



Effect of peer influence on unauthorized music downloading and sharing: The moderating role of self-construal



Zhiyong Yang ^{a,*}, Jingguo Wang ^{b,1}, Mehdi Murali ^{c,2}

^a Department of Marketing, University of Texas at Arlington, Box 19469, 701 S. West Street, Arlington, TX 76019, United States

^b Department of Information Systems and Operations Management, University of Texas at Arlington, Box 19437, 701 S. West Street, Arlington, TX 76019, United States

^c Haskayne School of Business, University of Calgary, 2500 University Drive NW, Calgary, AB T2N 1N4, Canada

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ABSTRACT

This research develops an integrative model of music piracy, specifying self-control and differential association as antecedents, peer influence in music downloading/sharing as mediator, and self-construal as moderator. Disentangling peer influence into two forms—informational influence and normative influence—this research examines their differential effects on two aspects of music piracy: unauthorized downloading and unauthorized sharing. The findings suggest that informational influence is the key underlying mechanism through which self-control affects unauthorized downloading, whereas the two forms of peer influence mediate the relationship between differential association and both aspects of music piracy. Furthermore, the relationships among antecedents, mediator, and consequences (i.e., unauthorized downloading and unauthorized sharing) are contingent upon individuals' self-construal. These findings yield important implications and intervention programs (e.g., interpersonal skill training, educational extension programs, and artist-student contact points) that can curb music piracy.

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1. Introduction

Digital music services are rapidly expanding into new markets on a global scale, partially due to newly developed tools such as iTunes, Spotify and Deezer (Shanahan & Hyman, 2010). By now, digital music services are available in 58 countries, compared to only 23 at the beginning of 2011 (IFPI, 2013). Thirty-two percent of the music industry revenues in the world come from digital sources, far surpassing the film, newspaper, and book sectors (IFPI, 2013). Accompanying such an unprecedented global expansion is the prevalence of digital piracy. Because of music piracy, the overall global market declined around 31% from 2004 to 2010 (RIAA, 2014). On average, the music industry loses about \$5 billion every year to piracy worldwide (<http://www.soc.duke.edu/~s142tm01/piracyfaq.html>). Globally, one in four Internet users (28%) regularly accesses unlicensed services (IFPI, 2013). Apart from such financial consequences, music piracy may also have exerted detrimental impact on social, creative, and innovative developments, as well as respect for tradition, norms, and rituals.

As the world's largest music market, the American music industry also suffers a lot from the damage caused by piracy. Since 1999, sales

of recorded music in the U.S. have fallen by an average of 7% every year due to piracy (Connolly & Krueger, 2005), resulting in the loss of \$12.5 billion and dramatic hindrance in job growth (Siwek, 2007). Americans lose 71,060 jobs and \$2.7 billion in earnings every year, including at least \$422 million tax revenues (Siwek, 2007).

Recognizing the severe consequences mentioned above, prior researchers have examined the potential motives for music piracy and tried to find methods to reduce or prevent this behavior. They perceive self-control and differential association as the most impactful factors on music piracy among a variety of potential determinants (Higgins, Fell, & Wilson, 2006; Hinduja, 2006). *Self-control* refers to the ability to resist temptation to commit criminal or analogous deviant behavior (Gottfredson & Hirschi, 1990). Low self-control leads to computer crimes in general (Skinner & Fream, 1997), and MP3 downloading in particular (Higgins et al., 2006; Hinduja, 2006). *Differential association* reflects the degree to which an individual associates and interacts with those who engage in music piracy or express norms, values, and attitudes supporting pirating behaviors (cf. Akers & Jensen, 2006). It provides a social context where techniques, attitudes, drives, and rationalizations for music piracy are learned and internalized. The more a person is exposed to music piracy behavior and attitudes favorable of such behavior, the greater the probability of that person engaging in music piracy (Wang, Yang, & Bhattacharjee, 2011).

Extending the existing research, this paper develops an integrative model of music piracy (see Fig. 1), specifying self-control and differential association as antecedents, peer influence in music downloading/

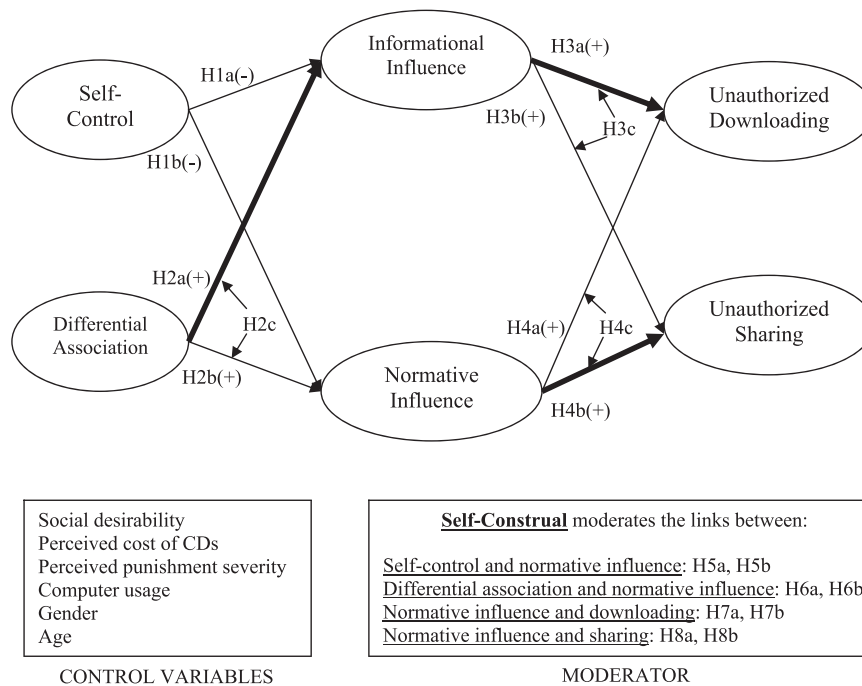
* Corresponding author. Tel.: +1 817 272 0153; fax: +1 817 272 2854.

