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Improving the Effectiveness of Anti-Piracy Educational Deterrence Efforts: The Role of Message Frame, Issue Involvement, Risk Perception, and Message Evidence on Perceived Message Effectiveness

Bong Keun Jeong [1,*], Tom Yoon [2] and Sarah S. Khan [3]

[1] Department of Management and Decision Sciences, Wall College of Business, Coastal Carolina University, Conway, SC 29528, USA
[2] MIS Department and Ancell School of Business, Western Connecticut State University, Danbury, CT 06810, USA; yoont@wcsu.edu
[3] Department of Business Management, Poole College of Management, North Carolina State University, Raleigh, NC 27695, USA; sskhan@ncsu.edu
* Correspondence: bjeong@coastal.edu

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Abstract: The objective of this study is to explore methods to improve the effectiveness of anti-piracy educational deterrence efforts. We studied the effects of message framing (positive vs. negative), issue involvement (high vs. low), risk perception (high vs. low), and message evidence (anecdotal vs. statistical) on the perceived effectiveness of an anti-piracy campaign message. Our experimental results suggest that message frame alone does not have an impact on perceived message effectiveness. However, the effect of message framing is moderated by issue involvement, risk perception, and message evidence. Specifically, a positively framed message is more effective for individuals with low issue involvement, high perceived piracy risk, and who are exposed to anecdotal evidence. In contrast, a negatively framed message is more effective for individuals with high involvement, low risk, and who are exposed to statistical evidence.

Keywords: digital piracy; piracy control; educational deterrence; anti-piracy campaign; perceived message effectiveness

1. Introduction

The wide-spread piracy of copyrighted digital content (e.g., software, music, games, books, and movies) has been a serious problem. Rapid developments in file-sharing and streaming technologies as well as decreasing cost of digital files copying mediums have provided consumers with greater access to free content. A recent survey shows that internet users made more than 300 billion visits to piracy sites in 2017, up 1.6% from 2016. Illegal downloading and streaming of TV shows is the most popular pirated content (106.9 billion visits) followed by music and movie [1].

To protect intellectual property and increase legitimate sales, digital goods industries have employed numerous anti-piracy strategies including technological protection measures and law enforcement. However, there is little evidence to suggest that these strategies have successfully decreased piracy [2,3]. Therefore, digital goods industries have started focusing on public anti-piracy educational campaigns. Organizations such as Universal Music Group (UMG), the Motion Picture Association of America (MPAA), and Creative Content UK have designed and executed public campaigns attempting to educate consumers about the risks of illegal downloading and the benefits of legally purchased digital products. Through this educational approach, organizations encourage

consumers to think critically about how they acquire software, music, and other forms of intellectual property [4–6].

Prior literature suggests that an anti-piracy educational campaign is an effective way to dissuade users from downloading illegal content [5,7]. However, changing consumers' attitudes towards piracy is still challenging, even with educational deterrence efforts. For example, the Software Alliance (BSA) launched a Facebook initiative called "No Piracy" (https://www.facebook.com/report software piracy). BSA developed different types of educational campaign messages aiming to change consumers' perception towards piracy and to promote appropriate purchase behaviors. Nevertheless, most comments and opinions posted on the Facebook page showed negative sentiments against BSA's objectives. Some examples include:

- "Go away. No one likes you";
- "I have pirated all my 1000's of hours of music. Come at me";
- "Sharing is caring";
- "You call it piracy. We call it FREEDOM";
- "The more you fight it, the more it fights back".

These negative sentiments towards anti-piracy campaigns indicate that the existing campaign messages may not be as effective as intended. Thus, it is important to investigate how to improve the effectiveness of anti-piracy campaign messages. Considerable studies [8–13] have examined the perceived message effectiveness in the areas of health-related promotions, advertising, and environmental contexts. However, the effectiveness of anti-piracy campaign has not received much attention.

The objective of this study is to explore methods to improve the perceived effectiveness of anti-piracy education campaign message. This study focuses on the perceived message effectiveness that is used to determine whether a campaign message is likely to be effective [14,15]. Establishing perceived message effectiveness is a necessary condition for changing beliefs, attitudes, and behavioral intentions [15]. Moreover, perceived message effectiveness has been frequently found to influence attitude, behavioral intent, and actual behavior [9,16–19]. By integrating persuasion research from communication, advertising, and health domains, we examine the impact of message frame, issue involvement, risk perception, and message evidence on the perceived effectiveness of an anti-piracy campaign message. A review of the framing literature indicates that the effectiveness of message depends on whether the message stresses the positive consequences of performing an act or the negative consequences of not performing the act [13,20–22]. We discuss the impact of different types of message framing on the effectiveness of anti-piracy campaign. In addition, the effectiveness of message framing can be moderated by different factors [23]. Moderating factors may enhance, eliminate, or even reverse the effects of message framing. Based on the literature review, we identify three moderating variables that are applicable in the context of piracy, i.e., issue involvement, risk perception, and message evidence. We examine the interaction effects of message frames and the moderating factors on the perceived effectiveness of anti-piracy educational messages. Our findings can offer recommendations for the design and implementation of anti-piracy educational campaigns.

The rest of this paper is organized as follows. Section 2 provides the theoretical foundation for our research framework and present hypotheses. Section 3 outlines the research methodology, and Section 4 presents the results of our data analysis. Section 5 discusses implications, conclusions, and directions for future research.

2. Literature Review and Hypotheses

2.1. Piracy Control Strategies

Digital piracy may be controlled through preventive controls or deterrent measures [7]. Preventive controls refer to providing legitimate consumers with additional benefits, low prices,

and using technology to prevent piracy. Offering additional benefits to the consumers are important to encourage them to engage in long-term relationships, where satisfied customers are less likely to engage in piracy [24,25]. In the context of digital piracy, companies can enhance consumers' use of legal products and turn them into loyal customers through lower-price and value-added product strategies, such as personalized recommendation and customization. Additional preventive strategies use technology to prevent unauthorized reproduction of digital content. Examples of technological preventive control methods include Digital Rights Management (DRM), encryption, and digital watermarks. However, technological preventive controls have often had limited success [26] and imposed unfair restrictions on legitimate consumers in terms of what they can do with the products they have bought. In addition, there is little evidence that preventive controls reduce piracy [3,27].

