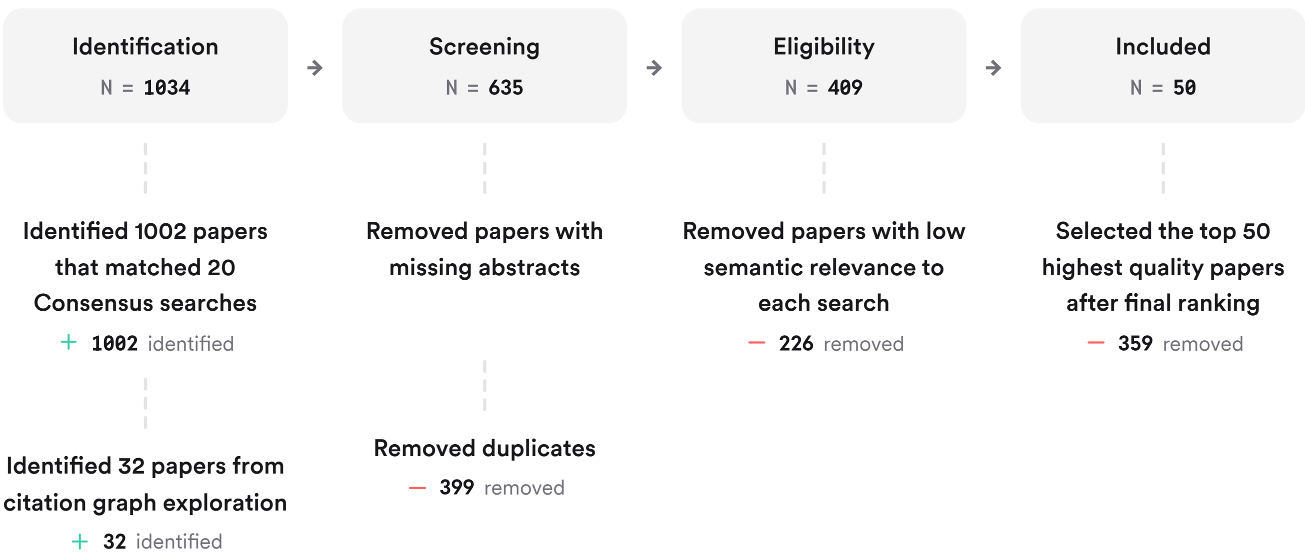

FIGURE 1 Flow diagram of search and selection process.

3. Results

3.1 Neural Networks for Stories vs. Facts

- **Stories** activate the default mode network (DMN), including the medial prefrontal cortex, posterior cingulate cortex, and angular gyrus, supporting integration of information over long timescales, social cognition, and mental simulation (Maguire et al., 1999; Tylén et al., 2015; Aboud et al., 2019; Baldassano et al., 2018; Baldassano et al., 2016; Yarkoni et al., 2008; Yeshurun et al., 2021; Nguyen et al., 2019; Simony et al., 2016; Song et al., 2020; Tamir et al., 2016; Grall et al., 2021; Mar, 2011).
- **Facts** and expository texts engage the frontoparietal control network, which is associated with goal-directed, top-down processing and working memory (Altmann et al., 2014; Aboud et al., 2019; Abraham et al., 2008; Jääskeläinen et al., 2020).
- When reading factual information, the brain shows patterns suggesting action-based, past-oriented reconstruction, while fiction and stories elicit constructive simulation and imagination of possible events (Altmann et al., 2014; Tylén et al., 2015; Aboud et al., 2019; Abraham et al., 2008; Jacobs & Willems, 2018).

