Rajiv K. Sinha & Naomi Mandel

Preventing Digital Music Piracy: The Carrot or the Stick?

The goal of this article is to ascertain the factors that govern consumers' willingness to pirate a digital product, such as a digital music track. The authors assess the tendency to pirate with both indirect measures (e.g., willingness to pay for the legal alternative) and direct measures (e.g., piracy preference). Whether measured indirectly or directly, the tendency to pirate depends, to different extents, on three key factors: positive incentives (e.g., improved functionality of the legal Web site), negative incentives (e.g., perceived risk of piracy), and consumer characteristics. Based on three studies, the results suggest that negative incentives are a strong deterrent for certain consumers but can actually increase piracy tendencies for others. Conversely, positive incentives, such as improved functionality, can significantly reduce the tendency to pirate among all the consumer segments studied. The authors conclude by discussing prescriptive recommendations for the recording industry.

Keywords: music, piracy, willingness to pay, risk tolerance

In recent years, music industry sales have declined in the United States by an average of 7% per year, after peaking in 1999 (Connolly and Krueger 2005). Much of this sales decline has been attributed to the widespread use of illegal file-sharing sites, such as Napster (introduced in 1999 and shut down in 2000) and, more recently, Grokster, LimeWire, and Morpheus (Liebowitz 2004; Peitz and Waelbroeck 2004). However, the success of iTunes and other legal file-sharing Web sites (Wade 2004) seems to indicate that though many consumers pirate their music, a portion of music consumers are willing to pay a positive amount to download music legally.

The primary goal of this article is to ascertain the factors that govern a consumer's decision to pirate a digital music track. Because of the sensitive nature of survey questions about illegal activity, we measure participants' willingness to pirate both directly (through a piracy preference measure) and indirectly (through willingness to pay [WTP] for the legal alternative). Whether it is measured indirectly or directly, we find that the tendency to pirate depends, to different extents, on three key factors: positive incentives (e.g., improved functionality of the legal Web site), negative incentives (e.g., perceived risk of piracy), and consumer characteristics.

Our findings are highly relevant to marketers of music and other products that might be digitized, such as movies and software. Record companies have used much of their resources in the past eight years to fight digital piracy in court. Their numerous copyright infringement lawsuits are intended to produce fear and restraint in consumers; however, there is little evidence that these lawsuits have directly decreased piracy levels. Although illegal downloading has decreased somewhat in recent years (Wade 2004), it is unclear whether this decrease is due to the lawsuits brought about by the Recording Industry Association of America (RIAA) or to the recent availability of rich, user-friendly, legal Web sites, such as iTunes and Real Rhapsody, as an alternative to illegal downloading (Easley, Michel, and Devaraj 2003). Although the music industry is currently working with file-sharing companies, such as Grokster, to convert free trading of digital music to paid services (Hansell 2005), there is much disagreement among industry players about issues such as the price to charge (Bhatia, Gay, and Honey 2003) and whether features such as digital rights management actually deter digital piracy (as intended) or encourage it (BBC News 2007; Bechtold 2004).

In this article, we develop hypotheses, drawn from existing economic, psychology, and consumer theory, that predict the relative success of negative incentives (e.g., legal enforcement) and positive incentives (e.g., enhanced Web features) in decreasing piracy and increasing WTP for the legal product. Our results from three studies suggest that negative incentives are a strong deterrent for certain consumers but can actually increase piracy tendencies for others. Conversely, positive incentives, such as improved functionality, can significantly reduce the tendency to pirate among all the consumer segments we studied.

Conceptual Framework

Digital music is frequently characterized as an information good that is expensive to produce but cheap to reproduce. In perfectly competitive markets, prices of information goods have been predicted to fall to zero (Shapiro and Varian 1999, pp. 19–23). Consistent with this notion, the decreased search costs in an online environment have been found to

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ISSN: 0022-2429 (print), 1547-7185 (electronic)

Journal of Marketing
Vol. 72 (January 2008), 1–15

increase consumers' price sensitivity, but only for commonly available merchandise, not for unique or customizable products (Lynch and Ariely 2000). Unfortunately for record companies, a popular song is commonly viewed as a commodity that can be easily copied with little loss in sound quality, making it a strong candidate for price erosion. We propose that a consumer's decision of whether to download a digital song for free (i.e., to pirate) or to pay for it (and, by extension, how much to pay for it) depends on three key factors: negative incentives (e.g., perceived risk of piracy), positive incentives (e.g., improved functionality of the legal Web site), and consumer characteristics.

Negative Incentives: Perceived Risk of Piracy

A consumer's choice to participate in a risky behavior, such as illegal file sharing, depends on the perceived risk associated with that behavior, which can be broken down into two dimensions: uncertainty (e.g., the probability of getting caught) and adverse consequences (e.g., the punishment) (Bauer 1960). In general, people are risk averse, and they are more averse to losses than to equivalent gains (Kahneman and Tversky 1984). Therefore, it seems plausible that increasing either the probability of getting caught or the negative consequences of illegal downloading should lead to a decrease in piracy. The RIAA has attempted to increase the perceived probability of getting caught by suing more than 14,000 file swappers (Reuters 2005). It has also attempted to increase the perceived magnitude of negative consequences by imposing excessive penalties, such as a fine of $750 per copyright infringement, which would amount to approximately $3 million for someone who has accumulated 4000 songs on a hard drive (Barker 2004). Indeed, some of the RIAA's actions appear to be working. For example, the NPD Group found that approximately 1.4 million people have deleted all illegal MP3 files from their computers in an attempt to protect themselves from impending lawsuits (Wade 2004). Therefore, we expect that there is a significant effect of perceived risk on consumers' tendency to pirate.

H_1: A consumer's perceived risk of getting caught downloading illegally decreases his or her tendency to pirate a digital song.

A closely related, albeit distinct, construct (to piracy potential) is the WTP for a legal song. The distinction between the two is that all pirates are unwilling to pay for a product, but not all consumers with a zero WTP (or a WTP that is less than the legal retail price) can be considered pirates. Rather, some of these consumers may prefer to purchase the music in CD format or to forgo the purchase because their WTP is less than the retail price. Nevertheless, the average WTP of any consumer segment will decrease with an increase in piracy so that ascertaining the average WTP of a group of consumers who are interested in owning a particular digital track (legally or illegally) provides an important indication of their tendency to pirate. For example, in the context of H_1, because fewer people should be willing to pay $0 (or pirate) when they believe that they are likely to be caught, the average WTP among participants should increase. Therefore, we expect that WTP for a legal download increases when perceived risk increases.

Consumer Characteristics

Next, we examine the demographic and psychographic profile of a consumer who downloads music illegally. Moe and Fader (2001) suggest that for "hedonic portfolio" (i.e., collectible) products, such as music, several different consumer segments exist, and these segments behave differently in terms of their product acquisition behavior. How do digital pirates differ from consumers who either download legally or purchase music in the traditional CD format? Digital music pirates tend to be young and male, and their likelihood of pirating increases with the price of the song, the popularity of the song, and the size of the bandwidth available (Bhattacharjee, Gopal, and Sanders 2003). College students make up a large portion of illegal downloaders, as a result of high-speed network connections and an abundance of free time (Wade 2004). Consistent with this argument, CD sales declined more at stores near universities after Napster's appearance than did sales in other regions (Fine 2000).

