Human-AI Cooperation to Tackle Misinformation and Polarization

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ADM + S
ARC Centre of Excellence for Automated Decision-Making and Society

RMIT UNIVERSITY

Information Retrieval on Country

by Treahna Hamm (Firebrace),
Yorta Yorta

admscentre.org.au/information-retrieval-on-country

Acknowledgments
(My research is collaborative)

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Prof Flora Salim (UNSW)

Prof Mark Sanderson (RMIT)

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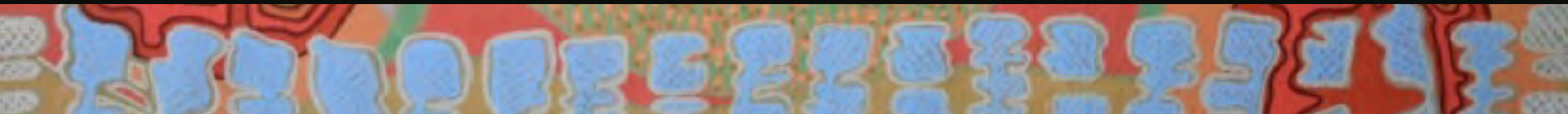
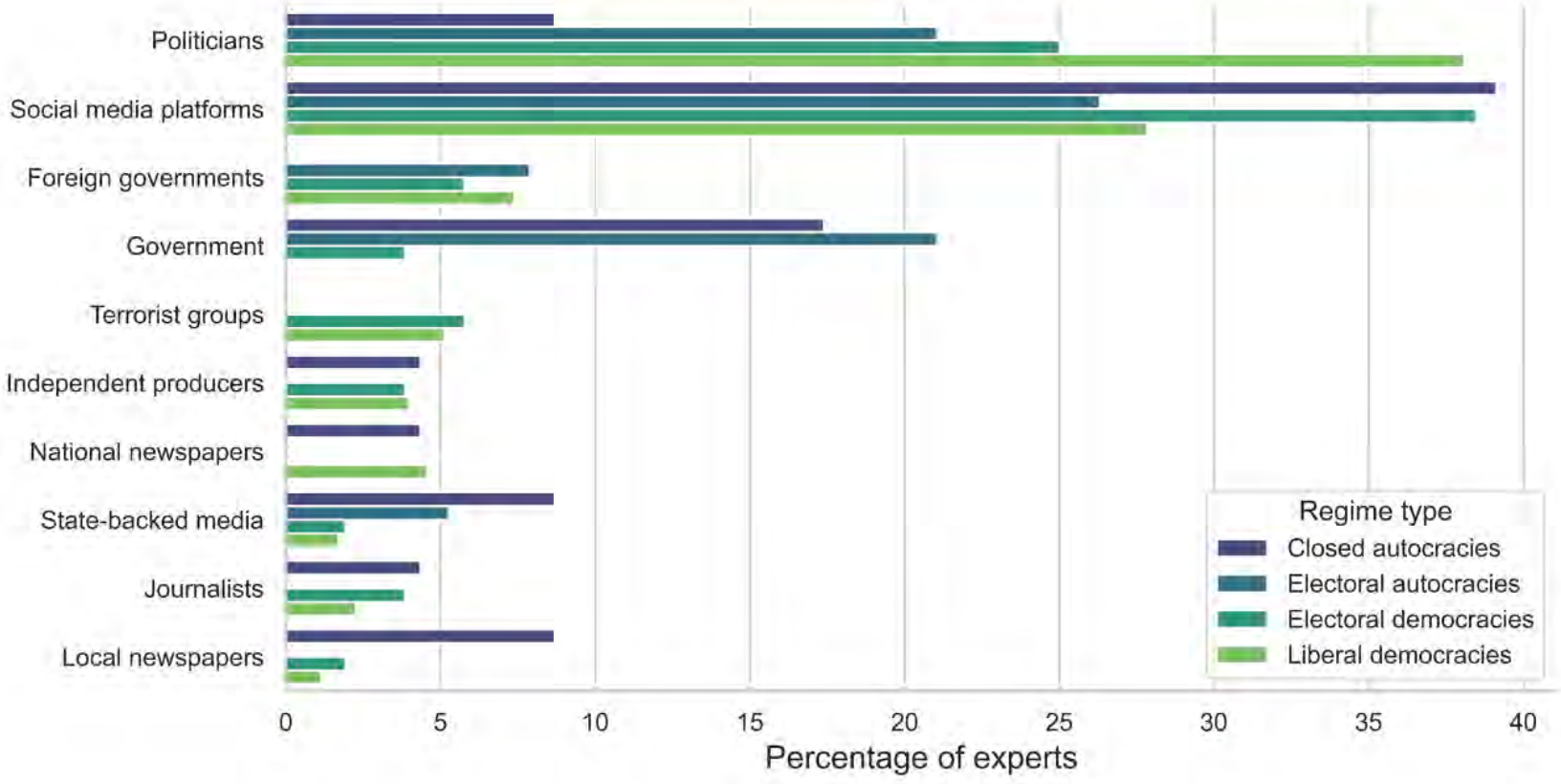


IPIE 2023 Expert Survey

- International Panel on Information Environment (IPIE)
- In 2023, the IPIE surveyed **289 scientists** —researchers who had authored a relevant, peer-reviewed journal article.
- Survey offered in **Arabic, Chinese, English, French** and **Spanish**
- Experts reported on trends in **54 countries**

https://www.ipie.info

Figure 2. Perceptions of the Most Threatening Actors to the Information Environment.