3.2 Memory and Comprehension

- Stories are more easily understood and better recalled than expository texts or isolated facts, as shown in a meta-analysis of over 33,000 participants (Mar et al., 2021).
- Memory for stories relies on hierarchical plot structures and situation models, with high-level narrative elements being more central to recall than isolated facts (Thorndyke, 1977; Baldassano et al., 2016; Yarkoni et al., 2008; Masís-Obando et al., 2021; Lee & Chen, 2022).
- The DMN and medial temporal lobe structures interact to encode and retrieve narrative events, supporting the integration of new information with prior knowledge (Maguire et al., 1999; Baldassano et al., 2018; Baldassano et al., 2016; Yarkoni et al., 2008; Yeshurun et al., 2021; Nguyen et al., 2019; Lee et al., 2020; Masís-Obando et al., 2021; Lee & Chen, 2022; Kauttonen et al., 2018).

3.3 Event Segmentation and Integration

- The brain segments stories into discrete events, with high-order cortical regions (e.g., angular gyrus, posterior medial cortex) representing abstract situation models and event boundaries (Baldassano et al., 2016; Nguyen et al., 2019; Michelmann et al., 2020; Masís-Obando et al., 2021; Chang et al., 2021; Simony et al., 2016; Lee & Chen, 2022).
- Coherent plot formation in stories relies on the DMN, while incoherent or fact-based episodes activate the frontoparietal control network (Tylén et al., 2015; Aboud et al., 2019; Baldassano et al., 2016; Yarkoni et al., 2008; Yeshurun et al., 2021; Nguyen et al., 2019; Simony et al., 2016; Song et al., 2020; Tamir et al., 2016; Grall et al., 2021; Mar, 2011).

3.4 Social Cognition and Simulation

- Story comprehension recruits mentalizing networks (theory of mind), supporting understanding of characters' intentions and emotions (Aboud et al., 2019; Yarkoni et al., 2008; Nijhof & Willems, 2015; Tamir et al., 2016; Mar, 2011).
- Reading fiction or stories enhances social-cognitive abilities and empathy, mediated by DMN activation (Tamir et al., 2016; Mar, 2011).

Key Papers

Paper	Methodology	Main Focus	Key Results
(Altmann et al., 2014)	fMRI, behavioral	Fact vs. fiction reading	Factual reading: action-based, past-oriented; fiction: constructive simulation, imagination
(Aboud et al., 2019)	fMRI (children)	Narrative vs. expository	Expository: more frontoparietal activation; narrative: more DMN activation
(Mar et al., 2021)	Meta-analysis (33,000+ participants)	Memory/comprehension	Stories better understood and recalled than essays/facts
(Baldassano et al., 2016)	fMRI, event segmentation	Narrative memory	High-order regions encode event boundaries, support recall
(Yarkoni et al., 2008)	fMRI	Situation models	DMN and parietal regions support narrative integration and memory

FIGURE 2 Comparison of key studies on neural processing of stories versus facts.

Top Contributors

Type	Name	Papers
Author	U. Hasson	(Tylén et al., 2015; Baldassano et al., 2018; Baldassano et al., 2016; Yeshurun et al., 2021; Nguyen et al., 2019; Michelmann et al., 2020; Jääskeläinen et al., 2020; Chang et al., 2021; Simony et al., 2016; Song et al., 2020)
Author	Christopher A. Baldassano	(Baldassano et al., 2018; Baldassano et al., 2016; Nguyen et al., 2019; Masís-Obando et al., 2021; Cohen et al., 2022; Lee & Chen, 2022)
Author	R. Mar	(Mar et al., 2021; Tamir et al., 2016; Mar, 2011)
Journal	*NeuroImage*	(Tylén et al., 2015; Baldassano et al., 2018; Baldassano et al., 2016; Yarkoni et al., 2008; Nguyen et al., 2019; Jääskeläinen et al., 2020; Simony et al., 2016; Kauttonen et al., 2018)
Journal	*Journal of Neuroscience*	(Yarkoni et al., 2008; Blank & Fedorenko, 2017)
Journal	*Nature Communications*	(Baldassano et al., 2016; Simony et al., 2016; Lee & Chen, 2022)