E-mail addresses: zyang@uta.edu (Z. Yang), jwang@uta.edu (J. Wang),

mehdi.murali@haskayne.ucalgary.ca (M. Murali).

¹ Tel.: +1 817 272 3520; fax: +1 817 272 5801.

² Tel.: +1 403 220 6684; fax: +1 403 282 0095.



Note:

For H2c, H3c, and H4c, the heavier line is hypothesized as a stronger impact compared to the lighter line.

Fig. 1. The music piracy model.

sharing as mediator, and self-construal as moderator. It intends to contribute to the literature in three ways. First, it develops a construct of “peer influence in music downloading/sharing”, drawing upon the relevant literature on interpersonal influence on consumption-related behaviors (Bearden, Netemeyer, & Teel, 1989; Bristol & Mangleburg, 2005; Mascarenhas & Higby, 1993; Yang, Kim, Laroche, & Lee, 2014; Yang & Laroche, 2011; Yang, Schaninger, & Laroche, 2013). Peer influence in this context refers to the tendency to be influenced by others to engage in music downloading and/or sharing. Note that, by definition, peer influence in music downloading/sharing is not piracy-specific; it also applies to the situation of downloading/sharing authorized music files (e.g., sampling or online purchasing). This research demonstrates that peer influence exerts significant impact on individuals' music piracy even if the construct itself has a neutral stand.

Studying music piracy from the perspective of peer influence is consistent with recent literature showing that word-of-mouth (Condry, 2004; Givon, Mahajan, & Muller, 1995), or making friends with relevant others (Hennig-Thurau, Henning, & Sattler, 2007), is a major motive to engage in piracy. According to Condry (2004), music piracy is essentially a group behavior that involves word-of-mouth discussions, friend-to-friend sharing, and convenience in music access. The culture of music piracy is so strong that lawsuits or technologies alone cannot easily change it (Condry, 2004). As evidence, although the RIAA has filed more than 21,000 illegal downloading/sharing suits since September 2003, the conviction rate is low (Triplett, 2007). Furthermore, there are lawsuits against the recording industry for violating antitrust laws, conspiring to defraud the courts, and making extortionate threats (Fitzgerald, 2007; Triplett, 2007). Such news, combined with conflicting views in the new social media, may create confusion in individuals' minds about whether music piracy is a socially acceptable behavior.

Second, this research simultaneously examines the effect of two types of peer influence (i.e., informational and normative) on two aspects of music piracy, namely unauthorized downloading and unauthorized sharing. *Unauthorized downloading* refers to the extent to which an

individual engages in downloading unauthorized music files from the Internet, while *unauthorized sharing* refers to the degree to which an individual engages in sharing unauthorized music with others (e.g., uploading music files to websites). Unauthorized downloading and sharing differ not only in the direction of piracy (e.g., download from vs. upload to the P2P networks), but also in the motives underlying these behaviors. According to Wang et al. (2011), unauthorized downloading is mainly driven by economic needs (e.g., convenience, money-saving), whereas sharing is largely driven by social needs (e.g., friendship, recognition from friends, reciprocity). The interplay of influence type and piracy dimension likely advances our understanding about differential motives underlying each component of music piracy.

Finally, this research is among the first to examine how self-construal sets a boundary condition for the proposed model of music piracy. According to Markus and Kitayama (1991), there are two types of self-construal, independent and interdependent, which correspond to the macrocultural constructs of individualism and collectivism, respectively. An independent self-construal defines oneself as a unique individual and separate from others, whereas an interdependent self-construal defines the self as a member of a group and connected with others (Ma, Yang, & Murali, 2014). Music piracy is a global phenomenon and poses a more alarming threat in collectivism-oriented countries (IFPI, 2009). Comparing music sharers between Japan and the U.S., Condry (2004) finds that the ‘culture’ of file sharing plays a stronger role in affecting music sharing among Japanese consumers. Although these studies provide intriguing findings, they infer rather than measure cultural values. We do not know the extent to which an individual's orientation toward collectivism/individualism affects his/her pattern of being influenced by peers in unauthorized downloading/sharing.

This research uses university students in the U.S. as primary test subjects to study music piracy for several reasons. First, the U.S. is currently leading the trend of the world's music market, and digital channels have overtaken physical formats to become the primary source of revenues for record companies (IFPI, 2013). Thus, studying American youth can

provide a future outlook to combat digital piracy on a global scale. Second, compared to other countries, the U.S. is more aggressive in using a variety of deterrence tools to tackle piracy (e.g., legal sanction, prosecuting and publicizing individuals who engage in piracy), but the effectiveness of such measures is questionable (Triplett, 2007). Even worse, 67% of digital piracy sites are in North America and Western Europe (<http://www.go-gulf.com/blog/online-piracy>). About 95% of American Generation Yers do not agree that downloading music for free from the Internet is wrong or unethical (Freestone & Michell, 2004). Therefore, understanding how these youths formed piracy “norms” is important for managers to develop new intervention programs to tackle the problem. Third, a majority of university students are music lovers, and a significant percentage of them pirate music on-campus (Sinha & Mandel, 2008). Because of this, the RIAA has recently refocused its anti-piracy efforts on universities (Musgrove, 2007). Studying peer influence among university students is also right on target, because most of them are at the post-adolescent age and more susceptible to peer influence than any other age groups (Yang & Laroche, 2011). Finally, studying cultural influences in a single country minimizes the influence of other exogenous cross-national differences that go beyond cultural orientation, such as corruption level, political issues, and GDP per capita.

