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# The rising tide of piracy: the influence of social roles, risks and norms on illegal consumption

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Digital piracy, including unauthorized access to entertainment content, continues to rise, yet traditional deterrence messages often fail. Research shows that men tend to pirate more than women, but it remains unclear whether gendered social factors contribute to this disparity. Informed by Social Role Theory, we examine social deterrents to piracy by gender, focusing on perceived social risk and social norms. First, we measure illegal content consumption by gender, controlling for differences in legal demand, and evaluate the role of perceived social risk. Results show that across both music and live sports, men accessed nearly twice the proportion of their total content illegally compared to women. Perceived social risks had no effect on music piracy for either gender, but was associated with reduced piracy among men but not women in the live sports context, possibly due to the male-oriented group dynamics of sports culture. Second, we test whether a normative intervention can deter piracy intentions. Using government data to correct participants' misperceptions of the social norm (false consensus), a controlled experiment measured changes in intentions pre to post intervention. The corrected social norm did not reduce intentions to engage in piracy for those who had overestimated its prevalence but, among men who underestimated others' piracy, it backfired, increasing their piracy intentions. These findings suggest that for private, self serving behaviors, norm messaging may justify rather than deter offending. Instead, it may be more effective for interventions to emphasize piracy's reputational cost, reframing it as low-status and socially discrediting.

## KEYWORDS

digital piracy, gender, false consensus, normative interventions, anti-piracy messaging, live sport piracy, music piracy, social role theory

## Introduction

During periods of economic strain, consumers often reduce discretionary spending, with digital subscriptions among the first to be canceled (Fitzgerald, 2023; Bansal, 2022). In this context, digital piracy, unauthorized access to copyrighted content, may become a tempting alternative. Recent data indicate a rise in piracy rates from 25% in 2022 to 32% in 2023, with men disproportionately engaging in the behavior (Gov, 2023; Cox and Collins, 2014; Whitman et al., 2024). Live sports and music, two domains with both cultural relevance and economic weight, are particularly affected, with illegal consumption now growing faster than legitimate market expansion in both industries (Kumar and Bhalla, 2021; The Policy Circle, 2020; Gov, 2023).

Efforts to deter digital piracy through public messaging, especially those emphasizing legal threats, often have little effect (Grolleau and Meunier, 2022). In some cases, particularly among men, such approaches may even backfire, increasing the very behavior

they aim to reduce (Whitman et al., 2024). In contrast, social influences such as perceived social risk and perceived social norms offer a less confrontational form of deterrence and have shown promise in reducing illegal behavior in contexts where legal boundaries are already established (Berkowitz, 2004; Kim and Wang, 2022). However, the specific role of social influences in deterring piracy behavior and how this relationship may differ by gender, remains unknown. According to Social Role Theory (Eagly and Wood, 2012), self-serving behaviors such as piracy may be more socially acceptable for men, who are typically afforded greater normative freedom to act in individualistic or self-interested ways. Reflecting this pattern, men typically report higher rates of piracy and more deviant peer groups than women (Hollinger, 1993; Hinduja, 2003; Tjiptono and Arli, 2016; Higgins, 2006). These findings raise the possibility that men and women tend to interpret and respond to social cues differently in piracy contexts. To investigate this possibility, the present paper examines the effects of two social factors; perceived social risk (Friedl et al., 2020) and perceived social norms (McAlaney et al., 2020), and assesses whether these social influences operate differently across genders in deterring digital piracy behavior.

Research shows that perceived social risk, meaning the potential damage to one's reputation, can deter antisocial behavior (Cunningham, 1967). However, its influence on digital piracy is less clear. Some studies find it discourages piracy (Tan, 2002), while others report no significant effect (Liao et al., 2010). These mixed results may stem from variations in the way that social risk operates across genders and cultural or entertainment contexts. For instance, live sports are typically consumed in social, group settings, whereas digital music is often enjoyed privately; additionally, the two industries differ in subscription models and pricing (Lau et al., 2007; Smart, 2005). Although research suggests women are generally more sensitive to risk, this sensitivity is not uniform across all domains (Xie et al., 2017; Lewis and Duch, 2021). Similarly, the social risk associated with piracy may differ depending on the type of entertainment. Therefore, this study explores gender differences in perceived social risk across two key entertainment categories, live sports and music, to better understand how social risk might be effectively emphasized to reduce piracy.

Normative beliefs play a key role in many behavioral models (Cialdini and Goldstein, 2004), but in covert behaviors like piracy, these beliefs are often inaccurate due to false consensus, the tendency to assume that "if I'm doing it, everyone must be doing it" (Harris and Dumas, 2009; Yoon, 2011). Research indicates that men tend to pirate more than women, partly because they are more frequently exposed to deviant behaviors within their peer groups (Higgins, 2006), suggesting distinct normative influences across genders. However, it remains unclear whether interventions that correct false consensus will affect men and women differently. To address this ambiguity, the current study uses government data to establish actual piracy rates and experimentally tests whether correcting misperceptions associate with variations in piracy intentions, and whether this effect varies by gender. This "Social Norms Approach" (Berkowitz, 2004) has not yet been applied to piracy but has proven effective in reducing other problematic behaviors such as alcohol misuse, smoking, and littering (Linkenbach et al., 2003; Dolan et al., 2012).

