

Contextualizing Fear Appeals: A Delphi-based Questionnaire Framework

Early stage paper

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ABSTRACT

Studies on fear appeals are becoming more common in behavioral security research. Nevertheless, creating powerful fear appeals is a challenge for behavioral security scholars. This study aims to provide theoretical guidance to contextualize fear appeals to ensure that the language used in fear appeals is consistent with the threat environment and the expectations of the audience for whom the fear appeals are targeting to bring behavioral change. This research offers a framework based on questionnaires for contextualizing fear appeals and ensuring rhetorical validity through a Delphi study. The recommendations made in this paper should ensure that fear appeals are valid by considering the rhetorical context (such as a threat environment), its exigence, the target audience, and any constraints.

Keywords

fear Appeals, rhetorical theory, rhetorical situation, information security

INTRODUCTION

Organizations continue to have serious concerns about information security (Willison et al. 2018). Understanding why employees violate information security policies has been a significant focus of behavioral security research (Cram et al. 2019). Nevertheless, research calls for further investigation in this field, highlighting the necessity of understanding information security compliance issues and encouraging appropriate security behaviors among employees (Wall and Buche 2017). Behavioral security research has seen an increase in interest in fear appeals. Fear appeals "*are persuasive messages designed to scare people by describing the terrible things that will happen to them if they do not do what the message recommends*" (Witte 1992, p. 329). These persuasive messages have their roots in health psychology and are frequently employed in behavioral security research to influence employee compliance with information security policies. (Cram et al. 2019). However, Wall and Buche (2017) recently highlighted the contradictions in fear appeals research, noting that response efficacy and self-efficacy are the most influential constructs in some fear appeal studies. However, other studies contradict these findings and cast doubt on the design and effectiveness of fear appeals suggesting that research has underestimated the influence of fear appeals on security behavior (Boss et al. 2015; Johnston et al. 2015; Orazi et al. 2019).

Such contradictions make it challenging for researchers to add new knowledge to the problem domain and build upon one another. Prior research has provided some broad guidance on this topic, such as designing abstract *versus* concrete fear appeals, improving the contextual relevance of field surveys in information security, and enhancing the power of fear appeals (Schuetz et al. 2020; Siponen and Vance 2014; Vance et al. 2022). However, there is still a lack of explicit theoretical recommendations for contextualizing fear appeals to their threat environments. To address this gap

and better understand the design and use of fear appeals in behavioral security research, we turn to the communication discipline, which has a rich body of knowledge on rhetoric and rhetorical theory applicable to designing persuasive discourse in organizations (Bitzer 1968; Cheney et al. 2004).

Our contextualization approach focuses on the context or threat environment, also known as rhetorical situations in which fear appeals are deployed (Bitzer 1968). A rhetorical situation refers to the audience and any constraint that affects how persuasive discourse is presented and received. It also refers to the exigence, the driving force behind persuasive discourse (Bitzer 1968; Bitzer 1980). Recognizing and understanding rhetorical situations allows behavioral security researchers to better articulate threats and coping mechanisms relevant to their audiences in their appraisal evaluation. This relevance is critical to the efficacy of fear appeals to bring the desired change in the audience's behavior (Tannenbaum et al. 2015). Unfortunately, behavioral security research has yet to embrace the idea of a rhetorical situation in fear appeal design, resulting in an insufficient level of contextualization for fear appeals to elicit desired outcomes effectively.

We contend that fear appeals should be rhetorically valid to catalyze behavioral change. Rhetorical validity is "*a specialized form of ecological validity in which the language used in the appeal is contextualized to the threat environment and expectations of its audience*" (Orazi and Johnston 2020, p. 196). A rhetorically valid fear appeal realistically describes the threat, the recommended behavior, and a representative description of the threat environment within which an audience receives and acts on the fear appeals. A lack of attention to the fear appeal's rhetorical validity is problematic and could lead to the stagnation of fear appeals research (Johnston et al. 2015). We propose that rhetorical theory is an appropriate lens to provide a framework for contextualizing fear appeals because it highlights the causal potency of language in shaping organizational life and

behavior (Hartelius and Browning 2008). Using rhetoric theory, we present our framework as a questionnaire describing *a priori* questions for fear appeal contextualization and *a posteriori* guidance for rhetorical validity assurance. In the following sections, we describe the rhetorical theory and research methodology.