2. Conceptual framework

2.1. Peer influence in music downloading/sharing

The marketing literature defines peer influence in product/brand choice as the need to identify with or enhance one's image in the opinion of significant peers through the acquisition and use of products and brands, as well as the willingness to conform to the expectations of peers regarding purchase decisions and/or the tendency to learn about products and services by observing peers and/or seeking information from peers (Bearden et al., 1989). According to the definition, peer influence includes the impact not only from people with whom consumers interact face-to-face, but also from others they like to psychologically associate with, such as a reference group. Further, there are two forms of peer influence, namely informational influence and normative influence (Bearden et al., 1989). Informational influence results from actively requesting information from knowledgeable peers or from passively observing others, due to lack of knowledge about a specific topic or subject. Normative influence originates from a desire to achieve a sense of belonging, to identify with peers, or to obtain social approval. Previous research in marketing shows that susceptibility to peer influence in product/brand choice shapes consumers' attitudes, norms, values and aspirations (Batra et al., 2001).

Following the literature on peer influence in brand/product choice, this research proposes that the influence that peers exert on an individual's music downloading/sharing also encompasses two forms, namely informational and normative. In this case, *informational influence* refers to the tendency to seek out information about music downloading/sharing (e.g., where, when, how) from peers, while *normative influence* reflects the willingness to conform to the expectations of peers to engage in music downloading/sharing or the desire to identify with or enhance one's image in the opinion of peers through engaging in music downloading/sharing. Focusing on the construct of “peer influence in music downloading/sharing”, this study examines its mediating role on the effect of self-control and differential association on unauthorized downloading/sharing.

2.2. The effect of self-control on peer influence

Individuals could obtain information about music downloading/sharing at the cognitive level through observing other people's actions or directly asking others. Peer groups often serve as important sources for individuals to learn such skills and knowledge and therefore exert significant informational influence on their behavior. Friends, for

instance, can be a reliable source to learn the newest songs and the latest techniques and tricks of downloading/uploading music files from/to networks. They can also bring in reliable communities for downloading/sharing (Brown, Sellen, & Geelhoed, 2001; Condry, 2004). This study anticipates that individuals with low self-control are more likely to seek information from peers than those with high self-control. Poor or ineffective parenting, the major cause of low self-control, often generates mistrust and negative relationship between parents and children (Peterson & Hann, 1999). Disturbing intergenerational relationships and unsupportive family environment usually lead children to seek advice from peers, instead of from parents or other adults, to resolve their problems (Yang et al., 2013).

H1a. Lower self-control leads to greater degree of being affected by informational influence.

Turning to relationship between self-control and normative influence, previous research indicates that low self-control leads to feelings of loneliness, heightened social anxiety, and lack of friendship (Tangney, Baumeister, & Boone, 2004). Such feelings of non-belongingness often make those low in self-control more vulnerable to peer influence. As a result, low self-control individuals tend to strive to gain the approval of others, a motive that drives them to engage in self-presentation strategies, such as voicing agreement with the views of significant others (Premeaux & Bedeian, 2003). Following the same vein, the lowly self-controlled would have greater tendency to meet the expectations of their friends to engage in music downloading/sharing because their need to keep the relationship with friends is stronger than that of the highly self-controlled. The forgoing logic suggests a negative link between self-control and normative influence.

H1b. Lower self-control leads to a greater degree of being affected by normative influence.

2.3. The effect of differential association on peer influence

We predict a positive link between differential association and informational influence. By definition, the higher one's differential association is, the greater portion of his/her friends engages in music piracy (c.f., Akers & Jensen, 2006). Association and interaction with pirating peers provide chances to passively observe downloading/sharing behaviors and/or actively seek information about downloading/sharing (Wang et al., 2011). As the level of differential association increases (e.g., hanging out with more pirating peers), people more likely observe or talk about music downloading/sharing with peers and thus the tendency to learn about music downloading/sharing increases. In addition, they often view pirating peers as experts of the latest techniques and tricks of music downloading/sharing, and as a reliable source to recommend downloading/sharing communities.

H2a. Higher differential association leads to a greater degree of being affected by informational influence.

Since the power to reward or punish is greater in a large group than in a small one (Latané, 1981), we also expect differential association to positively affect normative influence. A larger group of peers that engage in music piracy may have more music files to share and download. If an individual does not contribute to the group, the potential loss as a result of not being allowed to download music files or being expelled from the group is greater. Further, a larger group produces an increased concern with being liked (or not being disliked), which benefits or harms one's self-esteem implied by the consensus of the larger group (Insko et al., 1985). As a result, the tendency to engage in music downloading/sharing in order to meet the expectation of the peers is greater when the level of differential association is higher.

H2b. Higher differential association leads to a greater degree of being affected by normative influence.

We further propose that the impact of differential association on informational influence is greater than that on normative influence. Differential association reflects the potential sources of information for music downloading/sharing. A larger number of music-pirating peers in a group make it more frequently to get exposed to piracy behavior, and easier to come up with discussions related to music downloading/sharing, such as the newest songs, popular artists, and the latest downloading/uploading techniques. Relative to information, social norms in a group tend to be more stable and less sensitive to the growth of group members. The culture of music sharing is so strong that it could hardly be changed even by lawsuits or technologies (Condry, 2004). Therefore,

H2c. The effect of differential association on informational influence is stronger than on normative influence.

2.4. The effect of informational influence on unauthorized downloading and sharing

In order to engage in unauthorized downloading and sharing, individuals need to learn ways to upload, download, or convert/compress CDs into smaller digital files. They also need to identify reliable sources to download and share. Peer groups serve as a credible source to learn such skills and knowledge, and undoubtedly have great impact on one's own pirating behavior. Techniques of music piracy can be learned from friends, and reliable sources or communities can be identified for the purposes of pirating, even if the informational influence itself may involve both illegal and legal contents (e.g., free samples). Therefore, the higher the individuals' desire to know information about music downloading/sharing is, the more likely they engage in it. Consistent with this reasoning, Givon et al. (1995) found that word-of-mouth interaction is an important source from which some people learn about a software and are eventually converted into pirates of the software. Therefore, we expect informational influence to positively associate with unauthorized downloading and sharing.

H3a,b. A greater degree of being affected by informational influence leads to a higher level of: (a) unauthorized downloading, and (b) unauthorized sharing.