This study makes three key contributions to the literature. First, it examines gender differences in live sports piracy, a relatively understudied area, and compares them to gender differences in music piracy using a novel approach. By measuring illegal consumption as a proportion of total content consumed (legal and illegal), we isolate piracy-specific behavior from overall content demand. This distinction is important given that legal consumption varies by gender across entertainment types (Ofcom, 2024). Contributing to the literature on gender and digital piracy (Cox and Collins, 2014), our findings show that a greater share of live sports content is consumed illegally compared to music, with men reporting higher proportions of piracy in both categories, even when controlling for legal demand. Second, we offer new evidence on how perceived social risk associates with variations in piracy behavior across genders and content types, contributing new evidence to previous mixed findings (Tan, 2002; Liao et al., 2010). We find that higher perceived social risk tends to deter men's piracy of live sports, but has no significant effect on women or on either gender in the music context.

Third, this study presents the first application of a norm correction intervention in the context of digital piracy, assessing its impact by gender. While participants of both genders who overestimated others' piracy showed no change in their intentions on average, men, but not women, who had underestimated the prevalence of piracy among their peers (matched by age and gender) reported increased intentions to pirate following the correction. This finding contributes to Social Role Theory by suggesting that the awareness of other men's self-interested behavior may serve to legitimize similar behavior in men themselves, giving them a form of "permission" to engage in it. Overall, the results indicate that norm-based interventions may be ineffective, or even counterproductive, for addressing self-serving, gendered behaviors such as digital piracy. Publicizing data on descriptive norms, even with deterrent intent, risks normalizing and reinforcing the behavior, particularly among men. As an alternative, rights holders, especially in domains like live sports, may be more successful if they focus interventions on the reputational costs of piracy, reframing it not as clever or rebellious, but as low-status and socially or financially discrediting.

## Theoretical framework and hypothesis development

Social Role Theory (Eagly and Wood, 2012) suggests that gender differences in unethical or antisocial behavior stem from differing social expectations: men are encouraged to be assertive and self-interested, while women are socialized to be nurturing, rule-abiding, and prosocial. These gender roles shape perceptions of what is socially acceptable for each gender and, in turn, influence behavior. In the context of digital piracy, which benefits the individual financially at the expense of society and the rightsholder, such norms may provide justification to men to break rules in ways that align with gendered expectations of self-interest. In other words, social narratives like "boys will be boys", which imply that men are naturally inclined to break rules (Ford, 2019), may serve to legitimize egocentric behavior in men.

Piracy is often reported to be predominantly committed by men (Cox and Collins, 2014). However, little is known about the social cues that may help explain this gender disparity. Two such cues, perceived social risk (the belief that a behavior could harm one's reputation) and perceived social norms (beliefs about how common the behavior is among peers), have been identified in the literature as particularly relevant in deterring antisocial behavior. These factors may operate differently for men and women, potentially contributing to observed differences in piracy behavior.

## Gendered perceived social risk

Consistent with Social Role Theory, research suggests that women are more attuned to maintaining ethical and prosocial appearances than men. For instance, women tend to score significantly higher than men in terms of moral sensitivity (You et al., 2011), social responsibility and sensitivity (Reig-Aleixandre et al., 2023), and cooperative behavior (Molina et al., 2013). These traits often translate into greater concern about how one is perceived in social settings. Supporting this argument, studies show that women are more sensitive to reputational costs, for example, in how and when they post on social media platforms like Facebook (Lin et al., 2013). Women also tend to score higher on impression management measures, indicating a stronger motivation to appear morally upright or socially desirable (Becker and Ulstad, 2007).

Building on this evidence, we propose that perceived social risk, the potential reputational damage associated with unethical behavior, will negatively associate with piracy intentions across both genders. However, given women's heightened sensitivity to social evaluation and moral perception, we hypothesize that this effect will be significantly stronger for women than for men. This is tested through the following hypotheses:

**Hypothesis 1:** Higher perceived social risk will be associated with lower piracy across (a) live sports, and, (b) music.

**Hypothesis 2:** The influence of higher perceived social risk on lower piracy will be stronger for women compared to men in, (a) live sport piracy, and, (b) music.

## Gendered descriptive norm intervention efficacy

False consensus is a form of social projection bias in which individuals assume that others think and behave similarly to themselves. This perception is often grounded in one's own behaviors and beliefs (Marks and Miller, 1987; Ross et al., 1977; Cooter et al., 2008) and reinforced by social circles that are typically composed of like-minded individuals (Bruine de Bruin et al., 2019). Online communities, which are often designed to cultivate a sense of unity and shared identity, are especially conducive to this bias. Their homogeneous nature makes them fertile ground for the spread of false consensus, particularly around socially undesirable behaviors like piracy (Bunker and Varum, 2021; Quinton and Harridge-March, 2010; Lehdonvirta and Räsänen, 2011; Wojcieszak, 2008). As such, Bauman and Geher

(2002) argue that false consensus creates a self-reinforcing cycle: when individuals overestimate how common piracy is, it further normalizes the behavior and increase its prevalence.

