



Psychological Reactance to Anti-Piracy Messages explained by Gender and Attitudes

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Received: 9 December 2022 / Accepted: 8 December 2023
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Abstract

Digital piracy is costly to creative economies across the world. Studies indicate that anti-piracy messages can cause people to pirate more rather than less, suggesting the presence of psychological reactance. A gender gap in piracy behavior and attitudes towards piracy has been reported in the literature. By contrast, gender differences in message reactance and the moderating impact of attitudes have not been explored. This paper uses evolutionary psychology as a theoretical framework to examine whether messages based on real-world anti-piracy campaigns cause reactance and whether this effect is explained by gender and pre-existing attitudes. An experiment compares one prosocial and two threatening messages against a control group to analyze changes in piracy intention from past behavior for digital TV/film. Results indicate that the prosocial message has no significant effect, whereas the threatening messages have significantly opposing effects on men and women. One threatening message influences women to reduce their piracy intentions by over 50% and men to increase it by 18%. We find that gender effects are moderated by pre-existing attitudes, as men and women who report the most favorable attitudes towards piracy tend to demonstrate the most polarized changes in piracy intentions. The practical implications of the results are that men and women process threatening messages differently, therefore behavioral change messages should be carefully targeted to each gender. Explicitly, threatening messages may be effective on women, but may have the reverse effect on men with strong favorable attitudes towards the target behavior.

Keywords Digital piracy · Psychological reactance · Persuasive messages · Evolutionary psychology · Gender

Introduction

This paper studies the efficacy of anti-piracy messages on intended digital TV/film piracy behavior. Digital piracy refers to the accessing of copyrighted content from an unlicensed source, which includes BitTorrent, stream-rippers, cyberlockers and illegal streams of live events (Gov, 2021). A literature review by Danaher et al. (2017) suggests that 23 out of 26 studies find that piracy displaces legal sales

and causes economic harm. The Motion Picture Association suggests that piracy costs the US film industry \$6.1 billion (MPA, 2006), though Siwek (2006) suggests this estimate is modest. Thus, engagement in online piracy can be considered unethical, non-compliant and even criminal behavior that affects businesses directly (de Corte & Van Kenhove, 2017). Miocevic and Milakovic (2023) suggest that piracy behavior is driven by an adaptive appraisal of the threat posed by external legal pressures.

Anti-piracy advertising messages, funded by trade bodies and governments across the world, attempt to educate consumers about the harm of piracy to society and/or emphasize the risk of viruses and prosecution. However, despite the best efforts of rights holders, survey evidence from The Intellectual Property Office (IPO) suggests that copyright infringement is rising, with 25% of the UK population illegally accessing content (Gov, 2021). A report by infringement tracking company Muso suggests that 10.6% of all global piracy traffic came from the United States, and that

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over 50% of all worldwide piracy traffic was TV content (MUSO, 2022).

The literature on anti-piracy message efficacy is conflicting, with some studies advocating a prosocial approach (de Corte & Van Kenhove, 2017) and others suggesting that a threatening approach is more effective (Levin, Dato-on & Manolis, 2007). Furthermore, there is evidence that messages may cause an undesirable increase in piracy as a result of psychological reactance (Brehm & Brehm, 1981; Moon et al., 2015). However, little is known about the groups that are most likely to experience reactance. This paper aims to unpick the differences in message efficacy by examining gender as a key factor. Tjiptono and Arli (2016) indicated that men have more positive attitudes towards piracy and Milaković and Miocevic (2022) indicated that positive attitudes towards piracy lead to indignation against threatening copyright enforcement regimes. However, whether gender and attitudes predict reactance from threatening messaging is not known. This information is impactful because tailoring different piracy messages according to gender is easily implemented via targeted marketing.

This study contributes to the literature by proposing that a gender difference exists in reactance towards anti-piracy messages, which is moderated by pre-existing attitudes to piracy. Gender differences in reactance to threatening messages are discussed as an evolutionary adaptation to a perceived threat to freedom, with men tending to be more sensitive to threats from the outgroup than women. The messages used in the study were verbatim copies of three anti-piracy campaigns funded by industry/government/large institutions at the time of writing. Whilst the specific wording of the messages originates from UK campaigns, similar versions of the messages have been used in various countries around the world (e.g. France and the USA).

This study uses an experimental design to examine the change in TV/film piracy intentions among 962 adult participants compared with their past behavior. The experimental treatments measure the effects of exposure to (i) a prosocial, government-funded message *Get It Right* (GetItRight-fromaGenuineSite.com) and two threatening messages; (ii) *Crimestoppers* (CrimeStoppers-uk.org) a charity and film industry-funded message and; (iii) *Graduated Response*, a version of the three-strike approach implemented by governments and large institutions across the world. Each treatment is compared with a control group that receives no anti-piracy message.

The results indicate that the prosocial message has no significant effect, neither causing reactance nor influencing a decrease in piracy for either gender or attitude group. The threatening messages, in particular *Crimestoppers* which emphasizes the risk of computer viruses, had a polarizing effect on the group with favorable attitudes towards piracy. Men with favorable attitudes towards piracy reported an

increase, and women with favorable attitudes towards piracy reported a decrease in piracy intentions. The results support our evolutionary theoretical proposition that reactance to messages is adaptive, with men being more sensitive to threats to freedom by external forces than women.

The findings of the study have important practical implications. Behavioral change messages that aim to dissuade undesirable behaviors through the use of threats may only be effective on women. For men with favorable attitudes towards the behavior, threatening messages may actually serve to increase levels of the undesirable activity. For many behaviors, including piracy, it is likely that men with favorable attitudes towards undesirable behaviors are among the greatest perpetrators; hence threatening messages may have a net undesirable impact upon intentions. If messages cannot be accurately targeted to specific genders, the recommendation to policymakers is that threatening messages are to be avoided.

Anti-Piracy Messaging

Threatening vs Prosocial Messages

Empirical evidence as to the relative merits of legal vs. prosocial strategies is inconclusive (Jeong & Khouja, 2013; Jeong et al., 2012; Al-Rafee & Rouibah, 2010; Chiou et al., 2005; Chiu et al., 2008; Shultz & Saporito, 1996; Akman & Mishra, 2009; Jacobs et al., 2012). Sinha and Mandel (2008) found that for individuals with a high tolerance for risk, attempting to emphasize risks through messaging actually increased their likelihood of pirating. However, Levin et al. (2007) compared threatening messages to prosocial messages, finding that threatening messages were more effective in decreasing intentions to pirate.