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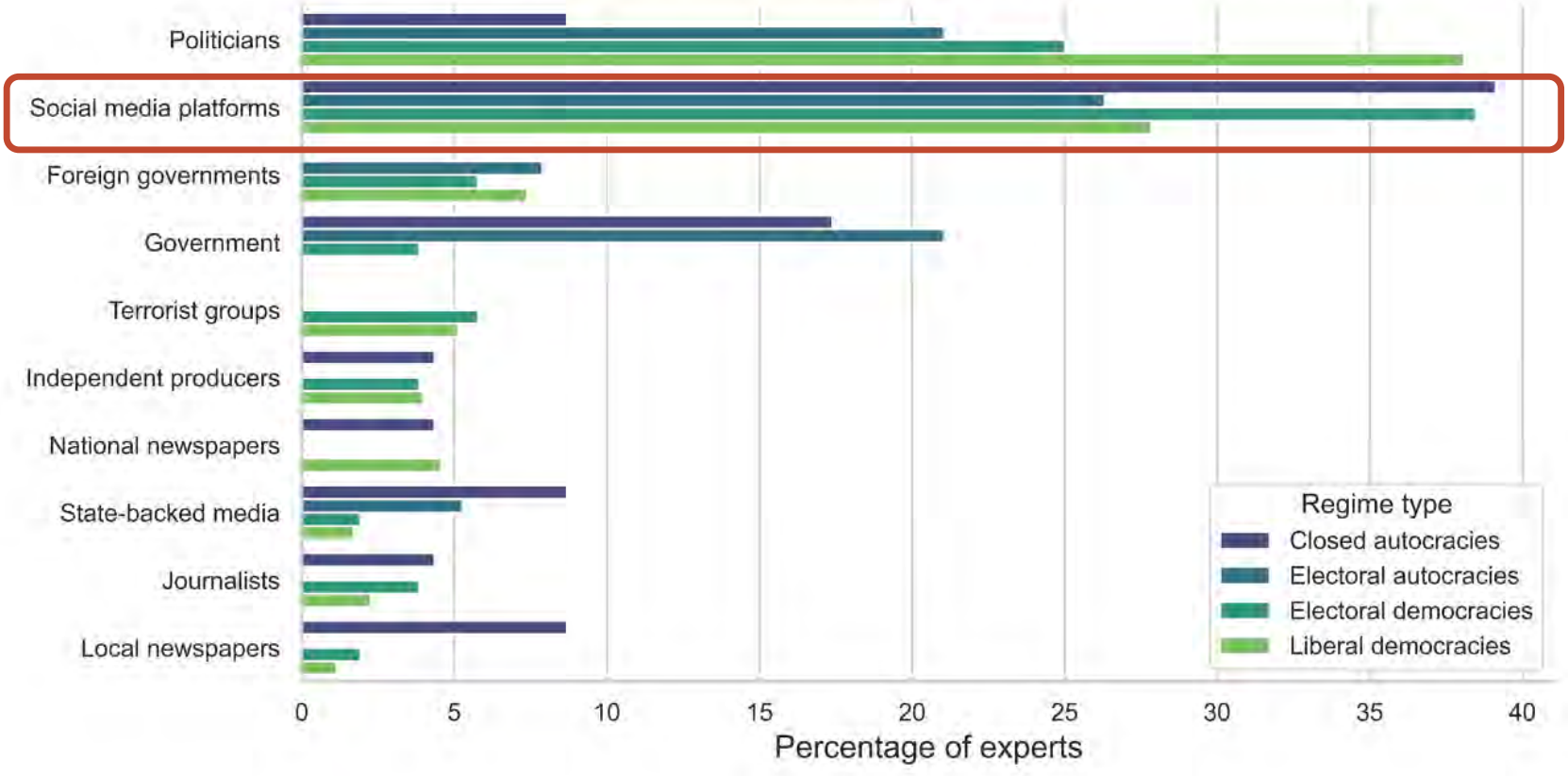

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DEAKIN UNIVERSITY

QUT

THE UNIVERSITY OF MELBOURNE

ARDC Australian Research Data Commons

ADM+S

A Focus Area of the Australian Research Data Commons (ARDC) HASS and Indigenous Research Data Commons, enabled by the National Collaborative Research Infrastructure Strategy (NCRIS).

Computational Methods to Assist in Fact-Checking

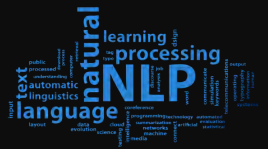
Spina et al. 2023. Human-AI Cooperation to Tackle Misinformation and Polarization. *Communications of the ACM 66, 7*.