To counteract false consensus, normative interventions offer the potential to correct misperceptions by highlighting more accurate and socially desirable behaviors (Berkowitz, 2004). Among the many types of social norm interventions, Cialdini et al. (1991) highlight descriptive norms as distinct from other forms and characterize perceptions relating to a perception of what most people do (or don't do, as per Bergquist and Nilsson, 2019). While other types of norms affect behavior for a variety of reasons relating to the normative expectation of others, descriptive norms are always directed by self-interest, for example to fit-in or make life easier in other ways – in other words to “do as the Romans do” (Bicchieri, 2005). Descriptive social norms operate through a combination of conformity, conditional co-operation toward a public good and/or information about the costs and benefits of an action (te Velde and Louis, 2022). Danilov et al. (2021) distinguish descriptive norms from guilt and finds that the pure effect of descriptive norms (the behavior of others) has a greater effect on behavior than guilt (the expectations of others). Descriptive norms have been shown to be powerful predictors of choice and behavior in experimental settings (e.g., Raihani and McAuliffe, 2014; Heinicke et al., 2022 in a dictator game) and have been shown to have significant effects on charitable giving (Shang and Croson, 2009), especially at the local level (Agerström et al., 2016), as well as drink and drug consumption (Perkins, 2003; Kremer and Levy, 2008). However, the evidence is somewhat mixed in the context of environmental behaviors (Goldstein et al., 2008; Reese et al., 2014) and tip-giving in restaurants (Azar, 2020; Lynn, 2021).

According to Social Role Theory, gendered expectations shape how individuals respond to the social cues derived from descriptive norms. When a behavior is stereotypically associated with a particular gender, social norms around that behavior tend to have a stronger influence on that gender. For instance, Prentice and Miller (1993) found that college men, more than women, adjusted their binge drinking behavior in response to perceived norms. They argued that drinking was more deeply embedded in male social culture at the time, making social expectations more salient and influential for men. In contrast, women, less central to the drinking culture, were more accustomed to resisting dominant norms and thus less affected by them. A similar gendered pattern was observed in McAlaney et al. (2020), where social norm interventions in online gaming, another male-associated domain, had a stronger effect on men. Given that digital piracy is also more commonly associated with men (Hollinger, 1993), we hypothesize that an intervention involving descriptive norms will have a stronger effect on men than on women. This is tested in the following hypotheses:

**Hypothesis 3:** Participants' estimates of the prevalence of digital piracy will positively correlate with their own piracy behavior, consistent with the false consensus effect.

**Hypothesis 4:** Over-estimators who learn the true (lower) prevalence via the descriptive norm will report reduced piracy intentions, and b: under-estimators who learn the true (higher) prevalence via descriptive norm will report increased piracy intentions.

**Hypothesis 5:** Gender will interact with the messages, in that compared to women, men who learn the true (lower) prevalence via the descriptive norm will more significantly reduce their piracy intentions, and b: under-estimators who learn the true (higher) prevalence via the descriptive norm will more significantly reduce their piracy intentions.

## Method

To understand how social factors influence digital piracy differently by gender, we conducted two analyses using distinct methodological approaches tailored to the nature of the constructs being investigated. First, we used a correlational design to examine the relationship between perceived social risk and reported piracy behavior across genders and content types. Perceived social risk, being subjective and context-dependent, is best assessed through self-reported attitudes and behaviors to uncover naturally occurring patterns of association. In contrast, when measuring the influence of perceived social norms, which are more amenable to manipulation, we used an experimental design to test whether correcting false normative beliefs (i.e., false consensus) would influence participants' intentions to engage in piracy activity over the next week. Because norms can be externally framed and corrected using empirical data, they lend themselves to intervention-based research. By combining these approaches, we capture both how perceived social pressures relate to real-world behavior (Analysis 1) and how shifts in perceived norms may associate with variations in piracy intentions (Analysis 2).

## Participants

A total of 684 participants (aged 18 to 77) were recruited through Prolific (<http://www.Prolific.com>), an online research platform widely used in behavioral science. The survey was advertised as an "Online Entertainment Consumption Study". Participants were paid £7.50 per hour, which matched Prolific's definition of a fair wage at the time of data collection. The sample included 426 women and 258 men. Given prior evidence suggesting that men are more likely to pirate than women (Gov, 2023), the sample intentionally oversampled women to ensure sufficient statistical power when analyzing gender-based effects (Prolific, 2024).

## Design

We conducted two analyses of the data. Analysis 1 examined how perceived social risk relates to past piracy across genders and entertainment categories, when piracy is measured as a percentage of total (legal + illegal) consumption. This measure of piracy behavior was used to control for a gender difference in demand for content.

Analysis 2 employed an experimental design to correct false social projections, based on government data ( $N = 5000$ ), which had been segmented into age and gender categories. Participants were randomly allocated to the intervention or control group using

a 2:1 randomization ratio, such that twice as many participants received normative feedback as those in the control group. Norm predications were based on age and gender groups, to reduce the self-other effect found in normative interventions (e.g., Hogg and Reid, 2006; Neighbors et al., 2010; McAlaney et al., 2020). Assignment to high or low treatment conditions was based on the direction of the participant's prediction error, calculated by comparing their norm estimate against the true value.

