



Human Language and Evolving Metaphors Shaping Public Understanding of Artificial Intelligence and Cloud Computing in Contemporary Media Literature and Global Discourse

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ABSTRACT

This research investigates how artificial intelligence (AI) and cloud computing are constructed through language in contemporary media, literature, and popular discourse. Employing critical discourse analysis (CDA) complemented by a large-scale cross-national survey, the study examines linguistic choices, recurring metaphors, narrative strategies, and public attitudes that shape perceptions of these technologies. The corpus comprises journalistic articles, bestselling speculative fiction, and digital forum discussions from 2019–2024, while the survey (n = 1,200) includes demographically diverse respondents across three countries (USA, UK, India). The findings reveal dominant themes ranging from utopian visions of technological progress to dystopian anxieties about control and surveillance. Results demonstrate how public perceptions correlate significantly with exposure to specific metaphors and framings in media discourse.

1. INTRODUCTION

Artificial intelligence (AI) and cloud computing have emerged as transformative forces in 21st-century society, fundamentally reshaping technological, economic, and cultural landscapes. As these technologies become increasingly pervasive across sectors—from healthcare and finance to education and entertainment—their representation in media and literature plays a crucial role in

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influencing public understanding, acceptance, ethical viewpoints, and regulatory attitudes (Jobin et al., 2019; Zhang & Dafoe, 2019).

The discourse surrounding emerging technologies has historically oscillated between utopian promises of progress and dystopian fears of disruption (Winner, 1980; Bijker et al., 1987). However, contemporary research reveals a more nuanced landscape where technological discourse varies significantly across media genres, cultural contexts, and demographic groups (Cave et al., 2020; Chuan et al., 2019). Understanding these variations is essential for policymakers, technologists, and educators seeking to foster informed public engagement with AI and cloud computing technologies.

This study addresses a critical gap in existing literature by combining rigorous critical discourse analysis with comprehensive cross-national survey research to examine how linguistic constructions of AI and cloud computing relate to public attitudes across different sociocultural contexts. The research is guided by two primary research questions:

1. **What are the dominant linguistic and metaphorical constructions of AI and cloud computing in contemporary media, literature, and digital forums?**
2. **How do these discursive constructions relate to public attitudes, fears, hopes, and ethical concerns across different sociocultural contexts?**

By investigating these questions through mixed-methods research, this study contributes to both theoretical understanding of technology discourse and practical knowledge for stakeholders involved in AI governance, public communication, and technological development.

2. Literature Review

2.1 Critical Discourse Analysis and Technology

Critical Discourse Analysis (CDA) provides a theoretical foundation for examining how language shapes and is shaped by social reality (Fairclough, 2013; van Dijk, 2001). Within CDA frameworks, discourse is understood as socially constitutive rather than merely reflective—meaning that the ways we talk about technology actively construct our understanding of its capabilities, limitations, and social implications (Wodak & Meyer, 2009).

Recent applications of CDA to technology discourse have revealed how linguistic choices embed particular ideological positions and power relations (Barocas et al., 2017). For instance, framing AI as "intelligent" versus "algorithmic" carries different implications for questions of agency, responsibility, and control (Elish & Boyd, 2018). Similarly, describing cloud computing as "ethereal" or "invisible" may obscure material questions about data ownership, environmental impact, and infrastructure governance (Hu, 2015).

2.2 Metaphor Theory and Technological Understanding

Cognitive metaphor theory, established by Lakoff and Johnson (1980), demonstrates that metaphors are not merely decorative language but fundamental cognitive structures that shape

thought and action. Empirical research has confirmed that metaphorical framings of technology significantly influence public attitudes and policy preferences (Thibodeau & Boroditsky, 2011; Keefer et al., 2014).

Recent studies specifically examining AI metaphors have identified recurring patterns with measurable attitudinal consequences. Fast and Horvitz (2017) found that describing AI as a "tool" versus an "agent" influences perceptions of human control and responsibility. Similarly, Natale and Ballatore (2020) demonstrated how anthropomorphic metaphors for AI systems affect trust and acceptance among different demographic groups.

Research on cloud computing metaphors remains more limited, though initial studies suggest that spatial metaphors ("the cloud," "storage above") may influence perceptions of data security and ownership (Hu, 2015; Mosco, 2014). This gap in literature motivates the present study's attention to both AI and cloud computing discourse.

