Message Framing in Social Networking Sites

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Abstract

Online social networking sites represent significant new opportunities for Internet advertisers. However, results based on the real world cannot be generalized to all virtual worlds. In this research, the moderating effects of need for cognition (NFC) and knowledge were applied to examine the impact of message framing on attitudes toward social networking sites. A total of 216 undergraduates participated in the study. Results reveal that for social networking sites, while high-NFC individuals form more favorable attitudes toward negatively framed messages than positively framed messages, low-NFC individuals form more favorable attitudes toward positively framed messages than negatively framed messages. In addition, low-knowledge individuals demonstrate more favorable attitudes toward negatively framed messages than positively framed messages; however, the framing effect does not differentially affect the attitudes of high-knowledge individuals. Furthermore, the framing effect does not differentially affect the attitudes of high-NFC individuals with high knowledge. In contrast, low-NFC individuals with low knowledge hold more favorable attitudes toward positively framed messages than negatively framed messages.

Introduction

Social networking sites have appeared for a long time, but they have exploded across the web in recent years. Facebook has overtaken MySpace and undoubtedly become the most popular social networking site. In the meantime, other social messaging platforms have been competing to be the top social networking sites. However, people on the Internet tend to perceive more risks of personal information leakage than in the real world, as they do not have to expose their personal information to the real world. Therefore, the security of social networking sites is regarded as the issue of most concern. Furthermore, as compared with general Web sites, social networking sites usually ask users to expose their personal information. For example, on Facebook, people are asked to reveal their personal information, such as birthday, education history, birthplace, and residence. Specifically, the personal information exposed in social networking sites is under more risk of leakage than in general Web sites, and thus the security mechanism is more important for social networking sites than for general Web sites and for the real world. The message framing for security mechanisms is acknowledged as being more effective in reinforcing people’s confidence in the security of social networking sites than in general Web sites and in the real world. However, this research does not explore what types of security systems can prevent the leakage of personal information. Instead, this research aims to examine the interaction effects of security message framing and individuals’ need for cognition (NFC) and knowledge.

An emerging interest in the impact of message framing on attitudes has been evoked in the past decades.¹,² Prospect theory³ has been employed to illustrate why attitudes are subject to message framing. In an advertising context, the increase in controversial negatively framed advertising has proved the importance of framing, even though consumers have indicated their unfavorable attitudes toward the negatively framed advertising.⁴ Academically, there is substantial disagreement regarding whether negatively versus positively framed messages are likely to be more persuasive.⁵ Frankly, the issues on the framing effect and NFC have been increasingly popular in the marketing or psychology literature recently. However, previous research focuses on the effect of message framing on attitudes and behavior on the tangible products or intangible services in the real world,⁶,⁷ and ignores the increasing consumption contexts in the virtual world. Moreover, most previous research on attitude formation was conducted in a real-world context; however, the external validity of those previous studies remains a concern when the context shifts to the virtual world. This research attempts to explore how individuals’ knowledge and NFC affect the impact of security message framing on attitudes toward social networking sites.

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Many cognitive differences have been identified between high-NFC and low-NFC individuals. For example, high-NFC individuals are less susceptible to message-framing effects than low-NFC individuals.\(^{26}\) In addition, high-NFC individuals are reported to recall more information arguments,\(^{27}\) generate more issue-relevant thoughts,\(^{28}\) and demonstrate more consistency between beliefs and attitudes.\(^{29}\) The attitudes of high-NFC individuals also have longer persistence,\(^{30}\) more resistance to counter-attitudinal influence,\(^{35}\) and more consistency between intentions and behaviors.\(^{31}\)

Martin et al.\(^{32}\) extend previous research from tangible goods and intangible services to the virtual world by demonstrating that consumers with high NFC prefer Web sites with more verbal (cognitive) content, which implies that NFC will affect consumer attitudes toward Web site information. Similarly, Miller et al.\(^{33}\) also argue that people varying in NFC will exhibit different attitudes toward the Web site information.