Deterrent controls refer to the use of education and legal campaigns and sanctions to reduce piracy. Legal deterrent controls attempt to dissuade users from copying digital products by disseminating litigious information about piracy to the public [7]. Law-suits have resulted in shutting down some of the well-known file sharing websites. However, studies show that the traffic volume of P2P (Peer-to-Peer) sites did not decrease significantly even after the legal threats, and the total number of files shared continues to increase [28]. Therefore, companies have started focusing on educational strategies that disseminate information to consumers about the damages that piracy cause [25,29]. For instance, record companies have designed and delivered public anti-piracy educational campaigns that attempt to educate and inform consumers that illegal music downloading activities harm artists, music companies, and society. Through this educational approach, record companies encourage consumers to think critically about how they acquire music and other forms of intellectual property [4,30,31].

Prior studies have investigated the impact of deterrent controls on piracy in digital good industries. For example, Gopal and Sanders [7] showed that deterrent controls employing educational and legal campaigns provide more profits to the publisher than technological preventive controls. In addition, deterrent controls are shown to be superior in terms of social welfare. Al-Rafee and Rouibah [32] found that education about the pitfalls of digital piracy plays an important role in deterring piracy, while law enforcements have no significant effect on piracy intention. Green [33] also indicated that lawsuits are not always successful in changing piracy behavior. These findings suggest that educational strategy is an effective way to dissuade users from downloading illegal content.

2.2. Message Framing

Message framing refers to the emphasis on positive consequences of following a recommendation or negative consequences of failing to do so in a message [13,20]. A positive frame presents favorable outcomes of adopting a certain behavior, whereas a negative frame usually delivers costs or unfavorable outcomes for not adopting the requested behavior. Although these two messages may convey the same information, one may be more effective than the other in a certain setting. Prospect theory serves as the foundation for message framing research. According to this theory, individuals are risk-seeking in the domain of losses and risk-averse in the domain of gains [34]. In message framing, this means that individuals are more likely to take risks when information is presented in a negative frame, and less likely to take risk when information is framed in positive frame [22,34].

Message framing is well-studied in the areas of health-related promotions, advertising, and environmental contexts because it entails a behavioral consequence [9–13,34–36]. Yet, findings on the effectiveness of positive versus negative frame are inconsistent. Some studies show that positively framed messages are more effective, whereas others demonstrate greater persuasive power of negative frames [9,21,37–40]. For example, Meyerowitz and Chaiken [41] showed that women are more willing to engage in breast self-examination (BSE) when information highlights negative consequences of not engaging in BSE than when information is presented with positive consequences of engaging in BSE. On the other hand, Cheng and Wu [10] examined the impact of a warning message and the level of involvement, such as de-biasing the framing effect on the Internet buyers' attitude and purchase intention. Results indicate that the participants exposed to a positively framed message have a positive

attitude towards the target product and higher purchase intention as compared to the participants exposed to a negatively framed message.

To address the inconsistent findings of message framing effects, researchers have examined the effect of moderating factors on the message frame. A review of the framing literature shows that the effects of message framing can be moderated by different factors [23,42]. The effect of message framing may not be uniform in all situations and can be enhanced, eliminated, or even reversed by a variety of factors [34,35,43–46]. As Table 1 shows, some factors are common across different contexts, and others are used only in a particular domain. For instance, issue involvement has been studied in e-commerce, adoption, and advertising. In this research, we examine three moderating variables in the context of digital piracy: issue involvement, risk perception, and message evidence. Other factors such as product function, product newness, or goal attainment are not applicable in our context, hence they are not considered. In the following section, we provide a detailed discussion about how issue involvement, risk perception, and message evidence may influence the effects of message framing in anti-piracy educational campaigns.

Table 1. Selected literature on message framing and moderating factors.

Authors	Context	Framing Effect	Moderating Factors
[9]	Advertising	N/A	Product function, product newness, perceived risk
[10]	E-commerce	Yes (positive)	Warning, issue involvement
[11]	Charity	No	Goal attainment, message evidence
[34]	Recycling, health	No	Reference point
[37]	Food Safety	Yes (negative)	Personal involvement
[39]	Health	Yes (positive)	Alcohol consumption, perceived social norms
[47]	Health	Yes (positive)	Message evidence
[48]	Product promotion	Yes (negative)	Environmental concern and type of product promoted
[49]	Sales	Yes (negative)	Issue involvement
[50]	Health	Yes (positive)	Perceived risk
[51]	Advertising	No	Issue involvement
[52]	Health	N/A	Perceived risk
[53]	E-learning environment	Yes (Negative)	Regulatory focus
[54]	Health	Yes (positive)	Message evidence

2.3. Issue Involvement

The term issue involvement is referred to as "a person's perceived relevance of the object based on inherent needs, values, and interests (p. 342)" [55]. Maheswaran and Meyers-Levy [38] proposed that the message framing can differ in their effectiveness depending on whether individuals employ a heuristic or systematic processing approach. People predominately rely on the systematic processing approach via scrutinizing and cognitively elaborating on the content of a message when personal involvement of a message issue is high or information is deemed relevant and important [41]. In this case, negatively framed messages are more effective, because negative information demands more cognitive resources to comprehend and evaluate the message [34]. Conversely, when personal involvement of a message is low, people rely more on heuristic processing and base their judgments on simple decision rules [38,48]. When conditions favor the dominant use of heuristic processing, positively framed

messages are more effective because a positively framed message requires fewer resources by relying on simple inferences rather than careful examination of the issue-relevant information [56–60].

