

Influencing social media users' information-sharing behaviour during hostage
situations: A research based on Aristotle's Rhetoric

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Abstract

Resharing personal information on social media about the parties involved during hostage takings could result in dangers to the victims' safety and hinder successful crisis management. This study explores whether the police can reduce citizens' tendency to reshare such messages through their active presence on social media. More specifically, it investigates the effectiveness of Aristotle's rhetorical principles of ethos, pathos, and logos in reducing this tendency to reshare. Participants ($N = 160$) were instructed to imagine themselves in a simulated scenario, in which they observed a hostage situation unfold on X from the perspective of an active social media user. Participants were shown a police message and divided across five conditions, distinguished by content. Four conditions requested refraining from sharing personal information; three were elaborated based on the rhetoric appeals, and one without elaboration (neutral). A fifth control message did not mention this behaviour. Subsequently, the resharing likelihood of four peer messages was measured. Results show that appealing to logos could effectively reduce the likelihood of resharing personal information compared to the request without substantiation. The conditions of ethos and pathos, however, generated only limited effectiveness compared to the neutral condition. These findings suggest that an appeal to logos is more effective in reducing the spread of personal information than ethos and pathos, compared to a message without substantiation for why this behaviour is necessary.

Introduction

In 2008, Mumbai experienced one of the worst terroristic attacks in India. Over four days that the attack lasted, bombings and raids on public buildings were carried out, killing at least 174 people (D'Souza, 2009). Bystanders started to share real-time information from the scene on social media as the attack unfolded, which law enforcement agencies used for strategic decisions. However, as an unforeseen consequence, the terrorists also monitored these social media messages and used them to their advantage (Oh et al., 2010). This incident depicts an important challenge in modern-day society: the extensive sharing of real-time updates during crises by bystanders on social media.

Platforms like X, with their accessible design and microblogging format, have accelerated public participation in crisis communication (Riglietti et al., 2020). Such platforms allow users to send small messages of 280 characters and to include hashtags that describe the topic of the message, functioning as a useful tool for searching for real-time updates (Chowdhury et al., 2020). These functionalities make X the most used social media platform for seeking and sharing information during crises (Bunker et al., 2020; Saroj & Pal, 2020; Starbird et al., 2010).

The widespread use of social media during crises offers great opportunities for crisis management but also creates potential risks. On the one hand, it allows law enforcement agencies to quickly communicate with citizens by spreading warnings and providing behavioural guidance (Wendling et al., 2013). Additionally, by monitoring social media posts, agencies can better understand the scope of the crisis (Amirkhanyan & Meinel, 2017) and improve their crisis management strategies based on this information (Asif et al., 2021). In turn, citizens expect to be informed by law enforcement agencies through social media for reassurance and to reduce their anxiety (Fowler, 2017; Oh et al., 2013). However, the large volume of detailed messages poses several risks, such as privacy violations for victims, perpetrators, or law enforcement personnel (BBCO-driehoek Crisiscommunicatie, 2024) and the possibility that this information could fall into the wrong hands (Groenewoud, 2022; Oh et al., 2013). The latter illustrates the same issue which

occurred during the terrorist attacks in Mumbai. It is therefore important to examine the right balance between potentially beneficial and harmful information spread on social media.

This research aims to determine how the number of messages containing harmful information during crises can be reduced while maintaining the spread of beneficial information for crisis management and other social media users. Even though several studies have highlighted that social media can be effectively used to stimulate the public's cooperation during crises (Bullock, 2017; Panagiotopoulos et al., 2016), and others have shown the negative consequences of information posted on social media (Archie, 2016; Oh et al., 2013), no known research to the author's knowledge has addressed the issue of how law enforcement agencies can mitigate the spread of harmful information.

One type of crisis for which the spread of information could be especially harmful is hostage situations. Previous incidents have shown that hostage-takers often use an accomplice who monitors social media messages, providing the hostage-taker with real-time updates about the situation (Groenewoud, 2022). Given the high-risk environment for escalation and unpredictable behaviour of the hostage-taker (Larned, 2011), social media messages could endanger both the crisis management, as well as the safety of the hostages. These specific elements emphasise why hostage situations in particular are vulnerable to negative consequences, created by messages on social media. Therefore, it is important to understand what types of information are disseminated and examine how bystanders' information-sharing behaviour can be influenced to reduce the spread of potentially harmful information.

To influence the information-sharing behaviour of social media users during hostage situations, Aristotle's rhetorical principles are used as a framework for persuasive communication. This theory argues that cooperation can be reached if the message appeals to the senders' trust, the receivers' emotions, or logical reasoning (Palash, 2021), and is consistently effective in crisis communication to stimulate cooperation (Ciurel, 2022; MacLeod, 2014; Wang, 2016). These persuasion strategies will be elaborated on later in this thesis.

Building on this theoretical foundation, this research establishes scientific relevance as it contributes to the growing literature on effective social media communication strategies during crises. It examines how social media can be used for public cooperation and support for crisis management, focussing on the unique context of hostage situations. More specifically, this study explores how the principles of Aristotle's Rhetoric can be applied to influence the information-sharing behaviour of citizens on social media concerning hostage situations.

This research is also relevant to practical issues. With the increased likelihood of hostage situations occurring in the Netherlands (Ministerie van Justitie en Veiligheid, 2024), it is important to investigate how law enforcement agencies can mitigate the spread of harmful or sensitive information. Understanding how rhetorical appeals can be used in online crisis communication can reduce the risks that social media messages hinder crisis management strategies. The findings of this study can be used to develop more effective communication strategies for law enforcement agencies by exploring ways to stimulate public cooperation through social media.

The first part of this thesis will elaborate on the nature of hostage situations and common crisis communication protocols in the Netherlands to get a better grasp of this study's practical background. Subsequently, Aristotle's principles of persuasion will be examined, specifically focusing on how these appeals can be applied in crisis communication strategies during hostage situations. Hypotheses will be formulated based on rhetorical appeals.

Hostage situations

Hostage situations are some of the most complex crises that law enforcement agencies can face. It can be defined as 'The detention of an individual against their will and without legal authority for a particular motive' (Alexander & Klein, 2010). Although this can happen in many different contexts with each its own risks (Maksymchuk, 1982), this research focuses on the so-called barricaded hostage situation: a situation in which the hostage taker is in a secure, known building with the hostages, usually in prevent law enforcement agencies from entering the building (Neller et al., 2021).

Barricaded hostage situations often involve high emotional involvement and tense communication dynamics. One thing that makes barricaded hostage situations very vulnerable to high-stakes consequences is that the hostage-taker is in control over the lives of the hostages (Grubb, 2023). Since the hostage-taker often experiences negative emotions, such as feelings of hopelessness and frustration (Völmml et al., 2012), it increases the risk of self-destructing behaviour and harm to the victim's safety (Tice et al., 2001). Hostage negotiators from the police are often deployed to lower these negative emotions and de-escalate the situation by establishing trust in the hostage-taker (Johnson et al., 2017; McMains & Mullins, 2010). However, this level of trust could be diminished when the hostage taker receives contradicting information from other sources, potentially damaging the process of successfully resolving the situation (Crisis Communication Officers, personal communication October 29, 2024).

