

Exploring the Potential Role of Digital Technologies to Support Family Networks with Misinformation Correction

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ABSTRACT

As we navigate into a more digital world, information gets easier to produce and share, and the credibility of information comes into question. Individuals are exposed to misinformation on a regular basis, from multiple sources, and this misinformation can cause changes to behaviour and identity, and can have detrimental effects on individuals' health and well-being. As misinformation spreads online, current research has focused on platform-based interventions to address these beliefs and to have a positive change on misinformed individuals' behaviours. My thesis explores how technology can support trusted individuals such as family members in their efforts challenging misinformed belief. Through this work my aim is to build a better understanding of how family members currently address misinformed beliefs, and where the limitations with current digital interventions lie, to create a tool to assist these conversations within families, and ultimately reduce the impact misinformation has on our society.

CCS CONCEPTS

• **Human-centered computing** → **Human computer interaction (HCI)**.

KEYWORDS

Misinformation, Family, Correction

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1 CONTEXT AND MOTIVATION

Misinformation, defined as information shared without harmful intent [6] that is incorrect based on the opinion of the relevant experts at the time [17], has been a growing concern following the COVID-19 pandemic, and has the potential to alter beliefs, behaviours, and identity. With the platform for misinformation spread being primarily digital, assuring individuals' beliefs are not permanently changed by misinformation is vital for HCI researchers,

society and developers alike, as it is often in interactions with digital tools that individuals become misinformed. There has been a range of research already conducted in multiple disciplines, including psychology and computer science, focusing on misinformation. However, this tends to cover platform-based interventions for misinformation, such as flagging misinforming posts [11], and does not fully explore misinformation spread within private social networks such as WhatsApp [10], where misinformation spreads from friends and family members.

Individuals have concerns about misinformation spread within their family [14] and during COVID-19 26% of a sample of 2244 UK residents reported having seen or heard COVID-19 anti-vaccination messages on social media, shared by friends and family members [3]. Research has also shown that misinformation correction is more effective from a trusted individual, such as a friend and family members [16] and information presented by those who share a close personal tie to the reader is considered to be trustworthy [15]. This places family members in a unique position, as a trusted spreader of misinformation, but also as a potential challenger of misinformation. There is currently little research into how family members address misinformation. One exception is work that has been conducted in the context of Indian families [7].

In this PhD project I aim to address gaps within related work, by looking specifically at misinformation correction within family networks in the United Kingdom, and the potential role technology can have supporting these interactions. Section 2 summarises key related work and where future research is required. Section 3 outlines my research question and aims, with section 4 explaining how I plan to address these aims, what has been accomplished so far what is yet to come, and section 5 identifying expected contributions. This is followed by section 6 describing my current status in the PhD, location and supervisors' details.

2 RELATED WORK

2.1 Using Technology to Challenge Misinformed Beliefs

Prior research focused on correcting misinformation spread and belief on social media platforms including Twitter (e.g. [13, 15]) and WhatsApp (e.g. [5]). Although this foundation provides a good, initial understanding of the methods to address misinformation on a digital platform, it is focused on the trustworthiness of the sources addressing the misinformation, its impact on misinformation belief and the likelihood of an individual challenging it after seeing others address it. For example, Tully, Bode and Vraga's work showed

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that individuals who disagree with misinformation are more willing to avoid responding to a misinforming post on Twitter, than addressing it [13].

Vraga and Bode also report that people can be discouraged from posting corrective information online when it risks conflict with families and friends [15]. This can be problematic as individuals are exposed to digital misinformation from friends and family members [3], through platforms such as WhatsApp [10]. The perceived risk of impacting relationships through correcting misinformed beliefs could partially be due to the "sticky" relationship between family members - meaning there will always be a connection on an emotional level and their existence is shaped by the family, regardless of the state of the relationship [12]. From this we can see that misinformation correction using technology has limitations, with people being reluctant to correct misinformation, and more so when risking conflict with those close to them. However, as misinformation spreads digitally, more research needs to be conducted regarding the use of technology to correct misinformation, whilst preserving these important relationships.

2.2 Misinformation Correction within Families

Information endorsed by a friend or family member deemed more reliable [1] and individuals utilise friends and family members to validate information they encounter [14], however this comes with its own dangers, if for example the family member they check with is misinformed, they may further encourage the misinformed belief. An individual's role within a family can also have an impact on their misinformation susceptibility, with parents being more likely than non-parents to have doubts about vaccinations [4]. There is little research that investigates misinformation correction within families in a generic context, with most investigating elements of a specific culture and the impact that has on correction (see below). However, as misinformation can become a part of an individual's identity [16] studies that explore discussions on other identity-related topics have relevance. For example Davies' work surrounding Brexit shows that discussing political decisions within families is rarely easy and can reignite past arguments [2]. Due to the limited amount of research on misinformation correction within families, expanding on this research to fully explore the impact family members can have is important, as family members are in a unique role where their relationship with the individual has a chance to significantly change the misinformed belief.