We further hypothesize that the effect of informational influence is stronger for unauthorized downloading than for unauthorized sharing. Music piracy is an illegal conduct according to the U.S. Copyright Law (Title 17 U.S.C. Section 101 et seq., Title 18 U.S.C. Section 2319). Engaging in unauthorized downloading/sharing involves certain risks of being caught and get fined. Given that sharing unauthorized music is by nature a riskier behavior than unauthorized obtaining, and chances of getting caught are higher (Ripeanu, Mowbray, Andrade, & Lima, 2007), informational influence should exert a greater effect on the former. The stronger effect of informational influence on downloading (vs. sharing) can also be understood from the differential motives underlying these two aspects of music piracy. Music downloading leads to economic benefit of saving money and immediate gratification, whereas sharing is chiefly driven by social activities and friendship (Brown et al., 2001). Relative to the direct, immediate, or obvious personal benefits from downloading, social benefits derived by sharing are indirect. In addition, inwardly endorsed motives such as personal interests are autonomous, whereas extrinsic motivations are forced (Coyle, Gould, Gupta, & Gupta, 2009; Deci & Ryan, 1985). When potential risk of being caught is present, individuals often assign priority to the actions with direct benefits rather than those with indirect benefits (Deci & Ryan, 1985).

H3c. The effect of informational influence on unauthorized downloading is stronger than on unauthorized sharing.

2.5. The effect of normative influence on unauthorized downloading and sharing

We anticipate a positive relationship between normative influence and unauthorized downloading/sharing. When facing peer pressure, those with a greater degree of being affected by normative influence are more likely to engage in the behavior that is consistent with their significant others' expectations in order to avoid punishments or gain rewards. Wooten and Reed (2004), for example, report that consumers with a higher level of normative influence put forth greater efforts to gain social acceptance through following their friends' expectations to make consumption-related decisions. A reward/punishment in the context of music piracy can be an enhanced/broken relationship with friends or a privilege/restriction to access a broader span of music files from the networks. Recent findings on music piracy show that free-riders (downloading without providing files to the network) in some networks are restricted to download (Becker & Clement, 2006), and that individuals who do not engage in music piracy run a risk of losing their pirating friends and being expelled from the pirating group (Wang et al., 2011).

H4a,b. A greater degree of being affected by normative influence leads to a higher level of: (a) unauthorized downloading, and (b) unauthorized sharing.

We further predict that normative influence has a stronger effect on unauthorized sharing than on unauthorized downloading. Downloading is substantially impacted by economic motives, whereas sharing is essentially a social behavior. The viability of a P2P network critically depends on the proportion of sharers to downloaders, and indirect reciprocity is a social norm that is voluntarily enforced by contributors in a music sharing network (Gu et al., 2008). Proactively engaging in sharing helps maintain and strengthen the relationship with other users in a network, whereas free-riders may run a risk of being expelled from the group (Becker & Clement, 2006). The forgoing discussion suggests that normative influence has a greater effect on sharing (vs. downloading). Consistent with this prediction, prior researchers (Becker & Clement, 2006; Ripeanu et al., 2007) found that recognition from friends increases one's involvement in sharing but not in downloading.

H4c. The effect of normative influence on unauthorized sharing is stronger than on unauthorized downloading.

2.6. Moderating role of self-construal

We propose that self-construal sets a boundary condition for the proposed music piracy model in Fig. 1. First, the effect of self-control on peer influence (informational and normative) is expected to be stronger for individuals with a predominantly independent self-view (henceforth termed the 'independents') than for those with a predominantly interdependent self-view (the 'interdependents'). One important difference across these two groups of people is their social orientation. The independents make judgments and decisions on the basis of their own internal repertoire of attitude and thoughts, with little reference to the attitude and thoughts of others; in contrast, the interdependents place great importance on social norms and the opinion of others in forming judgment and behavioral intentions (Ma et al., 2014). Self-control serves as internal discriminative stimuli that behaviorally restrict an individual from engaging in music piracy. This preventive mechanism should be more effective for the independents than for the interdependents.

H5a,b. The effect of self-control on (a) informational influence and (b) normative influence is stronger for the independents than for the interdependents.

Second, the effect of differential association on peer influence (informational and normative) should be stronger for the interdependents than for the independents. Peer groups expose the individual to the

various norms and values related to music piracy. Through peer groups, individuals become exposed to, and ultimately learn normative definitions (e.g., motives, drives, rationalizations, and attitudes) favorable and unfavorable to music piracy. Previous studies report that differential association exerts a strong influence on software piracy intention (Higgins et al., 2006), computer crime (Skinner & Fream, 1997), and MP3 file downloading (Hinduja, 2006). Given that the interdependents are more sensitive and vulnerable to group norms than the independents, associating with more pirating friends is likely to drive them to be influenced by peers to a greater degree.

H6a,b. The effect of differential association on (a) informational influence and (b) normative influence is stronger for the interdependents than for the independents.

Third, the effect of informational influence on music piracy is expected to be stronger for the independents (vs. interdependents). The rationale is grounded in another important difference across the independents and the interdependents: goal orientation or regulatory focus. The goals of the independents rest in a promotion focus and oriented toward seeking benefits, gains, and self-enhancements, whereas the goals of the interdependents feature a prevention focus and oriented toward avoiding uncertainty, mistakes, and losses (Ma et al., 2014). The difference in regulatory focus, and hence in general proclivities to benefits and risks, plays an important role in shaping individuals' propensity to be affected by informational influence. While informational influence likely drives the independents' music piracy, it may not drive the interdependents' behavior, depending on their perception of potential risks in the behavior.

H7a,b. The effect of informational influence on (a) unauthorized downloading and (b) unauthorized sharing is stronger for the independents than for the interdependents.

Finally, the effect of normative influence on music piracy should be stronger for the interdependents than for the independents. The interdependents are more likely to view themselves from the perspectives of others, are highly conscious of group memberships, more vulnerable to criticism and more concerned with the establishment and maintenance of harmonious ties with others (Markus & Kitayama, 1991). For those with a strong interdependent self, making decisions based upon their own inner feelings or beliefs may be regarded as immature or selfish; as a result, they are often encouraged to sacrifice personal goals for the good relationship with others (Yang & Laroche, 2011). The independents, by contrast, tend to make decisions based primarily on one's own internal repertoire of attitude and thoughts, but make little reference to the attitude and thoughts of others (Ma et al., 2014).