RHETORICAL THEORY

Rhetoric and rhetorical practices provide a theoretical foundation for studying the use of persuasive language and discourses. Rhetoric, which is most commonly associated with the Romans and Greeks, is the use of language to persuade (Aristotle 1926). Management research on rhetorical scholarship suggests that rhetoric is a powerful tool used by organizational managers to influence people, accustom them to new ideas, and control personnel (Hartelius and Browning 2008). Rhetorical practices comprise the rhetorical situation and strategy (Cheney et al. 2004). According to Bitzer (1968, there are three constituents of rhetorical situations: exigence, audience, and some constraints of the situation. Exigence is an imperfection that shows some urgency, something waiting to be done, or something other than it should be. For an exigence to be rhetorical, it should bring some positive modifications involving discourse. The audience is the individuals who can affect exigence in some way. Constraints can be persons, events, or objects relevant to rhetorical situations. Constraints can positively or negatively influence the audience's potential to affect the exigence. In conjunction with the rhetorical situation is the strategy rhetors take to persuade an individual to conduct a particular behavior. In other words, rhetoric is a combination of the rhetorical strategy by which practice is exercised to achieve the desired results within a specified rhetorical strategy. In behavioral security research, scholars focus on constructing and presenting a fear appeal to alter a target audience's security behavior.

Rhetorical theory suggests that fear appeals are a specific form of rhetoric (Burnkrant and Unnava 1989). However, a review of the research on fear appeals indicates that this research is fragmented with inconsistent findings (Wall and Buche 2017), emphasizing the importance of rhetorical relevance. For example, research suggests that fear appeals should have a sufficient level of personal relevance and must be grounded in the threat environment (i.e., rhetoric situation) to be effective (Burnkrant and Unnava 1989; Johnston et al. 2015). Even though rhetorical relevance is crucial, past research on fear appeals has concentrated chiefly on understanding the nomological networks triggered by fear appeals, with little attention paid to the rhetoric included in the fear appeals themselves (Boss et al. 2015).

Constructing the Framework for Assuring Rhetorically Valid Fear Appeals

Rhetorical research suggests that rhetoric could be most impactful in designing fear appeals (Neuman and Levi 2003). Based on rhetorical theory, we offer a framework of questions that researchers may use to assist their design of fear appeals and concentrate on alleviating initial concerns by focusing on the three components of a rhetorical situation to create rhetorically valid fear appeals. Critical to advancing behavioral response theories within the behavioral security field is the need to take a consensus view among scholars on the conditions in which rhetorical validity can be reasonably met while balancing the contextual elements within scholarly research. Therefore, we used a Delphi panel of cybersecurity academics versed in fear appeal design and application. The Delphi study is well-suited for developing conceptual frameworks (Okoli and Pawlowski 2004). The Delphi study relies on a series of decision tasks using a fixed panel of subject matter experts (e.g., behavioral security researchers) to reach a consensus on a specific topic or task (e.g., fear appeals design) (Skinner et al. 2015; Worrell et al. 2013).

The Delphi method builds on the independent judgments of an initial set of panelists to arrive at a consensus. It applies pressure in subsequent ranking rounds to induce a consensus-oriented disposition from these same panelists, based on the effort required for continued participation. While the panelists are anonymous, the process tests the strength of the confidence in their judgments when presented with the mean rank order and rationales that highlight each panelist's decision-making process. Consensus builds incrementally over time, reducing the influence of any individual panelist in favor of the panel's collective viewpoint. Prior research within the IS (e.g., Liu et al. 2010), and the behavioral security field specifically (e.g., Chang et al. 2020; Di Gangi et al. 2018), has demonstrated how the Delphi technique creates a consensus-oriented, prioritized list to serve as a qualitative framework for further inquiry and reflection (Skinner et al. 2015). The following section details the Delphi methodology, data analysis, and results.