Computational Methods to Assist in Fact-Checking

Claim Detection and Check-worthiness

Social Network Analysis

Natural Language Processing



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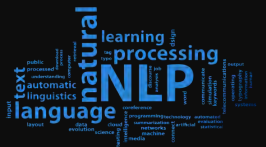

Information Access and Retrieval

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Computational Methods to Assist in Fact-Checking

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		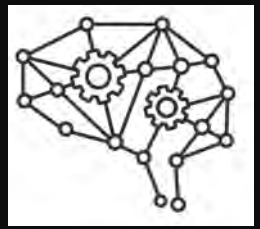
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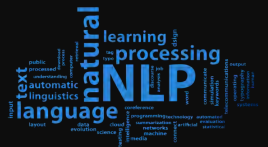		

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		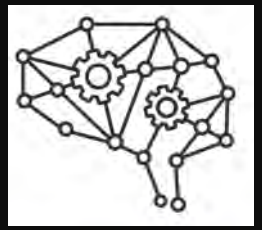	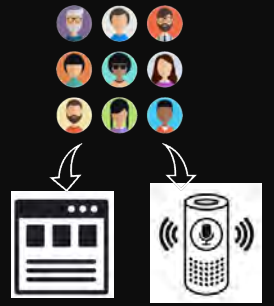
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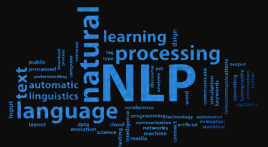			

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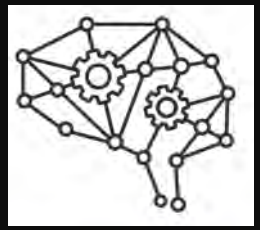

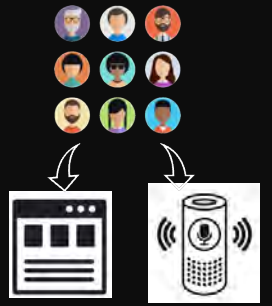

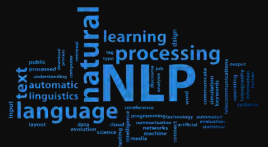

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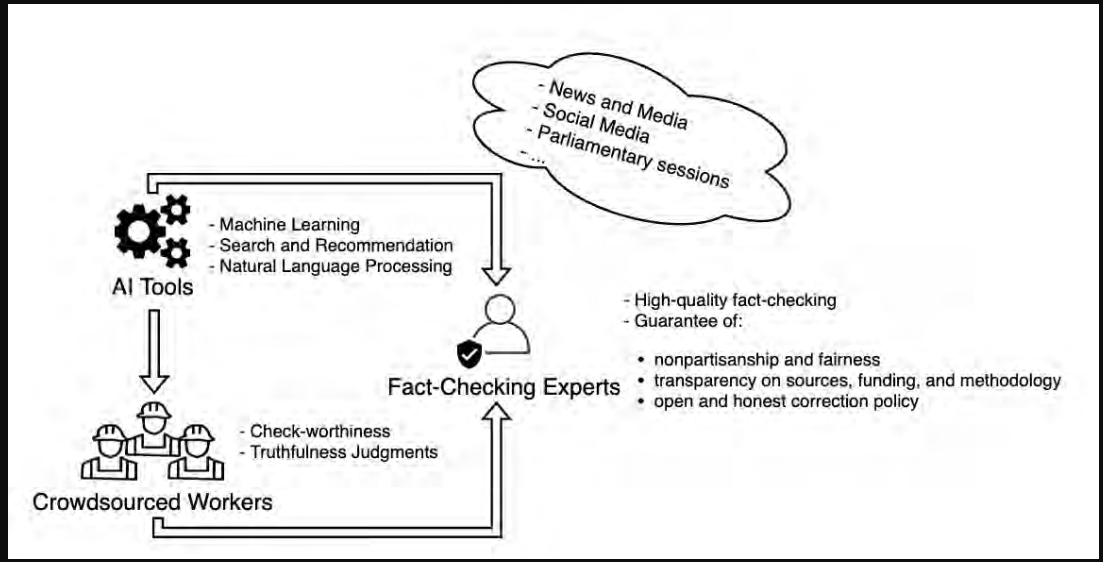
Human-AI Cooperation: Experts, AI, and Non-experts (Crowd Workers)



- La Barbera et al. Crowdsourced Fact-Checking: Does It Actually Work?, *Information Proc. & Management*, 2024
- Demartiini, Mizzaro & Spina. Human-in-the-loop Artificial Intelligence for Fighting Online Misinformation: Challenges and Opportunities, *Data Eng. Bulletin*, 2020
- Roitero et al. Can The Crowd Identify Misinformation Objectively? The Effects of Judgment Scale and Assessor's Background, *ACM SIGIR*, 2020
- …

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		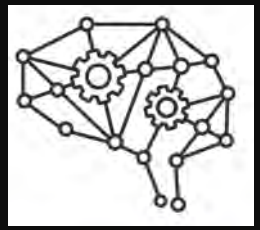	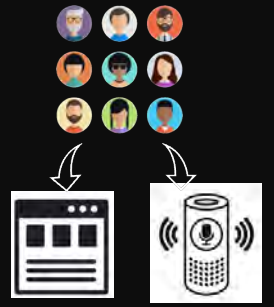
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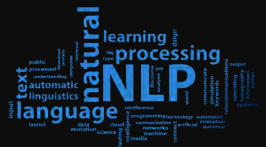			

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		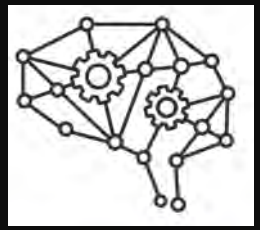	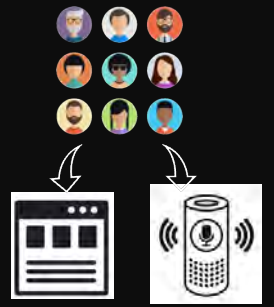
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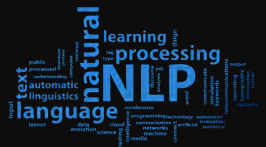			

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FACT CHECK

Adam Bandt says house prices are rising by $1,200 a day. Is he correct?