**Knowledge**

Engel et al.\(^{34}\) define knowledge as “the information stored within memory.” High-knowledge individuals are able to learn more new information about that domain and to process the information with less effort than low-knowledge individuals.\(^{35}\) High-knowledge individuals are able to identify relevant information, can easily comprehend and process information,\(^{35}\) and even pinpoint a wider problem space.\(^{36}\) Low-knowledge individuals, on the other hand, have little generalized knowledge. Lack of generalized knowledge makes low-knowledge individuals unable to comprehensively evaluate the message argument.

Knowledge can be measured either objectively or subjectively. Objective knowledge is measured by some testing procedures to detect true knowledge, whereas subjective knowledge is measured through self-evaluation to exhibit people’s personal perceptions.\(^{37}\) The literature has demonstrated that objective knowledge relies mainly on stored information on a product class, whereas subjective knowledge relies more on product-related experience.\(^{38}\) Moreover, subjective knowledge increases the likelihood that consumers will locate themselves proximate to stimuli consistent with their subjective knowledge, suggesting that subjective knowledge affects choices by restricting search between environments rather than within the environment.\(^{39}\) There are many procedural constraints in obtaining objective knowledge, such as the development of an inventory to measure it. As a result, subjective knowledge is easier to measure and is used frequently.\(^{40}\) Therefore, this research adopted subjective knowledge (perceived knowledge) instead of objective knowledge.
and persistent over time.\textsuperscript{44} However, when a message is positively framed, high-NFC individuals tend to assess both the message itself and potential alternatives. Positively framed messages, which require fewer cognitive resources to process, do not meet high-NFC people's personality traits of enjoying elaboration and hence may elicit less positive attitudes.

In contrast, low-NFC individuals who form their attitudes toward a message are likely to base it on simple inferences and process the peripheral routes heuristically instead of the central routes, in an attempt to reduce the required cognitive resources. The aforementioned positive framing requires fewer processing resources than negative framing. Hence, low-NFC individuals form more favorable attitudes toward positively framed messages than negatively framed messages.

**H1:** While high-NFC individuals form more favorable attitudes toward negatively framed messages than positively framed messages, low-NFC individuals form more favorable attitudes toward positively framed messages than negatively framed messages.

**Effects of knowledge and message framing on attitudes**

Previous research has suggested that individuals varying in knowledge and cognitive ability respond differently to message appeals.\textsuperscript{35} Brucks\textsuperscript{45} indicates that prior knowledge facilitates information processing. Therefore, high-knowledge and low-knowledge individuals differ in how they process information. High-knowledge individuals are more likely to process information analytically by applying available decision criteria stored in memory and are less likely to rely on heuristic cues than low-knowledge individuals while making decisions.\textsuperscript{46}

Specifically, individuals low in knowledge and cognitive ability tend to process information heuristically, and are affected by simple cue effects, such as appeals of loss aversion.\textsuperscript{46} The accumulation of knowledge helps decrease perceived risks\textsuperscript{35,47} and increase the ability of message evaluations,\textsuperscript{35,48,49} suggesting that low-knowledge individuals have higher perceived risks than high-knowledge individuals. As indicated above, negatively framed messages are regarded as reminding and warning to loss aversion. Clearly, negatively framed messages help reduce low-knowledge individuals' perceived risks. Moreover, O'Connor et al.\textsuperscript{50} argue that negative framing has an advantage over positive framing for the decision perceived as risky. Hence, it is assumed that negatively framed messages are more favorable than positively framed messages for low-knowledge individuals.

Marks and Olson\textsuperscript{51} imply that high-knowledge and low-knowledge individuals differ in the processes of message evaluations. Less cognitive effort is required and relevant knowledge structures can be activated automatically for high-knowledge individuals to process information.\textsuperscript{34} High-knowledge individuals appear to apply the central routes (systematic processing) without engaging in extensive cognitive resources to form their attitudes, regardless of how messages are framed. Specifically, the framing effect does not differentially affect the attitudes of high-knowledge individuals.

**H2:** While low-knowledge individuals form more favorable attitudes toward negatively framed messages than positively framed messages, the framing effect does not differentially affect the attitudes of high-knowledge individuals.