Gender differences in piracy message efficacy have not been examined, though some studies have suggested evidence to imply the possibility. de Corte and Van Kenhove (2017) examined the effect of prosocial versus legal campaigns on intentions to pirate. They found that the prosocial campaign, which emphasized damage caused by piracy to the creatives, creative industries and economy, was effective in decreasing digital piracy intentions. The legal message, which emphasized the risk of legal penalties such as fines, was ineffective in lowering piracy intentions and actually served to increase them among a ‘cavalier’ group, who, according to the study, were more likely to be men. This finding suggests that for male pirates in particular, restrictive or fear-inducing messages may be counterproductive.

A gender bias was also reported by Al-Rafee and Rouibah (2010) who conducted an experiment in a Middle-Eastern country to look at the effect of three different messages on intentions to pirate. The messages were delivered in person

by a confederate in the context of a university classroom. The three treatment groups, which were compared to a control group with no message, were ‘law’, ‘awareness’ and ‘religion’. The most effective message on intentions not to pirate was ‘awareness’ (i.e. awareness of the damage that piracy causes), with ‘religion’ having a lesser but significant effect, and ‘law’ having no significant effect. Though they were not testing for gender differences, the authors found evidence of a gender bias in the results and recommended that gender needs to be explicitly examined in future research.

A recent paper by Grolleau and Meunier (2022) suggests that *all* current anti-piracy messages, be they prosocial or threatening, are likely to increase rather than decrease piracy because they contain too many arguments and normalize the behavior. They suggest that message creators need a “fresh perspective”. This paper aims to use an evolutionary framework to identify specific groups on which such messages may or may not be effective in deterring piracy intentions. At the time of writing, the creative industries were using three anti-piracy messages; two threatening—*Graduated Response* and *Crimestoppers* and one prosocial *Get it Right*. These messages are examined and tested against a control in a survey experiment.

Theoretical Framework

Wasioleski and Hayibor (2009) suggest that evolutionary psychology provides a number of axioms on which organizational ethics can be understood. The authors argue that human nature is based on evolution, therefore all decision-making theories must ultimately derive from an evolutionary perspective. For example, reciprocity, cooperation, competition and group selection are all evolutionary mechanisms that impact business ethics. Mirowska et al. (2021) contribute to the evolutionary business ethics research by considering gendered adaptations—finding that men have a greater tendency than women to endorse tyrannical leaders when controlling for moral attitudes. Schuh et al. (2014) used an evolutionary approach to explain why women displayed less power motivation than men with respect to leadership roles.

This paper contributes to business ethics theory by examining gender differences in psychological reactance from an evolutionary perspective. Psychological reactance is an effect that has been suggested to cause an increase in undesirable behavior in response to persuasive messages (Engs & Hanson, 1989; Feingold & Knapp, 1977; Hyland & Birrell, 1979; LaVoie et al., 2017; Ringold, 2002; Youn & Kim, 2019). Dowd (2002) suggests that reactance may have an adaptive quality in that it suggests a resistance to change one’s core worldview, which brings risk and uncertainty (Giosan, 2004).

Evolutionary psychology research suggests that there are variations between men’s and women’s evolution, due to adaptations to environmental and social factors. For example, women have adapted to be more cooperative and socially sensitive and men have adapted to be more competitive against those from an external group (Eagly, 1997). Reed (2006) argues that differences in prosocial attitudes are an evolutionary adaptation to a patriarchal social structure. Evidence in support of this argument has been found by Vugt et al. (2007), who show that men contribute more funds to a public good if intergroup competition exists. Charness and Rustichini (2011) found evidence to suggest that women were significantly more cooperative than men in a prisoner’s dilemma game when their behavior was observed by a member of their group. Sugiura et al. (2017) indicated that men’s social dominance orientation could be more effectively primed by an outgroup threat than women’s. This is due to men having evolved to be competitive against rivals, the authors theorize that men have more to gain by endorsing a social hierarchy of which they have the potential to climb. Women, on the other hand, have more to gain by challenging a social hierarchy, which they have less potential to climb, leading them to be more egalitarian. Each of these findings has direct implications for the ethical behavior of individuals in business settings where cooperation and competition are inherent components.

This paper contributes to the theoretical literature by postulating that the gender differences found in ethically cooperative contexts and sensitivity to outgroup threats found in evolutionary psychology studies represent a motivation for psychological reactance. That is, if a threatening message is delivered from an outside party, women will be more inclined to cooperate and men will be more inclined to resist its demand. Though no studies have explicitly compared genders in this respect, there is evidence to support the theory that there are gender differences in anti-piracy messaging efficacy. Sinha and Mandel (2008) indicated that prohibitive messages may increase piracy intentions in risk-seeking consumers—which contemporary literature suggests are more likely to be younger men (for a meta-analysis, see Byrnes et al., 1999). De Corte and Van Kenhove (2017) indicated that threatening messages may increase piracy intentions among “cavalier” pirates, who the authors reported tended to be younger males.

One of the assumptions of psychological reactance theory is that individuals believe that they have freedom and that it is being threatened by another party (Brehm & Brehm, 1981). Evidence suggests that there are gender differences in reactance, manifesting more intently in men than women (Archer & Berg, 1978; Woller et al., 2007). In a meta-analysis of the efficacy of threatening messages, Tannenbaum, et al. (2015) indicated that threatening messages were more effective in audiences with a high proportion of women. The

piracy literature indicates that women tend to have more pro-social attitudes, perceiving piracy as unfair to creatives/rightsholders (Chiang & Assane, 2002; Cronan & Al-Rafee, 2008; Hinduja, 2003; Hinduja & Higgins, 2011; Tjiptono & Arli, 2016). However, whether gendered prosocial attitudes influence and moderate prosocial message efficacy is not known.

