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Nature or nurture? A meta-analysis of the factors that maximize the prediction of digital piracy by using social cognitive theory as a framework



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ABSTRACT

Digital piracy has permeated virtually every country and costs the global economy many billions of dollars annually. Digital piracy is the unauthorized and illegal digital copying or distribution of digital goods, such as music, movies, and software. To date, researchers have used disparate theories and models to understand individuals' motivations for stealing and sharing digital content. To establish a unified understanding of digital piracy research in order to set an agenda for future studies, we conducted a meta-analysis of the literature. We analyzed 257 unique studies with a total of 126,622 participants to examine all the major constructs and covariates used in the literature. Using social cognitive theory, we were able to resolve several contradictions and trade-offs found in the digital piracy literature. Further, our meta-analytic results suggest that four key sets of factors maximize prediction: (1) *outcome expectancies* (considerations of rewards, perceived risks, and perceived sanctions), (2) *social learning* (positive and negative social influence and piracy habit), (3) *self-efficacy* and *self-regulation* (perceived behavioral control and low self-control), and (4) *moral disengagement* (morality, immorality, and neutralization). Based on our results, we describe several patterns in the literature that suggest opportunities to further synthesize the literature and expand the boundaries of digital piracy research.

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1. Introduction

Digital piracy is a widely used term for the act of copyright infringement of electronic goods such as software, music, books, movies, TV shows, and games. For brevity, we use the term piracy interchangeably with digital piracy, while limiting our use to the digital realm. Piracy is a form of criminal behavior that has permeated every country in the world and costs the global

economy many billions of dollars annually. Approximately 99% of data transferred on peer-to-peer networks is copyrighted, 42% of the software currently in use worldwide is pirated, more than 75% of computers have at least one illegally downloaded application, 95% of music downloaded online is illegal (the rate in the United States alone is 63%), 66% of online torrents are illegal, 22% of Internet bandwidth worldwide is used for piracy, the music industry loses US\$12.6 billion a year to piracy, US\$59 billion in illegal software was downloaded in 2010, and 71,060 jobs are lost in the United States each year due to piracy (Go-Gulf, 2011; RIAA, 2015). Consequently, piracy stifles business innovation, destroys jobs, and thus negatively affects media companies, software companies, and publishers. Alarming, 70% of Internet users find nothing wrong

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with piracy. Piracy research generally attempts to account for the disconnection between this attitude and the negative consequences of piracy.

This literature rarely uses experimentation, and it primarily administers cross-sectional self-reporting surveys on piracy or surveys based on hypothetical piracy vignettes. Scores of theories and hundreds of constructs have been applied to the prediction of piracy. The most commonly used theories are deterrence theory (DT), neutralization theory (NT), self-control theory, social learning theory (SLT), the theory of planned behavior (TPB), and social cognitive theory (SCT). Several morality theories have also been applied. This theoretical mishmash has created results replete with contradictory findings, emphases, and conclusions.¹ Most of these studies apply one or two theories and a handful of constructs, and thus far, few study has attempted to unify the literature or rectify its fundamental conflicts.

The existence of so many stand-alone studies that use different theories, goals, and constructs makes it virtually impossible to reconcile the disparities in the literature through traditional review and survey methods. Until digital piracy researchers can reconcile and unify their approaches and, subsequently, their results, it will be difficult to help practitioners mitigate piracy. The conflicts and unanswered questions that haunt this literature beg for an approach that can systematically examine the conflicting results to determine the most likely predictors of piracy. Given this background, this is an ideal juncture for a meta-analysis that can identify unifying answers to advance the research and practice associated with preventing the noxious global problem of piracy. Meta-analysis is fundamentally a technique that relies on effect sizes to draw valid statistically significant conclusions across a body of related research. Its main strength, in addition to empirical rigor, is its ability to make sense of the natural variability that occurs across a body of research—often described as “contrary” or “mixed” findings—and to explain moderation effects based on quantifiable differences in each study.