Overreach

Share

The claim

The seemingly inexorable rise in house prices has been the subject of political debate for decades, with many blaming Australia's tax rules for favouring investors at the expense of first home buyers.

In a July 30 tweet, Greens leader Adam Bandt claimed house prices are rising by $1,200 a day, warning that younger workers have been locked out.

Adam Bandt
@AdamBandt

Young people have been left behind by this government.

Locked down by lack of vaccines.

Locked in to low wages.

Locked out of the housing market.

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Home › Fact-checks › Reports › 100-million people globally with...

100-million people globally with persistent symptoms? Two 'long Covid' stats, investigated

The term "long Covid" is by now familiar for the symptoms many suffer months after infection with Covid-19. But early studies used differing definitions for it and this, coupled with a lack of truly global data, has made conclusions on the phenomenon hard to reach.

Published on 09 February 2022

- While the term "long Covid" refers to a collection of long-term symptoms, the World Health Organization issued a standardised definition for the term in October 2020 to guide research.
- Estimates of long Covid prevalence vary widely – from as low as a quarter to as high as 80% – but experts told us that somewhere between 25 and 30% was "reasonable".
- A systematic review released in November 2021 – but not peer-reviewed – estimated the overall prevalence of long Covid at 43%, but calculations of worldwide numbers need to reference truly global and current data.

Kirsten Cosser

Share

The South African government has, as of 1 February 2022, relaxed its regulations to prevent the spread of Covid-19. Children have returned to school full-time and asymptomatic patients no longer have to isolate.

In the third year of the pandemic, life appears to be returning to normal. But concerns have been raised about the long-term health implications of Covid-19 infections.

In an interview on Cape Talk radio, professor of physiology at South Africa's Stellenbosch University, Resia Pretorius, described how people who had tested positive for Covid-19 experienced symptoms that lasted for months after the initial diagnosis.

"Between 25 and 30% of individuals will have these persistent symptoms," said Pretorius. She is one of the authors of an August 2021 paper looking into the possible causes of "long Covid".

In an article published by Cape Talk about the interview, the station said the number of people around the world thought to experience long Covid symptoms is estimated at "close to 100-million".

Are these estimates accurate? We checked.

Claim

"Between 25 and 30% of individuals" will have persistent symptoms after Covid-19 infection.

Verdict

Mostly Correct

Pretorius told Africa Check her claim was based on a study conducted in late 2020 which found that among "individuals with Covid-19 who were followed up for as long as nine

Claim

Two claims about long Covid

Verdict

One mostly correct, one unproven...

Source

Interview and article on South African radio station, Cape Talk (January 2022)

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Tweets

stated on August 30, 2021 in tweets:

A video shows the "Taliban hanging someone from a helicopter."

AFGHANISTAN | FACEBOOK FACT-CHECKS | TWEETS

FALSE

POLITIFACT TRUTH-O-METER

A U.S. Chinook helicopter flies over the U.S. Embassy in Kabul, Afghanistan, on Aug. 15, 2021. (AP/Gul)

By Bill McCarthy
August 30, 2021

Person hanging from helicopter in Afghanistan appears to be wearing a harness

IF YOUR TIME IS SHORT

- The person can be seen in other photographs and videos moving and waving his arms while suspended from a harness.
- Several news outlets and fact-checkers reported that the person had been tasked with trying to fix a flag on a public building.

See the sources for this fact-check

Conservative blog sites, pundits and politicians such as Sen. Ted Cruz, R-Texas, claimed that the Taliban hanged someone from a helicopter flying over Afghanistan.

The viral rumor was based on a short, blurry video that shows a helicopter flying over the country with a person dangling from a rope beneath it. It's not clear who filmed the footage and when, but the clip appears to be real. However, that doesn't mean it

If you're serious about photography, this book is a must-read. Consider it a necessary guide to making it.
DOUG MENUEZ
DEMETRIUS FORDHAM
AGUILAR
GUÍAS INDISPENSABLES

Presentation Strategies for Fact-Checked Content

Research Questions

What are the important design elements in a fact-checking report?

To what extent can these elements improve users' ability to accurately interpret fact-checking reports?

Hettiachchi et al. Designing and Evaluating Presentation Strategies for Fact-Checked Content. ACM CIKM, 2023.

Presentation Strategies for Fact-Checked Content

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What are the important design elements in a fact-checking report?

