Evaluating the Effects of Culture and Relationship Strength on Misinformation Challenging Behaviours Within the UK

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Abstract. Misinformation has proliferated throughout our digital ecosystem, through social media feeds and group chats with friends and family members. However, a gap exists in the current literature on how individuals challenge misinformed views outside of social media platforms. Through an online survey, we exposed multi ($n = 50$) and mono-cultural ($n = 50$) participants to misinformation scenarios involving close and weak relationship ties, to understand how tie strength and cultural background affects peoples behavioural responses. We found that both the tie strength between the misinformed individual and the cultural background of the challenger has a significant effect on the barriers that individuals foresee affecting their discussions about misinformation, and in the misinformed challenging behaviours. Our findings offer new insights into how relationship tie strength and culture affect misinformation challenging behaviours.

Keywords: Misinformation · Relationship · Culture.

1 Introduction

Misinformation has many different definitions, but can broadly be defined as *"incorrect information shared without harmful intent"* [11] which is categorised as false *"based on the opinion of relevant experts at the time"* [22], and is something individuals encounter regularly, such as in messaging platforms where families and friends connect [15]. Misinformation poses particular dangers where there is low public trust in institutions [18, 14, 19] and can have a significant effect on individuals' health, well-being and identity [21, 20], something that was experienced worldwide during the COVID-19 pandemic with the rise of vaccine hesitancy and anti-vaccination movements due to misinformation [8]. Due to its dangers, misinformation correction is an area currently being explored by HCI researchers [16, 12] covering many areas; including preventative and cure-type

digital interventions. Misinformation correction is often shared online, in publicly visible spaces; however, there is less work exploring corrections when it is taken from this public forum, and shared in a private (and sometimes offline) channel. Additionally, little research exists investigating misinformation correction where a personal tie is shared (such as friends or family), although there is an increased expectation for users of private, more intimate messaging spaces to correct the misinformed beliefs of friends and family members [12], or for those where misinformation is spread offline to correct the misinformed views in a conversation. This paper will cover related work and motivation for this study, followed by the method and sample descriptions, results and discussion, followed by future implications, limitations and conclusions.

2 Motivation

Information that aligns with an individual's identity is more likely to be believed [5], information that comes from a strong tie such as a friend or family member is also viewed with an increased level of trust [19, 3]. This can result in strong ties being placed in a unique position to curb misinformation beliefs. However, research has shown that, when discussing misinformation on social media with strong ties, it can cause the same disconnect and potential conflict as is seen with political conversations [4, 9], and that when faced with misinformation spread, the potential conflict that can arise can discourage individuals from correcting misinformed beliefs [20, 16].

Prior research provided insight into how misinformation conversations are practically undertaken where ties are shared. Research has identified multiple reasons individuals choose to challenge misinformation, including educating or trying to change the views of the misinformed person [16]. However, prior literature has also identified a range of barriers that impact misinformation challenging behaviours, both within families and online. These include the personality of the individual, lack of a preferred communication method, and the difference in the type of conversation in comparison to a regular chat [16]. As well as their potential reaction, their role within the family [13, 16], and their pre-existing views or identity [5, 16]. It is therefore important to understand how relationship strength impacts misinformation challenge behaviour. To address this gap, this study asked the following research question: ***(RQ1)*** *Does the tie strength between an individual and the misinformed person affect the individual's experience when encountering a misinformed person?* To answer RQ1 we test the following hypotheses:

H1: The tie strength between two individuals affects the actions an individual takes when exposed to a misinformed person.

H2: The tie strength between two individuals affects the barriers perceived to have an impact on discussions about misinformation.

Malhotra and Pearce have investigated misinformation challenging in the context of younger adults challenging older family members in India [12, 13]. However, in these studies the core cultural values of respect for elders may have

had an impact on willingness to challenge misinformation, and the strategies and barriers that they used or experienced during the challenge. Similar behaviours have been shown within Kenyan culture, where elders also play a vital role in family dynamics [17]. As there is little further research investigating the impact of culture when addressing misinformation where an existing tie is shared, our work builds upon this and provides insights on mono- and multi-cultural individuals living within the UK; offering insights into a range of cultures. To address this gap, we pose the following research question *(**RQ2**): Does cultural background affect the actions individuals would take when encountering a misinformed person?* To answer RQ2, we test the following hypotheses:

H3: The cultural background of an individual affects the actions they would take when exposed to a misinformed person.