We propose that a consumer's optimal stimulation level (OSL) (Leuba 1955; Raju 1980) also determines his or her piracy potential. According to OSL theory, every person has an ideal level of stimulation; when the stimulation offered by the external environment is too low, he or she will attempt to increase stimulation, and when the external stimulation is too high, he or she will attempt to decrease it. A consumer's OSL is typically measured with scales such as the sensation-seeking scale (Zuckerman 1979) or the arousal-seeking-tendency scale (Mehrabian and Russell 1974; Raju 1980). People with high OSLs desire novel, varied, and complex experiences and sensations, and in general, they are willing to take the risks necessary to achieve such experiences (Zuckerman 1979). The OSL is highly correlated with demographic variables, such as age, gender, employment status, and education. High-OSL consumers are relatively younger, more educated, better employed, and more likely to be male than low-OSL consumers (Raju 1980; Zuckerman 1994, p. 114). Finally, the OSL is an important determinant of a consumer's exploratory behaviors (Raju 1980). High-OSL consumers are more likely to participate in behaviors such as innovativeness, risk taking, and variety seeking, as measured by Raju's (1980) exploratory tendencies in consumer behavior (EXPL) scale.

High-OSL consumers show a greater preference for complexity, asymmetry, and the appearance of movement in visual images (Zuckerman 1994, p. 201). They also prefer complexity and novelty in music and enjoy live music performances (Schierman and Rowland 1985). Because high-OSL consumers are likely to seek out new artists and songs that are not currently in their collections and are willing to take risks to do so, we believe that OSL is positively related to the propensity to download illegally.

H_2: A consumer's OSL is positively related to his or her tendency to pirate a digital song.

Along the same lines, we expect that WTP for a legal download decreases when OSL increases.

Furthermore, we expect that OSL moderates the relationship between perceived risk and piracy. Recent studies indicate that legal restrictions may not always inhibit illegal file swapping; on the contrary, when consumers believe that the rules are too excessive, they become even more likely to break them (Raghu et al. 2005). Therefore, it is unclear whether increasing the perceived risk of piracy either increases or decreases consumers' digital piracy. We propose that the effect of perceived risk depends on a consumer's OSL. Specifically, low-OSL consumers should be less likely to pirate when the perceived risk is increased. However, high-OSL consumers have a higher tolerance for risk; therefore, we expect that increasing the perceived risk will not decrease their piracy levels. Indeed, if taking such a risk provides a higher level of arousal for high-OSL consumers, it might actually increase their piracy levels.

H_3: OSL moderates the relationship between perceived risk and piracy. For low-OSL consumers, increasing the risk of being caught decreases piracy, and for high-OSL consumers, increasing the risk of being caught does not decrease piracy.

Similarly, we expect that increasing perceived risk increases WTP for low-OSL consumers but not for high-OSL consumers.

We also examine the role of ethics in the file-sharing decision. Previous research has found that people who download illegally have a lower level of ethical concern than those who do not (Levin, Dato-on, and Rhee 2004). Thus, we expect that consumers who score high on the Machiavellian scale (Christie and Geis 1970) are less willing to pay for legal downloads than those who score low. Machiavellianism is characterized by "cool detachment" and clever manipulation of others to achieve personal goals. Therefore, it is likely that high scorers on this scale demonstrate less sympathy for the artists' and music companies' losses as a result of music piracy. Furthermore, respondents who score high on Machiavellianism demonstrate a distrust of others. For example, the Machiavellian scale (Mach IV; Christie and Geis 1970) includes items such as "It is safest to assume that all people have a vicious streak and it will come out when they are given a chance" and "Anyone who completely trusts anyone else is asking for trouble." We reasoned that many consumers engage in cheating behaviors, such as illegal downloading, because of the belief that "everyone else is doing it." Furthermore, it seems intuitive that high scorers on the Machiavellian scale will demonstrate a higher OSL than low scorers. Therefore, we expect that high scorers on the Machiavellian scale are willing to pay less than low scorers for a legal download.

H_4: Consumers with high scores on the Machiavellian scale demonstrate a greater tendency toward digital piracy than those with low scores.

Positive Incentives: Improved Functionality

Recent decreases in piracy may not be due to the RIAA's legal actions but rather to the availability of attractive legal alternatives, such as iTunes, which was launched in 2003 and accounted for more than 25 million legal downloads by the end of that year (Wade 2004). A way to mitigate the downward pressure on prices for pure digital products is to differentiate the product or service and create different versions for diverse market segments (Shapiro and Varian 1999, p. 53). Bakos and Brynjolfsson (1999, 2000) recommend using bundling strategies for information goods with zero marginal cost. For example, online music retailers might bundle songs by offering a monthly subscription for unlimited downloads (e.g., Yahoo Music Unlimited) or customized mix CDs (e.g., Real Rhapsody). Alternatively, they might charge higher prices for more popular songs, live recordings, or out-of-print recordings. For example, Sony BMG recently introduced ShopBootlegs.com, where consumers can legally download live concert recordings for $6.98 to $13.98 (Smith 2005).

In addition, online music retailers have been encouraged to differentiate from competitors and increase the perceived value of their products by offering superior service, user-friendly features, or customized recommendations (Bhatia, Gay, and Honey 2003; Easley, Michel, and Devaraj 2003). In support of this idea, a Gartner survey of 1500 "early adopters" of the Internet indicated that one in three consumers would be interested in using recommendation engines to suggest new music to try, based on their existing preferences (Sullivan 2005). Furthermore, navigation design that is easy to learn leads to more frequent visits and higher levels of purchasing (Johnson, Bellman, and Lohse 2003). Therefore, we propose that Web sites that offer features such as recommendation engines or easy navigation are able to command a higher price per song (thus resulting in lower levels of piracy) than Web sites that do not offer such features.

H_5: Enhanced functionality on a legal Web site decreases a consumer's tendency to pirate a digital song.

Piracy and Social Norms

The threat of embarrassment or shame associated with being caught might also influence a consumer's tendency to pirate. Reports of people arrested or sued by the RIAA have appeared in local and national newspapers, in television broadcasts, and on numerous Web sites and blogs. Breaking the law represents a transgression of social norms, which has been shown to cause embarrassment (Keltner and Buswell 1997). The negative outcome resulting from getting caught might threaten a consumer's identity, face, or approval from others (Weinstein and Martin 1969). Therefore, we expect that when the expected level of embarrassment associated with getting caught increases, people are more willing to pay for a legal download.

Another variable related to the level of embarrassment associated with illegal activity is the question whether the downloaded music is consumed publicly or privately. Embarrassment is a public emotion, and it usually occurs when a consumer feels conspicuous or self-conscious in front of others (Fenigstein 1979; Miller 1992). Consumers may feel embarrassed when purchasing products intended to be used in private, such as condoms (Dahl, Manchanda, and Argo 2001). Consuming an embarrassing product carries a social risk, which in some cases can have a more powerful effect on behavior than a financial risk (e.g., Mandel 2003). Therefore, illegal downloading behavior might

be viewed as embarrassing if the downloaded music is consumed with friends (e.g., at a party). Although the purchase price of a digital song may not be obvious to the party's guest, a pirated song is more likely to demonstrate skips, imperfections, abrupt endings, and/or lower digital quality. Therefore, consumers who are planning to play the music publicly might be more concerned about song quality and might be more willing to pay for a legal song, which is more likely to have been recorded at a higher bit rate. This line of reasoning leads to the following hypotheses:

H_6: The level of embarrassment associated with getting caught downloading illegally decreases a consumer's tendency to a pirate a digital song.