Prior literature suggests a relationship between issue involvement and prior experience [61]. In the context of digital piracy, issue involvement can be related to prior experience as well. Consumers with prior experience of buying pirated content are more likely to purchase pirated copies than those without such experience [62,63]. Thus, consumers who have prior experience of downloading and streaming pirated content are likely to repeat their actions. As they are repeatedly involved in digital piracy activities, individuals may believe that piracy becomes more relevant to them. This inclination could be attributed to the role of familiarity and knowledge about digital piracy. Prior experience may enable consumers to obtain illegal copies with little effort because knowledge reduces the time and effort needed to locate illegal copies [64].

Issue involvement strongly influences the effects of message framing [10,35,38,65]. Cheng and Wu [10] showed that the issue involvement moderates the influence of message framing on participants' attitude towards the product. In case of low-involvement participants, a positively framed message resulted in a more favorable attitude than a negatively framed message. In contrast, no framing effects occurred with high-involvement participants. Koklic et al. [66] examined the moderating role of issue involvement on consumers' attitudes towards digital piracy and behavioral intentions. They found that the issue involvement positively moderates the effect of attitude towards digital piracy on the intention to pirate. For highly involved consumers, attitudes towards piracy is a significantly better predictor of intention than participants with less involved consumers.

From the discussions above, we argue that, with high piracy involvement level, more cognitive resources may be required to process the message and coping mechanism for avoiding the highlighted problem. Therefore, a negatively framed message will be more effective than a positively framed message. However, when the piracy involvement level is low, people believe information to be less personally relevant. Therefore, they allocate fewer resources by relying on simple inferences rather than careful examination of the issue-relevant information. In this case, a positively framed message produces greater persuasion than a negatively framed message. Thus, we propose the following hypothesis:

Hypothesis 1 (H1A). *When issue involvement is high, a negatively framed message is more effective than a positively framed message.*

Hypothesis 1 (H1B). *When issue involvement is low, a positively framed message is more effective than a negatively framed message.*

2.4. Risk Perception

Perceived risk is formally defined as "a combination of uncertainty plus seriousness of outcome involved" [67]. In the context of consumer choice, perceived risk is "the expectation of loss associated with purchase and acts as an inhibitor to purchase behavior" [68]. Significant research has focused on measuring risk, building a formal model, and developing its components. Perceived risk has been modeled as a two-dimensional construct (i.e., uncertainty and negative consequences), as well as a multidimensional construct including financial, performance, physical, psychological, and social risk [63,64,66,69].

In promotional campaigns, the effectiveness of a message frame is dependent on the amount of risk individuals associate with the behavior. In addition, individuals tend to put greater importance on the message when the level of perceived risk is increased [13,45,52,70,71]. For instance, Lee and Aaker [72] provided strong experimental evidence for the moderating role of risk perceptions in message framing effects. They found that when the perceived risk is low, a gain-framed message is more effective than a loss-framed message, because people are likely to focus on the positive outcome. In contrast, when the

perceived risk is high, a loss-framed message is more effective, because it makes negative outcomes more salient and prompt greater vigilance.

It is likely that when the perceived piracy risk is high, individuals believe anti-piracy messages to be more important and can relate to them. Thus, they are likely to adopt the systematic processing approach, which requires more cognitive efforts to comprehend all relevant information. In this case, a negatively framed message may have a stronger impact than a positively framed message because negative information demands more cognitive resource requirements. On the other hand, when the perceived piracy risk is low, individuals perceive information in the anti-piracy message as less relevant. Thus, they are likely to rely on heuristic processing approach based on simple decision rules. In this case, a positively framed message may be more effective than a negatively framed message.

Hypothesis 2 (H2A). *When perceived piracy risk is high, a negatively framed message is more effective than a positively framed message.*

Hypothesis 2 (H2B). *When perceived piracy risk is low, a positively framed message is more effective than a negatively framed message.*

2.5. Message Evidence

The effectiveness of message framing can be enhanced by including message evidence [11,35,54]. Two types of message evidences, anecdotal and statistical evidence, are commonly examined in the literature. Anecdotal evidence focuses on stories, opinions, and judgments from others with narrative information about an event. Statistical evidence focuses on quantified descriptions of an event by including rate, frequency, percentage, probability, average, or other statistical parameters [73–76].

Ample research shows the moderating effect of message evidence on the perceived effectiveness of the message. However, there are contradictory findings about which types of evidence are more effective. Some studies found that anecdotal evidence is more compelling than statistical information because it invokes stronger intuitive appeal and vivid images [73,74,76]. However, other studies also showed that statistical evidence is more effective than anecdotal messages, since statistics provide a logical and rational explanation, as they objectively and systematically represent a larger population [75,77]. The way in which information is presented in a message greatly affects cognitive activity among recipients and, subsequently, the perceived message effectiveness [11,35]. Kopfman et al. [78] examined the effects of narrative versus statistical evidence on cognitive and emotional reactions to organ donation messages. They found that statistical evidence enhances elaborate message processing compared with anecdotal evidence. Furthermore, statistical evidence has a stronger effect on cognitive reactions, whereas narrative evidence impacts more on emotional reactions. Dardis and Shen [35] showed that participants who are exposed to informational (statistical) evidence exhibit more systematic processing and less heuristic processing than participants who are exposed to exemplar (anecdotal) evidence.

These findings indicate that the message framing may interact with the message evidence and in turn impact on the perceived effectiveness of an anti-piracy campaign message. Statistical evidence will increase cognitive reaction where individuals carefully elaborate on the content of a message and increase the perceived effectiveness of a negatively framed anti-piracy message. Conversely, anecdotal evidence requires less systematic processing (more heuristic). Therefore, the effectiveness of an anti-piracy campaign can be enhanced by a positively framed message.

Hypothesis 3 (H3A). *When an anti-piracy campaign message presents statistical evidence, a negatively framed message is more effective than a positively framed message.*

Hypothesis 3 (H3B). *When an anti-piracy campaign message presents anecdotal evidence, a positively framed message is more effective than a negatively framed message.*

3. Research Methodology

The research framework is shown in Figure 1. The experimental stimuli, message frame, and message evidence were manipulated, whereas participants self-rated their level of involvement and risk perception. The level of involvement and risk perception could be affected by the message framing treatment. To disentangle the effects of treatment on these moderators and avoid any potential confounds, participants' level of involvement and risk perception were collected before we introduced anti-piracy campaign messages.