The rise of social media adds another dimension to negotiating and establishing trust with the hostage taker. As barricaded hostage takings are usually at a known place with many visible features, they attract news agencies and interested civilians, leading to extensive (social) media coverage (Giebels et al., 2005). While this could benefit the negotiations and crisis management, it may also be helpful for the hostage taker (Groenewoud, 2022). For instance, the hostage-taker could use social media to verify the negotiator's words and monitor real-time developments, potentially limiting the negotiator's leverage and increasing the hostage-taker's knowledge.

The high emotional investment, great risk for the victim's safety, and hostage negotiations show the complexities of barricaded hostage situations. Both the positive and negative consequences of social media add another layer to resolving the crisis and ensuring the safety of the victims. Therefore, it is of utmost importance that we further explore both the opportunities and challenges that social media gives in hostage situations to examine how this can be implemented in crisis communication strategies to the public.

Crisis communication

Crisis communication is the strategic processing and dissemination of information needed to manage the public perception and understanding of high-stakes events (Coombs & Holladay, 2010). It aims to disseminate critical information, discuss potential consequences, and offer practical information to the affected communities and other stakeholders (Reynolds & Seeger, 2005). Although each crisis is unique and requires an adapted crisis communication strategy, organizations that have developed clear, flexible communication guidelines are better prepared to react and communicate under the pressure of the ongoing crisis (Palttala et al., 2012). As a starting point, it is important to determine how crisis information can be disseminated to civilians.

Dutch law enforcement agencies have embedded several ways of communicating crisis information to citizens. Frequently used communication platforms are radio/television, the police's website, or social media. The latter has been increasingly used by law enforcement agencies in the last decade due to increased usage by citizens (NCTV, 2023). Platforms such as X, Facebook, or Instagram are commonly used for disseminating information, offering guidance, and advising citizens on how to behave during a crisis (BBCO-driehoek Crisiscommunicatie, 2024). However, it is important to understand the target audience of the message to achieve its desired effect.

Law enforcement agencies distinguish various types of citizens related to ongoing crises. Generally, three parties are considered in crisis communication: those affected (victims), involved parties (local residents, families of the victims), and people who 'feel' involved (BBCO-driehoek Crisiscommunicatie, 2024). Those who feel involved often actively participate in social media communication to be informed about the situation and to keep others informed. While this behaviour supplements the spread of informative posts distributed by law enforcement agencies, it also gives rise to challenges. Whether this active engagement is preferred or undesirable, depends on the content of the posts.

Basic principles have been established for what information should or should not be disseminated. In general, the spread of information highlighting behavioural actions for citizens on how to cope with the situation is desired (NCTV, 2024). However, more strict protocols have been

created for information that should not be disclosed, known as the SISOS subjects (BBCO-driehoek Crisiscommunicatie, 2024). These include information concerning casualty numbers, identities of involved parties, potential scenarios, motives for the crisis, or financial damages. Such subjects should never be disseminated without consultation with the main crisis communicator appointed for the incident. Although this framework was developed for crisis communicators, it also emphasizes the importance of responsible information-sharing behaviour by civilians. Despite being the primary cause of this issue, social media can also be used as a tool to challenge this problem by applying tailored communication strategies.

Application of Aristotle's Rhetoric in Social Media Communication

In the modern day, Aristotle's rhetoric is a commonly used framework to persuade other people. This framework consists of principles for persuasive messaging, for instance, to reduce the spread of SISOS-related messages, and derives from the assumption that an audience can be influenced through speech, by targeting their way of thinking, feeling, and acting (Higgins & Walker, 2012). The ancient Greek philosopher Aristotle argued that speech needs to contain three components to gain maximum persuasiveness: *ethos* (credibility), *pathos* (emotion), and *logos* (logic) (Palash, 2021). Each principle aims to explain a distinct element of the message and is often applied in crisis communication to influence public opinion and stimulate collective action (Higgins & Walker, 2012; Ndiritu & Maina, 2024).

Ethos

Ethos appeals to the credibility of the message's sender. Although this sounds straightforward, establishing a strong ethos is much more complex. Essentially, a strong ethos relies on the audience's perception of the trustworthiness and morality of the message's sender (Conrad & Malphurs, 2008). However, this perception of the source's credibility must be obtained through the content of the message and not from pre-existing beliefs about the sender (Braet, 1992; Higgins & Walker, 2012; Rapp, 2023). This emphasizes the importance of designing a message carefully to make the source's credibility more salient.

Research shows that there are many strategies to exert credibility in a message. Commonly used strategies are appeals to authority and expertise to demonstrate competence (Baumlin & Meyer, 2018; Grimmelikhuisen & Meijer, 2014; Wu et al., 2021), emphasising similarities between the audience and the sender to create unity (Higgins & Walker, 2012; Pickering, 2021; Wang, 2016), or elements of self-criticism to show honesty in their communication (Beason, 1991; Higgins & Walker, 2012). However, for an ethos appeal to gain maximum persuasiveness, the source must show awareness and understanding of the audience's interests and values, which are essentially the underlying mechanisms for their initial behaviour (Braet, 1992). If these underlying mechanisms are being adhered to, members of the audience are more likely to accept the message's request (Shen, 2014).

In the context of active social media participation during hostage situations, people often seek and share information to understand the scope of the incident. (Mirbabaie & Zapatka, 2017). This behaviour stems from high levels of concern and anxiety about the outcome of the situation (Karmegam & Mapillairaju, 2020; Oh et al., 2013). Additionally, Mirbabaie et al. (2022) also emphasized that citizens use social media during crises as they often believe in collective action that contributes to resolving the situation. Given these two factors, building a strong message's ethos through increased credibility should, therefore, acknowledge the public's desire to inform and stay informed and express appreciation for their valuable contributions on social media. By incorporating these elements, the message is likely to generate more cooperation from the public, rather than unsubstantiated instructions. Thus, the hypothesis is:

H1: A message that includes an ethos-based appeal, particularly those showing understanding and appreciation for the audience's behaviour, will be more effective in encouraging citizens not to share SISOS-related information on social media during hostage situations than a persuasive message without substantiation.

Pathos

Pathos concerns the emotional appeal of the message. This appeal relies on the idea that emotions can shape the audience's beliefs, judgments and decisions, often ignored by rational thinking (Rapp, 2023). An effective emotional appeal can strengthen the identification between the audience and the source, making the audience more likely to comply with the request (Lu, 2015). Using these appeals in persuasion, the source wants the audience to feel specific emotions such as anger, rage, or happiness (Peters et al., 2022).

Research identifies various strategies to induce emotional responses in messages. Typical techniques are using dramatic language and imagery to increase expressiveness (Konat et al., 2024; Wong, 2020), appealing to commonly held values to increase identification (Higgins & Walker, 2012; Pickering, 2021; Shen, 2014), or emphasizing vulnerable and disadvantaged groups to induce compassion (Lu, 2015; Schwarz, 2012). However, the receiver's current emotional state primarily determines the interpretation of the message's request (Palash, 2021; Wang, 2016), highlighting the importance of understanding the audience's emotions to increase the message's persuasiveness.

During crises, the public expresses several emotions on social media. Primary subjects of social media users' posts relate to emotional support for the victims and expressions of concern for the victim's safety, indicating that the victims are central to the expressions of emotions (Scholten, 2024; Takahashi et al., 2015; Wendland et al., 2018). Persuasion strategies in crisis communication often use these emotions to encourage cooperation. One of the most common pathos appeals highlights these dangers for the victim's safety as it provides clear negative consequences of their initial behaviour (Færch, 2020; Skarzauskiene & Gudeliénė, 2017). Therefore, a persuasive message substantiated by emphasizing the dangers to the victim's safety could generate more cooperation than a persuasive message without substantiation. Based on this, the following hypothesis is proposed:

H2: Messages that use pathos appeals, particularly those emphasizing the safety of victims, will be more effective in encouraging citizens not to SISOS-related information on social media during hostage situations than a persuasive message without substantiation.

