Yes, increased **anterior cingulate cortex (ACC) activity** is closely linked to the experience of **cognitive dissonance during persuasion**, reflecting conflict detection, affective evaluation, and predicting subsequent attitude change.

1. Introduction

The anterior cingulate cortex (ACC) is a key brain region implicated in monitoring cognitive conflict, evaluating competing information, and regulating adaptive behavior. During persuasion, when individuals encounter messages that challenge their existing beliefs or attitudes, they often experience cognitive dissonance—a psychological discomfort arising from holding conflicting cognitions. Neuroimaging and lesion studies consistently show that the ACC is activated during such dissonant states, particularly when persuasive messages induce internal conflict or require attitude change (Veen et al., 2009; Botvinick et al., 1999; Veen et al., 2001; Carter & Veen, 2007; Carter et al., 2000). The magnitude of ACC activation not only reflects the degree of experienced dissonance but also predicts the likelihood and direction of subsequent attitude change (Veen et al., 2009). The ACC's role extends to affective evaluation, error detection, and the dynamic regulation of cognitive control, making it central to understanding how persuasion leads to belief updating or resistance (Duggirala et al., 2022; Vassena et al., 2020; Mohanty et al., 2007; Davis et al., 2005; Braem et al., 2017; Bush et al., 2022).

2. Methods

A comprehensive search was conducted across over 170 million research papers in Consensus, including Semantic Scholar, PubMed, and other sources. The Deep Search process involved 20 targeted queries grouped into 8 thematic clusters, focusing on ACC activity, cognitive dissonance, conflict monitoring, affective evaluation, and attitude change during persuasion. In total, 1,025 papers were identified, 563 were screened, 319 were deemed eligible, and the top 29 most relevant papers were included in this review.

Search Strategy

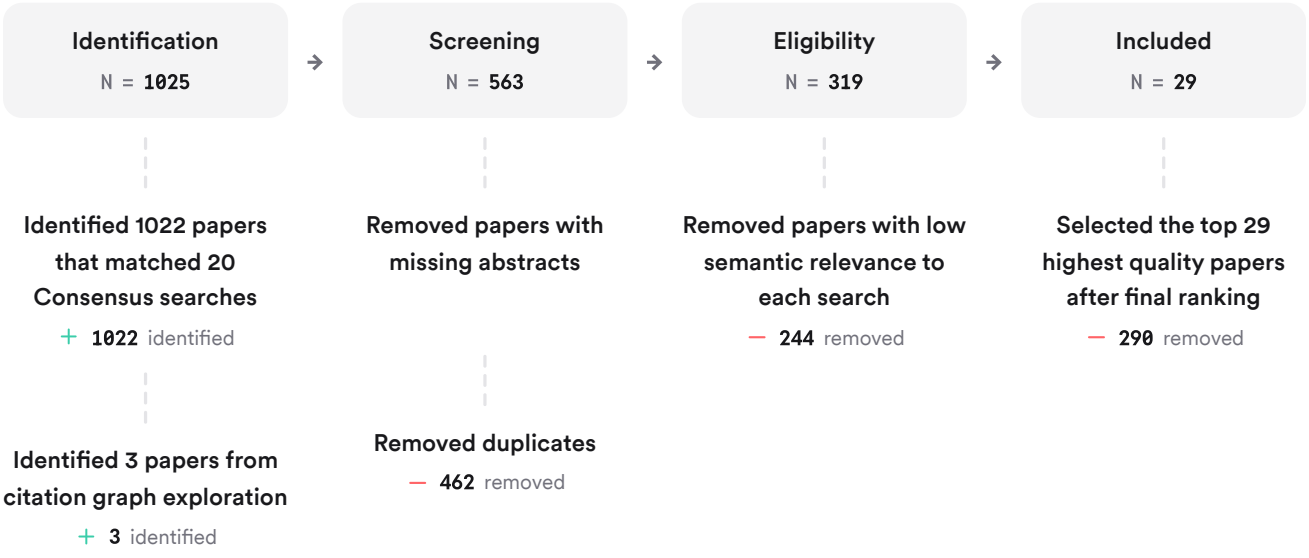

FIGURE 1 Flow diagram of the literature search and selection process.