H_7: Consumers are more likely to pirate a song to be consumed privately than to pirate a song to be consumed publicly.

Because digital piracy has negative legal and social implications, it might be considered a consumer "dark-side variable" and thus may be subject to socially desirable responding (Mick 1996). Measures of dark-side variables, such as materialism, can be distorted in the direction of respondents' perceptions of "correct" or socially desirable responses. Therefore, it is important to triangulate our measures of piracy preferences to ensure that they are not biased by socially desirable responding. A possible technique for debiasing stated piracy preferences is to frame them in a more positive manner by estimating respondents' WTP for a digital song of their choice under different circumstances. A WTP that is significantly lower than the prevailing market price would imply a higher preference for piracy, particularly for downloading a desirable digital song, which is a low-budget item and not subject to the usual budget constraints. Because piracy preference is a measure that may be highly sensitive to social norms, in Study 1, we use WTP as a surrogate for the tendency to pirate.

However, as we pointed out previously, WTP is an imperfect measure of willingness to pirate because there are consumers who exhibit low WTP but are also unlikely to pirate. For example, some people prefer to purchase CDs rather than to download a digital track (whether legal or illegal), and others are not in the habit of purchasing music. Therefore, in Studies 2 and 3, we examine alternative measures of piracy. Another option for debiasing piracy measures is the use of indirect questioning (Fisher 1993). This technique requires participants to project their own feelings or behavior onto others by answering questions from the perspective of another person or group. Indirect questioning can reduce the influence of socially desirable responses on measures that are sensitive to social influence (Fisher 1993). Therefore, Studies 2 and 3 use several different piracy measures. Specifically, Study 2 uses a direct piracy measure and the WTP measure used in Study 1. Study 3 measures piracy preferences from three perspectives: (1) approval of a fellow student's piracy behavior, (2) likelihood of piracy by other students at the same university, and (3) likelihood of one's own piracy.

In the remainder of the article, we first develop a model to measure piracy indirectly through WTP. Next, we present three studies that use both indirect and direct measures of piracy to test our hypotheses.

Study 1 examines the effects of perceived risk (H_1), Machiavellianism (H_4), embarrassment (H_6), and public versus private consumption (H_7) on WTP. Study 2 explores the effects of perceived risk (H_1), OSL (H_2 and H_3), and enhanced functionality (H_7) on both WTP and the tendency to pirate. Finally, Study 3 further investigates the effects of perceived risk, OSL, and enhanced functionality on a consumer's own tendency to pirate, as well as approval and expectations of others' piracy behaviors.

A Model for Estimating WTP

Various techniques, such as conjoint analysis and logit models, have been proposed to measure WTP for products (Jedidi and Zhang 2002). However, in marked contrast to these techniques, which often use attribute-based methods and are designed for assessing the magnitude of payment, we were interested in piracy and the consumers' tendency to avoid paying for the product. More important, we wanted to investigate how we might convert nonpaying consumers to paying ones. In this sense, our problem is similar to that of assessing consumers' WTP for public goods. Pure digital or information goods (e.g., music) share the two defining characteristics of public goods; they are both nonrivalrous and nonexcludable. Both properties are a consequence of the notion that information can be freely copied. Copying music makes its consumption nonrivalrous because consumption by one consumer does not reduce the ability of others to consume the same product. Copying also makes music nonexcludable because it is not possible to prevent others from consuming the same good by paying for it. A popular method for measuring and analyzing the value of public goods is the contingent valuation method (Haab and McConnell 2002; Wertenbroch and Skiera 2002). As we outline subsequently, these models are ideally suited for assessing the piracy potential of information goods.

These models directly estimate the WTP function by using a choice format that asks respondents whether they would be willing to pay a stated price for the product in question. In one version of the contingent valuation method, called the double-bound dichotomous choice (DBDC) format (Mitchell and Carson 1989),[1] respondents are provided with a sequence of two bids and are asked whether their WTP for a desirable product of their choice equals or exceeds that bid. The magnitude of the second bid depends on the answer (yes/no) to the first bid. The initial bid is denoted as B_1, and respondents are asked whether they would purchase the product if it were priced at B_1. If the answer is yes, they are presented with a new bid, B_H, where

[1]Based on the seminal work of Bishop and Heberlein (1979), this method was endorsed by the National Oceanic & Atmospheric Administration panel in 1993 (Arrow et al. 1993). It provides incentives for the truthful revelation of consumer preferences and greatly simplifies the cognitive tasks faced by respondents, particularly compared with the stated preference choice modeling approaches for measuring WTP. The numerous recommendations made by the panel to enhance the validity of the DBDC procedure were followed in this study.

$B_H > B_1$, and they are asked whether they are willing to pay the higher amount B_H. However, if the respondent's initial response is negative, they are presented with $B_L < B_1$ and are asked whether they are willing to pay the lower amount B_L. By varying the bid across subsamples systematically, it is possible to calculate the proportion of respondents who are willing to pay as a function of each bid. As we outline in the Appendix, the DBDC model provides a simple method to estimate the WTP for a digital song, which is the first of our three alternative measures for assessing piracy.

The main advantage of this approach over the stated preference choice models and conjoint models is that it more closely resembles consumer choice in an actual market situation, in which consumers are given prices (as opposed to being faced with open-ended questions, attribute descriptions, or lotteries). In addition, because the stated prices vary across subsamples, no single respondent can influence the final outcome. As a result, these dichotomous choice techniques are less susceptible to gaming and strategic behavior (Mitchell and Carson 1989), as well as starting point bias (Smith, Olsen, and Harris 1999). Finally, given the explicit focus on whether respondents would "pay anything at all," this method is well suited for developing measures of willingness to pirate and for assessing the impact of covariates on piracy.

Study 1: The Effects of Machiavellianism, Risk, Embarrassment, and Public Versus Private Consumption on WTP

Pretest

We collected data from 425 students during fall 2002 to get initial WTP estimates. These respondents represented a mix of undergraduate students, graduate students, and executives. We collected the data in both a classroom setting and a popular campus music store. These students were randomly exposed to one of five bid sets, which varied systematically between \$0 and \$1.50; the following numbers denote the initial bid, the subsequent higher bid (if respondents said yes to the initial bid), and the subsequent lower bid (if respondents said no to the initial bid), respectively: (\$.10, \$.25, \$.05), (\$.25, \$.50, \$.15), (\$.50, \$.75, \$.25), (\$.75, \$1.00, \$.50), and (\$1.00, \$1.50, \$.50). Estimation of the likelihood function described in Equation A1 in the Appendix yielded a WTP estimate of \$.75 (SE = .034) with a 95% confidence interval of \$.68–\$.82. Note that 64% of the respondents who were faced with an initial bid of \$1.00 responded affirmatively. However, 42% of these respondents were unwilling to pay \$1.50 for these songs. These numbers are consistent with the pricing at Apple's iTunes, which was launched approximately three months after the conclusion of this study (March 2003). In Studies 1 and 2, we use this pretested model to understand the impact of factors such as negative incentives, individual differences, and positive incentives on WTP, as well as more direct piracy measures.

Method

We conducted Study 1 immediately after the RIAA lawsuit against university students in September 2004, in which RIAA sued file sharers at 21 universities across the country in federal courts. The purpose of this study was to examine the impact of three manipulated variables (risk, embarrassment, and public versus private consumption) and one measured variable (Machiavellianism) on a consumer's WTP to download a song. The consumption setting (public versus private) was a between-subjects factor, and risk and embarrassment were within-subjects factors. We also varied the initial bid between subjects at the same five levels that were used for the estimation of the DBDC model.