Logos

Logos refers to the logic and reason an argument holds. An effective appeal to logos must contain logical arguments that underline the clarity and integrity of the message (Holt & Macpherson, 2010). While this is not limited to only providing facts, simply appearing rational can have a similar persuasive effect by appealing to the audience's common sense (Higgins & Walker, 2012). However, to gain a stronger appeal to logos than just seemingly rational, the sender can substantiate their argument using data or statistics for more effective persuasion (Hill, 2019).

Research has identified multiple ways people exert persuasive power by appealing to logos. For instance, people can use statistics with visualisations to make the reason for persuasion easily understandable (Hullman & Diakopoulos, 2011; Pandey et al., 2014; Rosa & Kawshalya, 2022), using justifications and argumentation to make the audience understand the decisions made (Higgins & Walker, 2012; Ting, 2018), or elaborating on historical claims and events to show the consequences of certain behaviour or actions (Higgins & Walker, 2012; Peters et al., 2022). However, a pathos appeal should consist of three elements: a claim, evidence that supports the claim, and a statement of how to act correctly in the situation (Demirdögen, 2010). These elements must be adjusted to the situation so the audience can rationalize its argumentation (Palash, 2021), which is essential to the appeal's persuasive power.

In crisis communication, the police often deploy several ways to address the audience's logical thinking. Communicating the dangers of the situation and stimulating safety measures are frequently supported by argumentation, statistics, and historical examples (Ndiritu & Maina, 2024). The latter is especially important for crisis communication as it shows the public explicit examples of negative consequences when they 'disobey' the message's request (Campbell, 2022; Leveson, 2010).

One of the main negative consequences of sensitive information on social media during hostage situations is that the hostage taker also has access to this information. This could give the hostage-taker an advantage in planning its next move or harm the trust between a hostage-taker and a police negotiator (Crisis Communication Officers, personal communication October 29, 2024). Elaborating on past events and emphasizing the potential negative consequences could target rational thinking and effectively appeal to logos. This approach is likely to generate more cooperation from the public than a message without substantiation since it provides clear, logical reasons for the requested behaviour. Based on this, the following hypothesis is constructed:

H3: A message that uses a logos appeal, particularly those emphasizing the negative consequences based on historical examples, will be more effective in encouraging citizens not to share SISOS-related information on social media during hostage situations than a persuasive message without substantiation.

Effectiveness of ethos, pathos, and logos compared to each other

Different persuasive messages will likely differ in effectiveness when presented on social media in hostage situations. This mainly depends on the way that decisions are being made on the way that information is processed. There are two common ways of processing information: System 1 and System 2. Whereas System 1 often relies on fast, intuitive, and subconscious information processing (Krämer, 2013), it relies on System 2 processing on slow, rational, and conscious thinking (Demirdögen, 2010). Whether a person engages in System 1 or System 2 processing depends on the situation in which the information is presented and what type of information (Da Silva, 2023).

The characteristics of social media play an important role in how individuals process information. Social media users are often exposed to enormous amounts of information, creating the phenomenon of 'information overload', a state in which the vast amount of information makes it difficult to actively think and make rational decisions (Bawden & Robinson, 2020). As a result, users

cannot absorb each message individually, causing them to process the information unconsciously (System 1) (Alvi & Saraswat, 2020; Hogsnes et al., 2023).

System 1 processing is especially likely to occur during hostage situations. Due to their dynamic nature and high public interest, people continuously seek and share information on social media (Hasan et al., 2018). As a result, many social media posts concerning the crisis are disseminated, increasing the cognitive load and weakening the ability of System 2 processing (Pei et al., 2021). This raises the question of how ethos, pathos, and logos relate to these processing systems to estimate their persuasive effectiveness.

Since System 1 processing has a greater influence on resharing decisions than System 2, it can be argued that ethos and pathos will likely generate more cooperation from the message's request. These appeals are commonly processed through System 1 (Metzger & Flanagin, 2013) and have been shown to be effective in resharing decisions on social media (Zhang et al., 2013). In contrast, logos relies heavily on System 2 characteristics, which requires individuals to think logically about the argument and connect it with other pieces of information (Scullard et al., 2019). Given that social media behaviour is characterized by a lowered capacity to argue with the information and rationalise with it, especially during social crises (Pei et al., 2021), logos will likely be less effective in reducing the spread of SISOS-related messages than ethos and pathos. Therefore, the following hypothesis is constructed:

H4: A persuasive message that appeals to ethos or pathos will be more effective in encouraging citizens not to share SISOS-related information on social media during hostage situations than a message based on a logos appeal.

No substantiation compared to not mentioning the behaviour

In the previous parts, we hypothesised that persuasive messages based on ethos, pathos, and logos will be more effective than neutral persuasive messages without substantiation. However,

it is further expected that a message merely stating that citizens should refrain from sharing personal information, is likely to have a greater impact than not mentioning the behaviour at all. Although a claim without substantiation may be less effective than a substantiated claim, it can still create awareness and cooperation with the request (Bambauer-Sachse & Heinzle, 2017). Therefore, it can be assumed that all messages requesting civilians not to share personal information are more effective than those not mentioning this behaviour. Based on this, the following hypothesis is constructed:

H5: A neutral persuasive message without substantiation will be more effective in encouraging citizens not to share SISOS-related information on social media during hostage situations than a message not mentioning this request.

Method

Design

Participants were instructed to imagine themselves in a scenario in which they observed a hostage situation unfold on social media (Appendix A). Simultaneously, they were exposed to five X messages concerning this hostage situation. One of the messages was from a simulated police X account (Figure 1), designed to resemble a real X message and to influence the likelihood of resharing the succeeding messages. The content of this message served as the independent variable which differed between five conditions: three conditions based on the appeals to rhetoric (ethos, pathos, or logos), a neutral request, and a control message. The remaining four messages were from other X users and were consistent across the conditions. The dependent variables included the likelihood of resharing both the police message and other X users' messages. Participants were randomly assigned to one of the five conditions.

Figure 1

An image of the simulated X message of the police account for the ethos condition



Participants

We used a convenience sampling method to create the sample for this study. Participants were recruited from the personal contacts of the researcher and Test Subjects Pool SONA from the University of Twente. A power analysis determined the minimal sample size needed to gain statistical power. Using a confidence level of 90% with a margin of error of 5%, the minimal sample size per condition is 31 participants, resulting in a total minimal sample size of 155. All participants were 18 years and older, so no one was excluded based on their age.