H4: The cultural background of an individual affects the barriers perceived to have an impact on discussions about misinformation.

In summary, prior research has highlighted that misinformation correction where a personal tie is shared has the potential to result in more effective misinformation challenging, and that cultural values and backgrounds can have an impact on experiences and behaviours relating to misinformation challenging. However, the difference between challenging behaviours for strong and weak ties, and how culture affects misinformation correction requires more investigation. To explore this further, and address the research questions above, we designed and deployed an online survey with mono ($n = 50$) and multi ($n = 50$) cultural UK residents to investigate the different strategies individuals would take and barriers they would encounter if exposed to a misinformed individual where a prior personal tie was shared. We contribute to misinformation literature by finding that both culture and relationship tie strength play a role in the actions individuals would choose to take when exposed to a misinformed individual, and in the number of barriers that individuals foresee impacting/preventing their discussions about misinformed views.

3 Method

We designed and deployed an online survey with mono ($n = 50$) and multi ($n = 50$) cultural UK participants comparing experiences with strong and weak relationship ties, using a mixed factorial 2 x 2 design. This method was used as it allowed large volumes of data to be obtained in a short time frame [7], and it would not be limited by region, which could be used to investigate the gaps in literature. The online study was developed using Qualtrics [4], with recruitment facilitated via the academic recruitment portal Prolific [5] and participants were remunerated for their time ($\approx £10/ph$). We received ethical approval from Northumbria University (ref: 43163) and all participants provided informed consent. In this paper we report only on the quantitative findings.

[4] https://www.qualtrics.com/
[5] http://prolific.ac.uk/

3.1 Independent variables

To address our research questions and test hypotheses, we defined two independent variables: (1) cultural background (mono vs multi), and (2) tie strength (close vs weak).

Culture (between-subject) Within our sample, we defined the culture variable as either mono- or multi-cultural, which was determined at recruitment, based on preferences self-identified by participants on their Prolific accounts. Culture can be defined in a number of ways, and within our sample we observed a number of different interpretations used. For example, a mono-cultural participant identified as "British", a multi-cultural participant identified as "Japanese & Western European", but another identified as "Christian, European". Although cultural values such as power-distance, masculinity/femininity, uncertainty avoidance, long-term orientation and individualism were measured using the CVScale [23], when conducting an Independent Samples Mann-Whitney U Test to establish differences in these values for the two groups, the only score showing a statistically significant difference between these groups was individualism ($U = 903; z = -2.406; p = .016$). Throughout the analysis of this work, the self-identified categories are utilised for separating different cultural groups, as individuals' identities have a large role in both misinformation belief and subsequent correction [20].

Relationship Tie-Strength (within-subject) To determine the strongest and weakest tie for each participant from a pre-determined list (Mother, Father, Grandmother, Grandfather, Child, Romantic Partner, Colleague at work, friend, and strongest friend), we utilised the 'We Scale' [6], 'Inclusion of the Other Self' scale [1], and 'Subjective Closeness Index' [6, 2] to calculate their strongest and weakest ties. This was to compare participants' potential behaviours towards individuals with whom they share a strong tie, and a weak tie.

3.2 Dependent variables

Following the tie-strength questionnaires, participants were then shown two scenarios (presented randomly to prevent order bias), one involved the individual with the strongest tie and the other the individual with the weakest tie (based on the above calculations). The scenarios suggested the individual believed some form of health misinformation, and read as follows: *"You find out that your [strongest/weakest tie] believes some false information which could negatively impact their health. They have since started to share harmful articles and advice on social media"*. These scenarios explored whether the same behaviours and barriers shown in prior literature were utilised, and whether there were more common barriers and behaviours seen in different cultures or whether behaviours differed between individuals with a perceived strong or weak tie. Prior to being presented the scenarios, participants were informed of the following *"In*

this section you will be provided with a scenario related to a member of your family, a friend, or a work colleague that you should carefully read and consider. You will then be asked a series of questions related to this scenario."

The two dependent variables that we tested were (1) actions taken when encountering a misinformed individual (Actions Taken) and (2) barriers to discussing beliefs with a misinformed individual (Barrier Count).