We expected that the level of risk involved in choosing to download illegally, along with the potential embarrassment of getting caught, would affect participants' WTP for a legal download, as H_1 and H_6 suggest. Therefore, we manipulated three levels of risk by telling participants the probability of getting caught: 5% (low), 45% (moderate), or 100% (high). We also manipulated two levels of embarrassment by giving participants an estimated level of embarrassment that they would feel if they were caught on a scale from 1 to 10: 2 out of 10 (low) or 9 out of 10 (high). Because these factors were within subjects, each participant responded to one WTP bid set for each of the six scenarios. For example, in the low-risk, low-embarrassment scenario, they were told, "If you download the song for free, you have a very small probability (5%) of getting caught. If you get caught, it will cause you a level of embarrassment that you would rate a 2 (low) on a scale from 1 to 10." After providing their responses to the bids based on this scenario, participants repeated the task for the remaining five scenarios, in which we varied risk and embarrassment levels.

We also expected that participants would be willing to pay more for a song played in a public situation, such as a party, than for a song played privately in his or her own home or car, as proposed in H_7. Therefore, we manipulated the consumption setting by telling participants to "imagine you are creating a compilation CD of your favorite songs from your favorite musical artist (or band)" either to "listen to this CD in your car while commuting to school or work" (private condition) or to "play this CD at a party for a group of friends who share your musical interests" (public condition). This resulted in a 3 (risk of being caught: 5% versus 45% versus 100%) × 2 (level of embarrassment: 2 versus 9) × 2 (consumption setting: private versus public) × 5 (initial bid: .10 versus .25 versus .50 versus .75 versus 1.00) mixed experimental design.

Participants were 386 undergraduate students who completed the questionnaire in exchange for partial credit in a marketing course. Given the within-subjects design, this led to 2316 possible responses, 1925 (83%) of which were complete and consistent across the bid sets (i.e., the remaining 291 responses were either not completed or completed incorrectly). On the first page of the questionnaire, participants read a short news clip about the recent lawsuit in which 532 university students were sued by the RIAA for illegal downloading. On the next page, they were told to imagine creating a compilation CD for either private or public consumption. Then, they gave WTP estimates for

each for the six scenarios. Next, they completed the 20-item Machiavellian scale (Christie and Geis 1970), which contained items such as "The biggest difference between most criminals and other people is that criminals are stupid enough to get caught" and "These days, almost everybody cheats (or lies) to some extent," measured on a scale from 1 ("strongly disagree") to 7 ("strongly agree"). Finally, they answered questions about their musical tastes, Internet habits, and demographics.

Results

To understand the impact of perceived risk, embarrassment, public/private consumption, and Machiavellianism on WTP, we estimated various models on the basis of the likelihood function in Equation A1 of the Appendix. In addition to the variables of interest, we included three covariates pertaining to respondents' involvement in music: (1) whether they attended music concerts on a regular basis (attend), (2) whether they played any musical instruments (play), and (3) whether they owned an MP3 player (MP3). Finally, we also controlled for gender. Table 1 summarizes the results.

WTP. We estimated the mean WTP for this sample at \$.471 (SE = .017). This was less than the corresponding estimate in the pretest, primarily because we conducted Study 1 a year after the launch of iTunes, thus setting price expectations at \$.99 (or lower) for a song.

Risk, embarrassment, and consumption setting. As we hypothesized, risk had a significant, positive impact on WTP. As the risk coefficient in Table 1 suggests, on average, a 10% increase in the probability of being caught increased WTP by \$.03. Thus, this result provides evidence in support of H_1. In estimating the WTP for the three separate risk conditions, we found that the mean WTP for low-, medium-, and high-risk conditions was \$.34, \$.48, and \$.62, respectively. These results suggest that though an increased risk of being caught increases the WTP significantly, even the certainty of being caught does not increase the mean WTP levels to the \$.99 price point set by legal download sites such as iTunes. The impact of embarrassment was not significant, and thus H_6 was not supported by the data. However, we found a significant, negative impact of a private consumption setting on WTP, suggesting that public consumption of music increases the WTP for downloads. The magnitude of the private coefficient suggests that music intended for public consumption commands an average price premium of \$.12, which provides strong support for H_7.

Machiavellianism. Our analysis of the Machiavellian scale suggests a high level of interitem reliability among all 20 items of the Machiavellian scale ($\alpha = .75$). We also estimated the reliability of the three subscales of the Machiavellian scale: general negativism ($\alpha = .71$), duplicity ($\alpha = .70$), and distrust of others ($\alpha = .45$). Because the subscale reliabilities were lower than that of the overall scale, we combined all 20 items into an overall Machiavellian score for this analysis. As Model 1 (Table 1) shows, the duplicity and negativism subscales had significant, negative impacts on WTP, but the distrust subscale had no effect. Model 2 presents the results of combining the items to create one Machiavellian scale (referred to as Mach 1). The coefficient of Mach 1 is significant and negative, and these results provide strong evidence in support of H_4; that is, a consumer's Machiavellian score has a negative effect on his or her WTP for a download.

Demographics and psychographics. The median age of our sample was 21 years, with a range of 18–48 years. Of the respondents, 73% were employed on a full- or part-time basis, and 86% had high-speed Internet access at home. A significant majority (86%) admitted that they had previously downloaded songs for free from sites such as Kazaa, Morpheus, and Grokster. When asked about the primary reason for downloading without paying, 37% of the sample responded that "I hate the fact that buying CDs involved paying for songs that I do not want," 42% claimed that "[i]t is easier and/or more convenient than buying a CD," and 10% mentioned that they used it to "sample songs prior to

TABLE 1
Study 1 Results: Impact of Risk, Embarrassment, Consumption Setting, and Machiavellianism on WTP

	Model 1		Model 2	
Variables	**Coefficient**	**SE**	**Coefficient**	**SE**
Constant	.567**	.120	.57**	.118
Duplicity	–.004*	.002	—	—
Negativism	–.006*	.002	—	—
Distrust	–.005	.004	—	—
Mach 1	—	—	–.005**	.001
Risk	.003**	.0004	.003**	.0004
Embarrass	.005	.004	.005	.004
Private	–.112**	.033	–.120**	.033
MP3	–.049	.034	–.049	.033
Gender	.177**	.034	.177**	.034
Attend	–.103**	.037	–.103**	.036
Play	–.150**	.036	–.151**	.036

*$p < .01$.
**$p < .001$.

purchasing them in the form of CDs." Furthermore, in response to the individual bids, 36% of the responses were in the (no, no) category; that is, they would not pay the amount stated in both the initial and the second (lower) bid. Of these, 75% said that they "would not pay anything at all," and more than half (56%) stated that they would "only download songs if they were available for free." These responses are a clear indication of piracy in that they represent conditions under which people have no interest in paying anything for obtaining a song.

We found that women had a higher WTP (an incremental $.18) than men, which is consistent with prior findings (e.g., Bhattacharjee, Gopal, and Sanders 2003). Moreover, consumers who played musical instruments and attended concerts regularly (i.e., music aficionados) had a lower WTP than those who did not. People who played musical instruments had an average WTP of $.15 below those who did not, whereas regular concertgoers had a WTP that was $.10 below those who did not attend concerts regularly. Finally, the ownership of MP3 players had no impact on WTP.