Research indicates that there is a relationship between pre-existing attitudes and psychological reactance. In a study on facemask adherence during the COVID-19 pandemic, Taylor and Asmundson (2021) found that negative attitudes towards facemasks predicted reactance against a persuasive message. In the piracy domain, Milaković and Miocević (2022) compared the emotional reactions to tight (prosecution) and loose (no prosecution) copyright enforcement regimes, finding that participants with favorable attitudes towards piracy felt indignation in the tight, i.e. threatening, anti-piracy regime. However, the relationship between gender and pre-existing attitudes and their influence on psychological reactance has not previously been tested. Across three messages taken from rights-holders anti-piracy campaigns in 2021, this paper contributes to the literature an examination of the effect of gender and favorable attitudes towards piracy on the efficacy of prosocial versus threatening messages in intentions to pirate TV/films.

The Messages

Graduated Response (Threatening Message 1)

In 2009, the French government attempted to convey the importance of piracy by introducing the HADOPI law (Haute Autorité pour la Diffusion des Œuvres et la Protection des droits d'auteur sur Internet). This law was based on a graduated response or 'three strike' process, whereby infringers were given two written warnings and finally their internet access was terminated on a third infringement. Danaher et al. (2014) examined the effectiveness of this law by comparing iTunes sales data in France against five other countries with similar markets (UK, Italy, Spain, Germany and Belgium). They compared the sales trends before and after HADOPI was implemented and concluded that public awareness of the law induced a 22–25% iTunes sales increase in France. However, the law was ultimately revoked for being too heavy-handed. The three-strike, graduated response method is still implemented by large institutions such as Universities as a way to stop users from illegally downloading content from public Wi-Fi. The message used in this study is taken from a message sent to university students who have been caught, for the first time, infringing copyright. The message is highly threatening, suggesting

that a prison sentence is a possible outcome. The message contains the information; *“if a second copyright infringement is traced to you within 12 months, you will receive a final warning message. A third copyright infringement will result in your computer being blocked from the network. Subsequent copyright infringements may result in legal action”*.

Crimestoppers (Threatening Message 2)

In 2019, the UK creative industries promoted a different form of threatening message which sought to avoid any reputational risks caused by taking its consumers to court. The communication was delivered by crime reduction charity Crimestoppers (crimestoppers-uk.org) and funded by film industry trade body BASE (British Association of Screen Entertainment). The campaign focused on the individual's risk of computer viruses, identity fraud, money/data theft and hacking, using precise numbers of cases reported to legitimize their claims.

According to Sheehan et al. (2012), the Crimestoppers campaign has an empirical basis. The authors conducted a study in the US on the efficacy of anti-piracy advertising messages on college students to decrease illegal consumption. A 'risk of viruses' campaign, influenced a significant reduction in students' piracy intentions. The research indicated that messages that emphasize the risk of viruses, such as the Crimestoppers communication, may influence stated intentions to decrease piracy behaviors. The message used in this study was taken verbatim from the Crimestoppers webpage. The message starts by saying; *“Did you know... streaming pirated films, TV programmes and sport is a crime. 3.395 million illegal streamers have been infected with viruses this year...”*.

Both *Graduated Response* and *Crimestoppers* are threatening and freedom-limiting, suggesting that some participants may experience psychological reactance. However, *Graduated Response* directly threatens the reader whereas *Crimestoppers* suggests that the risks come from elsewhere—perhaps from pirates themselves. The *Graduated Response* message targets the perpetrator individuals, claiming that they have already been caught, and *Crimestoppers* is a broader threat—using data on virus attacks on other pirates to persuade the audience that piracy is not in their interests.

The two messages are tested against a control for psychological reactance. Though mixed, there are findings to suggest that threatening messages may be more effective on women than men (de Corte & Van Kenhove, 2017; Tannenbaum, et al., 2015) and that favorable attitudes towards piracy influence emotional responses to messages (Grolleau & Meunier, 2022). Given the evolutionary psychology perspective and gendered adaptation theory, the message efficacy is tested with the following two hypotheses;

Hypothesis 1 Men will experience more psychological reactance than women, increasing their piracy intentions after being exposed to the (a) Crimestoppers and (b) Graduated Response messages.

Hypothesis 2 Individuals with favorable attitudes towards piracy will experience more psychological reactance than individuals with less favorable attitudes towards piracy, increasing their piracy intentions after being exposed to the (a) Crimestoppers and (b) Graduated Response messages.

Get it Right (Prosocial Message)

To repair some of the reputational damage to the industry caused by heavy-handed anti-piracy campaigns (Bottomley, 2015) and to appeal to consumers' sense of fairness, in 2015 the music and film industries formed prosocial/awareness body Creative Content UK (Gov.uk, 2017). The message of their campaign "Get It Right from a Genuine Site" signposts consumers away from piracy sites and towards legal platforms such as Spotify or Netflix. Their marketing campaign features endorsements from relevant, independent creatives to convince consumers that piracy affects individuals as well as the wider economy. The UK government added £2 million of funding towards the campaign in 2018 (BPI, 2018). The content of the campaign stresses the value of music and film, both to the individual and to the economy. Jeong et al. (2012) examined the influence of different risks on piracy behaviors and found that 'moral awareness risks' were the most significant, suggesting that educational campaigns would be more effective than enforcement campaigns. The wording of the message used in this study is taken verbatim from the Get it Right website (www.getitrightfromagenuinesite.org). It starts by saying "*Creative ideas are unique. They need encouragement, dedication and protection. Creators must be rewarded for their artistic, intellectual and financial investments. Intellectual property industries, like film, music, television and computer software, are central to the health and stability of the UK economy*". The message has no threat, it emphasizes the importance of the creative industries, then goes on to signpost the reader to where they can find a list of safe, legitimate sites. The implication is that people can support creativity by purchasing content from a genuine site, making the message prosocial and altruistic in nature. The campaign is supported by evidence by Hashim et al. (2018) who suggested that messages that emphasize moral obligations will be effective in changing piracy intentions.