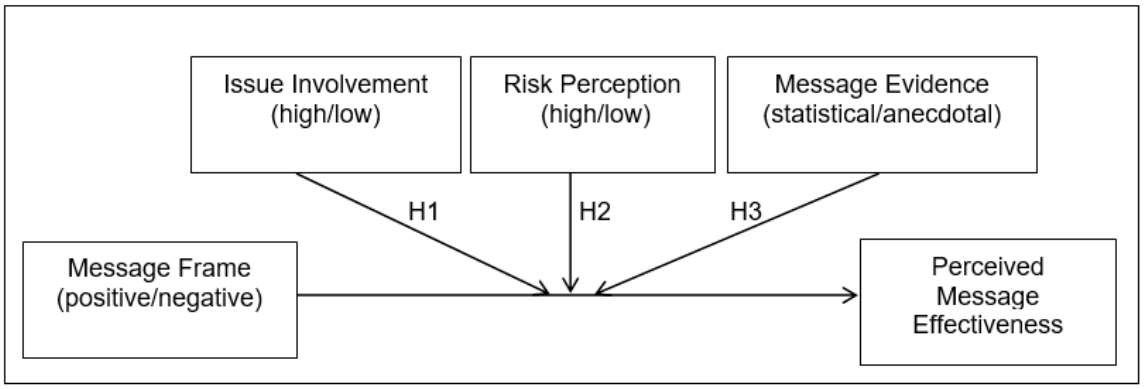

Figure 1. Research framework.

All participants were randomly assigned to one of the four conditions resulting from a combination of a positively/negatively framed message and statistical/anecdotal message evidence. Based on the Facebook "No Piracy" initiative, Microsoft piracy website (www.microsoft.com/piracy), and prior message framing studies, anti-piracy campaign messages were developed. For a positively framed message, we included statements such as "you are SAFE", "you are PROTECTED", and "BENEFITS of supporting intellectual property rights" to highlight favorable outcomes of engaging in appropriate downloading behavior. On the other hand, we used statements such as "you are exposed to the DANGER of lawsuit", "you are exposed to the DANGER of viruses", and "RISKS of violating intellectual property rights" to emphasize unfavorable outcomes of not adopting the requested behavior in a negatively framed message. The evidence type was manipulated by using either statistical evidences or a narrative example of digital piracy victims. For statistical evidences, statements such as "According to the statistics issued by Institute for Policy Innovation (IFPI)" and "A recent survey by Microsoft shows that 73% of pirated software contains viruses and malwares" were included. In addition, for anecdotal evidence, we included a statement "Here is the real story of James Morris from New York Times" to emphasize the story and emotional reactions (see Appendix A for the full campaign messages). After reading the message, participants were asked to evaluate the perceived effectiveness of message using a seven-point Likert scale (1 = strongly disagree to 7 = strongly agree).

For this study, we used a web-based survey. The survey items were adopted from the literature. To ensure construct validity, past operational measures for issue involvement, risk perception, and perceived message effectiveness were identified and slightly modified to fit our context of digital piracy [64,69,79–81]. The questionnaire was tested extensively for validity before the actual survey was administered. As mentioned, past operational measures were slightly modified to create the items used in the survey. While the use of previously developed constructs and items helped in developing our survey, it does not ensure validity. As suggested by Peace et al. [82], we went through iterative review process to maximize content validity and to identify ambiguous or poorly worded items. Twenty-four items were included in the survey in random order. The instrument was then pilot-tested to identify problems with its wording, content, format, and procedures. For the pilot test, the survey was distributed among 42 business students at a major university. The respondents completed the survey and provided comments about the length, wording, and instructions of the

survey. Based on these, further minor modifications were made to the survey. The final survey items as well as their sources from the literature are shown in Appendix B.

The sample for this study consisted of undergraduate students in major universities. Students are considered good subjects for studying piracy, since they are most likely to be engaged in pirating activities [83]. In addition, student subjects have been widely used in previous studies investigating the impact of software/music piracy [84,85]. Students enrolled in information systems courses were asked to review an anti-piracy campaign and then respond to a series of questions. One of the authors introduced the survey and invited the students to take some time to complete the web-based survey at the end of class. Participation was entirely voluntary, and there was no penalty for non-participation. The subjects were allocated fifteen minutes to complete the questionnaire. Interactions were not allowed, and confidentiality of responses was emphasized. In addition, the subjects did not identify themselves on the questionnaires to ensure they were truthful in their responses. Of 650 subjects, 406 returned fully completed questionnaires, yielding a response rate of 65 percent. Table 2 provides descriptive statistics on the demographic profile of the subjects.

Table 2. Demographic information on the subjects (n = 406).

		# of Participants	Percentage
Experimental Design	Positive × Statistical	101	24.88%
	Negative × Statistical	102	25.12%
	Positive × Anecdotal	101	24.88%
	Negative × Anecdotal	102	25.12%
Gender	Male	260	64.04%
	Female	146	35.96%
Age	11–20	42	10.34%
	21–30	268	66.01%
	31–40	69	17.00%
	Above 40	27	6.65%
Prior Experience	Yes	282	69.45%
	No	124	30.55%

4. Data Analyses and Results

4.1. Manipulation Check

To check the priming manipulation, participants were asked to rate the extent to which the message concerned favorable outcomes for engaging in the requested behavior (positive frame) or unfavorable outcomes for not engaging in the requested behavior (negative frame). They were also asked to rate the extent to which the message emphasizes statistical evidences or anecdotal information. *T*-test analysis showed that participants exposed to a positively framed condition thought the message conveyed more ideas about favorable consequences, $M_{positive}$ = 5.01 vs. $M_{negative}$ = 4.65, t(203) = 2.03, $p < 0.05$, whereas participants exposed to a negatively framed condition believed that the message conveyed more ideas about unfavorable outcomes, $M_{negative}$ = 5.75 vs. $M_{positive}$ = 4.01, t(203) = 10.75, $p < 0.001$. The manipulation check for message evidence (statistical vs. anecdotal) was also operated as intended. Participants who were exposed to statistical condition thought the message presented statistical evidence, M_{stat} = 5.57 vs. $M_{anecdotal}$ = 3.22, t(203) = 15.44, $p < 0.001$. On the other hand, participants in anecdotal condition indicated that the message conveyed narrative (anecdotal) evidence, $M_{anecdotal}$ = 5.23 vs. M_{stat} = 3.77, t(203) = 9.17, $p < 0.001$.