Actions taken when encountering a misinformed individual For each scenario, participants were asked *"Faced with this scenario, how would you respond? (Please choose from the following options)"*, and were presented 6 options, all derived from prior literature [16]: (i) talk to them and agree with their misinformed beliefs; (ii) avoid talking to them about their misinformed beliefs; (iii) talk to them to find out why they hold these misinformed views and beliefs, but do not agree or disagree with them; (iv) talk to them and disagree with their misinformed views and beliefs, but do not try and change their views or beliefs; (v) talk to them and disagree with their views and beliefs and try to persuade them that they are wrong; (vi) none of these. Participants could select one option, and if they selected 'none of these' they were prompted to explain what they would do instead.

Barriers to discussing beliefs with a misinformed individual Individuals were then asked what barriers they believed they would experience when discussing the misinformed individual's views, or that would prevent them from having a discussion about misinformation with this individual. They were asked the following, dependent on their response to the actions question (above): *"Are there any barriers that you would face whilst having this conversation? (Please tick all that apply)"* (if they had selected 'none of these'), *"Why would you choose not to address their misinformed beliefs? (Please tick all that apply)"* (if they chose not to discuss the misinformation), or *"Would any of these options pose a potential barrier to your strategy? (Please tick all that apply)"* (for other responses). We presented all participants with the following options, derived from prior literature, as potential barriers [5, 13, 16]: (i) an aspect of their personality; (ii) their reaction; (iii) the effort required; (iv) the lack of possible consensus; (v) the lack of a preferred communication method; (vi) their pre-existing views; (vii) the difference in the type of conversation as opposed to a regular chat; (viii) the role within their family; (ix) that the individual would not have appeared misinformed from the behaviour described; and (x) other. Participants were able to select multiple responses, and if they selected 'other' were prompted to enter any additional barriers they foresaw with the conversation.

3.3 Participant information

A total of 100 UK residents participated in this study, made up of two groups: 50 self-identified mono-cultural individuals, and 50 self-identified multi-cultural individuals. Of the 100 participants, 54 identified as female, 43 identified as male,

and 3 identified as non-binary. Ages ranged from 18-60+, with the most common age being 18-29 ($n = 35$), and the next common being 30-39 ($n = 33$). Data such as employment status and socio-economic status were not collected.

4 Results

To address our hypotheses two repeated measures mixed ANOVAs were run to determine the effect of culture and tie-strength on both the perceived number of barriers and the actions taken when exposed to the misinformed individual. For both tests, we checked the 7 main assumptions associated with this test [10] in that: the dependent variables were measured at the continuous level, the within-subjects factor consisted of two categorical, related groups, whereas the between-subjects factor consists of two categorical "independent groups", there are no significant outliers in the independent groups, the data was normally distributed, there was homogeneity of covariances, as assessed by Box's test of equality of covariance matrices (actions: $p = .160$; barriers: $p = .230$). and the data passed Mauchly's test of Sphericity, as there were only two levels of repeated measures.

For the perceived number of barriers participants foresaw affecting their conversations, there was no statistically significant two-way interaction between relationship and culture ($F(1, 97) = .897, p > 0.05$), whereas for the actions an individual would take when exposed to a misinformed individual, there was a statistically significant two-way interaction between relationship and culture ($F(1, 98) = 7.541, P < 0.05$). To explore this in more detail, simple main effects were run.

4.1 *RQ1*: Does the tie strength between an individual and the misinformed person affect the individual's experience when encountering a misinformed person?

Actions taken when encountering a misinformed individual The main effect of relationship showed a statistically significant difference in the actions an individual would take when exposed to the misinformed person ($F(1, 98) = 42.778, p < 0.05$), supporting H1. For those encounters where there was a strong tie, individuals preferred to talk about the misinformation and try to persuade the misinformed individual that they were wrong ($n = 70$), whereas with individuals where there was a weak tie, although the preference was still to address the misinformed belief ($n = 30$), behaviours were significantly more mixed.

Barriers to discussing beliefs with a misinformed individual The main effect of relationship showed a statistically significant difference in the number of perceived barriers that individuals foresee ($F(1, 97) = 27.683, p < 0.001$), supporting H2. Participants believed that the most common barrier that would impact/prevent a discussion about misinformed views where a weak tie was shared would be the personality of the individual and how they would respond

($n = 41$), whereas with individuals who shared a strong tie, participants thought that there would be no barriers ($n = 44$). The second most popular foreseen barrier for both groups was the potential reaction of the individual when the challenge took place (weak: $n = 36$, strong: $n = 36$).