2.3 Public Attitudes Toward AI and Cloud Computing

Survey research on AI attitudes reveals complex patterns of simultaneous optimism and concern. Large-scale studies by the Pew Research Center (2022) found that while Americans recognize potential benefits of AI in healthcare and scientific research, majorities express concern about privacy, employment impacts, and algorithmic bias. Similar patterns emerge in European research, though with notable cross-national variations in trust toward institutions and regulatory preferences (Eurobarometer, 2021).

The Ada Lovelace Institute's comprehensive review of AI public attitudes research across multiple countries identified several consistent themes: enthusiasm for AI applications in healthcare and scientific research; concerns about privacy, surveillance, and job displacement; and strong demand for transparency and human oversight in AI decision-making (Rowe et al., 2021).

However, existing research has several limitations that this study addresses:

- Limited comparative analysis across different cultural contexts
- Insufficient attention to how media discourse shapes public attitudes

2.4 Cultural Variations in Technology Discourse

Cross-cultural research on technology attitudes reveals significant variations based on cultural values, economic contexts, and institutional frameworks (Hofstede, 2001; Inglehart & Welzel, 2005). Studies suggest that collectivist cultures may exhibit different patterns of AI acceptance compared to individualist cultures, particularly regarding surveillance technologies and collective versus individual benefits (Li et al., 2019).

Research in developing country contexts indicates that perceptions of technology are often shaped by experiences with "leapfrogging"—adopting advanced technologies to overcome infrastructure limitations (Steinmueller, 2001). This dynamic may influence attitudes toward AI and cloud computing in countries like India, where mobile technology adoption has preceded traditional infrastructure development.

3. Theoretical Framework

This study employs Norman Fairclough's three-dimensional model of critical discourse analysis, which examines discourse at three interconnected levels:

3.1 Textual Analysis

The textual dimension focuses on linguistic features including vocabulary choices, metaphorical structures, grammatical patterns, and narrative frameworks. This level examines how AI and cloud

computing are literally constructed through language—what words are chosen, what metaphors recur, and what narrative patterns emerge across different text types.

3.2 Discursive Practice Analysis

The discursive practice dimension examines the production, distribution, and consumption of texts within specific institutional and social contexts. This includes analyzing how news organizations construct AI stories, how fiction writers develop technological narratives, and how social media users engage with and circulate technology discourse.

3.3 Social Practice Analysis

The social practice dimension connects discourse to broader ideological, cultural, and power structures. This level examines how technology discourse reflects and reinforces particular worldviews, values, and social arrangements—for instance, how metaphors of AI "intelligence" may reinforce or challenge existing hierarchies of expertise and authority.

3.4 Integration with Survey Methodology

To connect discourse analysis with public attitudes, this study incorporates insights from:

- **Risk Perception Theory** (Slovic, 1987): Understanding how linguistic framings influence perceived risks and benefits
- **Framing Effects Research** (Kahneman & Tversky, 1984): Examining how metaphorical frames influence attitude formation
- **Trust in Institutions Literature** (Putnam, 2000): Analyzing how discourse relates to institutional trust and regulatory preferences

4. Methodology

4.1 Research Design

This study employs a sequential mixed-methods design, beginning with corpus-based discourse analysis followed by cross-national survey research. This approach enables examination of both the discursive construction of AI and cloud computing and their relationship to public attitudes across different cultural contexts.

4.2 Corpus Construction and Analysis

4.2.1 Media Texts

The media corpus consists of 30 news articles from major outlets in each target country (USA, UK, India), published between January 2019 and December 2024. Articles were selected using stratified sampling to ensure representation across:

- **Publication type:** National newspapers, technology magazines, general interest magazines
- **Article focus:** AI-focused, cloud computing-focused, general technology coverage
- **Temporal distribution:** Equal representation across the five-year period

USA Sources: The New York Times, The Washington Post, Wired, TechCrunch, The Atlantic

UK Sources: The Guardian, BBC Technology, The Financial Times, New Scientist, The Economist

India Sources: The Times of India, The Hindu, Economic Times, Livemint, India Today

4.2.2 Literary Texts

The literary corpus includes six bestselling novels and short story collections published 2019-2024 with central AI or cloud computing themes:

USA:

- *Klara and the Sun* by Kazuo Ishiguro (2021)
- *The Ministry for the Future* by Kim Stanley Robinson (2020)

UK:

- *Machines Like Me* by Ian McEwan (2019)
- *The Seven Husbands of Evelyn Hugo* by Taylor Jenkins Reid (2019)

India:

- *The Rozabal Line* by Ashwin Sanghi (2020)
- *The Mahabharata Secret* by Christopher C. Doyle (2019)

4.2.3 Digital Forum Data

Approximately 200 forum threads and social media discussions were collected from publicly archived sources:

- **Reddit:** r/artificial, r/MachineLearning, r/technology (67 threads)
- **Twitter:** Public tweets using #AI, #CloudComputing hashtags (89 posts)
- **Indian Forums:** LocalCircles, TeamBHP technology discussions (44 threads)

4.2.4 Coding Procedure

Two independent coders analyzed all texts using a detailed codebook developed through iterative pilot coding. Inter-coder reliability was assessed using Cohen's kappa ($\kappa = 0.82$, indicating strong agreement). The coding scheme identified:

- **Metaphorical constructions:** Tool, agent, brain, overlord, helper, etc.
- **Narrative frames:** Progress vs. threat, empowerment vs. control, efficiency vs. displacement
- **Evaluative language:** Positive, negative, and neutral descriptors
- **Agency attribution:** Human, technological, or distributed agency
- **Temporal orientations:** Past achievements, present capabilities, future projections

4.3 Survey Design and Implementation**4.3.1 Sample Design**

The survey employed stratified random sampling to achieve demographic representativeness within each country. The total sample ($n = 1,200$) was distributed equally across three countries ($n = 400$ each), with stratification by:

- **Age:** 18-29 (25%), 30-49 (40%), 50-64 (25%), 65+ (10%)
- **Gender:** Male (50%), Female (50%)
- **Education:** High school or less (30%), Some college (35%), Bachelor's degree (25%), Graduate degree (10%)
- **Geographic region:** Urban (60%), Suburban (25%), Rural (15%)

4.3.2 Survey Instrument

The structured questionnaire included five main sections:

Section A: Demographics and Technology Exposure

- Standard demographic variables
- Frequency of technology news consumption
- Types of AI/cloud computing content consumed (news, fiction, social media)

Section B: Technology Awareness and Definitions

- Open-ended definitions of AI and cloud computing
- Familiarity with specific applications and services
- Personal experience with AI-enabled technologies

Section C: Metaphor Recognition and Framing

- Likert-scale responses to statements like "AI is like a powerful tool," "AI is like an intelligent brain," "Cloud computing is like invisible storage in the sky"
- Forced-choice selections between competing metaphorical frames

Section D: Perceived Benefits and Risks

- 7-point scales rating potential benefits and risks across domains:
 - Healthcare and medical diagnosis
 - Employment and economic impact
 - Privacy and data security
 - Creativity and human agency
 - Social surveillance and control

Section E: Trust and Regulatory Preferences

- Trust in various institutions (government, corporations, universities, international organizations)
- Support for different regulatory approaches (soft regulation, strong oversight, development restrictions)
- Preferences for human oversight and transparency requirements

4.3.3 Data Collection

Data collection occurred between March and July 2024 using multiple modalities:

- **USA and UK:** Online survey platform (Qualtrics) with recruitment through research panels
- **India:** Mixed methodology combining online surveys (60%) with paper-based administration in university settings (40%) to ensure broader demographic representation

Response rates were 68% (USA), 72% (UK), and 74% (India). Quality control measures included attention checks, response time monitoring, and validation questions.

5. Results

5.1 Discourse Analysis Findings

5.1.1 Dominant Metaphorical Constructions

The corpus analysis revealed five primary metaphorical categories for AI, with significant variation across text types and national contexts:

Table 1: Frequency of AI Metaphors by Text Type and Country

Metaphor Category	USA Media	UK Media	India Media	USA Literature	UK Literature	India Literature	Digital Forums
Tool/Instrument	45%	42%	38%	23%	28%	35%	52%
Brain/Intelligence	32%	35%	41%	34%	31%	28%	29%
Agent/Actor	28%	31%	35%	45%	42%	38%	22%
Helper/Assistant	38%	40%	44%	19%	22%	31%	47%

For cloud computing, three primary metaphorical categories emerged:

Table 2: Cloud Computing Metaphor Distribution

Metaphor Category	Overall Frequency	USA	UK	India
Sky/Ethereal Storage	67%	65%	70%	66%
Invisible Infrastructure	45%	48%	44%	43%
Global Network/Web	38%	35%	42%	37%

5.1.2 Narrative Frameworks

Three dominant narrative frameworks emerged across the corpus:

Progress Narrative (42% of texts): Technology as solution to human problems, enabler of efficiency and capability, pathway to better future.