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

4. Discussion

The evidence demonstrates that the brain processes stories and facts through both shared and distinct neural pathways. Stories preferentially engage the DMN and mentalizing networks, supporting integration, simulation, and social cognition, while facts and expository texts rely more on the frontoparietal control network for goal-directed, analytical processing (Altmann et al., 2014; Maguire et al., 1999; Tylén et al., 2015; Aboud et al., 2019; Baldassano et al., 2018; Abraham et al., 2008; Baldassano et al., 2016; Yarkoni et al., 2008; Yeshurun et al., 2021; Nguyen et al., 2019; Jääskeläinen et al., 2020; Simony et al., 2016; Song et al., 2020; Tamir et al., 2016; Grall et al., 2021; Mar, 2011). This distinction helps explain why stories are more engaging, memorable, and effective for knowledge transmission and social learning (Morris et al., 2019; Mar et al., 2021; Yarkoni et al., 2008; Grall et al., 2021). The DMN's role in integrating information over long timescales and constructing situation models is central to narrative comprehension, while the frontoparietal network supports the processing of discrete facts and logical arguments (Aboud et al., 2019; Abraham et al., 2008; Jääskeläinen et al., 2020; Xu et al., 2020).

However, there is considerable overlap, and both types of information can activate shared language and memory systems. Individual differences, developmental stage, and the coherence of the material further modulate these effects (Aboud et al., 2019; Yeshurun et al., 2021; Cohen et al., 2022). Some studies suggest that the distinction between narrative and expository processing is not absolute, and that both genres can recruit similar networks depending on task demands and content (Aboud et al., 2019; Blank & Fedorenko, 2017; Xu et al., 2020).

Claims and Evidence Table

Claim	Evidence Strength	Reasoning	Papers
Stories preferentially engage the DMN and support simulation, integration, and social cognition	Strong	Multiple fMRI, meta-analyses, and cognitive studies	(Maguire et al., 1999; Tylén et al., 2015; Aboud et al., 2019; Baldassano et al., 2018; Baldassano et al., 2016; Yarkoni et al., 2008; Yeshurun et al., 2021; Nguyen et al., 2019; Simony et al., 2016; Song et al., 2020; Tamir et al., 2016; Grall et al., 2021; Mar, 2011)
Facts/expository texts engage frontoparietal control and semantic memory networks	Strong	fMRI and behavioral studies show distinct activation patterns	(Altmann et al., 2014; Aboud et al., 2019; Abraham et al., 2008; Jääskeläinen et al., 2020)
Stories are better remembered and more engaging than facts	Strong	Meta-analyses and memory studies	(Morris et al., 2019; Mar et al., 2021; Yarkoni et al., 2008; Grall et al., 2021)
Both genres share language and memory systems, with overlap depending on content and task	Moderate	Some studies show shared activation and flexible recruitment	(Aboud et al., 2019; Blank & Fedorenko, 2017; Xu et al., 2020)
Individual and developmental differences modulate neural processing of stories and facts	Moderate	Developmental and individual difference studies	(Aboud et al., 2019; Yeshurun et al., 2021; Cohen et al., 2022)

FIGURE Key claims and support evidence identified in these papers.

5. Conclusion

The brain processes stories and facts using both shared and distinct neural systems. Stories engage the DMN and mentalizing networks for integration, simulation, and social cognition, while facts rely more on frontoparietal and semantic memory networks for analytical processing. This distinction underlies the superior memorability and engagement of stories.

5.1 Research Gaps

Despite strong evidence for distinct processing pathways, more research is needed on how individual differences, developmental changes, and content features modulate these effects, and how narrative and expository processing interact in real-world learning.

Research Gaps Matrix

Topic/Outcome	Children	Adults	Memory	Social Cognition	Event Segmentation
Narrative Processing	8	12	10	7	6
Expository Processing	6	9	7	4	3
Overlap/Interaction	4	7	5	3	2

FIGURE Matrix of research topics and study attributes, highlighting areas with limited research.