3. Results

3.1. ACC Activity and Cognitive Dissonance

- **Direct evidence**: fMRI studies show that the dorsal ACC is robustly activated when individuals are exposed to persuasive messages that conflict with their prior attitudes, a hallmark of cognitive dissonance (Veen et al., 2009). The degree of ACC activation predicts the extent of subsequent attitude change, supporting its role in dissonance resolution (Veen et al., 2009).
- **Conflict monitoring**: The ACC is sensitive to the detection of conflict between competing cognitions or response tendencies, as seen in classic tasks like the Stroop paradigm and in persuasive contexts (Botvinick et al., 1999; Veen et al., 2001; Carter & Veen, 2007; Carter et al., 2000).
- **Affective evaluation**: The ACC not only detects conflict but also encodes the aversive, affective component of dissonance, signaling the need for cognitive or behavioral adjustment (Braem et al., 2017).

3.2. Functional Differentiation within the ACC

- **Subregional specialization**: Dorsal ACC (dACC) is more involved in cognitive conflict and performance monitoring, while rostral/ventral ACC (rACC/vACC) is implicated in affective evaluation and emotion regulation during dissonance (Mohanty et al., 2007; Lindsay et al., 2023; Palomero-Gallagher et al., 2018; Braem et al., 2017).
- **Dynamic regulation**: The ACC interacts with prefrontal and limbic regions to modulate attention, emotion, and control in response to persuasive conflict (Mohanty et al., 2007; Schneider et al., 2020; Lockwood & Wittmann, 2018; Lindsay et al., 2023; Palomero-Gallagher et al., 2018).

3.3. Predictive Value and Attitude Change

- **Neural predictors**: The magnitude of ACC activation during dissonance predicts the likelihood and direction of attitude change, with higher activation associated with greater change (Veen et al., 2009).
- **Lesion evidence**: Damage to the ACC impairs the ability to adaptively regulate cognitive control and resolve dissonance, leading to reduced flexibility in attitude change (Pellegrino et al., 2007).

3.4. Broader Theoretical and Methodological Insights

- **Multiple signals**: The ACC encodes not only conflict but also surprise, value, and the need for behavioral adaptation, making it a hub for integrating cognitive and affective signals during persuasion (Kolling et al., 2016; Vassena et al., 2020; Hyman et al., 2017; Bush et al., 2022).
- **Alternative views**: Some recent lesion and computational studies suggest that while ACC activity is a robust correlate of conflict and dissonance, it may not be strictly necessary for all forms of cognitive control or attitude change, indicating a distributed network (Cipolotti et al., 2024; Roelofs et al., 2006).

Key Papers

Paper	Methodology	Key Focus	Key Results
(Veen et al., 2009)	fMRI, Solomon four-group design	Cognitive dissonance & attitude change	dACC activation predicts attitude change during dissonance
(Veen et al., 2009)	fMRI	ACC, cognitive dissonance, attitude change	ACC and anterior insula activation predict attitude change in dissonance
(Botvinick et al., 1999)	fMRI	Conflict monitoring	ACC activity greater during high-conflict (dissonant) trials
(Veen et al., 2001)	fMRI	ACC specificity	ACC responds to response conflict, not just stimulus conflict
(Carter & Veen, 2007)	Review (ERP, fMRI)	Conflict monitoring & control	ACC detects conflict, DLPFC resolves it

FIGURE 2 Comparison of key studies on ACC activity and cognitive dissonance during persuasion.