**Effects of NFC, knowledge, and message framing on attitudes**

High-NFC individuals with high knowledge may engage in less cognitive effort to evaluate the message arguments for their abundant experiences or expertise. However, owing to the innate disposition of enjoying thinking, high-NFC individuals with high knowledge tend to figure out alternatives beyond the messages, irrespective of the way of message framing. Consequently, the framing effect seems to become ineffective. In contrast, low-NFC individuals with low knowledge have relatively lower motivation and insufficient processing resources to carefully assess the messages, and hence are likely to rely on heuristic cues to evaluate the messages.\textsuperscript{46} Therefore, positive framing tends to be more favorable than negative framing.

**H3:** Message framing does not differentially affect the attitudes of high-NFC individuals with high knowledge; in contrast, low-NFC individuals with low knowledge form more favorable attitudes toward positively framed messages than negatively framed messages.

**Methods**

**Sample selection**

Martin et al.\textsuperscript{41} indicate that selecting an appropriate product or service is based on two criteria: (a) the product or service offers a range of attributes for manipulation, and (b) the product or service is relevant to the research sample. Most importantly, Calder et al.\textsuperscript{52} argue that students with similar profiles on relevant dimensions are qualified as homogeneous respondents. In rigorous studies, homogeneous respondents are preferred for two reasons. First, they permit more exact theoretical predictions than may be possible with a heterogeneous group.\textsuperscript{52} Second, homogeneous respondents are preferred since they diminish the chance of making a false conclusion about whether there is any covariation among the variables being studied. On the contrary, when respondents are heterogeneous with respect to characteristics that moderate their responses, the error variance is increased and the sensitivity of statistical tests in identifying the significant relationships declines.\textsuperscript{52} Specifically, it is adequate to select students as samples to empirically examine theories because of their high homogeneity. In addition, undergraduates are acknowledged as a key population using social networking sites. Therefore, undergraduates were asked to participate in the study.

**Research procedure**

A total of 216 undergraduate students (102 males and 114 females, mean age 20.6 years), who were self-reported members of social networking sites, and had logged into such sites every day, were randomly assigned to either positively framed or negatively framed conditions and each was given a premixed folder that contained a description of the research purpose, NFC and knowledge scales, and the attitude measures. The coordinator told the subjects that they were invited to join an ad survey for an upcoming social networking site. Subsequently, 108 subjects were asked to log into a prebuilt Web site to answer the questionnaires featured by positively framed messages, whereas another 108 subjects were asked to log into another prebuilt Web site to answer the
questionnaires featured by negatively framed messages. Both Web sites were identical except for the message framing.

**Manipulation for message framing**

The previous literature has indicated that individuals regard security as a major concern, namely, the level of perceived security is believed to affect the attitudes toward the Web sites. Moreover, Floh and Treiblmair argue that lowering the risk of online personal information leakage is a vital key to attracting and retaining individuals. Hence, this research chose the statement of security as the message framing.

For message framing manipulation, the message was clearly stated either positively or negatively. For example, the positive framing condition contained the following excerpt (the negative framing condition contained in parentheses):

The encryption system in our (other) social networking site(s) is superior (inferior) to the system in other sites (our site) and can (cannot) secure your personal information against leaking. You can (cannot) enjoy your social time here (there) with no worries.

**Measurement of NFC**

The 18-item NFC scale devised by Cacioppo et al. was employed to measure the degree to which individuals enjoy effortful thinking. Their responses were used to split the subjects into two groups: the group with scores higher than the mean was labeled as the high-NFC group, and the other group with scores lower than the mean was labeled as the low-NFC group.

**Measurement of knowledge**

A four-item questionnaire in a seven-point Likert scale designed to assess subjective knowledge of a social networking site was adapted from Martin et al. Subjects were dichotomized into high-knowledge and low-knowledge groups based on a median split.