Contemporary evidence suggests that prosocial messages may have different effects on men and women. Jackson and Jaouen (1989) examined whether a message designed to appeal to the conscience would be effective on prospective jurors' tax beliefs. Their results indicated that appeals tended to have more influence on women than men. Chang and Lee

(2011) examined gender differences in message efficacy upon charity giving. They found that an altruistic message had a more positive influence on attitudes and intentions among women compared with men. By contrast, an egoistic appeal had a more positive influence on men's attitudes and intentions. This finding is in line with previous research on charity messaging (e.g. Brunel & Nelson, 2000; Nelson et al., 2006), which suggests that women are more likely to be induced to donate than men. Given such an evolutionary psychological perspective and gendered adaptation framework, these arguments suggest that a prosocial message, such as *Get it Right* may be more effective on women than men. Furthermore, as it is not in any way threatening, it should induce minimal reactance. The message is prosocial in tone, therefore the hypothesis that it will be more effective on individuals with more prosocial attitudes, i.e. with less favorable attitudes towards piracy, is tested.

Hypothesis 3 The prosocial *Get it Right* message will (a) not induce significant psychological reactance, (b) be more effective in decreasing piracy intentions in women than men, and; (c) be more effective in decreasing piracy intentions in individuals with less favorable attitudes towards piracy.

Method

Participants

Participants were recruited through the digital survey company Prolific (www.prolific.co) in March 2021. The questionnaire was listed as "Online Entertainment Consumption Study", with an explanation that the research concerned film and TV online consumption. The survey took 12 min and participants were paid £1 (equivalent to £5 per hour) for their participation. Piracy or equivalent terms were not referenced in the invitation letter or introduction. Participants were required to meet the criteria of being aged 18 or over and residing in the UK. An attention check question was placed in the survey and participants who failed this were deleted from the sample ($n = 9$). Likewise, participants who identified their gender as non-binary ($n = 12$) or reported "prefer not to say" ($n = 3$) were also deleted from the analysis, as binary gender was a key variable in the study. This created a final sample of $N = 962$. The demographic composition of the sample can be seen in Table 1. The sample roughly reflects the adult internet population, although it contains disproportionately more women. It was decided to have more women than men in the sample as the literature (e.g. Sims et al., 1996) indicates that men typically pirate significantly more than women, suggesting that the pirating portion of the male group would be larger.

Table 1 Demographic composition of the sample

Characteristics	<i>N</i>	%
Gender		
Women	609	63
Men	353	37
Age		
Gen Z 18–25	222	23
Millennials 26–41	428	44
X 42–57	229	24
Boomer 58–72	83	9
Employment		
Full-time education	124	13
Employed	642	67
Retired	48	5
Unemployed	116	12
None of the above	32	3
Annual household income		
Less than £20 k	211	22
£20–£50 k	489	51
Over £60 k	199	21
Prefer not to say	63	7

Measures

The survey asked demographic questions and then gave definitions and examples of illegal ways to access content. Participants were then asked to report their past behavior in the question, “In a typical week, how often do you illegally access TV/film”, creating a *past behavior* variable. Following this, three attitude questions were asked on a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). The questions were;

1. Digital piracy does no significant harm to the individual creative
2. Digital piracy does no harm to society
3. Digital piracy should be legal

These questions were based on the themes of the pro-social message *Get it Right*, which aims to challenge attitudes that piracy is harmless. The sample was then randomly divided into groups that were exposed to a message, or just a click-through page for the control group. The participants then answered an *intentions* question; “Going forward, in a typical week, how often will you illegally access TV/film”. This answer, minus the past behavior answer, gave the dependent variable of *change in intended behavior*.

$$\text{piracy intentions next week} - \text{past piracy behavior} = \text{change in intended behavior}$$

Whilst intentions are not a perfect measure, Taylor (2012) finds that intentions are a good predictor of piracy behavior and have a significant predictive influence.

Results

The descriptive statistics indicated that 39.1% of men and 35.8% of women reported pirating TV/films at least once in the past week, which is not a statistically significant difference (χ^2 test p -value = 0.24). However, when comparing the frequency of consumption, women download/stream infringing content 4.5 times a week, compared to 6.4 for men. This difference is statistically significant (χ^2 p -value = 0.01). Figure 1 illustrates that younger males typically pirate the most

Fig. 1 Mean frequency of illegal content access in the past week by age and gender

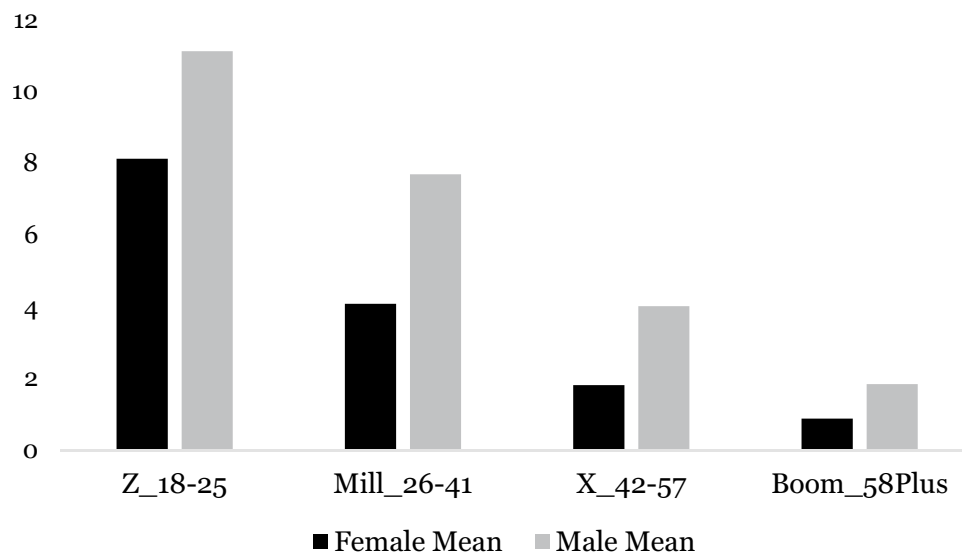


Table 2 Gender differences in attitudes towards piracy

Digital piracy		Does no significant harm to the individual/s who create the content	Does no harm to society	Should be legal
Female	Mean	2.08	2.30	2.25
	SD	0.99	1.070	1.10
Male	Mean	2.34	2.77	2.38
	SD	1.10	1.171	1.167
Gender difference	Wilcoxon rank-sum <i>p-value</i>	0.00	0.00	0.16

(1 = strongly disagree, 5 = strongly agree)

frequently, with Generation Z males accessing content on average 11.3 times a week.