METHODOLOGY

Prior literature indicates there is no *a priori* ideal panel size; instead, the composition of experts and their respective expertise to draw from is the crucial element to the success of the Delphi process. The authors recruited seven behavioral security researchers with experience designing and utilizing fear appeals. Panelists ranged in security experience from four to thirty years, with an average of 13.6 years. The panel consisted of two female and five male members. All panelists, except one, possessed doctoral degrees in disciplines related to behavioral security (e.g., IS, information science, and computer science). All panelists have published behavioral security research and have served as reviewers for fear appeal designed studies.

We utilized an unseeded, ranking-type Delphi approach where panelists are first introduced to the purpose of the Delphi, given definitions for key terms, and asked to generate the questions that would be used in subsequent steps. A strength of the unseeded approach is that it limits the

researchers' ability to frame the Delphi process questions, limiting threats to its internal validity (Rowe and Wright 1999; Schmidt 1997; Worrell et al. 2013). Panelists independently generated questions relevant to the *a priori* and *a posteriori* assessment of each constituent characteristic of rhetorical situations (i.e., exigence, audience, and constraints). The questions generated by the panelists and the authors' experience were combined into sets of questions for each characteristic, resulting in a total of six question lists (*a priori* and *a posteriori* for three characteristics each) for ranking by the panelists.

Panelists were presented with each question list in random order and asked to select the questions most relevant to the specific characteristic and identify questions that could be considered duplicates. If a panelist indicated duplication, a rationale was requested. Following Schmidt (1997) the questions were reduced to a subset question list based on the panel majority rule (i.e., greater than 50% of panelists indicated a question was important). Questions marked as potential duplicates were evaluated by the authors. If more than one panelist indicated a question as a duplicate, the authors reduced the question to the preferred one based on panelist guidance in their rationale. The authors reviewed the question if one panelist indicated a duplicate question. To reduce non-panelist interference, the authors took a conservative approach to question elimination. The reduced question lists were then presented to the panel in random order again, and panelists were asked to rank order questions based on their importance relative to the exigence, audience, or constraints in an *a priori* or *a posteriori* context. In addition, panelists were asked to provide a brief rationale for their decision-making process used in their ranking that would be shared in subsequent ranking rounds, consistent with prior Delphi research (Skinner et al. 2015; Worrell et al. 2013). This step resulted in the first set of mean ranks for each question list and a preliminary ordering based on relative importance.

The Delphi process terminates under a variety of conditions, such as 1) a strong consensus is reached, 2) a plateau in consensus is reached, 3) panelist fatigue is present, or 4) indications of panelist viewpoints are hardening or no longer showing signs of consensus-oriented influence (Avella 2016; Di Gangi et al. 2018; Schmidt 1997; Worrell et al. 2013). Until a termination condition is reached, panelists are presented with the rationales and current consensus level and asked to re-rank the questions ordered by mean rank.

DELPHI RESULTS

Table 1 presents the summary results of each step of the Delphi process. As expected, consensus incrementally increased during the ranking rounds. To assess consensus, a Kendall's Coefficient of Concordance (Kendall's W) statistic was calculated, determining the degree of agreement among panelists (Schmidt 1997; Worrell et al. 2013). A Kendall's W value less than .3 indicates weak consensus, .3 to .7 indicates moderate consensus, and greater than .7 indicates strong consensus within the panel.