## Instrument

The survey included six main components:

- 1) Demographic information, including age, gender, income. These data were used for both descriptive analysis and norm estimation matching.
- 2) Perceived social risk questions adapted from a previous study (Liao et al., 2010). These questions asked participants whether, if their friends and family were aware they had pirated, they would think the individual couldn't afford legal content/was unethical/was a criminal, on a 5-point Likert scale.
- 3) Self-reported legal and illegal live sport and music consumption, whereby participants were asked how many times in the past week they had accessed (either downloaded or streamed) content.
- 4) Norm estimation, for which participants estimated what percentage of people of their same gender and age group had accessed illegal music and live sports content in the past week.
- 5) Manipulation, for which each treatment group participant's estimate was compared to actual prevalence data obtained from a large-scale UK government dataset (Gov, 2020;  $N = 5,000$ ). This difference was communicated to the participant and their change in piracy intentions were calculated. The control group participants were not informed about the piracy of their peers.
- 6) Participants were asked about their intentions to consume legal and illegal live sport and music over the coming week.

## Procedure

After completing the background, entertainment consumption and perceived social risk questions, participants were randomly assigned to one of the experimental conditions. Those in the treatment groups received personalized normative feedback. This feedback restated the participant's own piracy estimate and presented the actual prevalence rate for their demographic group (age and gender). It then clearly cited the source of the normative data, including the sample size and year of collection (see Table 1).

The feedback was designed in line with the Social Norms Approach (Berkowitz, 2004), aiming to correct misperceptions and reduce false consensus beliefs which may serve to justify and perpetuate behavior. Participants who overestimated peer piracy rates received a "high-treatment" message indicating that the actual rate was lower than they thought. Those who underestimated



TABLE 1 Treatment group message description and sample size.

Treatment name	Message
<b>Low</b> ( <i>n</i> = 149, 30% men, 70% women) Underestimators: Estimates of other individuals' piracy habits/attitudes are lower than survey data.	You answered that? % of 25–36 year old men (women) illegally accessed content in the 3 months between ? and? According to government data by the Intellectual Property Office ( <i>N</i> = 5000), the real number is? %. Your guess was too low.
<b>High</b> ( <i>n</i> = 306, 40% men, 60% women). Overestimators: Estimate of other individuals' piracy habits/attitudes is higher than survey data.	You answered that? % of 18–24 year old women (men) illegally accessed content in the 3 months between? and ?. According to government data by the intellectual property office ( <i>N</i> = 5000), the real number is ?%. Your guess was too high.
<b>Control group</b> ( <i>n</i> = 229, 40% men, 60% women).	

received a “low-treatment” message stating that the actual rate was higher. Participants in the control group received no information about peer behavior. The messages can be seen in Table 1.

## Measures

The main focus of the study is self-reported piracy activity, as a proportion of overall consumption. It is worth noting that 52% of respondents in our study reported as having engaged in at least some form of past piracy. Comparing this figure against national averages, the IPO in the UK regularly measures the proportion of respondents that download or stream content copyright infringing materials onto their device. The most recent wave of the survey from 2024 suggests that around 30% of respondents admit to at least some form of infringement within the 3 months prior to the survey. Against this average, a relatively high proportion of respondents admit to infringements involving live sports (38%), while music piracy is somewhat lower at 26% of participants (Intellectual Property Office, 2024). These estimates are similar to those from the US, where numerous sources suggest that around 33% of American adults have pirated some form of content within the last year (CordCutting, 2024). The estimate also aligns with evidence from the academic literature using representative samples, which finds a prevalence of around 25% (see Lopez-Gonzalez et al., 2019 or Kukla-Gryz et al., 2021 for examples), although this figure tends to be higher among samples of young people or undergraduate students (see, Handa et al., 2022, or Nodeland and Morris, 2020, who estimate levels of 50 and 68% respectively).

Following this initial comparative analysis, the specific measures we use in the two studies are as follows:

**Past Piracy Behavior** – which was measured as an individual's percentage of illegal to total music or live sports consumption: *Past piracy behavior* =  $\text{illegal} / (\text{illegal} + \text{legal})$ .

Past piracy behavior is measured in this way to control for naturally occurring gender differences in legal consumption (and other demographic characteristics such as age), seen in previous

studies (Borja et al., 2015). In other words, if men consume more live sports than women, this trend would also likely be reflected in their illegal consumption, giving a false impression of the demographic differences in illegal consumption behavior.

**Perceived Social Risk** – which was measured using three items adapted from Liao et al. (2010). The scale demonstrated good internal consistency, with a Cronbach's  $\alpha$  of 0.80.

**Prediction Error** – which was the difference between the individual's *prediction* of their peers' piracy vs. the *real norm*, derived from a large Government survey dataset (*N* = 5,000), taken from the “Copyright Infringement Tracker” report published by the UK Government body, the Intellectual Property Office (Gov, 2020). This *real norm* was compared to the participants' *prediction* of what other members of their age and gender group would illegally consume in the timeframe stipulated. Estimating the descriptive norm has been shown to have a more significant impact on outcomes compared with simply being presented with the norm (Bartke et al., 2017). As the government data we use was not split into categories, the false consensus measure was not category-specific (i.e., a measure of general piracy rather than specifically live sport and music).

$$\text{Prediction error} = \text{real norm} / (\text{prediction} - \text{real norm}).$$

This measure was converted into an absolute value, to compare all predictions equally to the zero reference point (indicating a perfect prediction).