**Measures for framing, NFC, and knowledge and attitudes**

Independent variable and moderators. The framing manipulation was assessed by having respondents rate the message on a seven-point scale anchored by 1 = very negative and 7 = very positive. Participants rated how they had agreed with each statement. The obverse scaling ranging between 1 (strongly disagree) and 7 (strongly agree) was for the nine positive statements; the reverse scaling ranging between 7 (strongly disagree) and 1 (strongly agree) was for the other nine negative statements. Subjects were dichotomized into high- and low-NFC groups based on a median split. Cronbach’s alpha for NFC was satisfactory at 0.86. High-NFC and low-NFC individuals exhibited significant differences in the averaged score of NFC scales ($M_{\text{NFC}} = 4.75$, $M_{\text{NFC}} = 2.64$, $t(216) = 22.89, p < 0.001$). Knowledge was measured by asking respondents to indicate on four, seven-point scales anchored by know very little/know very much, inexperienced/experienced, uninformed/informed, and novice buyer/expert buyer. Cronbach’s alpha for knowledge was satisfactory at 0.87. Participants were dichotomized into high-knowledge and low-knowledge groups based on a median split. Results indicated that high-knowledge individuals have significantly higher scores on the knowledge scales than low-knowledge individuals ($M_{\text{hk}} = 5.26$, $M_{\text{lk}} = 3.36$, $t(214) = 40.27, p < 0.001$).

**Dependent variable.** Attitudes were measured by having them indicate their evaluations of the message on four, seven-point scales anchored by bad/good, dislike/like, irritating/not irritating, and uninteresting/interesting. Cronbach’s alpha for these measures was 0.76; hence, the responses to these four scales were averaged to form the attitudes toward the message.

**Results**

**Manipulation check**

An independent samples $t$ test was applied to examine how positive (or negative) the message was perceived. As expected, subjects rated significant differences between the positively framed and negatively framed messages ($M_{\text{pos}} = 2.39$, $M_{\text{neg}} = 4.81$, $t(214) = 19.28, p < 0.001$). Therefore, the manipulation check for message framing is effective.

**Hypothesis testing**

H1: Effects for NFC and message framing. An analysis of variance (ANOVA) was administered to examine the interaction effect of NFC and message framing on individuals’ attitudes. Results exhibit that the interaction effect of NFC x message framing is significant [$F(1, 210) = 45.89, p < 0.001, \eta^2 = 0.179$], implying that further examination of the simple main effect is required.

A further ANOVA reveals that while high-NFC individuals form more significantly favorable attitudes toward the negatively framed message than the positively framed message [$M_{\text{neg}} = 4.38$, $M_{\text{pos}} = 3.36$, $F(1, 107) = 47.44, p = 0.000 < 0.001$], low-NFC individuals form more significantly favorable attitudes toward the positively framed message than the negatively framed message [$M_{\text{pos}} = 5.08$, $M_{\text{neg}} = 4.68$, $F(1, 109) = 4.07, p = 0.046 < 0.05$; Fig. 1]. Therefore, H1 is supported.

![Interaction Effect of Need for Cognition x Framing](image-url)
H2: Effects for knowledge and message framing. Similarly, an ANOVA was administered to examine the potential interaction effect of knowledge and message framing. Results indicate that the interaction effect of knowledge × message framing interaction effect on attitudes is significant [$F(1, 210) = 19.184, p < 0.01, \eta^2_p = 0.084$].

A further ANOVA indicated that low-knowledge individuals express more significantly favorable attitudes toward the negatively framed message than the positively framed message [$M_{NF} = 4.92, M_{PF} = 4.13, F(1, 107) = 27.28, p < 0.001$]. However, high-knowledge individuals exhibit no differential attitudes between the negatively framed message and the positively framed message [$M_{NF} = 4.16, M_{PF} = 4.27, F(1, 109) = 0.217, p > 0.05$; Fig. 2]. Therefore, H2 is supported.

H3: Effects for NFC, knowledge, and message framing. A three-way ANOVA was administered to examine the interaction effect of NFC × knowledge × framing. Results indicate that the three-way interaction is significant [$F(1, 210) = 19.01, p = 0.000 < 0.001, \eta^2_p = 0.083$], implying that further tests of simple main effects are required.