The *a priori* constraints question list terminated in the second-ranking round based on the panel reaching a strong consensus. The remaining question lists continued for a third-ranking round and were terminated due to meeting two conditions. First, panelists indicated fatigue in continuing participation. Second, an inspection of the individual responses revealed a hardening of opinions formed within one panelist while the remaining panelists coalesced around a consensus opinion. Table 1 shows that when this panelist was removed, the remaining panelists achieved strong consensus in all panels except the *a priori* audience panel, which indicated a very high degree of moderate consensus. The Delphi process was terminated because it was unlikely to generate further consensus from subsequent ranking rounds. The *a posteriori* constraints panel indicated lower consensus in the final ranking round; therefore, the previous ranking round with the higher

Kendall's W value was used as the final question list. Tables 2 and 3 present the results of this process with a prioritized order of questions for scholars to reflect upon when designing fear appeals that align with the underlying rhetorical situation and assure their rhetorical validity. Table 2 shows the questions that should be asked *a priori* fear appeal contextualization in exigence, audience, and constraints categories. Table 3 lists a set of questions that should be asked *a posteriori* for rhetorical validity assurance.

	Rhetorical Constituent	Step 1 - # of Questions Generated	Step 2 - # of Questions Remaining	Step 3 - Initial Rank Consensus	Step 4 – 2 nd Ranking Round Consensus	Step 5 – 3 rd Ranking Round Consensus
<i>A Priori</i>	Exigence	15	13	.360	.452	.558 (.803)
	Audience	16	12	.241	.358	.466 (.687)
	Constraints	17	14	.226	.744 (.805)	-
<i>A Posteriori</i>	Exigence	11	8	.282	.661	.687 (.849)
	Audience	12	11	.250	.189	.399 (.916)
	Constraints	11	10	.462	.684 (.721)	.576

Final Kendall's W values are in bold. Kendall's W values with outlier panelist removed in parentheses and italics.

Table 1. Delphi Panel Results

A Priori Fear Appeal Contextualization		
EXIGENCE - The real or potential threat to which systems users, employees, or insiders must be warned and provided with coping guidance.	AUDIENCE - The persons who receive and consider a fear appeal.	CONSTRAINTS - The audience's beliefs, dispositions, attitudes, and experiences that influence the ways in which they interpret the discourse of the message.
<i>Kendall's W = .558</i>	<i>Kendall's W = .466</i>	<i>Kendall's W = .744</i>
<ol style="list-style-type: none"> 1. Why do(es) the threat(s)/ risk(s) exist in the situation? (2.29) 2. Is the threat/ risk something that can be mitigated by behavioral change? (3.29) 3. How can the threat(s)/ risk(s) be made salient to the target audience? (4.14) 4. What is the desired behaviors that would address the threat(s)/ risk(s) of the situation? (5.29) 5. Can the threat(s)/ risk(s) be mitigated through a technological solution? (5.71) 6. How often does the target audience face the threat(s)/ risk(s)? (5.86) 7. To what extent will the recommended action reduce the threat(s)/ risk(s)? (6.43) 8. Can the desired behaviors be interpreted in multiple ways by the target audience? (7.57) 9. What is the cost of the recommended action in terms of effort and/or loss of functionality or goal satisfaction? (8.86) 10. Are there examples of the negative consequences readily available for failing to address the threat(s)/ risk(s)? (9.43) 11. Is the target audience aware of all the options for responding to the threat(s)/ risk(s)? (10.57) 	<ol style="list-style-type: none"> 1. What is the probability of the threat(s)/ risk(s) happening to the target audience? (2.71) 2. Is the target audience particularly vulnerable to the threat(s)/ risk(s) in this research? (3.43) 3. What makes the target audience susceptible to the threat(s)/ risk(s) that justifies a fear appeal approach? (4.57) 4. What is the harm that could result from a threat(s)/ risk(s) to the target audience? (4.71) 5. Does the target audience have the autonomy to introduce threat/ risk mitigation tactics, or does the target audience require organizational policy changes before acting? (4.71) 6. How much can the target audience relate to the threat(s)/ risk(s) or outcome behaviors? (6.29) 7. What are the knowledge, skills, and abilities of the target audience for understanding the intended threat(s)/ risk(s)? (6.86) 8. What is the nature of the work environment that the target audience is immersed in? (7.71) 	<ol style="list-style-type: none"> 1. What prior experiences would the target audience possess that would affect their response? (e.g., prior experience with threat(s)/ risk(s)) (2.86) 2. Would any audience characteristics discount the fear appeal in its interpretation? (3.14) 3. Does risk aversion play a role in the target audience's behaviors? (4.57) 4. Does the target audience have the resources to deal with the threat(s)/ risk(s)? (5.00) 5. What job responsibilities does the target audience have, and how would that affect their experience with the fear appeal? (5.00) 6. What constraints may affect the target audiences' response to the fear appeal? (5.14) 7. Which constraints can be controlled or not controlled for in the study? (5.86) 8. Can demographic factors play a role in the interpretation of the fear appeal? (6.71) 9. Are the constraints (i.e., beliefs, dispositions, attitudes, experiences) of the target audience consistent over time? (9.29)