**Change in Piracy Intentions** – which measured by past weekly illegal consumption, asked early in the survey, was subtracted from the amount of illegal consumption that participants intended to consume in the following week, asked following the intervention. It should be emphasized that this measure simply reflects stated intentions on the part of participants and does not capture actual/observed behavior.

$$\text{Change in piracy intentions} = \text{illegal consumption intentions for the following week} - \text{reported illegal consumption for the past week}.$$

## Results

### Analysis 1: gender differences in perceived social risk

Before calculating the influence of perceived social risk, we first explored the gender differences in illegal consumption, when calculated as percentage of total consumption by category (music and live sports). Figure 1 illustrates a gender difference in illegal music consumption; 7% for men and 3% for women. The gender difference was also significant for live sports, with men consuming a greater proportion of their total live sport consumption from illegal sites compared to women, i.e., 21% compared to 8%. A Wilcoxon rank-sum test confirmed that the gender difference was statistically significant for both music and live sports ( $p$ -value < 0.01).

These results show that even when controlling for legal demand, men tend to pirate more than women. They also show that live sport consumers derive more of their consumption from illegal sources than music consumers.

To test for the influence of perceived social risk on the percentage of illegal consumption across categories, we

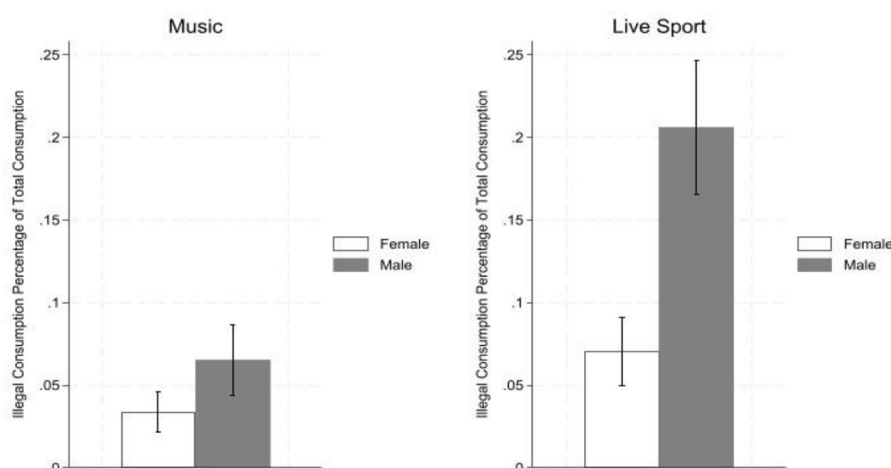


FIGURE 1

Gender differences in illegal music and live sport consumption as a percentage of total consumption. Error bars are 95% confidence intervals.

first examine gender differences in the three survey items. Table 2 indicates the means and deviations of the perceived social risk items. Women typically scored higher for each item, but results of a Wilcoxon rank-sum test suggested that a statistically significant difference between men and women was only observed for item 2 (“if my friends and family were aware I pirated online content they would think I was unethical”).

To test for the influence of perceived social risks across genders and entertainment contexts, a moderated linear regression was conducted with percentage of illegal consumption out of total consumption as the dependent variable (see Table 3).

The results of the analysis show that for live sports with no gender effects, social risk associates negatively with piracy consumption ( $p$ -value < 0.01). More specifically, on average greater levels of perceived risk associate with lower levels of live sports piracy (see model 1). Model 2 includes gender as a control variable, which does not meaningfully change the statistical significance of any of the model variables. Model 3 includes gender interaction effects, finding a significant gender interaction effect ( $p$ -value = 0.03), in that higher social risk perception had a greater negative influence on men’s piracy than women’s. In respect to music piracy, model 4 indicates that social risks were not influential when gender was not included in the model ( $p$ -value = 0.69). Model 5 indicated that statistical significance did not increase when gender was included as a control ( $p$ -value = 0.11). Model 6 indicated the results of an interaction effect between perceived social risks and gender, which were not significant ( $p$  = 0.39).

In summary, hypothesis 1a was supported, given higher perceived social risks were associated with lower piracy across live sports. However, hypothesis 2a was not supported, as the effect was found to be stronger for men rather than women. Hypothesis 1b and hypothesis 2b were not supported because perceived social risks were not associated with lower piracy across music, and no gender effects were observed.

## Analysis 2: gender differences in social norms intervention

To test for the presence of false consensus, we first examined the prediction error variable. This ranged from  $-0.9$  to  $7.4$  ( $M = 0.99$ ,  $SD = 1.70$ ). This suggests that participants typically overestimated rather than underestimated the piracy of their peers. The data were converted into positive numbers and categorized into a binary variable (low vs. high) with a median (0.71) split. A Wilcoxon rank-sum was conducted to test the effect of gender (male = 1, female = 0) on inflated prediction (high = 1, low = 0). The results suggest a statistically insignificant effect of gender ( $p$ -value = 0.35), suggesting that men and women do not have statistically different prediction errors.

To test for the presence of a false consensus effect (hypothesis 3), a moderated linear regression was conducted (see Table 4) to test the relationship between prediction error and past illegal consumption behavior. Models 1 and 4 suggest that prediction error positively correlates with past illegal behavior for both music ( $p$ -value = 0.01) and live sport ( $p$  < 0.01). This finding supports hypothesis 3, that false consensus is present, as an individual’s normative prediction is skewed toward their own behavior for both music and live sports piracy. Exploratory analysis (models 3 and 6) indicated that for music, the gender interaction effect ( $p$ -value = 0.69), or live sport ( $p$ -value = 0.29) was not statistically significant. In summary, false consensus was consistently present across genders and entertainment categories.