To analyze the risk perception, we first ran the factor analysis. Principal component analysis with varimax rotation was used to test the initial survey items' loading. The criterion used in the

analysis was a factor loading greater than 0.6 and Eigen values greater than 1.0 [86]. We found that all seven items loaded on one factor, and the loadings of all items were above the threshold value of 0.60 [87] (Table 3). Internal consistency for reliability was also evaluated by computing Cronbach's alpha. As shown in Table 4, the Cronbach's alpha for risk perception was 0.90, which is well above the cutoff level (0.7). Following the same approach, we confirmed that the items to measure issue involvement and perceived message effectiveness were loaded on the respective construct and showed high internal consistency as well.

Table 3. Results of principal component factor analysis.

Construct	Item	1	2	3
Risk Perception	RP1	0.79		
	RP2	0.81		
	RP3	0.82		
	RP4	0.72		
	RP5	0.65		
	RP6	0.61		
	RP7	0.76		
Issue Involvement	II1		0.82	
	II2		0.88	
	II3		0.90	
	II4		0.86	
	II5		0.86	
Perceived Message Effectiveness	ME1			0.85
	ME2			0.88
	ME3			0.86
	ME4			0.83

Table 4. Assessment of internal consistency.

	Number of Items	Cronbach's Alpha
Risk Perception	7	0.90
Issue Involvement	5	0.93
Message Effectiveness	4	0.93

A composite score for message effectiveness, involvement level, and risk perception was created by averaging four persuasiveness items, five involvement items, and seven risk perception items, respectively. Then, the composite scores for participants' level of involvement and risk perception were divided into two equal groups and used for further data analysis.

4.2. Impact of Message Framing

The data were analyzed using analysis of variance (ANOVA) to test the interaction hypotheses of framing, issue involvement, risk perception, and message evidence; 2 (framing: positive/negative) × 2 (issue involvement: high/low) × 2 (risk perception: high/low) × 2 (message evidence: statistical/anecdotal) ANOVA test was conducted for statistical analysis. Full results of the ANOVA are presented in Appendix C (Table A1).

We first examined the impact of message framing on the perceived message effectiveness. While participants in the negatively framed condition rated the anti-piracy message as being slightly more effective than the positive frame ($M_{positive}$ = 4.98 vs. $M_{negative}$ = 5.01), the difference was not statistically significant, F(1, 406) = 0.017. This finding indicates that the message framing itself does not have an impact on the perceived effectiveness of an anti-piracy message.

4.3. Impact of Message Framing and Issue Involvement on the Perceived Message Effectiveness

H1A posits that when the level of issue involvement is high, a negative frame will be more effective than a positive frame. However, when the issue involvement is low, a positive frame will be more effective than a negative frame (H1B). As shown in Table 5, we found that issue involvement had a marginal main effect of F(1, 406) = 3.44, $p < 0.10$. This finding suggests that the perceived effectiveness of message increases when the level of piracy involvement is low. In addition, there was a significant interaction effect between message frame and issue involvement on the effectiveness of anti-piracy campaign message, F(1, 406) = 17.95, $p < 0.001$.

Table 5. Results of ANOVA (frame and issue involvement).

Source	F-Value	Significance
Frame	0.017	0.896
Issue Involvement	3.443	0.064
Frame × Issue	17.958	0.000

Follow-up contrast analysis (Table 6) revealed that the low issue involvement group rated the anti-piracy message as being more effective when they were exposed to a positively framed message than a negatively framed message, $M_{positive,\ low}$ = 5.38 vs. $M_{negative,\ low}$ = 4.89, $p < 0.01$. Conversely, the high issue involvement group perceived the anti-piracy message as being more effective when they were exposed to a negatively framed message than a positively framed message, $M_{positive,\ high}$ = 4.70 vs. $M_{negative,\ high}$ = 5.06, $p < 0.05$. Hence, H1A and H1B are supported.

Table 6. Follow-up contrast analysis (frame and issue involvement).

	N	Mean	Std. Deviation	
Negative/High	96	5.06	1.22	
Positive/High	107	4.70	1.11	
Negative/Low	107	4.89	1.66	
Positive/Low	96	5.38	1.31	
Group	**Group**	**Mean Difference**	**Std. Error**	**Significance**
Negative/High	Positive/High	0.359	0.183	0.049
Negative/Low	Positive/Low	0.490	0.181	0.007

4.4. Impact of Message Framing and Risk Perception on the Perceived Message Effectiveness

H2A posits that with high perceived risk, negative frame will be more effective than positive frame. When the perceived risk is low, positive frame will be more effective than negative frame (H2B). We found a significant main effect of perceived risk, F(1, 406) = 4.31, $p < 0.05$, indicating that the perceived effectiveness of message increases when the perceived risk of participant is high than when it is low (Table 7). In addition, the interaction effect of message frame by risk perception was significant, F(1, 406) = 26.07, $p < 0.001$.

Table 7. Results of ANOVA (frame and risk perception).

Source	F-Value	Significance
Frame	0.017	0.896
Risk Perception	4.319	0.038
Frame × Risk	26.076	0.000

The follow-up contrast analysis between frame and risk perception (Table 8) showed that the high risk perception group perceived the anti-piracy message as being more effective when they were exposed to a negatively framed message than a positively framed message, $M_{positive, low}$ = 5.12 vs. $M_{negative, low}$ = 4.54, $p < 0.01$. On the other hand, participants with low risk perception rated the anti-piracy message as being more effective when they were exposed to a positively framed message than when they were exposed to a negatively framed message, $M_{positive, high}$ = 4.91 vs. $M_{negative, high}$ = 5.37, $p < 0.05$. This result supports H2A and H2B.