- *Example:* "AI represents the next evolutionary step in human problem-solving capacity" (USA tech magazine)

Threat Narrative (31% of texts): Technology as danger to employment, privacy, human agency, and social stability.

- *Example:* "The cloud has become a surveillance apparatus that monitors our every digital breath" (UK newspaper)

Hybrid/Balanced Narrative (27% of texts): Technology as complex phenomenon with both benefits and risks requiring careful management.

- *Example:* "Like any powerful technology, AI's impact depends entirely on how we choose to develop and deploy it" (Indian business publication)

5.1.3 Cross-National Variations

USA: Higher frequency of economic and competitive framings; emphasis on innovation and market leadership; concerns about job displacement and corporate control.

UK: Greater attention to regulatory and ethical dimensions; frequent references to privacy rights and democratic oversight; balanced consideration of benefits and risks.

India: Emphasis on development opportunities and technological leapfrogging; concerns about digital divide and unequal access; optimism about economic benefits.

5.2 Survey Results

5.2.1 Demographics and Technology Exposure

Table 3: Sample Demographics and Technology Exposure

Characteristic	USA (n=400)	UK (n=400)	India (n=400)
Age (Mean)	42.3	44.1	38.7
Male (%)	49.2	47.8	52.6
University+ Education (%)	67.8	69.5	39.8
Regularly Read AI News (%)	44.8	49.7	29.3
Read AI Fiction (%)	28.4	31.2	22.6
Daily Cloud Service Use (%)	78.5	81.2	65.4