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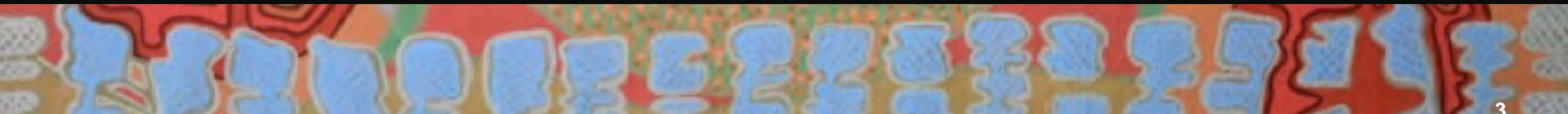

Participatory Research

A hands-on workshop that brought together fact-checking professionals, communication experts, computer scientists, and researchers (N=10).

Workshop Activities

Workshop Activities

- Understanding fact-checking presentation and different presentation elements

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- Understanding fact-checking presentation and different presentation elements
- Creating presentation strategies for Screens and Audio-only channels

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- Customising presentations for personas and scenarios

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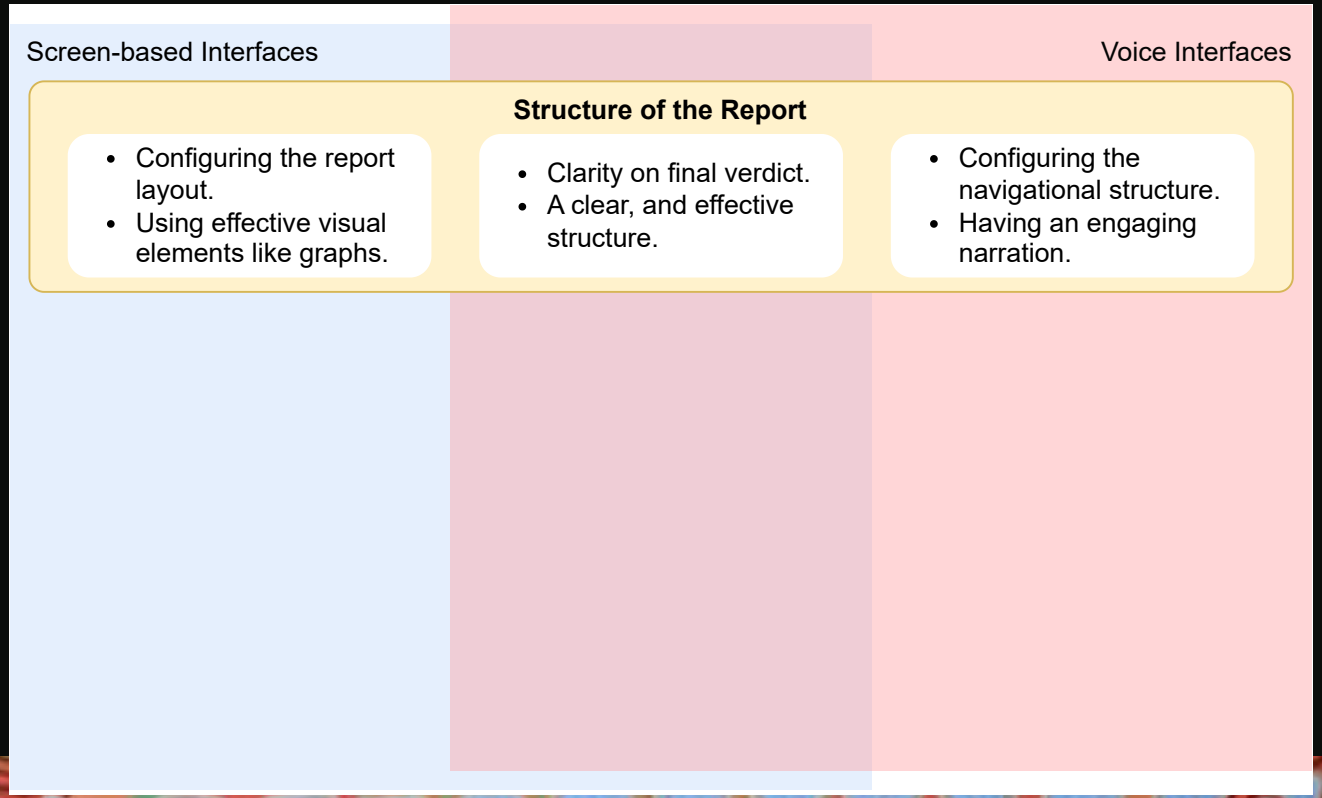
[Debrief Sessions]

Themes Emerged from Inductive Analysis



Themes Emerged from Inductive Analysis

Screen-based Interfaces		Voice Interfaces
Structure of the Report		
• Configuring the report layout. • Using effective visual elements like graphs.	• Clarity on final verdict. • A clear, and effective structure.	• Configuring the navigational structure. • Having an engaging narration.
Trust towards the Verdict		
• Details of the author • Organization branding and accreditations.	• Fostering perceived trust towards the organisation and the author.	• Leveraging the relationship between the user and the author.

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Trust towards the Verdict		
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Personalization		
• Customizing the layout to suit personal preferences.	• Preference for different channels. • Time availability.	• Using different voice-characters.