4.2 *RQ2*: Does cultural background affect the actions individuals would take when encountering a misinformed person?

Actions taken when encountering a misinformed individual The main effect of culture showed a statistically significant difference in the actions an individual would take when exposed to the misinformed person ($F(1, 98) = 4.073, p < 0.05$), supporting H3. For both groups, there was a preference to talk to the misinformed individual and try and persuade them that they were wrong. However, for individuals that identified as mono-cultural, a greater number of participants would choose to avoid the discussion completely compared to those who identified as multi-cultural.

Barriers to discussing beliefs with a misinformed individual The main effect of culture showed a statistically significant difference in the number of perceived barriers that individuals foresee ($F(1, 97) = 6.768, p < 0.05$), supporting H4. The most common foreseen barrier for both groups was the potential reaction of the misinformed person. With the second most common for both groups being that there would be no barriers to the discussion.

5 Discussion

This study identifies actions individuals would take when exposed to a misinformed individual with whom they already share an existing personal tie, and the barriers they would foresee affecting these conversations. We describe the impact that both relationship tie strength and culture has on actions taken when exposed to a misinformed individual, and the number of barriers that individuals foresee impacting conversations that challenge misinformation. It is already understood that where individuals with strong ties share misinformation on social media, disagreement on the legitimacy of the information can cause conflicts, frustrations, and arguments [9], and that individuals correcting misinformation who already share a tie with misinformed individuals have a better chance of success [21]. This study adds to prior literature by demonstrating that, although concerns surrounding these conversations exist [9], individuals are more likely to choose to discuss the misinformed person's views and explain they are wrong when a strong tie is shared, and foresee fewer potential barriers when having the conversation with a strong tie compared to a weak tie.

This study expands on prior knowledge regarding the impacts of cultural background when challenging misinformation. Prior research has identified that these can affect both willingness to challenge misinformation, but also the strategies used for the challenge [17, 12]. This study has also shown that cultural

background affects the actions individuals take when exposed to a misinformed person. Prior work that also took a culturally informed approach to exploring misinformation correction within families has established that both concerns about maintaining politeness to reduce negative reactions [13] and the role of the family hierarchy [12] are barriers that have directly influenced conversations around misinformation. Our results show that across both cultural groups the knowledge of the personality combined with their potential reaction, was of a high concern to participants. However, the role within the family, although shown to participants as an optional barrier, was not a priority within this space. This suggests that concerns surrounding family hierarchy may be specific to some cultures, rather than a generalised observation.

6 Limitations and Future Work

This work is not without limitations. Firstly, the sample is skewed towards younger individuals. Due to this, the data could be more indicative to behaviours that would be taken from younger individuals challenging older individuals (e.g mother, father etc.), a common limitation of work in this space (e.g. [16, 12]). Secondly, we have translated culture into a binary variable, self-identified by participants, due to the role that identity holds in relation to misinformation [21, 20]. Related literature may consider culture as a series of dimensions, such as those investigated by Yoo et al. [23]. Although within our work the individualism dimension indicated a statistically significant effect between our categories, future work should explore the role that specific cultural dimensions/values can have on misinformation challenging behaviours, as each can effect behaviour differently. Finally, due to the abstracted nature of the scenarios potentially prompting 'ideal world' thinking rather than reflections on real experiences, and additional limitations that come from the use of self-reporting Likert scale responses, participants may have provided insights into how individuals would like to act rather than how they would act in reality. More research to investigate misinformation challenging in practice from a cultural and relationship perspective would further address the research gap identified in this paper.

7 Conclusions

We investigated individuals' potential actions and concerns associated with exposure to misinformed individuals. Findings indicate that both tie strength and culture can have an impact on the actions an individual would take when exposed to a misinformed individual, and that the tie strength with the misinformed individual can have an impact on potential barriers that individuals foresaw affecting conversations with the misinformed individual, or barriers that would prevent them from conversing at all. This study expands on prior literature surrounding misinformation correction and provides grounds for future research to expand on the findings of this paper.

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