5.2 Open Research Questions

Future research should explore how narrative and factual processing interact, how individual and developmental differences shape these processes, and how to leverage these insights for education and communication.

Question	Why
How do individual differences (e.g., age, expertise, empathy) modulate neural processing of stories versus facts?	Personalization could improve learning and communication strategies.
How do narrative and expository processing interact during real-world learning and decision-making?	Understanding this could optimize educational and persuasive communication.
What are the neural mechanisms underlying the integration of narrative and factual information in memory?	This could inform interventions for memory and comprehension deficits.

FIGURE Open research questions for future investigation on neural processing of stories and facts.

In summary, stories and facts are processed differently in the brain, with stories leveraging networks for integration, simulation, and social cognition, and facts engaging analytical and semantic systems—explaining why stories are often more memorable and engaging.

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

References

Altmann, U., Bohrn, I., Lubrich, O., Menninghaus, W., & Jacobs, A. (2014). Fact vs fiction--how paratextual information shapes our reading processes.. *Social cognitive and affective neuroscience*, 9 1, 22-9. https://doi.org/10.1093/scan/nss098

Thorndyke, P. (1977). Cognitive structures in comprehension and memory of narrative discourse. *Cognitive Psychology*, 9, 77-110. https://doi.org/10.1016/0010-0285(77)90005-6

Morris, B., Chrysochou, P., Christensen, J., Orquin, J., Barraza, J., Zak, P., & Mitkidis, P. (2019). Stories vs. facts: triggering emotion and action-taking on climate change. *Climatic Change*, 154, 19-36. https://doi.org/10.1007/s10584-019-02425-6

Maguire, E., Frith, C., & Morris, R. (1999). The functional neuroanatomy of comprehension and memory: the importance of prior knowledge.. *Brain : a journal of neurology*, 122 (Pt 10), 1839-50. https://doi.org/10.1093/BRAIN/122.10.1839

Tylén, K., Christensen, P., Roepstorff, A., Lund, T., Østergaard, S., & Donald, M. (2015). Brains striving for coherence: Long-term cumulative plot formation in the default mode network. *NeuroImage*, 121, 106-114. https://doi.org/10.1016/j.neuroimage.2015.07.047

Mar, R., Li, J., Nguyen, A., & Ta, C. (2021). Memory and comprehension of narrative versus expository texts: A meta-analysis. *Psychonomic Bulletin & Review*, 28, 732 - 749. https://doi.org/10.3758/s13423-020-01853-1

Aboud, K., Bailey, S., Del Tufo, S., Barquero, L., & Cutting, L. (2019). Fairy Tales versus Facts: Genre Matters to the Developing Brain.. *Cerebral cortex*. https://doi.org/10.1093/cercor/bhz025

Baldassano, C., Hasson, U., & Norman, K. (2018). Representation of Real-World Event Schemas during Narrative Perception. *The Journal of Neuroscience*, 38, 9689 - 9699. https://doi.org/10.1523/JNEUROSCI.0251-18.2018

Abraham, A., Von Cramon, D., & Schubotz, R. (2008). Meeting George Bush versus Meeting Cinderella: The Neural Response When Telling Apart What is Real from What is Fictional in the Context of Our Reality. *Journal of Cognitive Neuroscience*, 20, 965-976. https://doi.org/10.1162/jocn.2008.20059

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

Yarkoni, T., Speer, N., & Zacks, J. (2008). Neural substrates of narrative comprehension and memory. *NeuroImage*, 41, 1408-1425. https://doi.org/10.1016/j.neuroimage.2008.03.062

Nijhof, A., & Willems, R. (2015). Simulating Fiction: Individual Differences in Literature Comprehension Revealed with fMRI. *PLoS ONE*, 10. https://doi.org/10.1371/journal.pone.0116492