H8a,b. The effect of normative influence on (a) unauthorized downloading and (b) unauthorized sharing is stronger for the interdependents than for the independents.

3. Study 1

The objective of Study 1 is to develop a measure of peer influence in music downloading/sharing, where peer influence is conceptualized as a two-dimensional construct. Such a conceptualization is in concert with the extant literature (Bearden et al., 1989; Bristol & Mangleburg, 2005; Mascarenhas & Higby, 1993; Yang & Laroche, 2011). Following established scale development procedures (Noar, 2003), this study constructed the instrument through literature review, focus groups, and experts. These items were validated by a sample of 306 students at a major university in the southern United States.

3.1. Sample and procedures

Researchers posted the survey invitation in public areas of the university. Participation was voluntary, and each participant received a \$6

gift certificate as a token of appreciation. Usable answers were gathered from 306 students. The sample was randomly split into two equal groups following established scale development procedures (Noar, 2003). Exploratory factor analysis (EFA) was carried out on one half of the sample to reduce the pool of items and confirmatory factor analyses (CFA) were performed on the other half in order to assess unidimensionality.

3.2. Measures

A new scale was developed for "peer influence in music downloading/sharing". Items for the scale were generated following a combination of inductive and deductive approaches. First, a pool of items was gathered from the literature on interpersonal influence (Bearden et al., 1989; Bristol & Mangleburg, 2005; Mascarenhas & Higby, 1993; Yang & Laroche, 2011), and adapted to the conceptual domain of peer influence in music downloading/sharing. Then, in order to achieve a richer spectrum of items, the researchers discussed the measures with five Ph.D. students, 12 undergraduate students, and four university administrative staffs. Duplicate items were then eliminated, leaving 16 items which were intended to reflect the domain of interest.

In order to ensure an adequate level of content and face validity, three researchers in marketing and one researcher from information systems at a major university were asked to evaluate the remaining items with regard to how well they reflected the definition of the intended construct (assessment of content validity) and not some other constructs (assessment of face validity). In addition, the experts were asked to point out ambiguously-worded and redundant items. As a result of the expert judges' evaluations, four items were eliminated, leaving 12 items.

Since self-reported peer influence measure may be biased by social desirability, it was considered prudent to test the peer influence in downloading/sharing scale for susceptibility to social desirability bias. Social desirability was assessed by a short version of the Marlowe–Crowne Social Desirability Scale developed and validated by Strahan and Gerbasi (1972).

3.3. Results

First, an EFA was carried out on one half of the sample. Two factors emerged from the data as expected. The loadings for each factor were evaluated sequentially using .4 and .5 respectively as the critical thresholds. In addition, each item was evaluated to verify whether deleting it would significantly change the domain of the construct. The evaluation of the item-to-total correlations resulted in the removal of one item, leaving 11 items. The exact wording of the remaining items is listed in Appendix A.

Next, the model was subjected to CFA in order to verify its unidimensionality. The data were obtained from the second half of the split sample, providing 153 questionnaires for the CFA. This procedure based on maximum likelihood was carried out on the combined measurement model. The results indicated that the model fit the data well, with $\chi^2 = 67.08$, $df = 43$, $\chi^2/df = 1.56$, RMSEA = .04, IFI = .97, and CFI = .97. Besides, items were loaded as predicted, supporting unidimensionality of the "informational influence" and "normative influence" subscales.

The correlation between the informational influence and social desirability measures was $-.077$ ($p = .23$, n.s.) and the correlation between the normative influence and social desirability measures was $-.014$ ($p = .82$, n.s.), suggesting that social desirability bias was not a significant problem for the peer influence scale.

4. Study 2

The objective of this study is to examine the conceptual framework in Fig. 1 and test H_{1a} through H_{8b}.

4.1. Sample and procedures

The invitations were distributed to more than 400 students taking business courses for partial credits. To ensure anonymity and confidentiality, no information related to their identity was collected. The survey resulted in 278 valid responses. The sample was representative of the student population in terms of gender (51% females), age (56% between 21 and 25 years old), and computer usage (91% spent at least 5 h on computer per week).

4.2. Measures

Self-control was measured with the 13-item Self-Control Scale developed by Tangney et al. (2004). Following Wang et al. (2011), differential association was assessed by a reflective second-order construct, with three first-order reflective constructs gauging differential association in downloading, uploading, and letting friends copy.

As in Wang et al. (2011), we used multi-faceted measures to assess both unauthorized downloading and unauthorized sharing. Each behavior is a reflective construct, measuring intensity, frequency, and amount of the behavior. For cases when both downloading and sharing were concurrent (e.g., BitTorrent), the behavior was completely or partially classified as one of these behaviors by the participants themselves, based on whether their intention was to download or to proactively share.

The moderator, self-construal, was assessed by the Self-Construal Scale developed by Singelis (1994). The independent self-construal ($\alpha = .78$) was measured by items such as “I enjoy being unique and different from others in many ways” (1 = strongly disagree, 7 = strongly agree). Trait interdependent self-construal ($\alpha = .70$) was measured by items such as “I usually sacrifice my self-interest for the benefit of my group”. Trait self-construal was indexed by the difference between the average scores of the interdependent and the independent subscales. A mean split of the self-construal index categorized the participants as predominantly interdependent or independent.

4.2.1. Control variables

To have a more conservative test of the hypotheses, the analysis controlled the effects of a variety of covariates, including participants' social desirability, perceived cost of CDs, perceived punishment severity, computer usage, and such demographics as age, gender, and employment level. Social desirability was assessed the same way as in Study 1. The measures of perceived cost of CDs and perceived punishment severity were adopted from Peace, Galletta, and Thong's (2003) study. Computer usage was reflected by hours of using computers every week (Wang et al., 2011). Age was controlled through using a homogeneous group of participants and therefore was not included in the data analysis. Gender was a dummy variable, with females coded as 0 and males as 1. Employment level was also a dummy variable, with holding a full-time job coded as 1.