A Wilcoxon rank-sum analysis was conducted to test the gender difference in the three attitude questions (see Table 2). We find a statistically significant difference by gender in response to the statements “does no harm to the individual” and “does no harm to society”, which indicates that men typically indicate higher favorable attitudes towards piracy compared with women. A non-parametric chi-square test was run to test the difference between men and women who strongly or somewhat agreed with the attitude statements. 15% of men strongly/somewhat agree that piracy does no harm to individual creatives compared with 10% of women ($\chi^2 p\text{-value} = 0.02$). 29% of men strongly/somewhat

agree that piracy *does no harm to society*, compared to 17% of women ($\chi^2 p\text{-value} > 0.01$). 17% of men strongly/somewhat agreed that piracy *should be legal* compared to 15% of women ($\chi^2 p\text{-value} = 0.54$).

A hierarchical linear regression with three models was conducted (Table 3) to examine the influence of gender and the three attitude questions on past piracy behavior. The analysis indicated that gender was a strong predictor of piracy, with men pirating more than women (see *model 1*). However, the gender difference lost statistical significance when the attitude questions were included in the model (see *model 2*) indicating that attitudes towards piracy explained the effect of gender on past piracy behavior to most degree. Responses to the statements, “digital piracy

Table 3 Hierarchical regression, gender, and attitude on piracy past behavior

Model	(1)	(2)	(3)
Variables			
Male	1.931** (0.764)	0.936 (0.760)	1.490 (2.071)
... no significant harm to the individual creative		0.296 (0.438)	1.150** (0.572)
... no harm to society		1.604*** (0.453)	1.451*** (0.537)
... should be legal		1.306*** (0.355)	0.782* (0.409)
Male x no harm to the individual creative			-1.985** (0.898)
Male x no harm to society			0.449 (0.958)
Male x no should be legal			1.165 (0.768)
Constant	4.467*** (0.409)	-2.780*** (0.897)	-3.025*** (0.951)
Observations	962	962	962
R-squared	0.007	0.083	0.090

The attitudes answers were binarized into High and Low when using interaction according to being above or below the median response

OLS regression with robust standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

does no harm to society” and, “digital piracy should be legal” (p -value < 0.01) were found to be significant predictors of piracy past behavior. The estimated coefficients were positive, indicating that agreement with the attitude question correlated with an increased likelihood of piracy. There was a significant interaction effect between the statement “digital piracy does no harm to the individual creative” and gender (male = 1), with a negative coefficient. This suggests that men who had more agreeable attitudes to piracy pirated less than women who had more agreeable attitudes to piracy.

A principal component analysis was conducted to create a latent variable called *favorable attitudes* from the three attitude questions; “digital piracy does no significant harm to the individual/s who create the content” (factor loading = 0.87), “digital piracy does no significant harm to society” (factor loading = 0.87) and “digital piracy should be legal” (factor loading = 0.76), with a total Cronbach’s alpha of 0.759. This *favorable attitudes* variable was used in a moderation analysis which examined whether gender differences in piracy behavior could be explained by favorable attitudes towards piracy. The analysis indicated that the confidence intervals did not include zero (0.543–1.466), so there was a significant moderation effect, with a standard error estimate of 0.236 (total effect size = 1.905, direct effect = 0.946, indirect effect = 0.959).

Message Efficacy

Non-parametric tests were conducted to examine the changes in piracy intentions as a result of the intervention (message exposure). The difference between the mean of past piracy behavior and piracy intentions after reading a persuasive message was taken for each experimental message group and split by gender. Figure 2 indicates the percentage change between the two means. The threatening messages influenced women to pirate less and men to pirate more. *Graduated Response* influenced women to decrease their piracy behavior by 52% and men to increase it by 18% (Wilcoxon

rank-sum p -value = 0.01). *Crimestoppers* influenced women to decrease their piracy by 23% and men to increase it by 31% (p -value = 0.01). There was very little gender difference in the *Get it Right* condition, with men increasing their intentions by 16% and women by 15% (p -value = 0.67).

Parametric tests were conducted to further explore the data. A linear regression with robust standard errors was run to test the effect of the messages on change in intended piracy behavior when compared to a control group. Table 4 models 1 and 2 indicate that the messages were not significant until gender (male = 1) was controlled for: statistically significant negative coefficients were estimated for both the *Graduated Response* (p -value < 0.01) and *Crimestoppers* (p -value < 0.05) variables. Interaction effects between gender and these groups were significant with positive coefficients (see model 3). This indicates that women intended to *decrease* their piracy and men intended to *increase* their piracy after message exposure in these groups.

An analysis was run to examine how favorable attitudes towards piracy influenced the results. For this, the continuous favorable attitudes latent variable was converted into a dummy variable, using the median value to split the results. This dummy variable was labeled as “favorable attitudes” = 1 (“less favorable attitudes” = 0). Model 3 indicates that interaction effects between *Crimestoppers/Get it Right* and favorable attitudes were nonsignificant for women. However, a negative and statistically significant coefficient was estimated for the interaction effect between favorable attitudes and *Graduated Response* (p -value < 0.01). This result suggests that women with more favorable attitudes towards piracy tend to be more likely to decrease their piracy behavior after reading the *Graduated Response* message compared with those who report less favorable attitudes towards piracy.