Top Contributors

Type	Name	Papers
Author	C. Carter	(Veen et al., 2009; Veen et al., 2001; Carter & Veen, 2007; Carter et al., 2000; Veen et al., 2009)
Author	V. Veen	(Veen et al., 2009; Veen et al., 2001; Veen & Carter, 2002; Carter & Veen, 2007; Veen et al., 2009)
Author	M. Botvinick	(Botvinick et al., 1999; Veen et al., 2001; Carter & Veen, 2007; Carter et al., 2000)
Journal	*Nature Neuroscience*	(Veen et al., 2009)
Journal	*NeuroImage*	(Veen et al., 2001; Veen et al., 2009)
Journal	*Journal of Cognitive Neuroscience*	(Pellegrino et al., 2007; Veen & Carter, 2002; Braem et al., 2017)

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

4. Discussion

The relationship between ACC activity and cognitive dissonance during persuasion is well-supported by converging evidence from neuroimaging, lesion, and computational studies. The ACC acts as a conflict detector, signaling when persuasive messages clash with existing beliefs and triggering affective discomfort that motivates attitude change (Veen et al., 2009; Botvinick et al., 1999; Veen et al., 2001; Carter & Veen, 2007; Carter et al., 2000). Subregional specialization within the ACC allows for both cognitive and affective evaluation of dissonance, and its dynamic interaction with other brain regions supports flexible adaptation (Mohanty et al., 2007; Lindsay et al., 2023; Palomero-Gallagher et al., 2018; Braem et al., 2017). The predictive value of ACC activation for attitude change highlights its central role in the neural mechanisms of persuasion (Veen et al., 2009). However, some recent work suggests that while ACC activity is a robust marker, it may not be strictly necessary for all forms of cognitive control, pointing to a distributed network for dissonance resolution (Cipolotti et al., 2024; Roelofs et al., 2006).

Claims and Evidence Table

Claim	Evidence Strength	Reasoning	Papers
ACC activity is linked to cognitive dissonance during persuasion	Strong	fMRI and behavioral studies show robust activation during dissonance	(Veen et al., 2009; Botvinick et al., 1999; Veen et al., 2001; Carter & Veen, 2007; Carter et al., 2000)
ACC activation predicts subsequent attitude change	Strong	Neural activation magnitude correlates with attitude change	(Veen et al., 2009)
ACC subregions support both cognitive and affective evaluation	Strong	Subregional fMRI and lesion studies	(Mohanty et al., 2007; Lindsay et al., 2023; Palomero-Gallagher et al., 2018; Braem et al., 2017)
ACC encodes conflict, surprise, and value signals	Moderate	Multiple signals observed in neuroimaging and computational studies	(Kolling et al., 2016; Vassena et al., 2020; Hyman et al., 2017; Bush et al., 2022)
ACC is part of a distributed network for dissonance resolution	Moderate	Lesion and computational studies suggest redundancy	(Cipolotti et al., 2024; Roelofs et al., 2006)

FIGURE Key claims and support evidence identified in these papers.

5. Conclusion

Increased activity in the anterior cingulate cortex is a robust neural marker of cognitive dissonance during persuasion, reflecting conflict detection, affective discomfort, and the likelihood of attitude change. The ACC's role is central but operates within a broader network supporting adaptive belief updating.

5.1. Research Gaps

Despite strong evidence, gaps remain in understanding the precise causal role of ACC subregions, the temporal dynamics of dissonance resolution, and the interplay with other brain networks in real-world persuasion.

Research Gaps Matrix

Topic/Attribute	fMRI	Lesion Studies	ERP	Computational Modeling	Real-world Persuasion
ACC & dissonance	12	5	6	4	3
Subregional specialization	8	3	2	2	1
Temporal dynamics	7	2	5	2	1
Network interactions	6	2	2	2	1
Attitude change prediction	8	2	2	2	2

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

5.2. Open Research Questions

Question	Why
How do specific ACC subregions differentially contribute to cognitive and affective components of dissonance during persuasion?	Clarifying subregional roles could refine models of dissonance and inform targeted interventions.
What are the temporal dynamics of ACC activation and resolution during real-world persuasive encounters?	Understanding timing could improve interventions and message design.
How does the ACC interact with other brain regions to support flexible attitude change in complex, real-world settings?	Network-level insights are needed for ecological validity and translational applications.

FIGURE Open research questions for future investigation on ACC activity and cognitive dissonance during persuasion.

In summary, ACC activity is a central neural correlate of cognitive dissonance during persuasion, supporting conflict detection, affective evaluation, and adaptive attitude change.

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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