4.3. Results

4.3.1. Assessment of measures

The following three methods indicated that the constructs had adequate convergent and discriminant validity. First, the square root of the average variance extracted (AVE) of all constructs was much larger than all other cross-correlations. Second, all AVEs were well above 0.50, suggesting that the constructs captured much higher construct-related variance than error variance. Third, all items loaded highest on their intended constructs with all factor loadings were greater than 0.70 (all *t*-values are significant).

The potential threat of common method bias was evaluated by Harman's one-factor test (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). The one-factor model yielded a χ^2 of 2479.9, *df* = 427 compared with χ^2 = 834.7, *df* = 392 for the measurement model. Since the one-

factor model was significantly worse ($\Delta\chi^2$ = 1645.2, Δdf = 35, $p < .001$), common method bias was not a serious threat to this study.

4.3.2. Effects of control variables

As shown in the full latent model (see Fig. 2), neither of the links from perceived cost of CDs to downloading or sharing was statistically significant (p 's > .10). Social desirability was not significantly related to unauthorized downloading or sharing (both p 's > .10). These findings are consistent with previous research showing that people nowadays do not view music piracy as a transgression of social norms (Sinha & Mandel, 2008). Reinforcing this argument, results also showed that perceived punishment severity was not significantly related to music piracy ($p > .10$). The full latent model fitted the data well, with $\chi^2(544)$ = 959.06, $p < .001$, χ^2/df = 1.76, CFI = 0.95, and RMSEA = 0.051.

Some demographics were found to significantly affect music piracy. More importantly, their influences on downloading and sharing were not the same. For example, holding a full-time job decreased music sharing ($b = -.096$, $p < .05$), but didn't affect downloading ($p > .10$). Males shared more music files than females ($b = .146$, $p < .01$); yet, they had about the same level of downloading ($b = .028$, $p > .10$). Heavy computer users downloaded more files than light computer users ($b = .201$, $p < .001$); nevertheless, no such difference existed on music sharing. These findings suggest that downloading and sharing are two related but distinct behaviors and have different predictors.

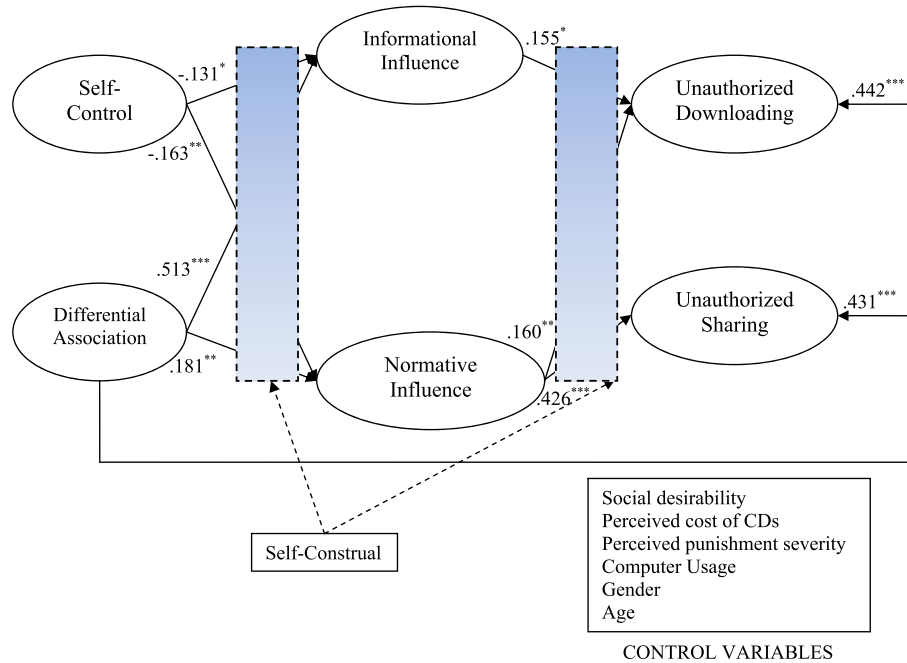
4.3.3. Testing hypotheses H_{1a} through H_{4c}

Consistent with H_{1a} and H_{1b} , self-control was negatively related to informational influence ($b = -.131$, $p < .05$) and normative influence ($b = -.163$, $p < .01$), respectively. Supporting H_{2a} and H_{2b} , the paths from differential association to informational influence ($b = .513$, $p < .001$) and normative influence ($b = .181$, $p < .01$) were positive and significant. Furthermore, the follow-up invariance test showed that the magnitude of these two estimates had a significant difference ($b_{\text{relational}} = .513$ vs. $b_{\text{normative}} = .181$, $\chi^2 = 27.12$, *df* = 1, $p < .001$), confirming H_{2c} .

In support of H_{3a} , the relationship between informational influence and unauthorized downloading was positive and significant ($b = .155$, $p < .05$). H_{3b} was not supported because the link between informational influence and sharing didn't reach statistical significance. H_{3c} predicts that the effect of informational influence on unauthorized downloading (vs. sharing) is stronger. The invariance test indicated that H_{3c} was marginally supported ($b_{\text{downloading}} = .155$ vs. $b_{\text{sharing}} = .038$, $\chi^2 = 3.23$, *df* = 1, $p < .10$). H_4 depicts a positive effect of normative influence on downloading (H_{4a}) and sharing (H_{4b}), but the effect on sharing would be stronger (H_{4c}). All these three hypotheses were supported, as evident by positive links from normative influence to downloading ($b = .160$, $p < .01$), and sharing ($b = .426$, $p < .001$). The difference between these two estimates was also significant and in the hypothesized direction ($b_{\text{downloading}} = .160$ vs. $b_{\text{sharing}} = .426$, $\chi^2 = 31.16$, *df* = 1, $p < .001$).