Why did we find a significant difference in WTP as a result of consumption setting (H_7) but not embarrassment (H_6)? One possible explanation is that participants had difficulty imagining the embarrassment resulting from the statistical probabilities given. Alternatively, they may have expressed a higher WTP for public consumption, not because of potential embarrassment but rather because of a higher demand for digital quality for music consumed publicly than for music consumed privately. In any case, potential embarrassment does not appear to provide the best explanation for differences in piracy potential. Therefore, in Study 2, we turn to the effects of positive incentives and risk tolerance and attempt to illuminate further the effect of negative incentives on pirating tendencies.

Study 2: The Effects of Negative Incentives, Positive Incentives, and OSL on WTP and Piracy Preference

We conducted Study 2 in mid-2005, approximately a year after the RIAA lawsuit against university students mentioned in Study 1. The primary goal of this study was to investigate whether a consumer's OSL determines his or her overall tendency to pirate music and his or her reaction to a negative incentive (i.e., risk) when deciding whether to engage in piracy. Because high-OSL consumers desire novel, varied, and complex experiences and are willing to take the risks necessary to achieve such experiences, we expected them to be more prone to piracy and more immune to risk. In addition, we estimated the effects of adding positive incentives (e.g., user-friendly Web site design or exciting features) on all participants' WTP. Finally, we added a more direct measure of tendency to pirate at the end of the questionnaire.

Pretest

A potential limitation of Study 1 is that we manipulated risk by simply telling participants to imagine a probability level of getting caught. A more realistic manipulation would be to have participants read a news article about the risks of illegal downloading that alters their risk perceptions. Therefore, for Study 2, we pretested three fictional news articles about a new wave of RIAA lawsuits targeting university students. The low-risk article stated that the RIAA recently sued 120 computer users, including 11 students at 3 universities. The moderate-risk article stated that the RIAA sued 750 computer users, including 125 students at 13 universities. The high-risk article stated that the RIAA sued more than 2500 computer users, including 25 students at the participants' own university. Immediately after participants read one of the three news articles, we measured their levels of perceived risk and likelihood of getting caught for engaging in music piracy. Furthermore, to determine which positive incentives they would be most likely to pay for, we asked, "Would offering the following features make you more likely to use the legal, pay site?" (1 = "would not influence my decision to pay," and 7 = "would make me much more likely to pay"), for the following features of a legal music downloading Web site: extensive music catalog, free samples, easy navigation, a recommendation engine that remembers preferences, and ease of burning compilations. We also asked, in free-response format, for other features that might increase participants' WTP for legal downloads.

Participants were 273 business undergraduate students who completed the pretest in exchange for partial course credit. The results indicated that reading the moderate-risk article resulted in a higher level of perceived risk (M = 3.96 versus 3.46 on a seven-point scale; $t(179) = 2.13$, $p < .01$) and a higher perceived probability of getting caught (M = 3.04 versus 2.37; $t(179) = 3.35$, $p < .005$) than reading the low-risk article. The perceived risk and probability of getting caught actually decreased slightly between the moderate-risk and the high-risk scenarios, but the differences between these two scenarios were not significant (M = 3.96 versus 3.85 for risk, not significant [n.s.]; M = 3.04 versus 2.75 for probability of getting caught, n.s.). Therefore, we used only the low-risk and moderate-risk scenarios as manipulations in Study 2.

Of the positive incentives we offered, a Web site that offered easy-to-burn compilations was the most likely to make participants want to pay for the legal site (M = 4.98 out of 7), followed by free samples (M = 4.88), an extensive music catalog (M = 4.60), ease of navigation of the site (M = 4.48), and a recommendation engine that remembers preferences (M = 4.21). For the free responses, many participants indicated that they would never pay for music downloads. The most popular write-in response for a feature that would indicate use of a legal site was a low price or discount. Other frequent responses included the following: good organization or file storage; other available downloads, such as ringtones or video; fast download times; security/privacy measures; high digital quality; access to rare or exclusive songs; and a flat membership fee. We used many of these free responses to formulate our questions about positive incentives in Study 2.

Method

In Study 2, we manipulated two levels of risk, using the low- and moderate-risk (now called high-risk) news articles from the pretest. We also varied the initial bid for the WTP estimation at the same five levels as in Study 1, which resulted in a 2 (perceived risk: low versus high) × 5 (initial bid: .10 versus .25 versus .50 versus .75 versus 1.00) between-subjects design. Three hundred fifty-nine respondents completed the questionnaire for partial credit in a marketing course. They read the low- or high-risk news article, rated their perceived risk and the probability of getting caught, and then gave their WTP estimates for downloading a legal song, using the DBDC model. They were told that the song would be part of a compilation CD, and the consumption setting was unspecified. Next, they responded to the question, "Would offering the following features make it more likely for you to use the legal, pay Web site?" on a scale from 1 ("would not influence my decision to pay") to 7 ("would make me much more likely to pay"), as in the pretest. The positive incentives offered were (1) an extensive music catalog; (2) free samples of the music; (3) easy navigation of the site; (4) a recommendation engine that remembers preferences; (5) easy-to-burn compilation CDs; (6) extremely fast downloading time; (7) rare recordings, exclusive artists, and/or new releases; (8) extremely high digital quality; (9) live concerts on the Web site; and (10) availability of additional downloads, such as ringtones or video. They subsequently completed the sensation-seeking scale (Zuckerman 1979), which is an instrument used to measure OSL (Raju 1980), and several questions about their music preferences, downloading experience, and demographics. One of these questions was an overall measure of tendency to pirate: "Are you more likely to download from a free site or a pay site?" (1 = "much more likely to pay," and 7 = "much more likely to download for free").

Results

Manipulation checks. Participants who read the high-risk news article demonstrated a marginally higher level of perceived risk (M = 3.81 versus 3.52; F(1, 344) = 2.86, $p < .10$) and a significantly higher level of perceived probability of getting caught (M = 2.80 versus 2.50; F(1, 344) = 4.40, $p < .05$) than participants who read the low-risk news article. Therefore, it appears that participants viewed illegal downloading as a riskier proposition after reading the high-risk article than after reading the low-risk article.

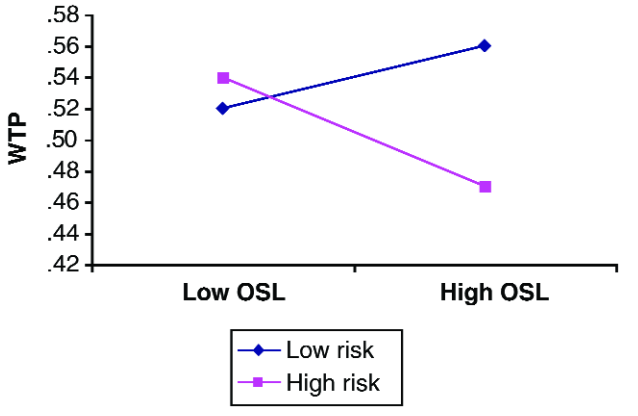
There was a high level of reliability among the 40 items on the sensation-seeking scale ($\alpha = .83$). Therefore, we combined the responses to all 40 items into an overall OSL score. When we split the participants into high- and low-OSL groups according to the median score, we found that high-OSL participants perceived illegal downloading as less risky than low-OSL participants (M = 3.37 versus 3.89; F(1, 269) = 18.01, $p < .0001$). High-OSL participants also believed that they would be less likely to get caught than low-OSL participants (M = 2.29 versus 2.92; F(1, 269) = 26.18, $p < .0001$).