Model 3 indicates that the three-way interaction terms between male and favorable attitudes towards piracy were estimated to be statistically significant for both the *Crimestoppers* and *Graduated Response* treatments. The estimated coefficients were positive, indicating that men

Fig. 2 Percentage change of piracy intentions from past behavior after message exposure, split by gender

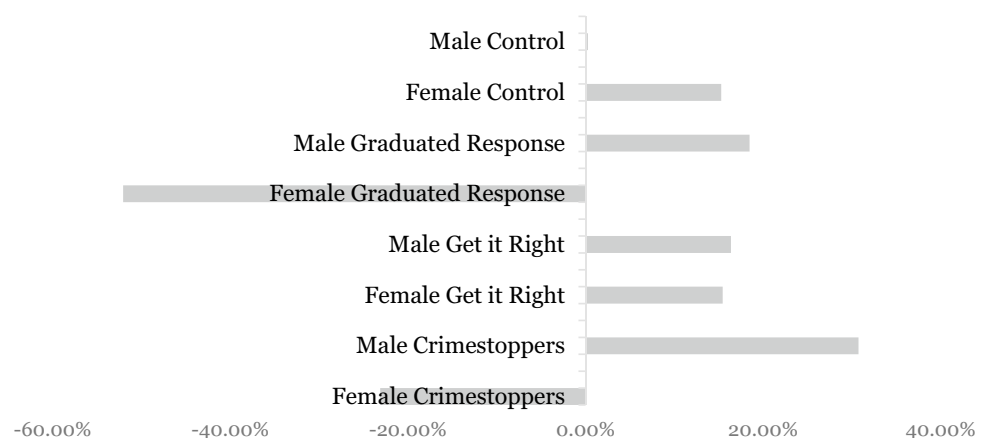


Table 4 Linear regression testing change in intentions after message exposure compared to the control group. Two-way interactions with gender and three-way interactions with gender and favorable attitudes towards piracy included

Model	1	2	3
Crimestoppers	- 0.267 (0.708)	- 1.875** (0.856)	- 0.626 (0.586)
Get it right	0.348 (0.589)	- 0.195 (0.823)	0.192 (1.108)
Graduated response	- 1.019* (0.575)	- 2.268*** (0.799)	- 0.291 (0.722)
Male		- 0.898 (0.704)	0.544 (1.157)
Crimestoppers × Male		4.402*** (1.505)	0.582 (1.769)
Get it right × Male		1.408 (1.126)	- 0.357 (1.665)
Graduated response × Male		3.474*** (1.068)	0.965 (1.399)
Favorable attitudes			2.029* (1.103)
Crimestoppers × Favorable attitudes			- 2.898 (1.991)
Get it Right × Favorable attitudes			- 0.835 (1.633)
Graduated response × Favorable attitudes			- 4.558*** (1.724)
Male × Favorable attitudes			- 2.850* (1.596)
Crimestoppers × Male × Favorable attitudes			7.558** (3.193)
Get it right × Male × Favorable attitudes			2.917 (2.269)
Graduated response × Male × Favorable attitudes			5.361** (2.318)
Constant	0.530 (0.366)	0.887* (0.520)	- 0.013 (0.482)
Observations	962	962	962
R-squared	0.005	0.025	0.041

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

with favorable attitudes towards piracy exposed to one of these risk messages were more likely to increase their piracy consumption than women and those in the control group.

Figure 3 illustrates the three-way interaction by showing the difference in coefficients compared to the control group when the data is split by gender and (less) favorable attitudes towards piracy. The figure indicates that the messages were typically similarly effective for men and women with less favorable attitudes towards piracy, possibly because their piracy was low to begin with. However, men and women with favorable attitudes towards piracy tended to offer more polarized responses, particularly in response to the Crimestoppers message. The message causes psychological

reactance in men with favorable attitudes towards piracy but has a positive effect on women with favorable attitudes towards piracy.

The linear regression tested the intensive margin (by how much it changed). However, additional analysis is needed to test the extensive margin (whether it changed and in what direction) to see how effective the messages were at influencing a change in intended behavior. Therefore, a multinomial logistic regression was conducted, with the dependent variable categorized into three levels; - 1 = decrease in intentions, 0 = no change, and 1 = increase in intentions, with 0 as the reference category (see Table 5, which indicates 3 models). In model 1, the aggregate effect of the messages

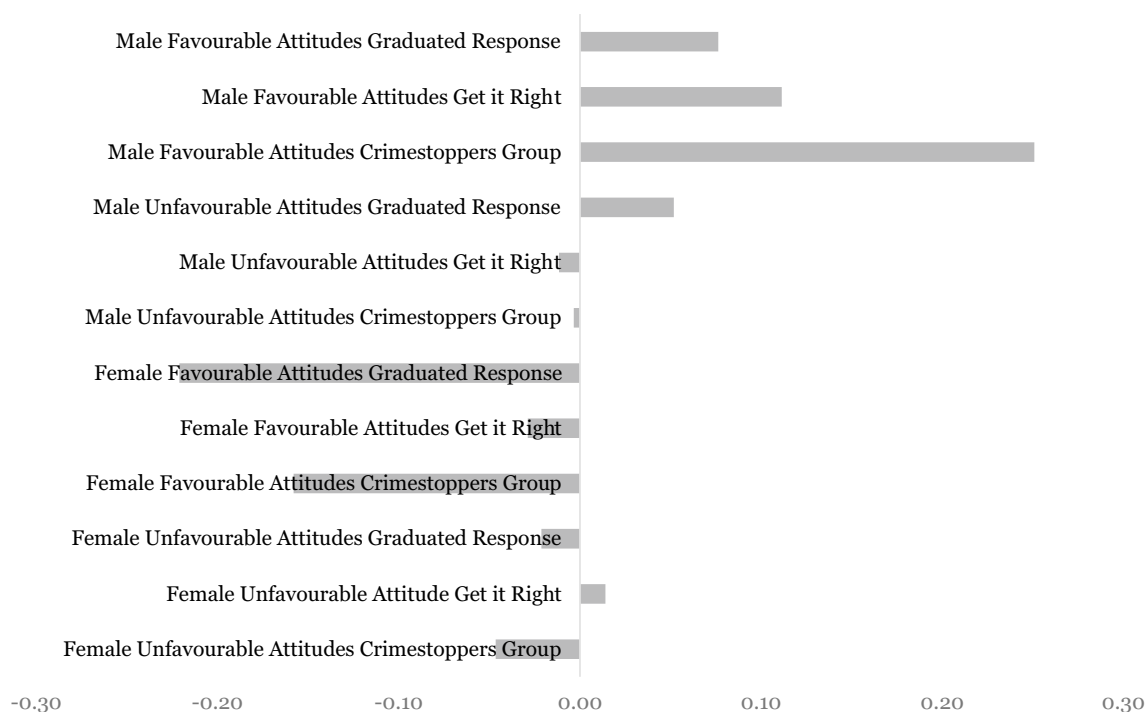


Fig. 3 Directions of coefficients against the control group after message exposure, of change in piracy intentions, by gender and favorable vs unfavorable attitudes towards piracy

on change in piracy behavior is null. Model 2 indicates that women tend to be significantly more likely to decrease their piracy intentions after reading the Crimestoppers message compared with the tendency to increase or not change intended piracy behavior. For men, both the Crimestoppers and Graduated Response messages had reactive effects with intended change in piracy behavior having a higher tendency to increase than to decrease or not change (significant coefficients of the message and gender interaction effect in column 4). This result was mainly driven by men with more favorable attitudes towards piracy. Model 3 indicates a significant three-way interaction effect on increased piracy intentions between gender, favorable attitudes towards piracy and Get it Right (p -value < 0.10) and Graduated Response (p -value < 0.05). This indicates that men in those message groups (especially Graduated Response) with favorable attitudes towards piracy were more likely to increase their piracy intentions than the control group.