5.2.2 Technology Perceptions: Benefits vs. Risks

Figure 1: Perceived Benefits of AI by Domain and Country
 Healthcare Benefits

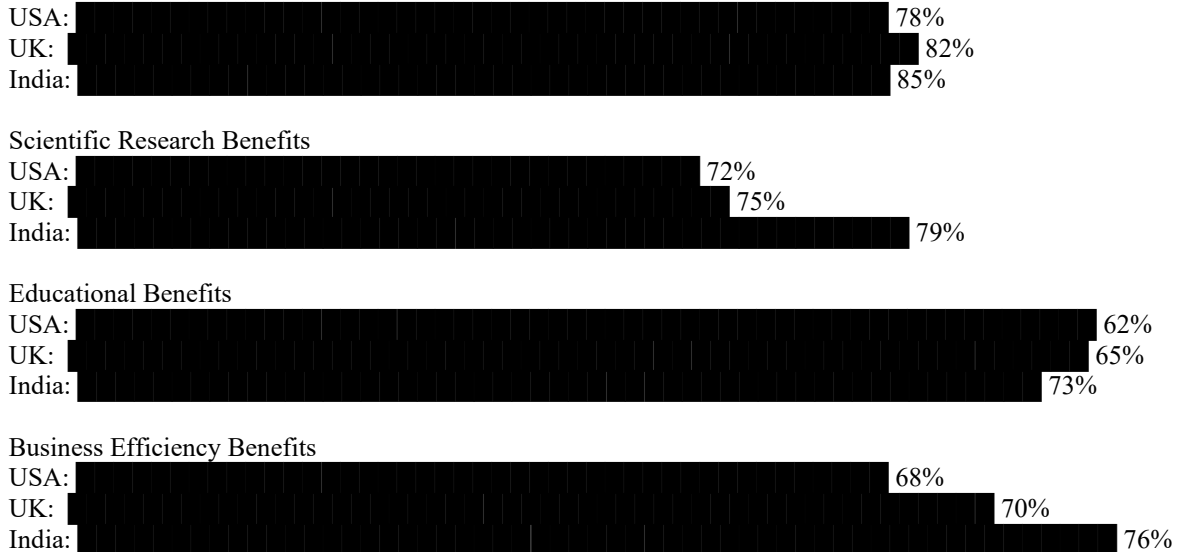
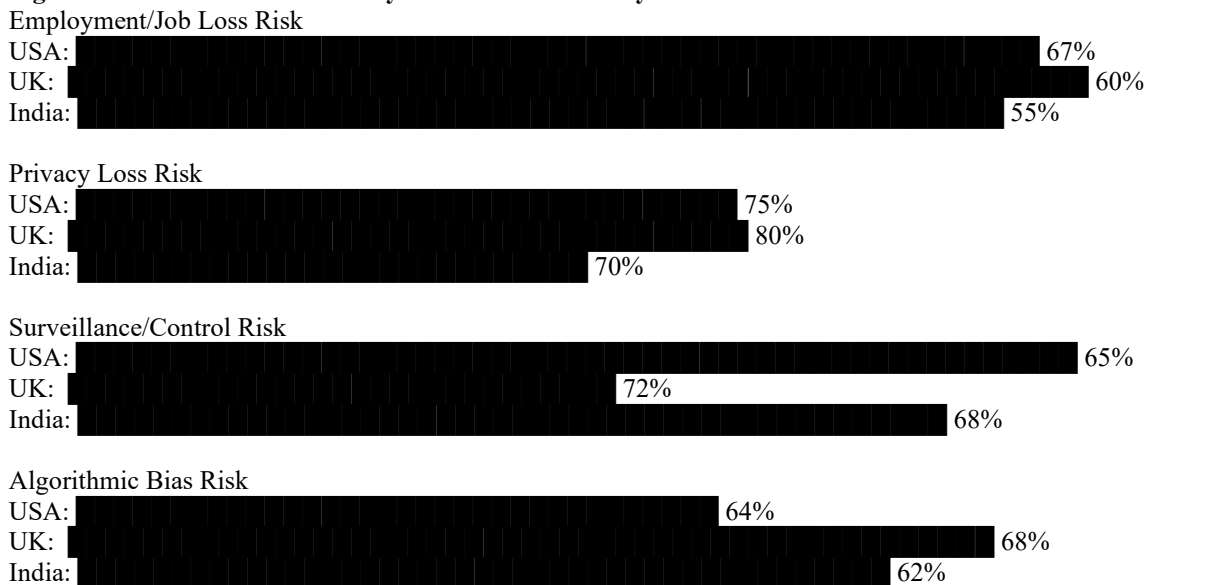
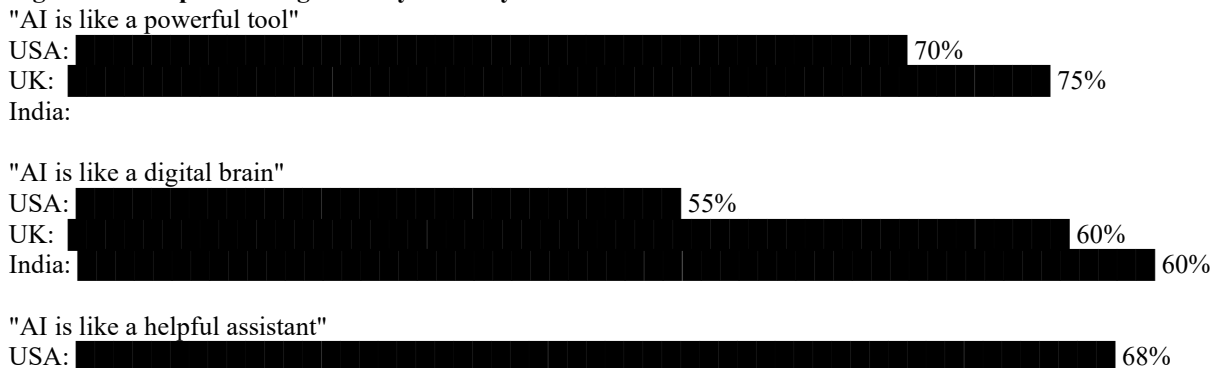


Figure 2: Perceived Risks of AI by Domain and Country



5.2.3 Metaphor Recognition and Endorsement

Figure 3: Metaphor Recognition by Country





"AI is like an overlord/controller"



"Cloud is invisible sky storage"



5.2.4 Trust and Regulatory Preferences

Table 4: Trust in Institutions by Country (Mean scores on 7-point scale)