Negative incentives. The estimated mean WTP in the high-risk condition was significantly higher (M = $.60) than that in the low-risk condition (M = $.43; t = 34.9, $p < .0001$), providing strong support for H_1, which suggested that an increase in the perceived risk would lower the tendency to pirate (and thus increase WTP).

OSL. We found that the mean WTP for high-OSL participants was lower than the corresponding value for low-OSL participants (M = $.51 versus $.54; t = 3.92, $p < .0001$). This supports H_2, which proposed an inverse relationship between OSL and the tendency to pirate. Furthermore, a correlation analysis of OSL with demographic and behavioral variables revealed that high-OSL consumers are more likely than low-OSL consumers to be men (r = .21, $p < .001$), to have a high-speed Internet connection (r = .24, $p < .0001$), and to attend concerts regularly (r = .20, $p < .001$).

Negative incentives × *OSL*. H_3 suggested that OSL would moderate the relationship between perceived risk and WTP. To test this hypothesis, we estimated WTP for the four conditions of high risk/high OSL, high risk/low OSL, low risk/high OSL, and low risk/low OSL. The results (see Figure 1) provide support for the moderating effect of OSL proposed in H_3. When there was a low level of perceived risk, low-OSL participants had a lower WTP than high-OSL participants (M = $.52 versus $.56; t = 3.41, $p < .001$), but when there was a high level of perceived risk, low-OSL participants indicated a significantly higher WTP than high-OSL participants (M = $.54 versus $.47; t = 7.43, $p < .0001$). Indeed, high-OSL participants significantly decreased their WTP when the perceived risk increased (from $.56 to $.47; t = 9.39, $p < .0001$). Therefore, although the RIAA's threats of potential arrest and/or lawsuits might halt piracy among low-OSL consumers, it is likely to backfire among high-OSL consumers and may even cause a higher rate of piracy.

FIGURE 1
Study 2 Results: The Effect of Risk and OSL on WTP (in $)

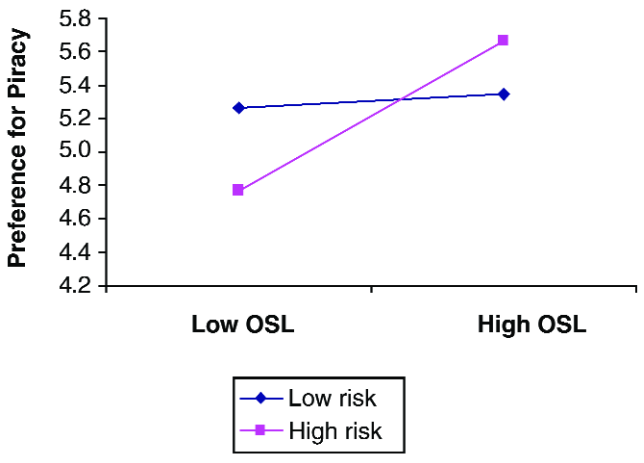


We also ran a 2 (risk: high versus low) × 2 (OSL: high versus low) analysis of variance (ANOVA) on participants' overall tendency to pirate (reported on a seven-point scale). In support of H_2, we found a significant main effect of OSL on tendency to pirate ($F(1, 340) = 4.92$, $p < .05$), such that high-OSL participants were more likely to engage in piracy than low-OSL participants (M = 5.51 versus 5.00). Furthermore, in support of H_3, we found a marginally significant risk × OSL interaction ($F(1, 340) = 3.21$, $p = .07$), which Figure 2 illustrates. When the risk level was low, high-OSL and low-OSL participants were equally likely to pirate (M = 5.35 versus 5.26; $F(1, 340) = .09$, n.s.), but when the risk level was high, high-OSL participants were significantly more likely to pirate than low-OSL participants (M = 5.67 versus 4.77; $F(1, 340) = 8.04$, $p < .005$). Indeed, high-OSL participants slightly (but not significantly) increased their likelihood to pirate when risk went up (M = 5.35 versus 5.67; $F(1, 340) = .82$, n.s.), whereas low-OSL participants marginally decreased their likelihood to pirate under the same circumstances (M = 5.26 versus 4.77; $F(1, 340) = 3.03$, $p = .08$).

Positive incentives. Respondents indicated a WTP of an additional amount for all the features that were proposed. The most popular features overall were fast downloading speed (M = 5.66 out of 7), availability of rare recordings (M = 5.50), high digital quality (M = 5.47), free samples (M = 5.24), and easy compilations (4.92).

Demographics and psychographics. Of the 344 participants, the mean age was 22.2 years (SD = 3.68), the minimum age was 19 years, and the maximum age was 51 years. The majority of participants worked part time (55.7%), and the remainder worked either full time (18.6%) or not at all (25.5%). Of the participants, 83% previously downloaded music for free from sites such as Kazaa, Morpheus, or Grokster. When asked the reasons for downloading free songs, the most popular response was, "I hate the fact that buying CDs involves paying for songs I do not want" (48.9%), followed by "It is easy to do and everyone does it anyway" (35.8%).

FIGURE 2
Study 2 Results: Preference for Piracy as a Function of Risk and OSL



Discussion

Although our results regarding positive incentives provide preliminary support for H_5, we cannot rule out the null hypothesis, because we did not measure WTP for each feature (or the tendency to pirate for each feature), and thus we cannot compare these measures with those for the unenhanced product. Therefore, in Study 3, we present hypothetical music retail Web sites with three levels of functionality (low, medium, and high) and compare the tendency to pirate among these three levels.

A possible alternative explanation raised in Study 2 is that our OSL findings are simply due to differences in perceived risk. The risk manipulation led to differences in the participants' perceived level of risk, which in turn led to differences in piracy and WTP measures. However, it is also possible that our moderating variable, OSL, simply measures differences in consumers' perceived risk rather than differences in willingness to take risks, as we intended. Indeed, high-OSL consumers reported lower levels of perceived risk than low-OSL consumers, as we reported previously. Furthermore, when we added perceived risk to the ANOVA model, it demonstrated a highly significant main effect on likelihood to pirate ($F(1, 336) = 20.04$, $p < .0001$), and the main effect of OSL and its interaction with manipulated risk were no longer significant. Participants who perceived a low level of risk were much more likely to pirate than those who perceived a high level of risk (M = 5.78 versus 4.66). In light of these findings, we cannot rule out the possible confound between OSL and perceived risk. Therefore, in Study 3, we use an alternative measure of consumer risk taking called the EXPL scale (Raju 1980). This scale measures a consumer's need for stimulation from the external environment and includes items such as "When I eat out, I like to try the most unusual items the restaurant serves, even if I am not sure I would like them." Although the EXPL scale is related to sensation seeking, it more specifically measures consumer risk taking, which is likely to take the form of variety seeking or early product adoption rather than general risk-seeking behavior. By using the EXPL scale to measure consumer risk taking, we hope to avoid confounding our manipulated variable (risk) and our measured variable (OSL).

Study 3: The Effects of Negative Incentives, Positive Incentives, and OSL on Preference for Piracy

We conducted Study 3 in fall 2006, approximately two years after the RIAA lawsuit against university students mentioned previously. Our main goal was to illuminate further the relationship among positive incentives (functionality), negative incentives (risk), and consumers' willingness to engage in music piracy. In addition, we further investigated the moderating role of OSL by using a more behavioral, consumer-oriented measure of individual differences

in innovativeness, the EXPL scale (Raju 1980). We also measured piracy tendencies through both direct and indirect questioning (e.g., Fisher 1993).