4.3.4. Testing moderating effects of self-construal (H_5 to H_8)

Prior to moderation tests, two baseline structural models were tested following the procedure recommended by Byrne (1994), one for the interdependents (*n* = 126) and the other for the independents (*n* = 152). These models, along with corresponding fit indices and standardized parameter estimates, are presented in Table 1. Following Byrne's (1994) approach, measurement-level constraints (i.e., configural invariance, metric invariance, factor covariance invariance, and error variance invariance) were introduced to test the equality of the measurement models across the interdependents and the independents. Chi-square difference tests were used to identify the best model that could represent common measurement properties for the two samples. The results showed that the factors in our interdependent and



Note:

***, $p < .001$; **, $p < .01$; *, $p < .05$.

^a All possible paths in the model were estimated, but only significant paths are displayed. Values associated with each path are standardized regression coefficients.

Fig. 2. Results of the proposed music piracy model^a.

independent samples had at least the same factor patterns, factor structure, and factor covariances.

H₅ predicts that the effects of self-control on (a) informational influence and (b) normative influence are stronger for the independents (vs.

interdependents). Supporting H_{5a}, self-control's impact on informational influence was indeed stronger for the independents ($b = -.204$) than for the interdependents ($b = -.047$; $\chi^2 = 4.78$, $df = 1$, $p < .05$). Also, its impact on normative influence was stronger for the

Table 1
Music piracy model for interdependents and independents.

Causal paths in the music piracy model	Standardized β values		Chi-square (p -value)	Hypothesis testing results
	Interdependents ($n = 126$)	Independents ($n = 152$)		
<i>Hypothesis testing</i>				
Self-control \rightarrow informational influence (H5a)	-.047	-.204*	4.78 (.029)	Supported
Self-control \rightarrow normative influence (H5b)	-.004	-.176*	3.87 (.049)	Supported
Differential association \rightarrow informational influence (H6a)	.669***	.422***	5.13 (.024)	Supported
Differential association \rightarrow normative influence (H6b)	.319**	.082	7.47 (.006)	Supported
Informational influence \rightarrow unauthorized downloading (H7a)	.005	.238*	6.02 (.014)	Supported
Informational influence \rightarrow unauthorized sharing (H7b)	-.061	.109	1.06 (.303)	<i>Not Supported</i>
Normative influence \rightarrow unauthorized downloading (H8a)	.260**	-.028	6.91 (.009)	Supported
Normative influence \rightarrow unauthorized sharing (H8b)	.493***	.230**	4.77 (.029)	Supported
<i>Control paths</i>				
Self-control \rightarrow unauthorized downloading	-.064	-.089		
Self-control \rightarrow unauthorized sharing	.000	-.069		
Differential association \rightarrow unauthorized downloading	.623***	.350**		
Differential association \rightarrow unauthorized sharing	.565***	.330**		
Fit indices	$\chi^2(1088) = 1634.4, p < .001,$ $\chi^2/df = 1.50, IFI = 0.93,$ $CFI = 0.93, RMSEA = 0.043$			

* $p < .05$.

** $p < .01$.

*** $p < .001$.

independents ($b = -.176$) than for the interdependents ($b = -.004$; $\chi^2 = 3.87$, $df = 1$, $p < .05$), supporting H_{5b} .

H_6 states that the effects of differential association on (a) informational influence and (b) normative influence are stronger for the interdependents (vs. independents). In support of H_{6a} , the estimate of the link between differential association and informational influence in the interdependent model ($b = .669$) was significantly larger than that in the independent model ($b = .422$; $\chi^2 = 5.13$, $df = 1$, $p < .05$). Furthermore, the estimate of the link between differential association and normative influence was larger for the interdependents ($b = .319$) than for the independents ($b = .082$; $\chi^2 = 7.47$, $df = 1$, $p < .01$), supporting H_{6b} .

H_7 posits that the effects of informational influence on (a) unauthorized downloading and (b) unauthorized sharing are stronger for the independents (vs. interdependents). Supporting H_{7a} , the coefficient of the link between informational influence and downloading was larger for the independents ($b = .238$) than for the interdependents ($b = .005$; $\chi^2 = 6.02$, $df = 1$, $p < .05$). H_{7b} was not supported, as the positive effect of informational influence on sharing did not differ between the independents and the interdependents.

H_8 specifies that the effects of normative influence on (a) unauthorized downloading, and (b) unauthorized sharing are stronger for the interdependents (vs. independents). Consistent with H_{8a} , normative influence on downloading was stronger for the interdependents ($b = .260$) than for the independents ($b = -.028$). Similarly, normative influence on sharing was also stronger for the interdependents ($b = .493$) than for the independents ($b = .230$; $\chi^2 = 4.77$, $df = 1$, $p < .05$), supporting H_{8b} .

5. Discussion

This study introduces the concept of “peer influence in downloading/sharing” into the piracy literature and develops a scale that measures two forms of such influence: informational and normative. Focusing on two dimensions of music piracy—unauthorized downloading and sharing—it shows that the two forms of peer influence have differential effects on the two aspects of music piracy. Informational influence has a greater impact on unauthorized downloading (vs. sharing), but the reverse is true for normative influence. In addition, informational influence is a key mechanism underlying the impact of self-control on unauthorized downloading, whereas both forms of peer influence mediate the effect of differential association on music piracy. Examining these effects in a cultural context, the findings suggest that the effect of informational influence on unauthorized downloading is stronger for the independents than for the interdependents, whereas the effect of normative influence on both aspects of music piracy is stronger for the interdependents than for the independents.

5.1. Theoretical contributions

The findings of this research have several theoretical implications. First, the study's primary contribution is the development and validation of the construct “peer influence in downloading/sharing,” which can be used in future research to explain the psychological processes underlying the popularity of music piracy in the P2P networks. Although the cybercrime research recognizes the importance of peer influence, it is mainly at the conceptual level. To our knowledge, there is no measure in the literature to assess individuals' tendency to be influenced by their friends in downloading/sharing. Given that music pirating hinges to a large extent on individuals' status of self-control and differential association (Higgins et al., 2006), integrating the mediating role of peer influence into the nomological network advances our understanding of the underlying mechanism through which self-control and differential association change downloading and sharing.