In total, 160¹ participants completed the survey, resulting in a sample size of 32 participants per group. Of the sample, 89 were female (55.6%), 69 were male (43.1%), and 2 were non-binary (1.3%) with an average age of 26.68 ($SD = 9.93$). Most of the participants had a Dutch nationality (70.0%), 20.6% were German, and 9.4% had other nationalities (French, $N = 3$, Polish, $N = 2$, Belgian, $N = 2$, British, $N = 1$, Guatemala, $N = 1$, Greek, $N = 1$, Hungarian, $N = 1$, Turkish, $N = 1$, Indonesian, $N = 1$, Chinese, $N = 1$, Indian, $N = 1$). The majority's highest educational degree obtained was a bachelor's degree ($N = 74$), followed by secondary education ($N = 45$), master's degree ($N = 31$), secondary vocational training ($N = 8$) and doctorate ($N = 2$). This means that from the sample, 66.9% had obtained a bachelor's degree or higher, which is much higher than the Dutch average (36.4%) (CBS, 2024).

¹ The total included sample is slightly higher than the power analysis recommended, as additional participants were obtained before the final analysis. They were included in the analysis to enhance statistical power.

Measures

Manipulation check

A manipulation check was performed on whether the participants actively observed the experimental manipulation. After being exposed to the X messages, the participants were asked about the content of the message from the official police account. They had to choose between six options, of which five quoted the content of the police message of each condition. A sixth option included that the person did not recall what the content of the police message was. The manipulation check was successful if the person chose the option that included the police message that the participant was exposed to.

Perceived Persuasiveness Scale

A nine-item scale to measure the perceived persuasiveness of the police's message was used in this study which was developed by Thomas et al. (2019). The nine items measured three independent factors (Effectiveness, Quality, and Capability) that each contribute to the overall perceived persuasiveness. The original items were adjusted to fit in the context of this study. For example, an item in the original scale stated, 'This message will cause changes in my behaviour', which was adjusted to 'The police's message will cause changes in my information-sharing behaviour on social media'. Other examples included are 'I believe the police's message is true' and 'The police's message has the potential to inspire social media users'. A full list of items can be found in Appendix B. Participants could respond to the statements on a 5-point Likert scale ranging from 1 (disagree) to 5 (agree) (Likert, 1932). The scores from the nine items were averaged to create a composite score for perceived persuasiveness. Higher scores indicated that the participants found the message more persuasive, while lower scores indicated less persuasiveness.

Descriptives

For the self-rating of the participants' English proficiency. The participants could slide a bar depicting their English proficiency ranging from 1, 'very bad', to 10, 'very good'. This question was

added after the first participants already filled in the survey. Therefore, we had 43 missing values for this question.

Participants had to answer several questions regarding their social media usage and social media posting behaviour. These questions were answered on a 5-point Likert scale ranging from 1 ('I never use/post on social media') to 5 ('Multiple times a day').

Finally, the participants had to indicate to which extent they felt capable of imagining themselves in the scenario and to which extent they felt that the scenario was realistic. Both questions had to be answered on a 5-point Likert scale ranging from 1 ('Not at all') to 5 ('Very much'). All the descriptive questions described are added in Appendix C.

Resharing likelihood for the X-message

For the police's message and each of the messages of other X-users, participants had to answer based on a 7-point Likert scale. The scale was adjusted to this study and participants could respond to the questions from 1 ('Very unlikely to share') to 7 ('Very likely to share').

Decision to reshare messages

Participants were requested to elaborate on their considerations about whether to reshare the message in an open-question format. A coding scheme for the responses was created using Atlas.ti 24. An inductive coding approach was used, meaning that the codes were created based on the information gained in the study (Thomas, 2006). The coding scheme was iteratively adapted which allows for a structured but flexible analysis of the data (Snodgrass et al. 2020).

Procedure

The participants were asked to participate in an online survey, written in English, investigating citizens' information-sharing behaviour on social media during crises. After agreeing to participate, they were provided with an introduction to the study, and informed consent, containing the reassurance of the anonymity and confidentiality of their answers. They were reminded that participation was voluntary and that they could withdraw from the study at any time. Following the informed consent, participants had to answer demographic questions, including their age, gender,

nationality, and highest educational degree. To check for potential confounding factors in resharing behaviour, the participants were also asked to rate their English proficiency how frequently they use social media and how often they post on social media.

The participants were introduced to a hypothetical scenario describing a situation in which the participant saw a hostage situation unfold on social media (Appendix A). They were instructed to imagine themselves in this scenario and read it from the perspective of an active social media user. The scenario described a real-life situation where the participant would come across many alarming posts about a hostage situation, which was designed to elicit feelings of urgency and high emotional involvement. The participants were asked to reflect on how they would feel or think when being in a similar situation.

The participants were randomly assigned to one of five conditions. Each participant was first exposed to a message from a simulated official Police X account. These messages differed for each of the conditions. In four conditions, the police's message contained instructions for civilians not to disseminate personal information about the involved parties in the hostage situation. Three of these included a justification for why the person should not distribute this information, each based on a different rhetorical appeal (ethos, pathos, or logos). The fourth condition included the same statement but without justification. The fifth condition included a control group, not related to sharing information. The content of the police's message for each condition can be found in Table 1. Apart from the manipulation, the rest of the message's content has been kept the same. To check whether the rhetorical messages from the police's X account were likely to be used in an actual situation, the messages were sent to senior crisis communicators of the Dutch police. In response, we got feedback that the messages of ethos and logos could be in real-life situations, although for the logos message, clear coordination with involved parties would be necessary. However, there were some doubts about whether the message based on pathos would be shared in real-life situations. They mentioned that this message could raise some discussion as it goes short, leaving a high possibility of negative side effects for both the involved parties and the crisis management.

Table 1*The content of the independent variable for each condition*

Condition	Independent variable
Ethos	'Please avoid sharing personal information about those involved in the hostage situation. We value your online engagement and understand you want to share updates about the hostage situation, but this information could harm the crisis management. Thank you for your cooperation.'
Pathos	'Please avoid sharing personal information about those involved in the hostage situation. This info could put the lives of the hostages and their families in great danger, so together we need to make sure the victims remain unharmed. Thank you for your cooperation.'
Logos	'Please avoid sharing personal information about those involved in the hostage situation. Evidence shows that hostage-takers might monitor social media and exploit this info, putting the successful resolution of the situation at great risk. Thank you for your cooperation.'
Neutral	'Please avoid sharing personal information about those involved in the hostage situation. The emergency agencies are actively working at the scene to resolve the situation.'
Control	'There is currently a hostage situation ongoing. Emergency services are on-site to handle the situation as effectively as possible.'

After being exposed to the police's message, four simulated messages from other X users were shown in a randomised order. The content of the four messages was drawn up based on whether the message should or should not be reshared. Two of those were related to the personal information concerning the perpetrator and casualties involved in the hostage situation, which were part of the SISOS subject and should not be disseminated. The other two messages consisted of a statement urging others not to come to the scene, which should be reshared, and a message stating that there is a hostage situation going on, which should nor should not be reshared. The content of the messages and whether they should be shared can be found in Table 2.

Table 2

The content of the X-user messages and whether they should be shared

Name	Content of the X-user messages	Should the message be reshared?
Casualty numbers	'Four employees of the local store are being held hostage!'	No
Perpetrator information	'The suspect involved is identified as an armed male in his mid-30s holding hostages'	No
Urging others	'For everybody's safety, just do not come to the scene and stay inside if you're nearby until the situation is resolved'	Yes
Normal	'I heard that there is a hostage situation going on!'	Neutral

Next, the participants answered an open question about their decision-making for sharing the messages and a manipulation check about the content of the police message. This was followed by the nine statements as part of the Perceived Persuasiveness Scale. It is important to note that the participants were not instructed that these questions regarded the perceived persuasiveness, but rather their general perception of the police's message. After that, two questions were asked concerning to which extent they were able to imagine themselves in the scenario and if they thought this scenario would likely happen. Finally, after completing these questions, the participants were thanked for their participation, instructed to press the continue button to finish the survey, and debriefed about the study.