Method

Study 3 used a 2 (risk: high versus low; between-subjects) × 3 (functionality: high versus medium versus low; within-subjects) × 2 (OSL: high versus low, between-subjects) mixed design. We manipulated risk by using the same news articles from the previous study. Furthermore, we described three different levels of functionality that the pay Web site offered and presented these to each participant as three separate scenarios. Scenario 1 described the low-functionality Web site, which was rated low in user friendliness by other users; offered songs that were low in digital quality and slow download speeds; and did not offer any samples, rare recordings, live concerts, or other downloads. Scenario 2 described the moderate-functionality Web site, which was rated high in user friendliness and offered free song samples, fast download speeds, and easy-to-burn compilations but did not offer any special items, such as rare recordings, live concerts, or other downloads. Scenario 3 described the high-functionality Web site, which offered all the features of the moderate-functionality Web site but also offered high-digital-quality downloads; an extensive catalog of rare recordings, exclusive artists, and new releases; viewing of live concerts; and additional files for download, such as ringtones and videos.

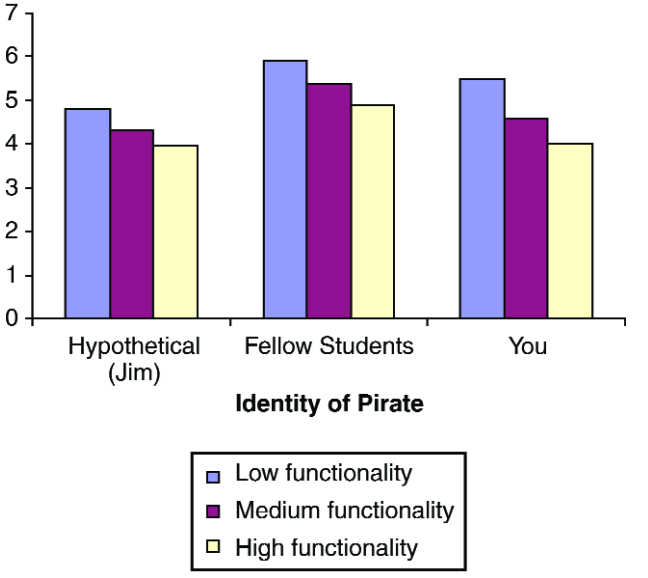
Participants were 165 undergraduate business students, who completed the questionnaire for partial credit in a marketing course. They first read the low- or high-risk news article and rated their perceived risk and the probability of getting caught. Next, for each of the three scenarios, they answered the following questions: (1) "Jim M., a student [at your university], regularly downloads music from the illegal Web site rather than paying for his music from the pay Web site described above. How acceptable do you find Jim's behavior?" (2) "How likely would other students [at your university] be to download from the pay Web site, versus the free, illegal Web site?" and (3) "How likely are you to download from the low-functionality pay Web site, versus the free, illegal Web site?" Because of the sensitive nature of these questions, we used a funneling technique; we first asked participants to judge the behavior of others and then to predict their own behavior. Each question appeared on a separate screen on the computer. We never used terms such as "piracy" or "theft." Instead, participants rated their own and others' likelihood of piracy on a seven-point scale, ranging from "much more likely to pay" (1) to "much more likely to download for free" (7). In the next section, they completed the 39-item EXPL scale (Raju 1980), an alternative measure of consumers' levels of OSL. Finally, they completed several demographic questions, such as age, gender, and income.

Results

Composite piracy measure. We analyzed the effects of risk and functionality on all three piracy measures (approval of Jim's piracy, likelihood of others' piracy, likelihood of own piracy) as a repeated measure, which we refer to as "identity." We found that risk (i.e., a negative incentive) had no significant effect on overall piracy ($F(1, 161) = .59$, n.s.), nor did it interact with exploratory behavior ($F(1, 161) = .01$, n.s.) or the identity of the pirate ($F(2, 160) = .14$, n.s.).

In support of H_5, the main effect of the pay Web site's functionality (i.e., a positive incentive) on overall piracy was highly significant ($F(2, 162) = 56.82$, $p < .0001$). Respondents were less likely to pirate music for themselves when functionality was moderate at the pay site than when functionality was low (M = 4.58 versus 5.49; $F(1, 163) = 52.29$, $p < .0001$), and they were even less likely to pirate when functionality was high than when it was moderate (M = 4.01 versus 4.58; $F(1, 163) = 26.89$, $p < .0001$). Moreover, they were less likely to expect others to pirate when functionality was high than when it was low (M = 4.87 versus 5.92; $F(1, 163) = 34.81$, $p < .0001$), and they were less approving of Jim's piracy when functionality was high than when it was low (M = 3.97 versus 4.81; $F(1, 163) = 36.56$, $p < .0001$). We also found a main effect of identity ($F(2, 162) = 24.55$, $p < .0001$), indicating that the participants believed it was more likely that other students would engage in piracy than that they would engage in piracy themselves. Finally, there was a significant functionality × identity interaction ($F(4, 160) = 3.73$, $p < .01$), suggesting that participants believed that differences in functionality would have stronger effects on their own piracy behavior than on the behavior of others. Figure 3 illustrates these findings.

FIGURE 3
Study 3 Results: Approval of Piracy/Likelihood to Pirate as a Result of Functionality of the Pay Site and Identity of the Pirate



OSL and a consumer's own likelihood to pirate. The 39 items on the EXPL scale (Raju 1980) were sufficiently intercorrelated (α = .83), but three of the scale items demonstrated negative correlations with the total. After we dropped these three items, Cronbach's alpha increased to .87. Therefore, we used the mean of the remaining 36 items as an overall measure of each participant's level of OSL.

Because participants predicted similar (and sometimes stronger) effects of the manipulated variables on their own behavior compared with others' behavior, we focused on this single dependent variable (own piracy behavior) for the remainder of our analysis. Therefore, we dropped identity and added OSL to the analysis, which resulted in a 2 (risk: high versus low) × 3 (functionality: high versus moderate versus low) × 2 (OSL: high versus low; median split) ANOVA. There was no main effect of risk on participants' predictions of their own piracy behavior. However, we found a three-way interaction among functionality, risk, and OSL ($F(2, 160) = 3.07$, $p < .05$). We show this interaction in Figure 4.

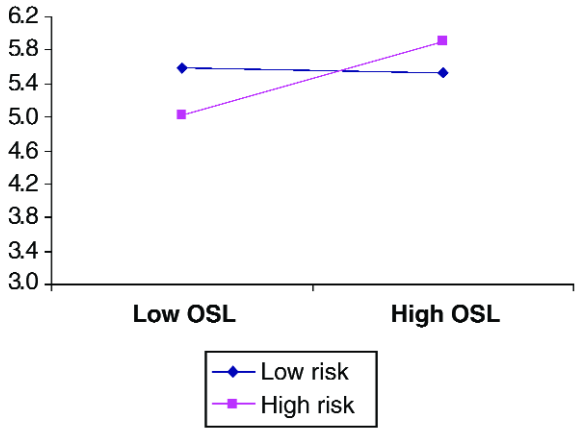
When the pay site was described as having low functionality, our results replicated those of Study 2 (in which participants likely assumed that the pay site did not offer any "extras," because none were indicated). In this condition, there was a marginally significant two-way interaction between risk and OSL ($F(1, 161) = 2.63$, $p = .10$). When the risk was low, participants were equally likely to pirate, regardless of whether they scored high or low on OSL (M = 5.54 versus 5.57; $F(1, 161) = .01$, n.s.). In contrast, when the risk was high, those who scored high on OSL were significantly more likely to pirate than those who scored low (M = 5.90 versus 5.02; $F(1, 161) = 4.91$, $p < .05$). This finding provides additional support for H_3, which predicted a risk × OSL interaction. However, when the pay site was described as having moderate or high functionality, there were no significant effects of risk, OSL, or their interaction (all comparisons were not significant). This three-way interaction represents an important boundary condition to our prior findings. When the functionality at the pay site was high (or moderate), the differences in piracy tendencies between high- and low-OSL consumers were no longer significant.