Although we found that Taylor, Ishida, and Melton (2014) have already conducted a meta-analysis on digital piracy, their work was largely preliminary, thus leaving several key opportunities we address. First, Taylor et al. (2014) built their meta-analysis study on an existing theoretical model by Higgins and Marcum (2011); however, the original focus of this conceptual model is on the mediation effects among the antecedents of digital piracy, which cannot be tested using meta-analysis. For this reason, there is not a good fit between the theoretical model of Higgins and Marcum (2011) and the meta-analysis of Taylor et al. (2014). Thus, there is a strong need to further propose an overarching theoretical framework to guide future meta-analysis on digital piracy. Second,

¹ The following are examples of disparities in the piracy literature. Some studies show that DT-based sanctions are efficacious (e.g., Lysonski & Durvasula, 2008; Moores & Dhillon, 2000), others show the opposite (e.g., LaRose et al., 2005; Siponen et al., 2012), and still others show mixed results (e.g., Fetscherin, 2009; Gunter, 2008, 2009). Some show that morality matters (e.g., Seale, 2002; Siponen et al., 2012), whereas others do not (e.g., Chan et al., 2013; Holt & Morris, 2009). Some point to the importance of neutralization in increasing piracy (Kos Koklic et al., 2016; e.g., Siponen et al., 2012), whereas others show that it does not increase piracy (e.g., Jacobs et al., 2012; Smallridge, 2012). The disparity of findings is not surprising given the use of many different theoretical perspectives. Some claim piracy is a planned, rational, cost-benefit act focused on outcome expectancies (e.g., Al-Rafee & Dashti, 2012; Aleassa et al., 2011; Wang & McClung, 2011), whereas others represent it as determined primarily by irrational forces such as low self-control (LSC) or low self-regulation (e.g., Burruss et al., 2013; Malin & Fowers, 2009). Some claim that negative social influence or social learning is crucial (e.g., Higgins & Makin, 2004a; Higgins, 2006), whereas others claim the opposite (e.g., Holt & Morris, 2009; Wolfe et al., 2008). Some emphasize that negative socialized habits matter (e.g., Akbulut, 2014; Cronan & Al-Rafee, 2008), whereas others argue that they do not (e.g., Phau et al., 2014; Setiawan & Tjiptono, 2013).

Taylor et al. (2014) unfortunately overlooked the majority of published empirical piracy studies, and included only 42 studies in their meta-analysis. Based on our literature review, there are more than 250 empirical digital piracy studies from which effect sizes can be derived. Crucially, to be accurate meta-analysis articles must be based on a sample as close as possible to the whole population, or sample selection bias will be introduced. Third, they left uncovered several theoretical and methodological considerations that are ripe for traditional moderation analysis via meta-analysis. These include using student samples compared with non-student samples, using surveys of actual experience or scenarios for participants, differences in the kinds of goods being pirated (e.g., music, software, movies), and so on.

Recognizing the many opportunities to conduct meta-analysis on the digital piracy literature, we carefully reviewed the digital piracy literature and conducted a comprehensive meta-analysis of the predictors of piracy committed by consumers. Our review of the literature yielded 257 unique empirical studies with a total of 126,622 participants. By taking a comprehensive account of piracy's predictors, we were able to resolve several of the apparent contradictions and trade-offs in the literature. We also identified exciting opportunities for the further improvement and unification of piracy research.

The structure of the article is as follows. In Section 2, we discuss the background of digital piracy research, and provide some key findings from our literature review of 257 empirical studies on this topic. In Section 3, based on our comprehensive literature review, we propose a SCT theoretical framework of digital piracy that summarizes virtually all the relevant predictors of digital piracy in existing studies. This comprehensive model, serves as a guide for our meta-analysis, based on which we identify the relevant antecedents of digital piracy and conduct the data coding. Section 4 details the formal procedures we followed to conduct our meta-analysis, including the processes of sample selection, data coding and entry, the calculation of effect sizes in meta-analysis, and so on. The results of the data analysis are presented in Section 5. Finally, in Section 6, we discuss the implications of the key findings of the meta-analysis, as well as limitations and future research opportunities on digital piracy.

2. Background on digital piracy and its theories

2.1. Digital piracy as a form of criminal computer abuse

Digital piracy occurs when a consumer intentionally uses, distributes, shares, copies, stores, or acquires copyrighted digital goods (e.g., software, music, books, movies, TV shows, and games) without the permission of the copyright holder and with the knowledge that the works are not the consumer's property (Aleassa, Pearson, & McClurg, 2011; Moore & McMullan, 2004; Nandedkar & Midha, 2012). Despite near-universal international laws against these actions, piracy research suggests that most consumers do not view illegal file downloads as a crime or rationalize such criminal behavior as too minor to worry about (Go-Gulf, 2011; RIAA, 2015). In the minds of these consumers, piracy is not commensurate, morally or legally, with crimes such as petty theft and shoplifting from a retailer. Consequently, a major thrust of piracy research is to understand how the online or digital context of this criminal activity changes consumer perceptions of criminality. Thus, it is important to explain the criminal nature of piracy and to consider how piracy fits into the more general research on criminology.

Although piracy is a criminal act, not all criminal acts are committed for the same reasons or in the same circumstances. It is thus important to get inside the minds of individuals who choose to

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