Ethical approval

This study was approved by the BMS ethical committee/ Domain Humanities & Social Sciences (request nr: 241086), ensuring compliance with ethical standards for research involving human subjects. All the data used was retrieved in an anonymised format.

Results

Manipulation check

A manipulation check was conducted to assess whether participants accurately identified the police message they had seen. While participants in the control ($N = 2$) and neutral conditions ($N = 4$) generally provided minimal incorrect responses, those in the rhetoric conditions of ethos ($N = 9$), pathos ($N = 12$) and logos ($N = 15$) performed worse. In total, 42 out of the 160 participants failed the manipulation check.

The manipulation check did not give the expected results, meaning that a substantial number of people failed to select the correct police message they previously observed. The reason why the rhetoric condition had much more incorrect manipulation check responses can likely be attributed to the recognition heuristic, where individuals neglect superseding cues when they observe information that they recognise (Gigerenzer and Goldstein, 2011). The neutral and rhetoric conditions all started with the same sentence. Most wrong manipulation check responses from the rhetoric condition chose the neutral condition instead, which was the first answer option. Therefore, it is likely that participants saw the first sentence that they recognized and chose this answer without reading further.

Impact of excluding wrong manipulation check answers

To evaluate whether including participants who failed the manipulation check influenced the results, a repeated measures ANOVA was conducted comparing the likelihood of resharing the messages across conditions, both with the correct and incorrect manipulation responses. The measures were done only for the resharing likelihood of the messages with perpetrator information and casualty numbers since these variables are used to test the hypotheses of reducing the spread of personal information.

Results show no significant differences between the means of correct and incorrect responses to the manipulation check for each condition (Appendix D). However, within the pathos condition for *Casualty numbers*, a mean difference of $-.97$ was observed ($F(1, 150) = 2.60, p = .109$,

$\eta^2 = .017$). This suggests that when only participants who passed the manipulation check were included, they were, to some extent, less likely to share the message of *casualty numbers*. Although these numbers do not reach statistical significance, we must carefully interpret the findings specific to this condition.

Overall, the findings indicate that the observed differences between conditions remain consistent, regardless of whether participants who failed the manipulation check are included in the analysis. We argue that the participants who failed the manipulation did perceive the manipulation correctly, but that the manipulation check was suboptimal. Therefore, we chose to include the participants who failed the manipulation check to ensure an acceptable sample size.

Perceived Persuasiveness Scale

The perceived persuasiveness scale was used to measure the differences between the perceived persuasiveness of the police's messages. A one-way ANOVA revealed small average differences between the conditions ($F(4, 155) = 1.57, p = .185, \eta^2 = .04$). The rhetoric groups of ethos ($M = 3.99, SD = .63$), pathos ($M = 4.04, SD = .64$), and logos ($M = 4.00, SD = .56$) showed averages of around 4 while neutral ($M = 3.89, SD = .56$) and control ($M = 3.71, SD = .60$) showed slightly less high averages. These findings indicate that there are small, but not significant differences between the experimental groups. However, each group showed high averages which suggests that every police's message has a high perceived persuasiveness, regardless of the content.

To strengthen the decision to include the wrong manipulation check responses, an independent sample t-test was conducted. The average agreement for nine perceived persuasiveness scale items was compared between the correct ($M = 3.95, SD = .59$) and wrong ($M = 3.85, SD = .63$) manipulation check responses. This resulted in a small but not significant difference ($F(1, 158) = .96, p = .328, \eta^2 = .01$).

Descriptives

All the participants who indicated their perceived English proficiency rated their English as sufficient ($N = 113, M = 8.08, SD = 1.17$), ranging from 6 to 10. Most participants use social media at

least a few times a week ($N = 134$, $M = 4.30$, $SD = 1.18$), but the frequency of posting was much lower, with the majority posting once a week or less ($N = 137$, $M = 1.81$, $SD = .75$). Furthermore, 73.2% felt capable of imagining themselves to some extent in the situation described in the scenario ($N = 112$, $M = 3.70$, $SD = 1.00$) and 70.0% thought that this scenario could realistically happen ($N = 107$, $M = 3.86$, $SD = 1.07$).

To check whether a response to one of the descriptive questions influences the outcomes of the hypothesis tests, each descriptive question has been added separately to the analysis for each hypothesis as a control variable. Results show that including each of the descriptive questions in the analyses does not affect the results. Therefore, we did not include the descriptive questions in the final analyses.

Hypothesis testing

Assumption checks

Before analysing the hypotheses, the assumption of homogeneity of variances for the SISOS messages was calculated, as the hypotheses concern these two messages. Levene's test showed that the homogeneity of variances was violated for both *Perpetrator information* ($F(4,155)$, $p < .001$) and *Casualty numbers* ($F(4,155)$, $p < .001$). Therefore, planned comparison ANOVAs were conducted to analyse hypotheses with the assumption of unequal variances.

The assumption of normality was checked using the Shapiro-Wilk test, which indicated significant deviations for both *Perpetrator information* as well as *Casualty numbers* ($p < .001$). Given that each group had an equal size of 32 participants, the planned comparison ANOVA was considered robust for these violations.

Since several comparisons will be made in this study, we set the significance level at $p < .01$. However, p -values between .01 and .10 will be interpreted as marginally significant.

Overall effect of messages and conditions

A repeated measures ANOVA was conducted to examine the overall effect of the conditions on the message with SISOS subjects (including *Perpetrator information* and *Casualty numbers*). This

test was chosen because each participant responded to multiple messages, allowing us to take into account the personal differences in overall resharing likelihood. A graph with the average likelihood of resharing the SISOS messages can be found in Appendix E. The test of the within-subjects effect of the messages was marginally significant ($F(1, 155) = 4.92, p = .028, \eta^2 = .03$), suggesting that the type of message influenced the participants' resharing decisions to some extent. The between-subjects effect was significant ($F(4, 155) = 4.55, p = .002, \eta^2 = .11$), which means that the extent to which participants were likely to reshare the message was significantly influenced by the observed police message. Therefore, further analyses were done to examine which police message exerted more or less influence.

Neutral compared to the rhetorical conditions

Planned comparison ANOVAs within a repeated measures design were conducted to examine whether there were significant differences in the likelihood of SISOS-based messages between the neutral condition and the rhetorical conditions (Table 3). This measurement was chosen as it allows us to focus specifically on the pre-determined comparisons. It was hypothesised that a persuasive message based on an ethos (H1), pathos (H2) or logos (H3) appeal would be more effective in reducing the likelihood of resharing personal information.

The comparison of neutral and ethos conditions showed no significant difference in resharing the message containing perpetrator information ($t(155) = -.29, p = .775$). However, a marginal effect was observed for resharing the message containing casualty numbers ($t(155) = -2.22, p = .028$), suggesting that a message based on ethos may reduce the likelihood of resharing messages containing information about the victims. Nevertheless, H1 is rejected.

Similar results were found for comparing pathos with neutral. No significant difference was found for resharing the message containing information about the perpetrator ($t(155) = -.50, p = .617$). However, marginal effects were observed in resharing the message with casualty numbers ($t(155) = -1.91, p = .058$), indicating a reduced likelihood of resharing this message when the persuasive message is based on a pathos appeal. Nevertheless, H2 is rejected.