The ANOVA reveals that for the high-NFC individuals with high knowledge, no differentially favorable attitudes toward the negatively framed message over the positively framed message were expressed [$M_{NF} = 3.85, M_{PF} = 3.69, F(1, 53) = 0.37, p > 0.05$; Fig. 3], implying that the framing effect does not differentially affect the attitudes of high-NFC individuals with high knowledge. Alternatively, the low-NFC individuals with low knowledge express more significantly favorable attitudes toward the positively framed message than the negatively framed message [$M_{PF} = 5.71, M_{NF} = 4.45, F(1, 55) = 29.45, p < 0.001$; Fig. 4]. Hence, H3 is supported.

Discussion

Theoretical implication

This research differs from the prior research in three main respects, which contribute to the cyberpsychology literature. First, this research takes the lead to provide empirical evidence that NFC moderates the framing effect in the virtual context. Although NFC has been identified as a potential moderating factor in previous research (e.g., Martin et al.41) in the context of a real world, its impact on the framing effect and knowledge in the context of the virtual world has rarely been examined. This research supports the belief that NFC plays a key role in the framing effect in the virtual world. Second, this research speculates that the framing effect on attitudes is driven not only by personality traits but also by other factors (i.e., consumer knowledge).

At last, Sicilia et al.57 made a preliminary study of how the dual mediation hypothesis and the effect transfer hypothesis operated on the web, and Martin et al.32 concluded that high-NFC people evaluate Web sites with high verbal and low visual complexity more favorably; however, scant studies have been conducted to examine the NFC and framing effects on the evaluations of messages in the context of a real world. This research further examines the moderating effects of NFC and knowledge between message framing and consumer attitudes toward messages on social networking sites. Results of this research successfully extend the NFC and framing effect from the real world to the virtual world.
This research concludes that the message-framing effect can be moderated by other factors (i.e., NFC and consumer knowledge), which implies that social networking sites are advised to adopt a message-framing strategy together with other marketing stimuli or market segmentation. The research findings indicate that for social networking sites, negatively framed messages are more effective for high-NFC individuals, and positively framed messages are more effective for low-NFC individuals. Considered in this way, social networking sites may wish to frame their security messages negatively and provide more informative messages to allow high-NFC consumers engaging in cognitive resources to elicit their positive attitudes. In contrast, social networking sites may seek to include more positive and digestible messages to minimize the required cognitive resources for low-NFC individuals to facilitate their positive attitudes.

Furthermore, social networking sites are advised to adopt a positive framing strategy for their legible benefits for low-NFC individuals with low knowledge to decrease their investment of cognitive resources and further elicit their favorable attitudes. Instead, for the prospective market consisting of high-NFC individuals with high knowledge, social networking sites may choose other strategies (rather than message framing) to elicit their favorable attitudes. For example, social networking sites can shed light on the complex but discernible attributes for those customers to scrutinize to lower their perceived risks toward the Web site security.

In general, contemporary online communication tools or social networking sites enable people to share a range of personal information with “friends.” With the growing popularity of social networking sites, the issue on the leakage of personal information receives much attention, as in e-commerce or m-commerce. Social networking sites are responsible for setting up a highly secure environment to prevent the users’ personal information from leakage.

Limitations and Future Research

It seems a tough task to precisely measure the NFC level of individuals in practice. The social networking sites may wonder how to identify the NFC level of individuals before their intended messages are announced. Martin et al. suggest that one approach is to know the nature of the media vehicle in which the individuals are interested.

The issues on social networking sites are emerging and diversified; however, current research rarely explores the personality traits of the users of those social networking sites. This research takes the lead to examine the moderating effect of NFC on attitudes in the context of social networking sites. Future research is advised to include more effective moderators to explore the message-framing effect on social networking sites.

At last, this research adopted subjective knowledge (perceived knowledge) rather than objective knowledge to measure how the security messages were perceived. Future research is expected to use the measures of objective knowledge to re-examine the framing effect for further refining this research area.

Author Disclosure Statement

No competing financial interests exist.

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