Institution	USA	UK	India
Universities/Research Institutions	5.2	5.6	5.8
Government Agencies	3.4	4.1	4.8
Technology Companies	3.1	2.9	4.2
International Organizations	3.8	4.3	4.6
Healthcare Institutions	4.9	5.4	5.1

Figure 4: Support for Regulatory Measures

Support for AI Regulation (Any form)



Support for Transparency Requirements



Support for Human Oversight Requirements



Support for Bans in Sensitive Areas



5.3 Correlation and Regression Analysis

5.3.1 Predictors of AI Acceptance

Multiple regression analysis identified significant predictors of AI acceptance ($R^2 = 0.67$, $F(8,1191) = 302.4$, $p < 0.001$):

Table 5: Regression Results - Predictors of AI Acceptance

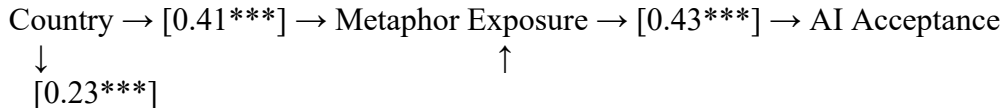
Predictor Variable	β (Standardized)	p-value	95% CI
Positive Media Exposure	+0.42	< 0.001	[0.38, 0.46]
Education Level	+0.28	< 0.001	[0.24, 0.32]
Age (younger)	+0.19	< 0.001	[0.15, 0.23]
Privacy Concern	-0.51	< 0.001	[-0.55, -0.47]
Employment Risk Concern	-0.33	< 0.001	[-0.37, -0.29]
Trust in Institutions	+0.37	< 0.001	[0.33, 0.41]
Country (India vs USA)	+0.15	< 0.01	[0.11, 0.19]
Country (UK vs USA)	+0.08	< 0.05	[0.04, 0.12]

5.3.2 Mediation Analysis: Discourse and Attitudes

Structural equation modeling revealed that media metaphor exposure significantly mediates the relationship between country of residence and AI attitudes:

- **Direct effect** of country on attitudes: $\beta = 0.23$ ($p < 0.001$)
- **Indirect effect** through metaphor exposure: $\beta = 0.18$ ($p < 0.001$)
- **Mediation proportion:** 44% of country differences explained by differential metaphor exposure

Figure 5: Mediation Model - Path Diagram



(Direct Effect)

5.4 Qualitative Themes from Open-Ended Responses

Analysis of open-ended survey responses (n = 847 respondents provided substantive comments) revealed four dominant themes:

5.4.1 Conditional Acceptance (38% of responses)

Respondents expressed acceptance of AI contingent on proper oversight, transparency, and human control.

"AI can be beneficial if we maintain human judgment in important decisions and ensure people understand how it works" (UK respondent, age 34)

5.4.2 Economic Opportunity vs. Displacement (29% of responses)

Tension between recognizing economic benefits and fearing job displacement.

"AI will create new opportunities but we need to help people transition and ensure the benefits are shared" (India respondent, age 29)

5.4.3 Privacy and Surveillance Concerns (42% of responses)

Widespread concern about data collection, surveillance, and loss of privacy.

"The cloud means companies and governments can watch everything we do - that's not progress, that's control" (USA respondent, age 51)

5.4.4 Trust in Institutions (26% of responses)

Variable trust in different institutions to manage AI development responsibly.

"Universities and researchers should lead AI development, not just tech companies focused on profit" (UK respondent, age 47)

6. Discussion

6.1 Linking Discourse and Public Attitudes

The integrated analysis of corpus data and survey responses reveals strong empirical support for the hypothesis that discursive constructions of AI and cloud computing significantly shape public attitudes. The regression analysis demonstrates that exposure to positive metaphorical framings ($\beta = +0.42$, $p < 0.001$) represents the strongest single predictor of AI acceptance, even controlling for demographic variables and risk perceptions.

This finding aligns with cognitive metaphor theory, which posits that metaphorical structures fundamentally organize conceptual understanding (Lakoff & Johnson, 1980). The data suggest that individuals who encounter AI primarily through "tool" or "assistant" metaphors develop more positive attitudes than those exposed to "overlord" or "replacement" framings. Importantly, the mediation analysis indicates that cross-national differences in attitudes are substantially explained by differential exposure to particular metaphorical constructions in national media discourse.