When comparing logos with neutral, significant results were observed for resharing messages containing both information about the perpetrator ($t(155) = -3.22, p = .002$) as well as casualty numbers ($t(155) = -3.97, p < .001$). Participants in the logos condition showed a significantly lower likelihood of resharing messages compared to the neutral conditions. This suggests that a persuasive message based on a logos appeal might be especially effective for reducing the resharing behaviour of personal information. Therefore, H3 is supported.

Comparing logos to ethos and pathos

The prediction was that a persuasive message based on an ethos or pathos appeal would be more effective in reducing the likelihood of resharing personal information than an appeal to logos (H4). Results showed that an appeal to logos resulted in a significantly lower likelihood of resharing personal information about the perpetrator than for both ethos ($t(155) = 2.94, p = .004$) and pathos ($t(155) = 2.72, p = .007$). For the likelihood of resharing the message with casualty numbers, marginal effects were found between logos and ethos ($t(155) = 1.76, p = .081$) and logos and pathos ($t(155) = 2.06, p = .041$). These findings reject the hypothesis that appeals to ethos and pathos are more effective in reducing the likelihood of resharing personal messages on social media. On the contrary, these results even indicate that an appeal to logos is slightly more effective in reducing the spread of perpetrator-related information.

Control compared to neutral

The prediction was that the neutral would be more effective than the control group in reducing the likelihood of resharing personal information on social media (H5). Results indicate a neutral message is not significantly more effective in reducing the likelihood of resharing perpetrator information ($t(155) = -.14, p = .886$) and casualty numbers ($t(155) = -.61, t = .542$). These results reject H5.

Table 3

Means and standard deviations of each condition for perpetrator information and casualties

Message	Condition									
	Control		Neutral		Ethos		Pathos		Logos	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Perpetrator	2.91	1.86	2.97	2.15	2.84 ^c	1.80	2.75 ^c	1.70	1.56 ^a	1.01
Casualties	2.84	1.83	3.09	1.99	2.19 ^b	1.62	2.31 ^b	1.64	1.47 ^a	.89

Note: For each condition *N* = 32

^a mean resharing likelihood is significantly different compared to the neutral message at the level of .01 (2-tailed)

^b mean resharing likelihood is marginal significantly different compared to the neutral message at the level of .1 (2-tailed)

^c mean resharing likelihood is marginal significantly different to the logos message compared to the rhetoric conditions at the level of .1 (2-tailed)

Considerations to reshare the messages

Participants were asked to give their considerations when deciding whether to reshare the messages in an open-question format. Two hundred and fourteen codes were assigned to 157 responses to the open questions in the survey. Thirteen subcategories were identified and subdivided into four categories. A table with an overview of the categories, subcategories, example answers, and their frequencies has been placed in Appendix C.

Impact for others

The category with the most codes is *Impact of Resharing* (*N*=90). This category includes all answers mentioning that their resharing behaviour is determined by the potential consequences of this behaviour. Three subcategories were identified: *Usefulness for others* (*n*=59), *Safety of others* (*n*=20), and *Safety of victims* (*n*=11).

Usefulness for others. This subcategory includes responses which mention that their decision on whether to reshare the message was based on perceived benefits others would have from the information. Participants frequently indicated factors such as the importance, relevance, or interest of the content for other social media users, friends, or involved people. For example, '1

thought mostly about if other social media users would benefit from the post that I share' (r. 98, 2024) emphasizes that the participant would reshare the message if other social media users would benefit from the information. Other responses in this category similarly express the intention to enhance understanding and awareness of their (online) community.

Safety of others. The responses in this category reflect concerns regarding the public's safety, excluding the group of victims/hostages. Their decision-making process involved assessing whether the information could contribute to preventing harm or a safer situation for others. For example, a participant responded, 'whether this repost could help others avoid getting in dangerous situations' (r. 22, 2024), showing that the participant's likelihood to reshare the post was influenced by maintaining general safety for others.

Safety for victims. Although closely linked to *Safety of Others*, the responses in this subcategory specifically mentioned concerns for the safety and well-being of victims or hostages. Participants who fell into this category stated that their decision to reshare the message was primarily influenced by how the information could impact those directly affected by the situation. For instance, 'I depend my answer based on the safety of the victims' (r. 105, 2024) explicitly states the safety of victims to be a primary factor for resharing the messages.

Source

The second category is *Source* (N=59), which includes all answers that mention the message's source to be an important factor in whether they will reshare the message. Three subcategories are identified that fall among *Source: Source credibility* (n=34), *Source (unspecified)* (n=15), and *The police's message* (n=10).

Source credibility. This subcategory includes responses that emphasize the trustworthiness, reliability, and seriousness of the source as a key factor in the decision to reshare. Participants indicated their willingness to reshare the message depended on whether they perceived the author of the message as credible. For instance, a participant stated, 'Whether the author of that post

appears credible' (r. 69, 2024) reflects how the source's credibility is expressed influenced their decision-making.

Source (unspecified). Closely related to *Source Credibility*, this subcategory includes responses in which participants mention the source as an important factor without specifying what characteristics of the source influence the decision. These responses typically include a general belief in the source. For instance, 'Depends on who is posting the message' (r. 128, 2024) indicates that the source's identity matters but it does not provide additional details on why. Such responses suggest that familiarity or reputation may play a role. Though some might be the same reason for resharing as the responses in *Source Credibility*, we cannot be sure that this is the case. Therefore, we distinguished these responses.

The police's message. Responses in this subcategory specifically refer to the message shared by the police. Participants indicated that they based their decision on whether it aligned with the request of the police. For example, 'I considered of it was in line with what the police shared.' (r. 23, 2024) shows that a message from an 'official' social media account could influence the decision-making to reshare the message. This highlights the importance of designing a clear request from the police to generate the right cooperation.

Content

The third category is *Content (N=30)*, which consists of all answers stating that the content is a primary factor in deciding whether to reshare the message. This category consists of two subcategories: *Content reliability (n=18)* and *Content (unspecified) (n=12)*.

Content reliability. The responses in this subcategory refer to mentions of the reliability or trustworthiness of the content itself as a factor for resharing. Participants indicated that the content must be accurate, valid, or well-written to increase the likelihood of resharing the message. For example, 'I considered whether the posted posts were formulated in a professional and neutral way' (r. 94, 2024) emphasizes the influence of the way a message is written, with increased effectiveness when the message is objective in nature.⁴

Content (unspecified). The messages in this subcategory refer to all responses that mentioned the content to be a factor in the consideration to reshare the message, without specification how the content influenced this decision. However, some answers indicated that it depends on how much information was in the message and whether the information was authentic. For example, 'considering the information in the post' (r. 86, 2024) suggests that it depends on what information the tweet holds on whether to reshare the message.

Personal

The last category identified is *Personal* ($N=27$), which refers to personal characteristics which determine on whether the person would reshare the message or not. *Personal* consists of two subcategories: *Social media usage* ($n=21$) and *Opinion* ($n=6$).

Social media usage. This subcategory includes all mentions of participants' habits or behaviours on social media as influencing their resharing decisions. These answers describe how personal tendencies, such as the frequency of using social media or general online behaviour, play a role. Most of these include that participants usually never share anything on social media or that they do not obtain any account. For instance, 'I never share posts on social media.' (r. 127, 2024) reflects how online behaviour influences their resharing tendencies.