A moderated linear regression was conducted to test the change in intentions for music and live sport (see Table 5). If intentions change in the intended direction, i.e., toward the corrected norm and supporting hypothesis 4, a significant negative coefficient should be observed among the high group, where participants overestimated the piracy behavior of their peers. A significant positive coefficient estimate should be observed in the low group, where participants underestimated the piracy behavior of their peers. For hypothesis 5 to be supported, a gender interaction

TABLE 2 Perceived social risk items means, standard deviations and gender comparison.

If my friends and family were aware I pirated online content...	All	Men	Women	Wilcoxon rank-sum
Item 1: They would think I couldn't afford legal content	( <i>M</i> = 2.45) ( <i>SD</i> = 0.42)	( <i>M</i> = 2.36) ( <i>SD</i> = 0.66)	( <i>M</i> = 2.51) ( <i>SD</i> = 0.05)	( <i>p</i> -value = 0.07)
Item 2: They would think I was unethical	( <i>M</i> = 2.39) ( <i>SD</i> = 0.43)	( <i>M</i> = 2.27) ( <i>SD</i> = .067)	( <i>M</i> = 2.46) ( <i>SD</i> = 0.56)	( <i>p</i> -value = 0.04)
Item 3: They would think I was a criminal	( <i>M</i> = 2.08) ( <i>SD</i> = 0.04)	( <i>M</i> = 2.00) ( <i>SD</i> = 0.63)	( <i>M</i> = 2.13) ( <i>SD</i> = 0.53)	( <i>p</i> -value = 0.18)

TABLE 3 Moderated linear regression testing for the influence of perceived social risk and gender on percentage of illegal content across live sports and music.

Model	Live sports			Music		
	1	2	3	4	5	6
Social risk	−0.064*** (0.012)	−0.058*** (0.011)	−0.039*** (0.011)	−0.012* (0.006)	−0.010 (0.006)	−0.015** (0.007)
Male		0.128*** (0.023)	0.250*** (0.070)		0.030** (0.013)	0.002 (0.036)
Social risk × male			−0.057** (0.027)			0.013 (0.015)
Constant	0.262*** (0.032)	0.201*** (0.030)	0.158*** (0.032)	0.071*** (0.016)	0.057*** (0.017)	0.067*** (0.019)
Observations	684	684	684	684	684	684
R-squared	0.038	0.089	0.096	0.004	0.014	0.015

\**p* < 0.1.  
\*\**p* < 0.05.  
\*\*\**p* < 0.01.  
Robust standard errors in parentheses.

term indicating that the messages were more influential in changing the intentions of men compared with women should be statistically significant.

The results in model 1 suggest neither the low group (*p*-value = 0.32) nor the high group (*p*-value = 0.08) influenced a statistically significant change in music piracy intentions. Adding gender as a control variable (model 2), did not increase the statistical significance of coefficient estimates in a meaningful way. This finding suggests that hypothesis 4 could not be supported. To test hypothesis 5, gender interaction effects were measured for the low and high groups. The findings in model 3 suggest that the interaction between gender and the high group was not statistically significant (*p*-value = 0.86). However, the interaction between gender and the low group was found to be positive and statistically significant (*p*-value = 0.02). This result indicates that the low treatment increased men's intentions to engage in illegal online consumption. Model 4 adds age and income as control factors, which do not meaningfully change the significance. It should be noted that the constant term in model 3 is positive and statistically significant at the 95% confidence level. This result indicates that even those in the control group intended to increase their piracy consumption in the future. Taken independently, this finding could imply that a meaningful proportion of the sample were intending to increase their piracy activity in the future anyway, e.g., as a result of constraints imposed by the cost-of-living crisis. Alternatively, it may be that simply participating in

an experiment concerning digital piracy has the effect of increasing piracy intentions regardless of the treatment received. However, as the constant term is statistically insignificant in model 4, it may be that the age and income variables are now partly capturing some of the variation that was previously caught by the constant.

Predicted means for each group, derived from the regression model, are presented in Table 6. Among men, intentions in the “low treatment” condition increased by +3.70 units relative to male controls. This corresponds to a moderate effect size (standardized  $\beta$  = 0.49, Cohen's *d* = 0.49), explaining approximately 0.9% of the variance in intentions (partial  $\eta^2$  = 0.009). These results confirm that the “low treatment” had a measurable impact on men's intentions.

## Discussion

This study provides new empirical insights into the social drivers of digital piracy, focusing on gender differences across entertainment categories and the influence of perceived social risk and descriptive norms. By examining illegal consumption of music and live sports, we contribute to an underexplored but growing area of concern, particularly in the context of live sports (Gov, 2023). Supporting the literature indicating a gender difference in piracy and more broadly unethical behavior (Cox and Collins, 2014; Bada et al., 2021; Meng et al., 2025) our

TABLE 4 Linear regression correlating prediction error and music and live sports piracy past behavior, with gender effects.