Discussion

An experiment was conducted to test whether threatening and prosocial TV/film anti-piracy messages used by charities, trade bodies, governments, and large institutions, cause psychological reactance. Using evolutionary psychology

to inform our theoretical framework, gender and attitudes toward piracy were included as moderators. The results indicated that both men and women typically pirate TV/films each week and that men tend to do so significantly more frequently than women. Men also tend to have more favorable attitudes towards piracy than women, with almost a third believing that it does no harm to society.

A linear regression tested the efficacy of the experimental groups; two threatening messages; Crimestoppers and Graduated Response, and a prosocial message; Get it Right, against a control group. The prosocial Get it Right message used in this study, was not found to be influential for either gender or attitude level. This result is contradictory to that of Al-Rafee and Rouibah (2010) who suggested that an educational message would be effective in deterring piracy. Our findings indicate that none of the sub-components of hypothesis 3 (the prosocial Get it Right message) are supported. Jeong et al. (2020) suggested that whether a prosocial message is framed positively or negatively will have different efficacies depending on the levels of involvement of the reader, however, this analysis did not find that splitting the sample by attitude level as a measure of involvement improved the message's influence.

The results indicated that the threatening messages, especially Graduated Response, tended to associate with a statistically significant change in piracy intentions when controlling for gender. With respect to the threat of viruses

Table 5 Multinomial logistic regression on message effect on change in intentions, with two- and three-way interactions between messages and gender and favorable attitudes towards piracy variables

Model	1		2		3	
	1	2	3	4	5	6
Change in intentions	Decrease	Increase	Decrease	Increase	Decrease	Increase
Crimestoppers	0.364 (0.262)	– 0.236 (0.247)	0.558* (0.336)	– 0.863** (0.354)	0.192 (0.461)	– 1.453** (0.681)
Get it Right	0.020 (0.279)	0.110 (0.231)	0.173 (0.364)	0.109 (0.290)	0.288 (0.469)	0.015 (0.472)
Graduated response	0.203 (0.270)	– 0.171 (0.245)	0.497 (0.342)	– 0.521 (0.327)	– 0.049 (0.492)	– 0.260 (0.492)
Male			0.298 (0.400)	– 0.103 (0.346)	– 0.049 (0.714)	0.827 (0.538)
Crimestoppers × Male			– 0.521 (0.551)	1.357*** (0.513)	0.111 (0.890)	0.371 (0.959)
Get it right × Male			– 0.365 (0.573)	– 0.003 (0.481)	– 0.462 (0.988)	– 1.576 (0.968)
Graduated Response × Male			– 0.902 (0.590)	0.838* (0.500)	– 1.471 (1.287)	– 0.449 (0.783)
Favorable Attitudes					0.232 (0.546)	1.125** (0.443)
Crimestoppers × Fav Att					0.837 (0.684)	0.991 (0.815)
Get it right × Fav Att					– 0.288 (0.749)	0.176 (0.611)
Graduated response × Fav Att					1.047 (0.702)	– 0.382 (0.670)
Male × Fav Att					0.374 (0.891)	– 1.701** (0.710)
Crimestoppers × Male × Fav Att					– 1.053 (1.174)	1.532 (1.164)
Get it right × Male × Fav Att					0.326 (1.259)	2.143* (1.146)
Grad resp × Male x Fav Att					0.667 (1.486)	2.180** (1.035)
Constant	– 1.674*** (0.199)	– 1.247*** (0.167)	– 1.802*** (0.270)	– 1.207*** (0.212)	– 1.897*** (0.358)	– 1.792*** (0.342)
Observations	962	962	962	962	962	962

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

and hacking messages—Crimestoppers, women tended to express a decrease in piracy intentions, while men tended to express an increase. A similar polarization could be seen in the direct threat of the prosecution group—Graduated Response. These results show support for the findings by de Corte and Van Kenhove (2017) who found that “cavalier” pirates, who were more likely to be men, were influenced to increase their piracy intentions after being exposed to a threatening message. The data also supports the findings by Sheehan et al. (2012), who found that messages that threaten

a risk of computer viruses are effective in reducing piracy intentions. However, our study could only support this finding in the case of women. Similarly, Danaher et al. (2014) suggested that a Graduated Response message is effective in reducing piracy, but again, our study only found that to be true of women. The results indicate support for the sub-components of hypothesis 1 (men will experience more psychological reactance than women, increasing their piracy intentions after being exposed to the (a) Crimestoppers and (b) Graduated Response messages).

Further analysis indicated significant interactions between gender and attitudes towards piracy. Men and women with less favorable attitudes towards piracy tend to respond similarly to the messages compared with the control. However, men with more favorable attitudes towards piracy tended to report a significant increase in their piracy intentions, and women with more favorable attitudes towards piracy reported a significant decrease, especially in response to threatening messages. This suggests that men and women with favorable attitudes towards piracy respond oppositely to threatening messages and that men are more likely to experience reactance. This evidence supports hypothesis 2 (individuals with favorable attitudes towards piracy will experience more psychological reactance than individuals with less favorable attitudes towards piracy, increasing their piracy intentions after being exposed to the (a) Crimestoppers and (b) Graduated Response messages), but only in the case of men.