Opinion. The messages in this subcategory refer to the participants' opinions on or agreement with the content of the post. Whether the person agrees with what the message says determines the likelihood of resharing the message. If it aligns with personal beliefs, values, or feelings, the participants are more likely to reshare the post. For example, 'I am more likely to share messages that are not too conflictive and that fit to my character.' (r. 40, 2024) reflects this explanation.

Additional exploratory analyses

Impact on other messages

Besides the messages with SISOS subjects, we are interested in the effect of the independent variable on resharing the remaining messages, despite expectations to what extent they will be

reshared. The means and standard deviations can be seen in Table 4. Post-hoc pairwise comparisons were conducted within the repeated measures ANOVA to explore differences between the conditions. Using Bonferroni corrections to limit the probability of false positive values and to account for multiple comparisons, no significant differences were found between any of the conditions (all $p > .05$). Despite the lack of statistical significance, notable differences can be observed between logos and the rest of the conditions for the normal and urging other messages. Therefore, Cohen’s d was calculated to measure the effect size between logos and the rest of the conditions for these two messages, which revealed a moderate to strong effect size (Cohen’s $d = .43$) (Lovakov & Agadullina, 2021). While the police’s messages for each condition did not aim to reduce the likelihood of resharing these messages, the results suggest that the message with a logos appeal did reduce this likelihood.

Table 4

Means and standard deviations for the non-SISOS messages for each condition

Message	Condition									
	Control		Neutral		Ethos		Pathos		Logos	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Police	4.25	2.03	3.78	2.11	4.31	2.15	4.47	2.17	4.09	2.22
Normal	2.00	1.48	2.34	1.77	1.97	1.62	2.03	1.38	1.56	1.05
Urging others	4.16	1.92	4.06	2.17	3.84	2.05	3.81	2.19	3.06	1.92

Comparing resharing considerations with resharing behaviour

In the survey, participants had to answer an open question concerning their decision-making factors for whether to reshare the message. We are interested in whether the police message influenced this process and if the decision-making factors influenced to likelihood of resharing the message. Therefore, we first examined the distribution of several codes across the conditions to subsequently map the mean differences between whether the response was assigned the concerning code. Only the code groups that formed a sufficient number of codes were included in this analysis.

Impact of resharing. The code group that contained the most responses was *Impact of resharing*. For the analysis, we included all the codes that were assigned to this code group (*relevance for others, safety for victims, and safety for others*) and combined them ($N = 74$), as these all relate to the impact resharing would have on other people. The distribution of these codes across the conditions was the same for ethos, pathos, neutral, and control ($n = 16$), while logos had less ($n = 10$), indicating that participants who were exposed to the logos condition were less likely to base their decision-making of resharing the message on the impact on others.

To examine whether an impact on others influenced resharing behaviour, we conducted a t-test comparing participants who indicated this in their response to those who did not. Results showed that participants who considered the impact on others ($M = 3.09, SD = 1.93$) compared to those who did not ($M = 2.19, SD = 1.58$) significantly differed in the likelihood of resharing message with perpetrator information ($t(141) = -3.23, p = .002$). Similar results were found for the message with casualty numbers, which differed marginally significantly ($t(142) = -2.49, p = .014$) between those who included the impact on others ($M = 2.74, SD = 1.84$) and those who did not ($M = 2.07, SD = 1.53$). These results suggest that people who considered the impact on other people were more likely to reshare the message with perpetrator information and somewhat more likely to reshare the message with casualty information.

Source. We examined whether the participants who indicated that the source influenced their decision-making process to reshare the messages. All the codes from the code groups *Source* were included (*Source (unspecified), Source reliability, The Police's message*) and combined ($N = 50$). The distribution of the codes did not notably differ across conditions (ethos ($n = 7$), pathos ($n = 11$), logos ($n = 11$), neutral ($n = 8$), control ($n = 13$)).

Discussion

Summary of main results

This study examined the effectiveness of Aristotle's rhetorical appeals (ethos, pathos, and logos) in reducing the information-sharing tendencies of SISOS-related subjects on social media users

during a simulated hostage situation. Participants were exposed to two SISOS messages containing personal information about the perpetrator and victims. While ethos and pathos showed minimal to small effect, a logos appeal significantly reduced the likelihood of resharing both SISOS messages compared to a message without substantiation for why this behaviour is necessary. Similarly, logos was found to be more effective in reducing these messages than ethos and pathos. Additionally, merely mentioning that people should refrain from disseminating SISOS-related information showed no effect compared to not mentioning this behaviour at all. These outcomes indicate that for social media users to reduce the likelihood of resharing SISOS-related messages, an appeal to logos explanation should be provided for why this behaviour is necessary.

These findings align with prior research suggesting that persuasive messages based on rhetorical appeals can increase compliance with a message's request (Ndiritu & Maina, 2024). However, contrary to the expectations, the effect of ethos (credibility appeal) and pathos (emotional appeal) on reducing the likelihood of resharing SISOS-related subjects was limited. We argued that if we tailored our persuasion strategy to the initial beliefs and emotions of the audience, it would generate more cooperation to the message's request. This means we targeted the citizens' tendency to inform others and beliefs in collective action to establish credibility for the ethos appeal (Braet, 1992; Mirbabaie et al., 2022; Shen, 2014). For the pathos appeal, we addressed the concern for the safety of those involved to align with citizens' emotions (Takahashi et al., 2015; Wendland et al., 2018). While participants indicated the safety and usefulness of others as important factors in their decision to reshare the message, revealing that we addressed the right considerations, it did not reduce the likelihood of resharing SISOS-related messages compared to a message without elaboration.

Interestingly, appealing to logos (logic) appeared to be effective in reducing the spread of SISOS-related messages, even to some extent compared to ethos and pathos. This contradicts our hypothesis, in which we argued that ethos and pathos would have been more effective than logos due to its connection to System 2 processing, which requires active and rational thinking

(Demirdögen, 2010). Since decisions to reshare messages often rely on System 1 (intuitive) processing (Hogsnes et al., 2023), we suggested that ethos and pathos, which primarily rely on System 1 processing (Metzger & Flanagin, 2013), would generate a stronger persuasive effect. However, despite our initial hypothesis, the high effectiveness of logos compared to ethos and pathos might still be related to System 1 and System 2 processing.

The unexpected finding could be attributed to the availability of participants' cognitive resources. Prior research indicates that higher intelligence and educational levels are associated with high reliance on System 2 processing as they generally have a higher cognitive ability to process the information actively (Evans & Stanovich, 2013). Since logos-based messages require individuals to reason with the argumentation (Palash, 2021), individuals with higher cognitive ability are likely more capable of engaging with the argumentation critically rather than intuitively. This suggests that participants in our sample, mainly of higher educated individuals, are more likely to accept the logic-driven argument, overriding the susceptibility to emotional or credibility-based (System 1) persuasion (Evans & Stanovich, 2013).

Besides individual cognitive ability, the study's setting might have further contributed to the increased cognitive resources to engage actively with the information. Participants completed the survey at their own pace, likely in a low-pressure environment. When individuals are not under cognitive strain or time pressure, they are more likely to engage in System 2 processing and think more rationally about their decisions (Slovic et al., 2004). However, in a real-world social media environment, users often experience information overload and increased cognitive pressure, causing them to rely more on System 1 processing (Alvi & Saraswat, 2020). While the results of this study show very little effect for ethos and pathos, these appeals might be more influential in real-life scenarios due to a higher cognitive load.