Model	Music			Live sport		
	1	2	3	4	5	6
High prediction error	1.787*** (0.539)	1.700*** (0.535)	1.518** (0.589)	2.450*** (0.773)	2.167*** (0.748)	1.460** (0.672)
Male		1.488** (0.601)	1.240* (0.685)		4.837*** (0.896)	3.868*** (1.089)
High prediction error # male			0.482 (1.189)			1.881 (1.777)
Constant	1.091*** (0.293)	0.573* (0.325)	0.659** (0.306)	2.310*** (0.429)	0.627 (0.409)	0.964*** (0.320)
Observations	684	684	684	684	684	684
Adjusted R-squared	0.014	0.023	0.022	0.013	0.065	0.065

\* $p < 0.1$ .  
\*\* $p < 0.05$ .  
\*\*\* $p < 0.01$ .  
Robust standard errors in parentheses.

TABLE 5 Linear regression testing the influence of treatment group and gender for piracy change in intentions.

Model	1	2	3	4
Low	1.279 (1.280)	1.188 (1.303)	−0.990 (1.628)	−0.971 (1.629)
High	2.214* (1.269)	2.226* (1.265)	2.070 (1.818)	2.090 (1.825)
Male		−1.135 (1.112)	−3.260** (1.494)	−3.217** (1.499)
Low × Male			6.263** (2.735)	6.184** (2.732)
High × Male			0.432 (2.431)	0.351 (2.436)
Age				0.021 (0.043)
Income				−0.093 (0.194)
Constant	1.167 (0.802)	1.622* (0.984)	2.474** (1.180)	2.181 (2.610)
Observations	684	684	684	684
R-squared	0.004	0.006	0.015	0.016

\* $p < 0.1$ .  
\*\* $p < 0.05$ .  
Robust standard errors in parentheses.

findings find that the difference persists even when controlling for legal consumption by measuring piracy as a percentage of total (legal and illegal) content. For example, in the case of live sports, men’s illegal consumption comprised 21% of their total viewing, compared to just 8% for women. These results support Social Role Theory (Eagly and Wood, 2012), which posits that men are culturally afforded more freedom to pursue self-interested behavior than women.

Our perceived social risk analysis indicated that social risk had no significant association with on intentions to engage in music piracy, but it was significantly associated with a reduction in intentions to engage in live sports piracy relative to prior activity. These findings support our hypothesis. Interestingly, the observed effect was stronger among men than women, contrary to initial expectations. One possible explanation lies in the group-oriented nature of sports fandom, where men may be particularly sensitive to peer judgment and reputation. The social risk measure included perceptions such as whether piracy implies someone is a criminal or cannot afford legal access. These concerns may resonate more strongly with men, given masculine norms that emphasize financial competence, independence, and status. In male-dominated social environments, the reputational cost of appearing “cheap” or financially incapable may be especially pronounced. This aligns with research suggesting that men are often motivated to act prosocially when doing so helps maintain a generous or high-status reputation (Willer et al., 2010). Another contextual factor may be that, while the “personal” aspects of music streaming may restrict acts of sharing and group consumption (Hagen and Lüders, 2017), whereas viewing streams of live sporting events sports is a social activity that is more likely to be undertaken in a group or setting (Kim and Kim, 2020). The act of streaming live sports may therefore be innately more subject to social risk than music consumption. Future research could experimentally test messages that emphasize the social risks of piracy, to assess whether such interventions have differential effects on men and women across various types of entertainment.

Before testing the intervention, we confirmed the presence of false consensus across both domains and genders, consistent with prior research (Mullen et al., 1985; Marks and Miller, 1987). However, correcting this misperception did not reduce piracy intentions among participants who had overestimated the prevalence of piracy, regardless of gender. In contrast, among men who had underestimated how common piracy was, the corrected (higher) descriptive norm led to an increase in their piracy intentions. There are two possible explanations for this



TABLE 6 Predicted means &amp; effect sizes from regression.

Group	Predicted mean (DV units)	Difference vs. male baseline	Std. $\beta$ (approx)	Cohen's $d$	Partial $\eta^2$
Female – baseline	1.53	—	—	—	—
Female – low	0.57	—	−0.10	−0.10	0.002
Female – high	2.48	—	0.1	0.1	0.001
Male – baseline	−0.67	—	−0.23	−0.23	0.006
Male – low	3.02	3.7	0.49	0.49	0.009
Male – high	1.49	2.16	0.13	0.13	0.001

finding. First, following theories of motivated reasoning (Kunda, 1990; Exley and Kessler, 2024), it may be that individuals selectively interpret information in ways that align with their desires or justify self-serving behaviors. Our results suggest a gendered pattern in this reasoning. On this basis, male participants appeared more likely to reject descriptive norms that contradicted their prior beliefs, perceiving it as manipulative or untrustworthy; a pattern aligned with research on gendered confirmation bias (Nickerson, 1998; Zhao et al., 2020). This finding may reflect a broader psychological resistance to messages perceived as limiting personal freedom or autonomy (Whitman et al., 2024). On the other hand, it is possible that the observed pattern of behavior reflects conformity to descriptive norms, in that individuals engage in digital piracy at least partly because they believe others do so. This possibility creates a degree of ambiguity that may be investigated and addressed in future studies.

Taken together, the evidence from our study suggests that norm-correction strategies may backfire for men, especially when the message conflicts with their self-interest or perceived agency. This finding supports contemporary research suggesting that normative interventions can have unintended, undesirable outcomes (Byrne and Hart, 2009; Schultz et al., 2007; Burchell et al., 2013). For instance, Beshears et al. (2015) found that normative messages intended to encourage saving led to reduced savings among certain subgroups, while Richter et al. (2018) showed that normative messages could decrease sustainable food consumption by making the information seem manipulative or autonomy-reducing. Similarly, the present study indicates that attempts to correct false consensus through normative messages might backfire, particularly in the domain of digital piracy. The phenomenon, known as *The Streisand Effect*, illustrates how efforts to suppress or highlight undesirable content online can inadvertently increase its visibility and appeal (Van der Sar, 2021; Hagenbach and Koessler, 2017).