Table 8. Follow-up contrast analysis (frame and risk perception).

	N	Mean	Std. Deviation	
Negative/High	104	5.37	1.51	
Positive/High	99	4.91	1.22	
Negative/Low	99	4.54	1.29	
Positive/Low	104	5.12	1.03	
Group	**Group**	**Mean Difference**	**Std. Error**	**Significance**
Negative/High	Positive/High	0.460	0.179	0.011
Negative/Low	Positive/Low	0.57	0.17	0.001

4.5. Impact of Message Framing and Message Evidence on the Perceived Message Effectiveness

H3A posits that when an anti-piracy message presents statistical evidence, a negatively framed message will be more effective than a positively framed message. In contrast, H3B states that, when an anti-piracy campaign presents anecdotal evidence, a positively framed message will be more effective than a negatively framed message. We found a significant interaction effect between message frame and message evidence on perceived effectiveness of anti-piracy campaigns, $F(1, 406) = 15.74$, $p < 0.001$ (Table 9).

Table 9. Results of ANOVA (frame and message evidence).

Source	F-Value	Significance
Frame	0.017	0.896
Evidence	1.198	0.274
Frame × Evidence	15.747	0.000

Follow-up contrast analysis between message frame and message evidence revealed that participants in the statistical evidence condition perceived the anti-piracy message as being more effective when they were exposed to a negatively framed message as compared to when they were exposed to a positively framed message, $M_{positive, stat}$ = 4.88 vs. $M_{negative, stat}$ = 5.25, $p < 0.05$. On the other hand, participants in the anecdotal condition rated the anti-piracy message as being more effective when they were exposed to a positively framed message as compared to when they were exposed to a negatively framed message, $M_{positive, anecdotal}$ = 5.16 vs. $M_{negative, anecdotal}$ = 4.68, $p < 0.01$ (Table 10). Therefore, H3A and H3B are also supported. We summarize the moderating effects of issue

involvement, risk perception, and evidence type on message effectiveness through message framing below, in Table 11.

Table 10. Follow-up contrast analysis (frame and message evidence).

	N	Mean	Std. Deviation	
Negative/Stat.	102	5.25	1.37	
Positive/Stat.	101	4.88	1.30	
Negative/Anec.	101	4.68	1.51	
Positive/Anec.	102	5.16	0.92	
Group	**Group**	**Mean Difference**	**Std. Error**	**Significance**
Negative/Stat.	Positive/Stat.	0.373	0.182	0.041
Negative/Anec.	Positive/Anec.	0.478	0.182	0.009

Table 11. Summary of moderating effects on message framing and message effectiveness.

Moderating Factors	Factor Values	Message Frame	
		Positive	**Negative**
Issue Involvement	High		X
	Low	X	
Risk Perception	High		X
	Low	X	
Message Evidence	Statistical		X
	Antidotal	X	

4.6. Relationship between Issue Involvement and Risk Perception

We also explored the relationship between issue involvement and risk perception. One question that has not been previously addressed is whether the perceived risk changes with the level of involvement. Some people may perceive a higher risk of prosecution if they are heavily engaged in downloading illegal contents. In contrast, downloaders may be less concerned with the law and ethical concerns [52]. We measured different components of piracy risk in the survey: overall risk, performance risk, privacy risk, prosecution risk, social risk, and financial risk [64]. For example, financial risk is referred to as the risk that pirating activities may cause a monetary loss (reinstall software and recover data) due to viruses or malware. Performance risk refers to the risk that pirating activities may create a loss due to a downloaded file's malfunctioning or not performing as designed.

We compared the mean risk difference between the high-involvement and low-involvement groups. As shown in Table 12, all risks were statistically significant except for the financial risk. High issue involvement group showed a lower piracy risk on overall risk, privacy risk, prosecution risk, and social risk. However, it is interesting to note that performance risk is actually higher in the high-involvement group though it was marginally significant. This suggests that the high-involvement group perceives a higher risk that some of the files are polluted or the quality of the pirated content is significantly lower than the original one.

Table 12. Mean risk comparison.

Risk	Involvement	Mean Risk	Significance
Overall Risk1	High	5.29	t(406) = 2.23 $p < 0.05$
	Low	5.76	
Overall Risk2	High	5.09	t(406) = 2.65 $p < 0.01$
	Low	5.67	
Privacy Risk	High	4.84	t(406) = 3.15 $p < 0.01$
	Low	5.56	
Prosecution Risk	High	4.53	t(406) = 3.03 $p < 0.01$
	Low	5.24	
Performance Risk	High	5.14	t(406) = 1.93 $p < 0.10$
	Low	4.71	
Social Risk	High	3.29	t(406) = 4.34 $p < 0.001$
	Low	4.43	
Financial Risk	High	5.68	t(406) = 0.20 N/S
	Low	5.64	

5. Discussion and Conclusions

There has been a significant growth of anti-piracy educational campaigns in the media. Prior literature also suggests that educational campaigns are effective in dissuading people from piracy activities [5,7,88]. However, the negative attitudes towards anti-piracy campaigns indicate that existing campaign messages may not be as effective as intended. Hence, it is important to investigate how to improve the perceived effectiveness of anti-piracy campaign messages. Based on persuasion research from several domains, this study is the first to explore the role of message framing, issue involvement, risk perception, and message evidence on the perceived effectiveness of anti-piracy campaign message.

While prior studies suggest that the effectiveness of a message may be influenced by the message frame [66], we found that the message framing itself does not have an impact on perceived effectiveness of an anti-piracy campaign message. However, the effect of message framing can be enhanced or diminished through the moderating effect of other factors. This finding suggests that while designing anti-piracy campaign messages, we should not focus only on framing of the message, since the framing itself is not effective at dissuading people from piracy activities. As our results indicate, if the message includes an appropriate combination of message framing and message evidence (i.e., anecdotal or statistical evidence), the perceived effectiveness of message can be increased. Specifically, the perceived effectiveness can be improved if a negatively framed message is complimented by statistical evidence supporting the message. Conversely, the perceived effectiveness of an anti-piracy campaign message can be improved if a positively frame message is supported by anecdotal evidence.