2.3 How Culture Impacts Misinformation Challenging

Researchers Malhotra and Pearce investigated misinformation correction within families in India, where there are strict family hierarchies, impacting the likelihood and method of misinformation correction. In one study, they investigated politeness in relation to misinformation correction, and strategies that Indian young adults use to correct misinformation [7]. Findings showed that in this context, politeness has a massive impact on methods selected to correct misinformation. Strategies utilised by participants within their study included: use of other sources, a preference for face-to-face communications and, addressing the "ideological issues that underpinned the spread of certain falsehoods" (p.13). In another

study, young people found face-to-face conversations to be more polite than conversations on social media, as they were in real-time and more private [9]. Malhotra and Pearce also show that when correcting misinformation, the corrector's intention is not always perceived as intended from an outside perspective [8]. This research shows that the cultural values synonymous with Indian families have had an impact on misinformation correction within that context, however there is little research showing the extent to which culture has an impact in any other context due to the lack of family correction research present. Therefore, more research needs to be conducted within this space to determine how far culture (and what elements of culture) impact misinformation correction within family networks.

3 RESEARCH QUESTIONS AND AIMS

The gaps in the literature above show that there is still much work to be completed on the topic of misinformation correction, especially considering the potential role of technology (one of the main carriers of misinformation) as a resource to address misinformation within families, how conversations about misinformation are carried out in practice, and what are the reasons individuals would choose not to discuss misinformation. As the current research about misinformation correction within families is focused on one main context, expanding the understanding of misinformation correction within families and the effects that culture, and relationship can have on these corrections is vital. Given these gaps, the overall research question that my doctoral thesis aims to address is:

What is the role that technology can have in supporting misinformation correction within family networks?

This question will be explored by addressing the following research aims:

- (1) To explore how misinformation correction between families takes place.
- (2) To explore the impact that cultural background has on misinformation correction behaviours within families.
- (3) To identify the limitations technology has when used to address misinformed beliefs within families.
- (4) To explore the potential benefits and downsides of digital tools to assist with misinformation correction within families.

4 RESEARCH APPROACH

The research approach (shown in Figure 1) comprises of three phases: an exploratory phase, a co-design phase and an experimental phase. The exploratory phase comprises of an interview study and questionnaire study to explore how misinformation is currently corrected within family networks and the role that culture can have within these interactions. The co-design phase will incorporate design workshops to identify potential digital resources to assist with misinformation correction, and limitations with those designs. These designs and the insights will then serve as the basis to developed into an experimental software, and tested with participants during the applied phase.

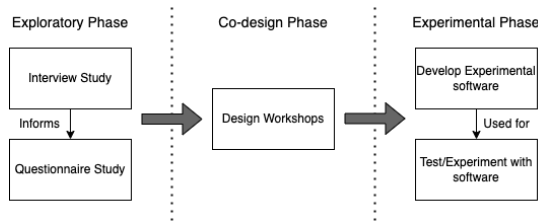


Figure 1: The three phases of the PhD process

4.1 Progress to date

4.1.1 How misinformation correction within families takes place.

As there is limited past work on correction misinformation within families, the first priority of this project was to investigate how family members challenge misinformation in practice and, unlike other studies, to develop an understanding the motivations of those who choose not to challenge misinformation. Malhotra and Pearce establish a series of difficulties that their participants have when correcting misinformed belief including the need for politeness to maintain the family relationship [7, 9]. Their work provides a foundation for future work on misinformation correction within families, but more depth is needed in multiple contexts, as family composition and values differ around the world. To explore this, I conducted an interview study in my first year with UK participants to investigate how conversations correcting misinformation took place in practice, and what challenges or resources individuals used when challenging misinformed belief.

Results from the interview study showed that there are a series of barriers, tools, coping mechanisms, motivations and results to/from challenging misinformation belief within a family network. This study also showed that both misinformation itself, and conversations surrounding misinformation, have a lasting (often negative) impact on family relationships. The results also indicated that, although most misinformation spread that the interviewees encountered occurred on social media platforms, a synchronous communication method for addressing misinformed belief was preferred, either face-to-face or through a telephone call. In part this was due to limitations inherent in existing technologies, such as the difficulty to address misinformed beliefs over a message. However, technology and online resources were often used to support these conversations, with credible sources such as the UK National Health Service website being used to attempt to alter the misinformed beliefs.