These findings highlight the importance of the audience's characteristics in the persuasive effectiveness of rhetorical appeals. When individuals have the cognitive ability to actively process the argumentation, they are more likely to engage in System 2 processing, indicating why logos

appeared to be more effective in reducing the spread of SISOS-related information than ethos and pathos. This raises important questions about the generalizability of these findings. Changing or increasing the participants' cognitive demands during the study could shift the focus between System 2 and System 1 processing, potentially influencing the effectiveness of the three rhetorical appeals.

Limitations

One limitation is related to the representativeness of the sample. The highest obtained educational degree is much higher in this sample than the Dutch average, assumably influencing the likelihood of resharing. As mentioned earlier, higher educated people generally have a greater cognitive ability, potentially causing logos to generate the highest cooperation. Besides that, it can also influence the perception of how the participants observed the police's message. Since higher-educated citizens generally have a higher level of trust in the police (Centraal Bureau voor de Statistiek, 2024), they are more likely to accept a request to change their behaviour. Similar findings apply to the age, for which younger people generally have more trust in the police than older people (Centraal Bureau voor de Statistiek, 2024). As the average age of participants is around 26 years, participants likely have more trust in the police based on their age. These findings can be observed from the results of the perceived persuasiveness scale, as the participants score very high on average across all conditions. To check whether this applies, future studies could measure the trust in the police prior to the experiment. Moreover, future studies should focus on getting a more representative sample for the Dutch population, as social media usage does not limit itself to a specific age or education.

A second potential limitation is that we tried to apply each of the three rhetoric principles within a single short message in this study. While prior research shows that it is possible to effectively appeal to a rhetoric principle in a single message (Demirdögen, 2010; Isai et al., 2020), sending multiple messages could strengthen the effect of persuasion. Repetition and reinforcement of arguments across multiple messages can strengthen persuasiveness, as they allow individuals to

process the messages more thoroughly (Johnston, 2013). Especially the appeals to pathos and ethos would likely benefit from multiple appeals as these principles derive from constructing a deeper connection between the sender and the audience (Konat et al., 2024; Wang, 2016). Additionally, the repetition-variation theory suggests that besides repetition, variation within those messages can maintain attention and generate greater cooperation (Schumann et al., 1990). Since the rhetoric principles can complement each other to increase effectiveness (Higgins & Walker, 2012), future research could explore the effect of applying multiple messages in the context of resharing behaviour on social media.

A third limitation of this study is the substantial number of wrong manipulation check answers. While the results indicate that the participants who answered the manipulation check incorrectly may still have noticed the manipulation, we cannot know this for sure. Future studies could start the messages with the manipulation sentence instead of the same sentence across the conditions, which was done in this study. This would potentially enhance the recollection of the observed manipulation through the primacy effect, which argues that people are more likely to remember the first information they observe (Digirolamo & Hintzman, 1997).

Conclusion

The present study demonstrated the effectiveness of using Aristotle's appeals to rhetoric, ethos, pathos, and logos, to reduce the dissemination of SISOS-related messages on social media. While the appeal to logos significantly reduced the spread of these messages, ethos and pathos showed only limited effects. Nevertheless, the results suggest promising potential for these principles to stimulate public cooperation. These findings contribute to the growing scientific understanding of applying rhetorical principles in persuasive communication on social media. The Dutch police could build further on the application of integrating these principles in their social media communication strategies to stimulate civilian cooperation during social crises. Despite the promising results, more research is needed to understand the persuasive power of these principles

in different settings, such as a sample representative of the Dutch population or changes within cognitive pressure.

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Appendix

Appendix A: Introduction of the scenario

Please read the following text carefully:

I want to ask you to take the time to imagine yourself the following situation:

You are an active social media user. For you, social media is more than just a platform for entertainment: it is an important tool for connecting with others and staying informed. You use it daily to communicate with friends and family, follow current events, and share your thoughts and opinions on important topics with your followers. You believe that sharing information through social media is an essential way to contribute to public awareness and keep others informed.

It's a Tuesday morning. You're taking a coffee break from your work. You have a few minutes before going back to work, so you start scrolling through X (Twitter). Suddenly, you come across multiple alarming posts about an ongoing hostage situation taking place at a store in the centre of Enschede. The building where the hostage situation is taking place is known to you which creates a strong feeling of involvement and a rush of emotions. You're alarmed, anxious, and deeply concerned. You are trying to get continuously new updates and as you scroll through X, you see more and more posts on social media appearing that relate to the hostage situation and you really want to do something to help.

Ask yourself this: How would it feel like to be in the position of this person? What thoughts does this situation evoke in you? What feelings do you get?

Appendix B: Perceived Persuasiveness Scale

Factors	Scale items
Effectiveness	'The police's message will cause changes in my information-sharing behaviour on social media'
	'The police's message causes me to make some changes in my information-sharing behaviour on social media'
	'After seeing the police's message, I will make changes in my attitude to share information on social media'
Quality	'The police's message is accurate'
	'The police's message is trustworthy'
	'I believe the police's message is true'
Capability	'The police's message has the potential to change the information-sharing behaviour of social media users'
	'The police's message has the potential to influence the information-sharing behaviour of social media users'
	'The police's message has the potential to inspire social media users to change their information-sharing behaviour'

Appendix C: The demographic questions from the survey

1. How would you rate your English proficiency?
2. How frequent do you use social media platforms (Instagram, Facebook, X (Twitter), or TikTok)?
3. How often do you post something on social media?
4. To what extent did you feel capable of imagining yourself in the requested scenario?
5. To what extent do you think this scenario could realistically happen?

Appendix D: Table with the resharing-likelihood differences between the correct and wrong manipulation check responses

Message	Manipulation	Condition				
		Ethos	Pathos	Logos	Neutral	Control
	<i>N</i> wrong	9	12	15	4	2
Perpetrator	Correct	2.83	2.70	1.59	2.86	2.97
	Wrong	2.89	2.83	1.53	3.75	2.00
	ΔM	.063	.133	-.055	.893	-.967
	Sig.	.928	.836	.930	.345	.454
Casualty numbers	Correct	2.13	1.95	1.47	3.04	2.90
	Wrong	2.33	2.92	1.47	3.50	2.00
	ΔM	.203	.967	-.004	.464	-.900
	Sig.	.754	.109	.995	.598	.454

Appendix D: Table with coding scheme

Code	Definition	Subcategory	Example	Frequency
Impact of resharing	Answers stating concerns or benefits about the consequences of resharing the message	Usefulness for others Safety of others Safety for the victims	“I will only share messages with information that can help others” (r. 30, 2024)	90 (44.1%)
Source	The source influences their resharing behaviour	Source credibility Source (unspecified) Police’s message	“I had to consider who was sharing the information” (r. 27, 2024)	59 (28.9%)
Content	The content of the message influenced their resharing behaviour	Content (unspecified) Content reliability	“How likely it is that the content is actually true” (r. 79, 2024)	30 (14.7%)
Personal	Whether resharing the messages depends on personal characteristics	Social media usage Opinion	“I never share posts on social media” (r. 43, 2024)	27 (12.3%)

Appendix E: Graph with the average mean likelihood of sharing the SISOS messages per group