Our results also suggest that individual differences play an important role in improving the perceived effectiveness of anti-piracy campaign messages. We found that issue involvement moderates the effect of message framing on the perceived effectiveness of anti-piracy campaign messages. In the case of low-piracy-involvement participants, a positively framed message resulted in a higher message persuasiveness. However, high-involvement participants showed greater persuasiveness when negative frame is used in the message. In addition, we found evidence of a reversal in message-frame effectiveness, due to risk perception. The participants with high perceived risk towards piracy activities found a negatively framed message more effective. In contrast, a positively framed message produced greater persuasion among participants with low perceived piracy risk. This finding is consistent with previous research that individuals with high risk perception are more likely to adopt a systematic processing of a message, which requires more cognitive effort [45,72]. Thus, a negatively framed

message has a stronger impact on persuasion than a positively framed message, since negative information demands more cognitive resource requirements. On the other hand, when the perceived risk is low, individuals are likely to rely on a heuristic processing approach based on simple decision rules. In this case, a positively framed message produces greater persuasion than a negatively framed message.

5.1. Implications to Practice

Our results provide several practical implications for strategizing and designing anti-piracy educational campaign messages. The findings indicate the importance of audience profiles in targeted campaigns along with the content of message designed for each type of audience. To improve the effectiveness of anti-piracy educational campaigns, it is important to develop targeted campaigns that will appeal to audiences based on their piracy involvement and piracy-related perceived risk. In particular, the campaign message that focuses on benefits of appropriate downloading behavior, such as device protection from viruses and social responsibility to support artists, could be more effective for individuals who are less involved in piracy-related activities and perceive piracy to be a high risk. For an audience more involved with piracy but who perceive piracy to be a low-risk endeavor for themselves, negatively framed campaign messages focusing on caveats of piracy, such as harmful exposure to viruses and negative impact on the national economy, could improve message effectiveness. To further improve the effectiveness of anti-piracy educational campaigns, it is important to properly segment audience before designing and launching an anti-piracy campaign. The segmentation of the audience with varying digital piracy behavior is possible. Corte and Kenhore [89] identified four distinct segments of pirates (anti-pirate, conflicted pirate, cavalier pirate, and die-hard pirate) based on behavioral variables, such as attitude towards piracy, ethical evaluation of piracy, and guilt associated with piracy. These segments show varying behaviors in the form of pirating frequency, pirating intention, subjective norm, perceived harm, perceived illegality, self-efficacy, and perceived triviality. Digital pirates' behavior also varies on several dimensions including risk perception (subjective norm, perceived harm, perceived illegality, ethical evaluation of piracy) and issue involvement (pirating frequency, pirating intentions), and they are identifiable based on their piracy behavior.

This study also provides insights about the role of appropriate message content in anti-piracy campaign as evidence to support the message. Personalized stories about individuals experiencing harmful effects of piracy such as identity theft, legal action, negative social pressure, impact on personal devices, and data, etc., will work best when combined with a positively framed message that focuses on the benefits of supporting intellectual property rights. For messages using numbers and statistics to highlight the risks of illegal downloads are effective when combined with a negatively framed message. For instance, a message including information, "73% of pirated software contains viruses and malwares" may be more persuasive when combined with a negatively framed statement "don't expose yourself to malware". Similarly a message including information, "I was a victim of identity theft due to malware" may be more persuasive when combined with a positively framed statement "be safe from malware". This finding confirms that the negatively framed message is more effective when the message requires more cognitive reaction or systematic processing. However, anecdotal evidence requires a more heuristic processing; hence, the perceived effectiveness of anti-piracy campaign can be enhanced by presenting a positively framed message, if anecdotal evidence is utilized.

Lastly, major piracy campaign themes currently focusing on lawsuits, peer pressure, fear, or identity theft are not effective for highly involved consumers who perceive less risk on these dimensions (privacy risk, prosecution risk, and social risk). Downloaders show lack of ethical concern and are less concerned with the law [90]. Fear, guilt, and shame appeals are less likely to change behaviors in the high-involvement consumer segment. Instead, the campaign message would be more effective if it emphasizes a loss due to malfunctioning or poor performance of illegally downloaded files (i.e., product performance risk). For example, a message like "90% of music files available on popular P2P

networks are not the same as the quality of audio CDs. A pirated copy does not function as well as a legitimate product or as it was designed to function," can be a better way of persuading highly involved pirates.

Based on our findings, we propose the following recommendations for the campaign makers:

1. Develop targeted campaigns that appeal to audiences based on their piracy involvement and perceived risk:
    a. Use a positively framed message for individuals who are less involved in piracy-related activities and perceive themselves to be at a high piracy risk;
    b. Use a negatively framed message for individuals who are more involved in piracy-related activities and perceive themselves to be at a low piracy risk.
2. Develop appropriate message content in anti-piracy campaign:
    a. Use personalized stories about individuals experiencing harmful effects of piracy combined with a positively framed message that focuses on the benefits of supporting intellectual property rights;
    b. Use numbers and statistics combined with a negatively framed message that highlights the risks of illegal downloads.
3. Develop campaign messages that focus on a performance risk (e.g., malfunctioning or poor performance) for individuals who are highly involved in piracy activities and perceive themselves to be at a low risk.

5.2. Limitations and Future Research

Several limitations apply to our study and provide avenues for future research. First, the stimulus used in this study represented only two types of piracy risks (virus and lawsuit), and participants were exposed to only one campaign of interest. There are other types of risks involved in piracy such as quality of product, peer pressure, etc. Furthermore, an educational campaign can be designed to emphasize the benefits instead of the risks (e.g., rewards given for whistle blowing). Future research could include multiple campaigns across multiple types of piracy risks to produce more generalizable findings. Second, engaging undergraduate students is appropriate and convenient for testing hypotheses, but it limits the generalizability of our findings. As shown in Table 2, we had a relatively small percentage of participants (23 percent) who reported their age over 30. Future research could use a more representative sample from the general population so that piracy behavior for older adults could be represented.