A possible explanation for the reactive response by men with favorable attitudes towards piracy is the way they tend to interpret information in the messages. Lord and Lepper (1979) indicated that informative messages can increase already polarized beliefs. They theorized that people will select evidence that confirms their beliefs, whilst disregarding information that is incongruous in an effect called *confirmation bias*. In a qualitative study, Brown and Knox (2015) indicated that confirmation bias may lead to polarized piracy beliefs, as there is so much contradictory information on this issue available in the public domain. For example, subcultures such as BitTorrent giant The Pirate Bay suggest that the establishment is trying to “fool” the public into thinking that there is anything dangerous or wrong with copyright infringement (Beyer & McKelvey, 2015). As piracy is cheaper and sometimes faster and more accessible than legal alternatives, this is a potentially comforting and convenient message. Peters (2022) suggests that confirmation bias has an adaptive purpose, as it helps individuals convince their group about the correctness of their opinions.

Individuals with more favorable attitudes towards piracy are likely to have greater experience with moral reasoning to justify the behavior, and will be well armed with rationalizations. This argument is supported by the findings of Hashim et al. (2018) who suggested that attitudes mediate rationalizing moral obligations. Schwind and Buder (2012) suggest that prior knowledge of a subject may exacerbate evaluation bias (a related mechanism to confirmation bias, concerned only with how information is evaluated, rather than selected). Therefore, the more information a message contains, the more the potential points of disagreement. Zhou and Shen (2022) indicated that attitude certainty exacerbates confirmation bias, so that the more certain a person is in their attitudes, the more biased their interpretation of a message will tend to be. In this study, the less directly

threatening and more informative *Crimestoppers* message tended to cause more reactance in men with favorable attitudes towards piracy than the highly and directly threatening message *Graduated Response*. This outcome may occur because some of the latter group found the message sufficiently threatening that they resultantly expressed reduced piracy intentions. Another explanation might be that the use of statistical information in the *Crimestoppers* message exacerbated confirmation bias; in other words, there was more rope with which to be hung. More research is needed to explore this theory.

Although *confirmation bias* has been argued to be “ubiquitous” (Nickerson, 1998: p. 208), our study finds evidence to imply that men are more likely than women to disregard non-confirmatory information (Muhl et al., 2020; Traut-Matthaus et al., 2011; Liu et al., 2017). This result may explain why women with favorable attitudes towards piracy reacted less negatively towards the inconvenient, incongruous messages than men. Chung and Monroe (1998) suggest that men are more concerned with preserving their self-esteem, resulting in more biased message interpretations.

Our results support the findings by d’Astous et al. (2005) who found that a prosocial message was not effective in changing piracy intentions. One explanation may be that messages used in academic studies, this one included, are not typically visual or personal, i.e. they do not have any images, videos or case studies by the artists impacted by piracy, as would be the case in a well-funded advertising campaign. Research suggests that campaigns that humanize victims by drawing a narrative, rather than quoting statistics can be highly effective. For example, the Swedish Red Cross received a 55-fold increase in donations when an effecting image of a small dead refugee child washed up on a beach was printed in the worldwide press, which triggered an emotional response in people and motivated them to donate (Slovic et al., 2017). However, more research is needed to discover whether a more emotionally affecting prosocial message from a credible source would be more effective in changing piracy intentions.

There are limitations of the present study which need to be considered. Firstly, the sample was taken from an internet survey company (Prolific) which may not be fully representative of the internet population. However, the sample contained a relatively high proportion of self-confessed pirates (over a third) which, given a limited sample size, conveniently enabled us to examine differences in piracy behavior before and after the intervention. Furthermore, a wide variation of age, income, and occupation was represented in the sample. The three messages used in the experiment are taken from real-world communications to render the research more applicable to policy-making. However, this decision does pose a flaw in the experimental design in that the differences between the exact wording used in the communications (e.g.

the terms fused to describe piracy) cannot be exactly compared. To reduce the variation between the communications, a decision was taken not to provide accompanying pictures. However, this in turn would have presumably reduced the persuasive impact of the messages.

The messages used in this study were delivered as part of a university-funded questionnaire rather than from a victim of piracy such as an artist in the case of the prosocial message, or an authoritative organization such as law enforcement in the case of the threatening messages. Cialdini (2001) posits that there are six main methods of persuasion, with the likeability and authority of the source being the key factors in the persuasive power of a message. Future research could test whether messages delivered by more likable or authoritative sources are more effective, and to see if gender and attitude reactive effects still occur.

Conclusion

The TV/film industries are profitable to the global economy and protecting their intellectual property is important to innovation and growth. Notwithstanding, evidence from this study suggests that a third of the population admits to pirating TV/films and a fifth of the population believes that piracy does no harm to society. This indicates that a message that challenges attitudes could be an important intervention in combatting piracy. Our results show that pro-social, educational messages tend to be an ineffective intervention in reducing piracy intentions. This may be caused by the survey delivery method of the message in this study and more research is needed to test the effect of more engaging educational messages on piracy attitudes and behaviors.

This study suggests that the group who pirate the most frequently (men with favorable attitudes towards piracy) is also the group who react the most negatively to threatening messages, suggesting the presence of psychological reactance. The message that caused the most reactance (Crimestoppers) in this group was the most detailed in terms of technical risks. The authors speculate that the level of detail induces reactance—as there is more information to disagree with—priming confirmation bias. More research is needed to test nuances in risk messages and to compare whether the level of threat or the level of detail influences reactance in men with favorable attitudes towards piracy. The results of this research indicate that by targeting threatening anti-piracy messages, particularly the Graduated Response message, carefully at women, they may be effective in decreasing overall piracy.

Funding University of Portsmouth.

Declarations

Conflict of interest There are no potential conflicts of interest.

Consent for Publication This research was reviewed and approved by the Business of Law Department of the University of Portsmouth Ethics Committee in March 2021.

Informed Consent The participants were asked for informed consent before the start of the study. All the collected data was anonymised from the outset, hence there was no issues regarding handling of the confidentiality data.

Research Involving Human and Animal Right Participants Ii. This research involves human participants. The experimental procedure and payment protocol involved transparency between researchers and participants, no deception, fair pay and respectful treatment of participants and researchers. This study was carried out in adherence to the commitments set out in the Concordat to Support Research Integrity the RCUK Policy and Guidelines on governance of Good search Conduct.

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