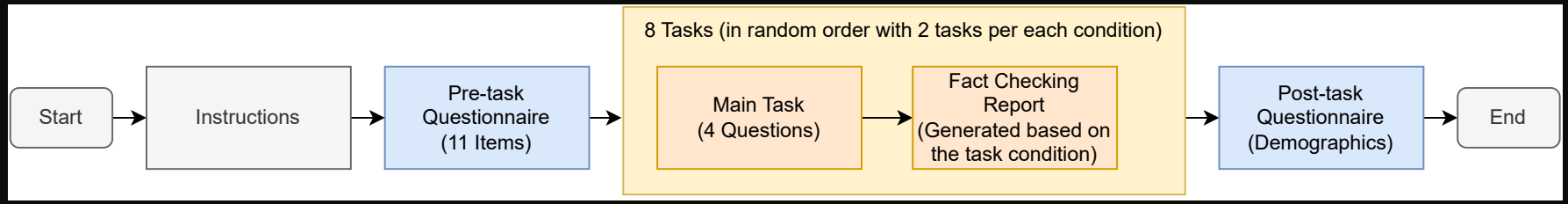
Presentation Strategies for Fact-Checked Content

What are the important design elements in a fact-checking report?

To what extent can these elements improve users' ability to accurately interpret fact-checking reports?

Crowdsourcing Study

- Participants (N=76) located in the US, recruited through Mturk
- 8 fact-checking articles



Fact-Checking Report

No Improvements (Baseline)

[B] Task 1 - Fact Checking Report - Return to the task window after reading the following.

Fact Check Report by POLITIFACT

Posted on 13 September 2022

40% of student borrowers lack a four-year degree

POLITIFACT
The Poynter Institute

A manicurist at work in a nail salon in New York in January 2015. Cosmetology degrees are the fifth most popular program among student borrowers. (AP)

As Republicans see it, President Joe Biden's student debt relief plan is a gift to the well-off. But Sen. Elizabeth Warren, D-Mass., has pushed back against the image of the privileged borrower.
"The average income for truck drivers is about $70,000 a year, exactly the kind of middle-class worker the Biden administration is helping," Sarabia said.

Debt relief is available for people who earn up to $125,000 a year.

Warren said that "40% of the folks who have student loans do not have a college diploma, four-year diploma. These are people who are truck drivers and who are nail technicians and nurses' aides."

The data on borrowers and the degrees they hold are imperfect, but they support Warren's statistic. Some of the data suggests she underestimated the number, which could be as high as 60%.

As for the types of jobs touched by Biden's plan, a sizable percentage of people took on student debt to attend non-college degree programs in cosmetology and nursing and health care. Truck drivers are less numerous, but they are still among the borrowers.

We rate this statement True.

Fact Check by Jon Greenberg

Fact-Checking Report

Improving Presentation (IP)

- Veracity Indicator
- Structure
- Summary

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40% of student borrowers lack a four-year degree

POLITIFACT
The Poynter Institute

If your time is short

The figure cited by Sen. Elizabeth Warren, D-Mass., could be an underestimate. About 60% of student debt borrowers lack a four-year degree, according to data from the U.S. Education Department.

Cosmetology is the fifth most popular program among student borrowers. Nondegreed nursing programs account for four out of the top 20 programs.

The claim

As Republicans see it, President Joe Biden's student debt relief plan is a gift to the well-off. But Sen. Elizabeth Warren, D-Mass., has pushed back against the image of the privileged borrower.

"40% of the folks who have student loans do not have a college diploma, four-year diploma," Warren said Aug. 28 on CNN's State of the Union. "These are people who are truck drivers and who are nail technicians and nurses' aides."

The data isn't perfect, but there is substance behind Warren's claims about borrowers, their degrees and occupations.

Borrowers who lack a four-year degree

Two data sets shine some light on degrees held by federal borrowers. Both back up Warren.

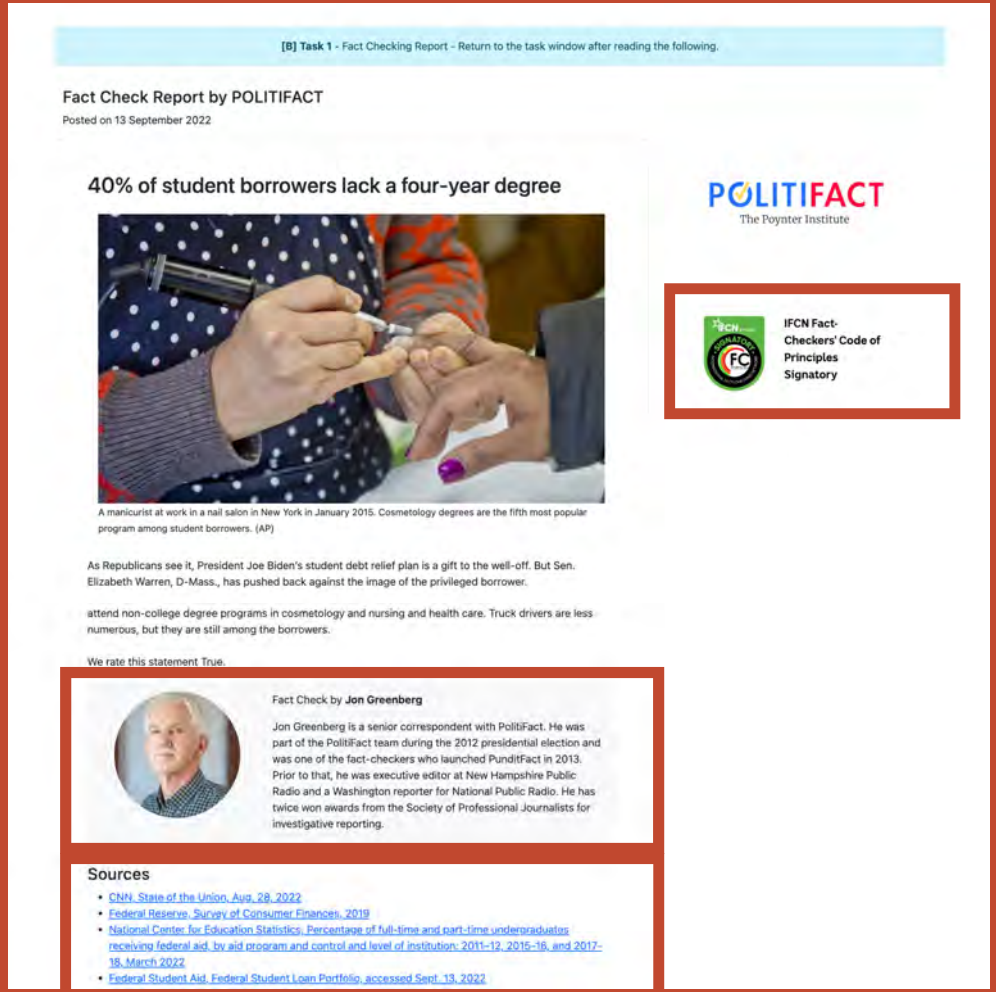
The National Center for Education Statistics looked at students at thousands of schools who borrowed when starting college in 2012 and then checked on their status five years later.