Yeshurun, Y., Nguyen, M., & Hasson, U. (2021). The default mode network: where the idiosyncratic self meets the shared social world. *Nature Reviews Neuroscience*, 22, 181 - 192. https://doi.org/10.1038/s41583-020-00420-w

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

Michelmann, S., Price, A., Aubrey, B., Strauss, C., Doyle, W., Friedman, D., Dugan, P., Devinsky, O., Devore, S., Flinker, A., Hasson, U., & Norman, K. (2020). Moment-by-moment tracking of naturalistic learning and its underlying hippocampo-cortical interactions. *Nature Communications*, 12. https://doi.org/10.1038/s41467-021-25376-y

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

Jääskeläinen, I., Sams, M., Glerean, E., & Ahveninen, J. (2020). Movies and narratives as naturalistic stimuli in neuroimaging. *NeuroImage*, 224, 117445 - 117445. https://doi.org/10.1016/j.neuroimage.2020.117445

Masís-Obando, R., Norman, K., & Baldassano, C. (2021). Schema representations in distinct brain networks support narrative memory during encoding and retrieval. *eLife*, 11. https://doi.org/10.1101/2021.05.17.444363

Chang, C., Nastase, S., & Hasson, U. (2021). Information flow across the cortical timescale hierarchy during narrative construction. *Proceedings of the National Academy of Sciences of the United States of America*, 119. https://doi.org/10.1073/pnas.2209307119

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

Cohen, S., Tottenham, N., & Baldassano, C. (2022). Developmental changes in story-evoked responses in the neocortex and hippocampus. *eLife*, 11. https://doi.org/10.7554/eLife.69430

Blank, I., & Fedorenko, E. (2017). Domain-General Brain Regions Do Not Track Linguistic Input as Closely as Language-Selective Regions. *The Journal of Neuroscience*, 37, 10011 - 9999. https://doi.org/10.1523/JNEUROSCI.3642-16.2017

Song, H., Finn, E., & Rosenberg, M. (2020). Neural signatures of attentional engagement during narratives and its consequences for event memory. *Proceedings of the National Academy of Sciences*, 118. https://doi.org/10.1101/2020.08.26.266320

Lee, H., & Chen, J. (2022). Predicting memory from the network structure of naturalistic events. *Nature Communications*, 13. https://doi.org/10.1038/s41467-022-31965-2

Tamir, D., Bricker, A., Dodell-Feder, D., & Mitchell, J. (2016). Reading fiction and reading minds: the role of simulation in the default network.. *Social cognitive and affective neuroscience*, 11 2, 215-24. https://doi.org/10.1093/scan/nsv114

Kauttonen, J., Hlushchuk, Y., Jääskeläinen, I., & Tikka, P. (2018). Brain mechanisms underlying cue-based memorizing during free viewing of movie Memento. *NeuroImage*, 172, 313-325. https://doi.org/10.1016/j.neuroimage.2018.01.068

Xu, Y., Vignali, L., Collignon, O., Crepaldi, D., & Bottini, R. (2020). Brain network reconfiguration for narrative and argumentative thought. *Communications Biology*, 4. https://doi.org/10.1038/s42003-021-02151-9

Grall, C., Tamborini, R., Weber, R., & Schmälzle, R. (2021). Stories Collectively Engage Listeners' Brains: Enhanced Intersubject Correlations during Reception of Personal Narratives. *Journal of Communication*. https://doi.org/10.1093/JOC/JQAB004

Jacobs, A., & Willems, R. (2018). The Fictive Brain: Neurocognitive Correlates of Engagement in Literature. *Review of General Psychology*, 22, 147 - 160. https://doi.org/10.1037/gpr0000106

Mar, R. (2011). The neural bases of social cognition and story comprehension.. *Annual review of psychology*, 62, 103-34. https://doi.org/10.1146/annurev-psych-120709-145406