4.1.2 The impact of cultural values on misinformation challenging.

As Malhotra and Pearce have shown, cultural values can have a large impact on misinformation challenging, especially in areas where there is a strict family hierarchy that values respect [7, 9]. However, it is not clear what elements of cultural backgrounds impact misinformation correction. To explore this further, at the start of my second year I conducted a questionnaire study to explore impact culture values (determined using the CVSCALE [18]) had on challenging individuals participants considered to be close and distant, focusing on UK families. From those respondents, I then recruited those who had encountered misinformation before

to a separate survey, to explore whether culture impacted these conversations in reality.

The analysis from this study is ongoing. Preliminary results from the pilot study show that individuals that identify as multi-cultural have experienced more misinformation spread than those who identify as mono-cultural. For both groups, face-to-face conversations is still the preferred communication environment for a range of reasons including other methods resulting in arguments. Mono-cultural individuals foresaw more barriers to the fictional misinformation scenarios and experienced more barriers when discussing misinformation with a family member face-to-face.

4.2 Next Steps

4.2.1 *Limitations within current technologies when addressing misinformation.* Findings from the interview study have shown that there are limitations when using technology to address misinformed belief, resulting in a overarching preference for synchronous communication methods to be used during misinformation correction, matching prior literature [9]. Aside from the more personal nature of face-to-face conversations, and the additional effort required when crafting a message to challenge misinformation, it is unclear the extent to which limitations run in current technologies for addressing misinformation.

To investigate the potential and limitations of technology in addressing misinformation within families, I will conduct some co-design workshops, where participants will first be asked to generate some design solutions, and then in groups these will be discussed and critiqued in relation to existing technologies. The aim is to recruit individuals and their family members to the workshops, in order to provide an early indication of the limitations that exist with current and future technologies, when used in this way.

4.2.2 *The potential benefits of technology when addressing misinformation within families.* Given the initial findings from my PhD around a preference for face-to-face communications, it is worth exploring in what other ways technology can play a role when discussing misinformation beliefs. Findings from the co-design workshops will highlight the limitations and potentials for future technologies. Researchers have already shown that digital resources can be effective when addressing misinformation within large-scale groups, with one study using targeted messages from doctors over instant messaging platforms to challenge misinformation [5], and others exploring the effectiveness of external sources, information validation and trustworthy organisations as a method to assist with misinformation challenging [1]. However, it is important to understand how digital solutions and resources can be applied in the context of families discussing and correcting misinformation belief.

Following the co-design stage, the experimental stage of the PhD will translate insights from the workshops and the designs produced into a potential digital solution (e.g. digital resources to navigate conversations, ways to discover additional resources) and evaluate the benefits and challenges when designing technologies for addressing misinformation within families. Ultimately this stage will identify features that developers can implement into multiple platforms/devices to assist with conversations of this type.

5 EXPECTED CONTRIBUTIONS

The main contribution of this thesis is to knowledge, by expanding our current understanding of the impacts of misinformation within family relationships. Firstly, this will provide insights - currently lacking - on how misinformation correction conversations actually happen between family members. Secondly, it will also build on the current understanding we have of how cultural values impact the spread and rebuttal of misinformation. Thirdly, it will identify ways in which technology can assist with (or indeed limit) misinformation correction conversations. The thesis will also make a contribution to practice, providing design recommendations drawn from the development and evaluation of a digital tool, on how to best assist individuals with navigating misinformation correction within their family network.

6 DISSERTATION STATUS AND LONG TERM GOALS

I am currently a second-year PhD student in the Department of Computer and Information Sciences at Northumbria University, Newcastle upon Tyne, UK. I am supervised by Dr Mark Warner (University College London - first supervisor), Dr Marta Cecchinato (Northumbria University - joint first supervisor), and Dr Nick Dalton (Northumbria University). My PhD research is funded by Northumbria University and is a three-year program (full time). I am on track to complete my PhD in October 2024, having started in October 2021.

This is the first SIGCHI Doctoral Consortium I am applying for. Having completed the first year and collected some initial findings, I believe this is the perfect time to attend the CHI Doctoral Consortium as the feedback will help me shape my research going forward. Ultimately, my goal is to pursue a career in academia, so networking with peers and senior academics will help me find my feet in what I hope will become my research community.

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