Second, the study extends the piracy literature by demonstrating that different forms of peer influence exert differential effect on the

two aspects of music piracy. This also suggests that the effect of self-control and differential association on peer influence depends upon whether the influence is informational or normative. In the literature, both self-control and differential association are well-established key determinants of digital piracy. However, the process through which they impact pirating behaviors has remained an open research question. This is an important question to answer since the mechanism can provide insights into intermediate changes in individuals' vulnerability to peer influence, and hence researchers and managers can further develop intervening programs to curtail music piracy through reducing vulnerability to peer pressure. Our results suggest that peer influence is indeed a primary process through which self-control and differential association impact music piracy. Self-control, for example, decreases downloading by lessening people's degree to be affected by informational influence but diminishes sharing through reducing normative influence. On the contrary, differential association increases downloading through augmenting individuals' extent to be affected by informational influence, but encourages sharing through increasing normative influence.

Finally, this paper contributes to the literature by investigating the important role that self-construal plays as a boundary factor of the proposed model. The effect of self-control on peer influence is stronger for the independents than for the interdependents, whereas the effect of differential association on peer influence is stronger for the interdependents. These findings suggest that individual's cultural orientation toward independent self-view augments people's reliance on internal attributes to make piracy decisions, whereas the cultural orientation toward the interdependent self-view makes peer pressure salient. In the music piracy context, a higher level of differential association represents a higher level of pressure from friends to be involved in pirating. As the interdependents are more sensitive to social cues, they more likely feel such pressure and create internal dissonance to conduct piracy, especially unauthorized sharing.

5.2. Public policy managerial implications

From a public policy managerial perspective, different types of intervention strategies could be developed based on our findings. First, interpersonal skill training, such as training on how to say “no” to the friends who ask for copies of music files, could be covered in university, community college, and high school educational programs, or in ad-hoc community based informational and training sessions. In addition, successful counseling and intervention strategies need to be developed to prevent students from hanging out with music pirating groups, both physically and virtually. This is extremely important for students with a predominant interdependent self-construal. We should let our young consumers, especially the interdependents, know that differential association with pirating peers substantially increases their level of vulnerability to peer influence. In this way, students are aware of the risk and therefore consciously prepared to resist peer pressure. Furthermore, formal intervening systems could be established in schools, and students who have a pirating history could be asked to meet with trained school counselors and educated on how to control their behavior or resist peer pressure.

Educational communication through regular panels on school sites or on the web can also be developed to de-normalize or make those peers who engage in piracy less attractive. Marketers can set up good examples for students to follow. Exemplar figures can be established through advertising in college websites and newspapers to show that a good citizen on campus is the one who keeps away from unauthorized file downloading or sharing.

Further, the important role that peer influence plays in the piracy process also suggests that policy makers and businesses may have to move from a “controlled and powerful top-down” philosophy to a more “democratic” approach. For example, managers could devise more cost-effective business models so that the perceived benefits of

obtaining unauthorized music are reduced, and user-friendly shopping experience for music could be offered to enhance the benefit of “not pirating.” In addition, mechanisms can be set up to allow artists and college students to have more “contact points” at both offline (e.g., inviting artists to the campus as guest speakers) and online (e.g., forums dedicated to artist-student interfaces) to build trust between each other. In this way, students get to know more about the effort that artists put in developing new music and the importance to sustain creativity and innovation through a legal way to listen to music.

Finally, the findings suggest that informational influence exerts significant impact on unauthorized downloading. Therefore, the harmful effects of piracy on the music industry and music producers need to be disseminated and integrated into college and graduate school programs, not only in e-commerce or MIS, but also in ethics programs, and ongoing learning certification programs targeting professional counselors who deal with college students and their families. Professional articles such as our paper should be disseminated at university websites designed for such prevention knowledge to college counselors, professors, and students. This is especially important for the individuals having a predominant independent self-construal.

5.3. Research limitations and future research directions

A limitation of the current research is that it included only university students. On the one hand, this sample is highly relevant because university students represent a major target market for music companies and they also form the most active group of people in music downloading and sharing. In addition, the mediating role of peer influence in music downloading/sharing is likely to hold for other populations of music listeners as well, since the findings on interpersonal influence are consistent across many studies that have been examined with a wide span of age groups (Yang & Laroche, 2011). On the other hand, university students might not accurately reflect other populations, in terms of education, employment level, and computer usage. Future research should investigate the robustness of our model with a more heterogeneous population. Another caveat is that all measures in our model are self-reports, with no actual behaviors. Although common method bias was proven not to be a threat to the internal validity of the findings, including some behavioral measures in future research will improve the external validity of the proposed music piracy model. Finally, this research focuses on generic patterns of music downloading/sharing. However, there may be significant differences in “music culture”. Studying different forms of music culture may be a fruitful avenue to extend our framework because music communities are often formed according to artists and music genres.

Appendix A

Informational influence

INFO01: If I do not know where to download/upload music files, I often consult with others.

INFO02: I frequently gather information from other people about downloading/uploading music files.

INFO03: If I do not know how to download/upload music files, I often consult with others.

Normative influence

NORM01: A major reason that I let my friends copy the music files that I have is to maintain a good relationship with them.

NORM02: In most instances, I made copies of music files for my friends because they urged me to do so.

NORM03: To maintain a good relationship with someone, I often let him/her copy my music files.

NORM04: I made copies of music files for my friends in order to be popular with them.

NORM05: I made copies of music files for someone in order to make him/her like me.

NORM06: A major reason that I upload music files to the Internet is to show who I am, or would like to be.

NORM 07: A major reason that I upload music files to the Internet is to make friends.

NORM 08: I feel that uploading music files will enhance my image.

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