<p>12. Is the study focused on a single threat/ risk faced by the target audience? If so, what is the threat/ risk? If not, what are the common elements of the threats/ risks, and can they be addressed through the same desired behaviors? (10.71)</p> <p>13. Is the threat(s)/ risk(s) longitudinal in terms of its impact? Does the impact accumulate over time to become greater? (10.86)</p>	<p>9. What are the boundary characteristics of the target audience? (8.71)</p> <p>10. Why is this target audience important to research and/or practice? (9.00)</p> <p>11. Is the communication medium used to transmit the fear appeal appropriate for the audience? (9.29)</p> <p>12. What are the common language/ shared language norms associated with describing threat(s)/ risk(s) by the target audience? (10.00)</p>	<p>10. What is the target audience's preliminary feeling that they are vulnerable to attack and the control they have over being attacked? (9.29)</p> <p>11. What is the ambient anxiety of the target audience? (9.57)</p> <p>12. What are the current countermeasures or mitigation measures that can be deployed by practice beyond the proposed action? (11.86)</p> <p>13. If more than one countermeasure is a part of the proposed action within the study, what are the common elements associated with them? (12.86)</p> <p>14. Will the focus of the study be on a single constraint? If so, what has been the history of this constraint within the literature? (13.86)</p>
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NOTE: Mean Rank in parentheses. A Priori panel achieved strong consensus in the 2nd ranking round, terminating this panel from further ranking.

Table 2. Framework for Assuring Rhetorically Valid Fear Appeals: A Priori Fear Appeal Contextualization