Third, findings from this study should be interpreted with caution. For example, studies have shown that cultural difference (e.g., collectivism vs. individualism) has a significant impact on individuals' decision to engage in digital piracy. Therefore, our results may not be applicable in different cultures. In the future, it would be interesting to examine whether the results of this study can be validated in different contexts such as different cultures, national income (developed vs. developing), legal frameworks, IT infrastructure, and other factors. Fourth, this study uses perceived message persuasiveness as a dependent variable because establishing perceived message persuasiveness is a necessary condition for changing attitudes and behavioral intentions [15]. While prior studies (i.e., [16]) showed that perceived message effectiveness is a good proxy measure of attitude, behavioral intention, and actual behaviors, we can further investigate the relationships in the context of anti-piracy campaign. Lastly, individuals who engage in downloading/sharing of copyrighted content are likely to rationalize their behaviors. It would be interesting to examine how and to what extent different anti-piracy campaigns attenuate consumers' neutralization techniques, such as condemn the condemners, denial of injury, defense of necessity, denial of responsibility, or denial of the victim.

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Appendix A. Campaign Messages in the Experiment

Appendix A.1. Positive/Statistical

- If you engage in appropriate downloading behavior, you are SAFE from the lawsuit. According to the statistics issued by Institute for Policy Innovation (IFPI), more than 30,000 people in the United States have been sued for illegal music downloading since 2000.
- If you engage in appropriate downloading behavior, you are also PROTECTED from viruses and malwares. A recent survey by Microsoft shows that 73% of pirated software contains viruses and malwares that make your computer defenseless against any malicious threats.
- To find out more about the BENEFITS of supporting intellectual property rights, visit http://www.bsa.org/anti-piracy.

Appendix A.2. Negative/Statistical

- If you do not engage in appropriate downloading behavior, you are exposed to the DANGER of lawsuit. According to the statistics issued by Institute for Policy Innovation (IFPI), more than 30,000 people in the United States have been sued for illegal music downloading since 2000.
- If you do not engage in appropriate downloading behavior, you are also exposed to the DANGER of viruses and malwares. A recent survey by Microsoft shows that 73% of pirated software contains viruses and malwares that make your computer defenseless against any malicious threats.
- To find out more about the RISKS of violating intellectual property rights, visit http://www.bsa.org/anti-piracy.

Appendix A.3. Positive/Anecdotal

- If you engage in appropriate downloading behavior, you are SAFER from viruses and malwares. Here is the real story of James Morris from the New York Times.
- Morris downloaded pirated version of Adobe Photoshop, but he wasn't aware his computer was infected with viruses. After few months, he received a letter from collection agency about a past due credit card amount. He discovered that, due to the viruses, his personal information had been exposed to the Internet, and someone forged a credit card. He could have been PROTECTED if he committed to intellectual property rights. Twelve months later, he still answers calls from the collection agency.
- To find out more about the BENEFITS of supporting intellectual property rights, visit http://www.bsa.org/anti-piracy.

Appendix A.4. Negative/Anecdotal

- If you do not engage in appropriate downloading behavior, you are exposed to the DANGER of viruses and malwares. Here is the real story of James Morris from the New York Times.

- Morris downloaded pirated version of Adobe Photoshop, but he wasn't aware his computer was infected with viruses. After few months, he received a letter from collection agency about a past due credit card amount. He discovered that, due to the viruses, his personal information had been exposed to the Internet, and someone forged a credit card. Twelve months later, he still answers calls from the collection agency.
- To find out more about the RISKS of violating intellectual property rights, visit http://www.bsa.org/anti-piracy.

Appendix B. Survey Questionnaires

Appendix B.1. Perceived Message Effectiveness

1. This advertisement is persuasive
2. This advertisement is convincing
3. This advertisement is effective
4. This advertisement is credible

Appendix B.2. Risk Perception

1. Downloading illegal contents from the Internet is risky
2. Downloading illegal contents from the Internet is dangerous
3. Downloading illegal contents from the Internet causes me concern that I will lose control over the privacy of my information
4. Downloading illegal contents from the Internet worries me that I will be caught (punished) for the infringement of copyright law
5. As I download illegal contents from the Internet, I worry about whether the pirated contents will play as well as they are supposed to
6. Downloading illegal contents from the Internet may negatively affect the way others (e.g., friends, family, and colleagues) think of me
7. As I download illegal contents from the Internet, I worry that the pirated contents will cause damage to my computer due to viruses and malware

Appendix B.3. Manipulation Check (Positive vs. Negative)

1. This advertisement highlights positive consequences of supporting intellectual property rights
2. This advertisement highlights negative consequences of not supporting intellectual property rights

Appendix B.4. Manipulation Check (Statistical vs. Anecdotal)

1. This advertisement presents statistical information (evidences)
2. This advertisement presents stories

Appendix B.5. Issue Involvement

1. To me, downloading illegal contents from the Internet is:
2. Need—not needed
3. Useless—useful
4. Beneficial—not beneficial
5. Uninterested—interested
6. Appealing—not Appealing

Appendix C. Results of ANOVA

Table A1. Results of ANOVA.

Source	F-Value	Significance
Frame	0.017	0.896
Issue Involvement	3.443	0.064
Risk Perception	4.319	0.038
Evidence	1.198	0.274
Frame × Issue	17.958	0.000
Frame × Risk	26.076	0.000
Frame × Evidence	15.747	0.000
Risk × Issue	0.288	0.592
Risk × Evidence	0.109	0.741
Issue × Evidence	1.916	0.167
Frame × Risk × Issue	2.151	0.143
Frame × Risk × Evidence	0.208	0.649
Frame × Issue × Evidence	1.882	0.171
Risk × Issue × Evidence	2.721	0.100
Frame × Risk × Issue × Evidence	0.655	0.419

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