## Limitations

A key limitation of this study is that piracy behavior was assessed through self-reported intentions rather than observed actions. Additionally, piracy intentions were measured in terms of intentions to engage in piracy activities within the next week, rather than actual observed behaviors. While direct behavioral observation would offer a more objective measure, it is highly impractical in this context due to the illegal nature of digital

piracy and the widespread use of VPNs and other anonymizing technologies, which obscure actual online behavior. Consequently, self-reporting remains a common and pragmatic approach in piracy research. Importantly, there is evidence to suggest that intentions can serve as a reliable proxy for actual behavior. In a rare study that compared the two, Taylor (2012) found that digital piracy intentions were strong predictors of subsequent behaviors. Another limitation of the study concerns potential order effects within the survey design. Specifically, presenting questions about the social risk of piracy before asking about self-reported piracy behavior may have influenced participants' willingness to disclose such behavior. Similarly, questions about beliefs and justifications following self-reported behavior may have prompted participants to adjust their responses to align with or rationalize their prior answers, consistent with patterns observed in moral reasoning and self-justification (e.g., Bicchieri, 2005). While these order effects are a potential source of bias, the survey structure was held constant across all participants. As such, any order-related influence would apply equally across the comparison groups (e.g., men vs. women; live sports vs. music piracy), and is unlikely to systematically affect the observed group differences. Nonetheless, future research would benefit from employing counterbalanced or randomized survey designs to minimize these effects and better isolate the relationships between constructs. Although we test multiple hypotheses in the above analysis, it should be noted that we do not formally correct for multiple comparisons using Bonferroni or other formal corrections. This is a deliberate choice given that, although formally correcting for multiple comparisons reduces the likelihood of type I errors, it also simultaneously increases the likelihood of type II errors (Rothman, 1990). Rather than test every possible comparison within the data, our study is focused on a relatively small number of planned and comparisons based on a set of hypotheses that are strongly informed by theory. Given our work is therefore not an opportunistic statistical phishing exercise, we consider it unnecessary to formally correct for multiple comparisons in this instance (as per Hooper, 2025).

Finally, the false consensus measured in this study was determined by comparing participants' estimation of their peers' piracy to the reported level in another survey (Gov, 2020) rather than actual behavior. Respondents of both this study and those of the government survey may have been underreporting their piracy to appear more socially desirable. Evidence suggests that this social desirability bias may also be gendered, with women underreporting undesirable behaviors more than men (Dalton and Ortegren, 2011; Chung and Monroe, 2003). This bias may have

contaminated the data, but as observed piracy behavior is almost impossible to measure due to its clandestine nature, this was an inescapable limitation of the design. Notwithstanding, there was strong statistical evidence suggesting the presence of false consensus, i.e., that participants were using their own behavior to predict that of their peers. This is an important finding, as piracy studies looking to avoid social desirability bias by asking participants about their peers' piracy rather than their own (Kukla-Gryz et al., 2021), may confidently assume that one is highly predictive of another.

## Implications and conclusion

This research advances our understanding of gendered responses to anti-piracy interventions by examining how perceived social risk and normative beliefs influence illegal content consumption. Our findings reveal that digital piracy remains a significant issue, particularly in music and live sports, with men pirating more than twice as much content as women. Notably, 21% of men's live sports consumption is sourced illegally (compared to 7% for music), underscoring the urgency of targeted deterrence strategies in this domain.

Our social norms intervention, designed to correct misperceptions about the prevalence of piracy, proved largely ineffective and even counterproductive for male participants. Specifically, among men who underestimated others' piracy, exposure to norm-based messaging actually increased their willingness to offend. This result indicates that descriptive norm messaging may backfire when individuals interpret the behavior of others as justification for their own actions. These findings highlight the risks of campaigns that emphasize how common piracy is, particularly among men, without considering how such information may inadvertently normalize and license the behavior.

In contrast, perceived social risk emerged as a promising deterrent, particularly among men engaged in live sports piracy. Although perceived social risk was measured via a correlational analysis, rather than experimentally, we found evidence that higher perceived reputational risk (e.g., concerns that piracy might signal criminality or financial incapacity) was associated with a reduction in live sports piracy among men. This aligns with masculine norms that emphasize status, independence, and financial competence, especially within male-dominated, group-oriented social contexts like sports fandom. In these settings, the reputational cost of appearing "cheap" or socially deviant may be particularly salient, making social risk framing an effective behavioral intervention.

Together, these results suggest that anti-piracy efforts should prioritize social risk over descriptive norms, particularly in high-risk, male-dominated domains. Interventions that frame piracy as low-status, socially discrediting, or indicative of financial inadequacy are likely to resonate more with men and may offer a more effective deterrent than simply reporting piracy's prevalence.

## Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## Ethics statement

The studies involving humans were approved by University of Portsmouth Business and Law Ethics Committee. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

## Author contributions

KW: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Visualization, Writing – original draft. JC: Conceptualization, Supervision, Writing – review & editing.

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