<i>A Posteriori</i> Rhetorical Validity Assurance		
EXIGENCE - The real or potential threat to which systems users, employees, or insiders must be warned and provided with coping guidance.	AUDIENCE - The persons who receive and consider a fear appeal.	CONSTRAINTS - The audience's beliefs, dispositions, attitudes, and experiences that influence the ways in which they interpret the discourse of the message.
<i>Kendall's W</i> = .687	<i>Kendall's W</i> = .399	<i>Kendall's W</i> = .684
<ol style="list-style-type: none"> 1. Was the threat(s)/ risk(s) expressed in a compelling and clear manner to the target audience? (2.14) 2. Was there a personal consequence to the target audience if the threat(s)/ risk(s) materialized? (2.43) 3. Was the scenario embedded within the fear appeal one that would be realistically familiar to the target audience's work environment? (2.57) 4. Did the fear appeal specifically address the threat(s)/ risk(s) of interest? (4.71) 5. Was the recommended action assessed for feasibility by an industry or practice-oriented person? (4.71) 6. Was a measure used to determine whether the threat(s)/ risk(s) influenced the target audience? (5.71) 7. Were the characteristics of the threat(s)/ risk(s) of interest captured in the study? If so, were any salient characteristics of the threat(s)/ risk(s) omitted from the fear appeal design? (5.71) 8. Were scales consistent throughout measuring of threat(s)/ risk(s) perceptions by the target audience? (8.00) 	<ol style="list-style-type: none"> 1. Was fear measured before and after the introduction of the fear appeal? (3.29) 2. Were data related to the impact of the fear appeal on the target audience collected in the study? (3.71) 3. Did the study capture the feasibility of recommended action(s)? (3.71) 4. Did the study capture the feasibility of the perceived response efficacy of the targeted audience? (4.43) 5. Were appropriate filter/ validation questions used to identify the target audience of the fear appeal message for the study? (5.14) 6. What limitations are there relative to how the fear appeal influenced the target audience? (6.14) 7. Were the characteristics of the target audience captured in the study? (6.86) 8. What other emotion, beyond fear, materialized in the study by the target audience? (7.29) 9. Was the study able to capture whether fear waned or stabilized over time? (7.57) 10. Was a preliminary sample of target audience members consulted in the design 	<ol style="list-style-type: none"> 1. Were the constraints relevant to the target audience? (1.83) 2. Were the constraints appropriate for the threat(s)/ risk(s) of interest? (2.17) 3. Were the constraints controlled for within the study? (3.50) 4. What is the degree to which the target audience was influenced by the constraints? (4.00) 5. Were there any additional constraints that might have had an impact on this situation? (5.83) 6. Was a preliminary assessment of the constraints evaluated by a member of the target audience? (5.83) 7. Were there any changes in the constraints as a result of data collection? (7.17) 8. Was a control model first performed to assess the impact of the constraints on the recommended action(s)? (7.83) 9. Were preliminary assessments of risk aversion captured to compare changes prior to and after fear appeal introduction? (8.17) 10. Were comparisons made against prior demographics or other relevant

	<p>phase of the fear appeal development? (8.29)</p> <p>11. Is the operational criteria for the study and collection site identified and described within the study? (9.57)</p>	<p>constraints from the literature to situate the results of the study within the prevailing research? (8.67)</p>
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NOTE: Mean Rank in parentheses. A Posteriori panel consensus decreased in the final ranking round (2nd ranking round results presented)

Table 3. Framework for Assuring Rhetorically Valid Fear Appeals: A Posteriori Rhetorical Validity Assurance

FUTURE DIRECTIONS

Our next steps are to validate the questionnaire for *a priori* and a *posteriori* fear appeals contextualization using a multi-method approach. First, a new Delphi panel will be conducted to reduce the questionnaire to a more manageable set of questions relevant to a broad range of fear appeal-based theories. Second, a literature review of current fear appeals research will be conducted to identify how the proposed question for fear appeals contextualization and validation has already been addressed. The findings from this analysis should identify gaps in fear appeal design construction and which questions within the proposed framework have yet to be addressed to guide recommended actions and establish a course for further research. Lastly, a qualitative study based on interviews with behavioral security scholars would provide further theoretical direction for the validity and generalizability of the questions for persuasive message theories.

CONCLUSION

Behavioral security researchers face a significant challenge in designing effective fear appeals. By evaluating the rhetorical contexts, including the three key components of exigence, audience, and constraints, we provide guidance for creating fear appeals that are rhetorically valid and suitably contextualized for their intended audience. In this Delphi-based questionnaire framework, *a priori* questions identify context-specific factors for a particular rhetorical situation. A *posteriori* questions evaluate the validity of those factors and their operationalization within a fear appeal. By leveraging this framework, behavioral security scholars can ensure that the fear appeals are rhetorically valid and efficacious in motivating security behavior among their target audience. Research efforts in this direction should further contribute to advancing fear appeals research. More importantly, this research extends the fear appeal research, which has been experiencing

stagnation by tailoring persuasive messages using exigence, audience, and constraints (Johnston et al. 2015).

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