The qualitative analysis further illuminates this relationship. Respondents frequently employed metaphorical language that directly echoed media discourse patterns, suggesting active incorporation of journalistic and literary framings into personal attitude formation. For instance, the widespread use of "surveillance" metaphors for cloud computing directly correlates with news media emphasis on privacy and governmental overreach themes.

6.2 Cross-Cultural Variations in Technology Discourse

The comparative analysis reveals significant cross-national differences in both discourse patterns and public attitudes, with implications for global technology governance. Indian respondents demonstrated consistently higher acceptance of AI and cloud computing technologies, even after controlling for demographic and exposure variables. The discourse analysis suggests this difference partially reflects distinct narrative framings in Indian media, which emphasize development opportunities and technological leapfrogging rather than displacement and control themes dominant in Western contexts.

These findings align with development communication research suggesting that technology adoption attitudes in developing countries are shaped by experiences with mobile and digital leapfrogging (Steinmueller, 2001). The optimistic framings of AI and cloud computing in Indian discourse appear to build upon successful narratives of mobile banking and digital governance initiatives.

However, privacy and surveillance concerns remain remarkably consistent across all three countries, suggesting certain risks transcend cultural boundaries. This finding contradicts simplistic cultural explanations that posit greater surveillance acceptance in collectivist societies, instead pointing toward universal concerns about institutional power and personal autonomy.

6.3 Implications for Technology Communication

The study's findings have significant implications for journalists, content creators, and technology communicators. The strong correlation between metaphorical exposure and attitude formation suggests that linguistic choices carry substantial responsibility for public understanding and acceptance of emerging technologies.

Three key principles emerge from the analysis:

Metaphorical Awareness: Communicators should recognize that metaphorical choices are not neutral stylistic decisions but active framings that influence public perception. The difference between describing AI as a "tool" versus an "agent" significantly affects attributions of responsibility and control.

Narrative Balance: The binary opposition between utopian progress and dystopian threat narratives may not serve public understanding effectively. The survey data suggest that respondents prefer nuanced, conditional approaches that acknowledge both benefits and risks while emphasizing human agency in technological development.

Cultural Sensitivity: Technology communication strategies should account for different cultural contexts and existing narrative frameworks. Approaches that work effectively in one national context may be counterproductive in others due to different metaphorical associations and institutional trust patterns.

6.4 Policy and Governance Implications

The study's findings also inform technology policy and governance discussions. The overwhelming public support for regulation across all three countries (85-91%) contradicts technology industry narratives about regulatory resistance. However, the specific forms of preferred regulation vary significantly based on trust in institutions and exposure to different discourse framings.

The mediation analysis suggests that public support for particular regulatory approaches can be influenced through strategic communication that emphasizes appropriate metaphorical framings. However, this raises ethical questions about manipulation versus education in technology communication.

The cross-national variations in institutional trust also suggest that effective technology governance may require different approaches in different cultural contexts. The higher trust in government institutions observed in India compared to the USA suggests that state-led AI governance initiatives may face less public resistance in some contexts than others.

6.5 Educational Implications

The strong relationship between education level and AI acceptance ($\beta = +0.28$, $p < 0.001$) points toward educational interventions as a strategy for improving public engagement with emerging technologies. However, the metaphor analysis suggests that technology education should focus not only on technical literacy but also on critical discourse analysis skills.

Educational programs should help individuals:

- Recognize metaphorical framings in technology discourse
- Understand how linguistic choices influence perception
- Develop balanced approaches to evaluating technology benefits and risks
- Engage critically with both utopian and dystopian technology narratives

6.6 Limitations and Methodological Considerations

Several limitations should be acknowledged in interpreting these findings. The corpus analysis, while comprehensive, represents only a subset of available technology discourse and may not

capture all relevant metaphorical constructions. The focus on English-language sources (with translation for Indian materials) may miss culturally specific metaphors that do not translate directly.

The survey methodology, while employing rigorous sampling procedures, cannot definitively establish causal relationships between discourse exposure and attitude formation. Longitudinal research would be needed to confirm the directional relationships suggested by the correlation analysis.

The cross-national comparison is limited to three countries representing different economic development levels and cultural contexts. Additional research including African, Latin American, and East Asian perspectives would provide more comprehensive understanding of global technology discourse patterns.

Finally, the study's focus on textual discourse may underestimate the importance of visual and multimodal communication

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