By 2017, 39% had no degree, 10% had a technical certificate, 11% had an associate's degree and 40% had a bachelor's degree. Those results suggest that Warren underestimated the number of borrowers without a four-year degree —the number could be as high as 60%.

Fact-Checking Report

Improving Credibility (IC)

- Accreditation
- Author Details
- Sources



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IFCN Fact-Checkers' Code of Principles Signatory

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attend non-college degree programs in cosmetology and nursing and health care. Truck drivers are less numerous, but they are still among the borrowers.

We rate this statement True.

Fact Check by **Jon Greenberg**

Jon Greenberg is a senior correspondent with PolitiFact. He was part of the PolitiFact team during the 2012 presidential election and was one of the fact-checkers who launched PunditFact in 2013. Prior to that, he was executive editor at New Hampshire Public Radio and a Washington reporter for National Public Radio. He has twice won awards from the Society of Professional Journalists for investigative reporting.

Sources

- CNN, State of the Union, Aug. 28, 2022
- Federal Reserve, Survey of Consumer Finances, 2019
- National Center for Education Statistics, Percentage of full-time and part-time undergraduates receiving federal aid, by aid program and control and level of institution: 2011–12, 2015–16, and 2017–18, March 2022
- Federal Student Aid, Federal Student Loan Portfolio, accessed Sept. 13, 2022

Results

A significantly higher accuracy in conditions with **credibility** improvements
(Z = 104.0, p < 0.05)

Study Conditions		*B&IP*	*IC&IPC*
Credibility Improvements		No	Yes
Measured Outcomes	Task accuracy *	82.9	89.1
	Task time	292.1	307.5
	Click count	2.5	2.1
	Scroll events	585.3	639.5
	Maximum scroll depth	3993.2	4275.1
	Mouse movements	47.0	49.6

Study Conditions: Baseline (*B*), Improved Presentation (*IP*), Improved Credibility (*IC*), and Improved Presentation & Credibility (*IPC*)

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A significantly higher accuracy in conditions with **presentation** improvements
(Z = 148.5, p < 0.05)

Study Conditions		*B&IC*	*IP&IPC*
Presentation Improvements		No	Yes
Measured Outcomes	Task accuracy *	82.9	89.1
	Task time	295.3	304.3
	Click count	2.4	2.2
	Scroll events	651.0	573.8
	Maximum scroll depth	4123.7	4144.5
	Mouse movements	49.7	46.8

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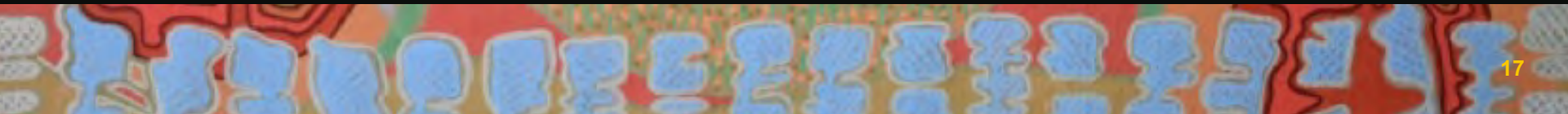
Impact of User Attributes

- Influence of the user attributes – from a generalized linear model
- Significant factors
  - Age
  - Previously shared misinformation -later discovered as misinformation through a social media user
  - Credibility of Science Scale
- Political leaning of the participant

Summary

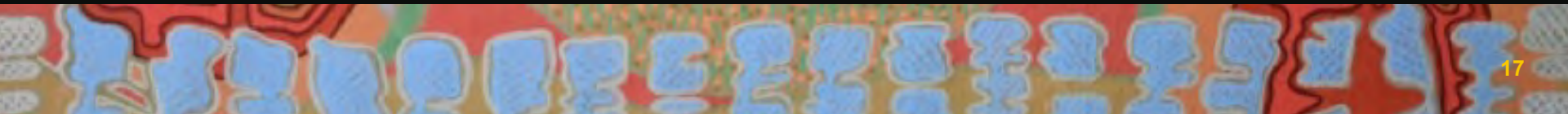


Summary

From workshop findings, we establish the characteristics and features of effective presentation strategies for both screen and voice-based interfaces.

We develop potential presentation enhancements, synthesize design recommendations, and introduce a crowdsourcing experimental setup to evaluate fact-checking presentation strategies.

We demonstrate through our study that proposed presentation improvements can significantly improve users' ability to accurately interpret the verdict of the fact-checking articles.



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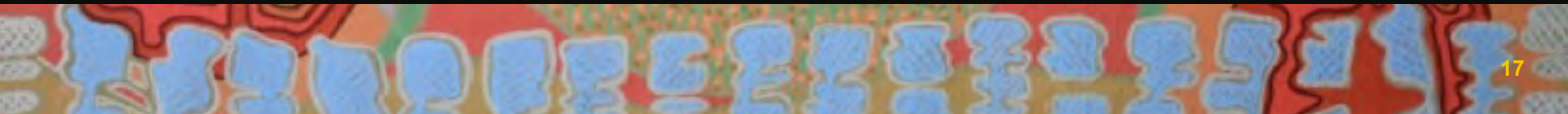

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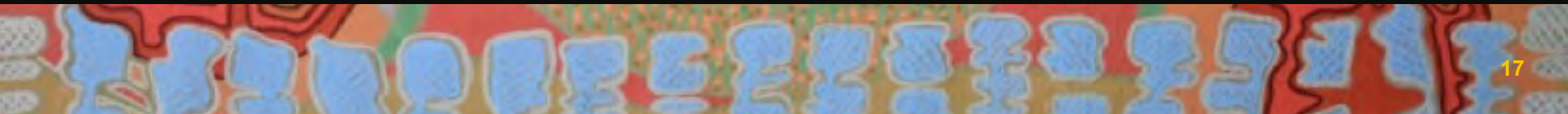

Comment | Published: 20 November 2023

& information environments

To protect science, we must use LLMs as zero-shot translators

Brent Mittelstadt ✉, Sandra Wachter & Chris Russell

Nature Human Behaviour **7**, 1830–1832 (2023)

Large language models (LLMs) do not distinguish between fact and fiction. They will return an answer to almost any prompt, yet factually incorrect responses are commonplace. To ensure our use of LLMs does not degrade science, we must use them as zero-shot translators: to convert accurate source material from one form to another.

Human-AI Cooperation to Tackle Misinformation and Polarization

admscentre.org.au/quantifying-and-measuring-bias-and-engagement/

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ADM+S ARC Centre of Excellence for Automated Decision-Making and Society

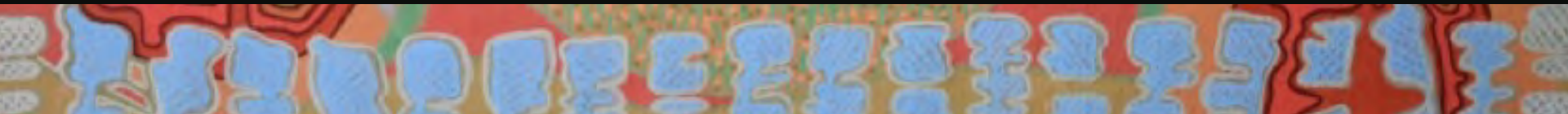
RMIT UNIVERSITY

Selected Publications

Damiano Spina, Mark Sanderson, Daniel Angus, Gianluca Demartini, Dana Mckay, Lauren L. Saling, and Ryen W. White. 2023. Human-AI Cooperation to Tackle Misinformation and Polarization. Commun. ACM 66, 7 (July 2023), 40–45. https://doi.org/10.1145/3588431

Danula Hettiachchi, Kaixin Ji, Jenny Kennedy, Anthony McCosker, Flora D. Salim, Mark Sanderson, Falk Scholer, and Damiano Spina. 2023. Designing and Evaluating Presentation Strategies for Fact-Checked Content. In Proceedings of the 32nd ACM International Conference on Information and Knowledge Management (CIKM '23). Association for Computing Machinery, New York, NY, USA, 751–761. https://doi.org/10.1145/3583780.3614841

David La Barbera, Eddy Maddalena, Michael Soprano, Kevin Roitero, Gianluca Demartini, Davide Ceolin, Damiano Spina, Stefano Mizzaro. 2024. Crowdsourced Fact-checking: Does It Actually Work?. Information Processing & Management, 61, 5 (Sep 2024), 103792. https://doi.org/https://doi.org/10.1016/j.ipm.2024.103792

Gianluca Demartini, Stefano Mizzaro, and Damiano Spina. "Human-in-the-loop Artificial Intelligence for Fighting Online Misinformation: Challenges and Opportunities." IEEE Data Eng. Bull. 43.3 (2020): 65-74.. http://sites.computer.org/debull/A20sept/p65.pdf

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