Furthermore, the EXPL scale appears to be a more valid measure of the factor that moderates the relationship among risk, functionality, and tendency to pirate, because unlike the sensation-seeking scale, it is not confounded with perceived risk. Indeed, participants who scored high on EXPL actually rated the perceived risk of piracy slightly higher than did those who scored low on the scale (M = 3.88 versus 3.36; $F(1, 161) = 4.63$, $p < .05$), but that did not stop them from pirating. If our findings could be explained as simply the result of differences in perceived risk, we might expect consumers who are low on EXPL to engage in more piracy than those who are high on EXPL, contrary to our actual results.

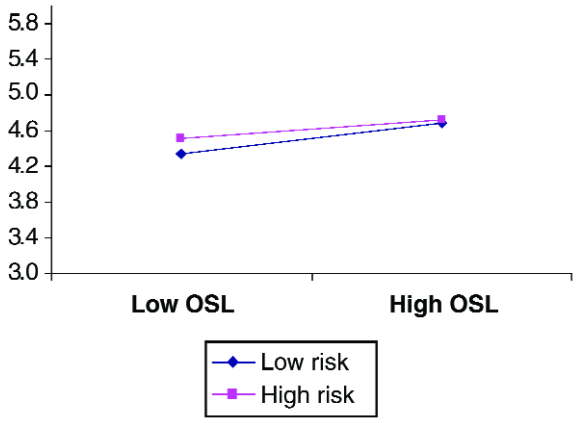
Demographics and psychographics. Of the 165 participants in this study, the mean age was 21.5 years (SD = 3.34), the minimum age was 19 years, and the maximum age was 45 years. Only 10% of participants worked full

FIGURE 4
Study 3 Results: Own Likelihood to Pirate as a Result of Functionality of the Pay Site, Risk, and OSL

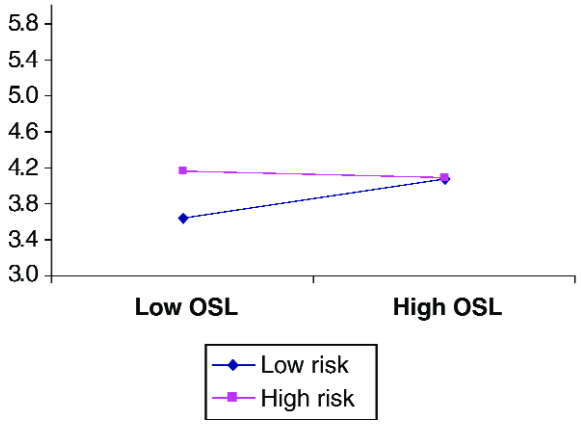
A: Legal Option Has Low Functionality



B: Legal Option Has Moderate Functionality



C: Legal Option Has High Functionality



time, 62% worked part time, and 28% did not work at all. When asked for their incomes, 59.4% of respondents indicated incomes of less than $10,000 per year, 25.5% indicated $10,000–$24,999 per year, 9.7% indicated $25,000–$39,999 per year, and .5% indicated more than $40,000 per year. When age and income were included in our model, they both demonstrated significant main effects on a consumer's own likelihood to pirate. Older participants were significantly less likely to pirate than younger participants ($F(1, 161) = 5.92$, $p < .05$), regardless of the level of risk or functionality. Moreover, higher-income participants were significantly less likely to pirate than lower-income participants ($F(1, 161) = 6.57$, $p = .01$), regardless of the level of risk or functionality. These findings suggest that a large proportion of piracy occurs within the segment of the population that is under the age of 21 and earns less than $10,000 per year. A large percentage of participants had previously downloaded music for free from sites such as Kazaa, Morpheus, or Grokster (76.4%), and as in Study 2, the most popular reason for this piracy was "I hate the fact that buying CDs involves paying for songs I do not want" (46.0%). Therefore, we believe that our sample of undergraduate students adequately reflects the population that recording companies should target with their antipiracy strategies.

Discussion

The results of Study 3 offer further evidence that increasing the risk and/or consequences of illegal piracy is unlikely to discourage this undesirable behavior for certain consumers—namely, those with a high tolerance for risk. On the contrary, for these consumers, such a policy might actually backfire, causing them instead to increase their piracy levels. However, our results also provide some hope for recording companies; companies can decrease piracy behavior by offering their music on legal, pay Web sites that offer enhanced features, such as a user-friendly environment, live concerts, and downloadable ringtones. Indeed, when these upgraded features are present, potential pirates do not allow other variables, such as risk and exploratory behavior, to influence their piracy decision.

Although it may seem unsurprising that our effects were much stronger for the within-subjects factor (functionality) than for the between-subjects factor (perceived risk), we argue that our manipulations accurately reflect the real-world environment that potential music pirates encounter. Consumers are likely to estimate only one level of perceived risk before making the piracy decision, but they may allow the offerings of several retail music Web sites (e.g., iTunes, Real Rhapsody, Yahoo Music) to influence their decision.

General Discussion

The results of these studies indicate that the RIAA's efforts to use fear and shame to stop digital piracy may be effective only for certain segments of consumers. In Study 1, we found that a 10% increase in perceived probability of getting caught resulted in an increase of only $.03 in consumers' WTP for a legal download. Furthermore, in Study 2, we demonstrated that for consumers with high levels of optimum stimulation (and, thus, higher tolerance for risk), increasing the perceived risk might actually backfire by slightly increasing their likelihood to pirate. Finally, the results of Study 3 indicate that whereas increasing the perceived risk may have a limited effect on decreasing piracy, offering enhanced Web site features can be highly effective. We found that all participants were less likely to pirate when the alternative, pay Web site offered features such as extensive music catalogs and the availability of extras, such as rare recordings, live concerts, and downloadable ringtones and videos.

We recommend that the RIAA make additional efforts to work with legal Web sites to make such features available. Some consumers have already demonstrated a WTP of up to $2.49 for a partial song (e.g., a ringtone) downloaded directly to their cell phones, and they may be willing to pay as much or more to download a rare recording (Fry 2005). Furthermore, some consumers are paying anywhere from $6.98 to $13.98 to download live concerts (Smith 2005). Therefore, the music industry must continue to engage consumers with creative, engaging features to encourage legal downloading. We also agree with Bhatia, Gay, and Honey (2003), who suggest that when music distribution inevitably shifts to the Internet, music companies can cut costs by shifting much of the research and promotional costs associated with signing new artists to the Internet. For example, consumers willingly rate new songs when they are provided with a free download, and the subsequent online ratings charts may lead other consumers to pay to download music from these new artists. Furthermore, tiered pricing models might allow music companies to extract the maximum consumer surplus from each individual music track.

A limitation of the current research is that it included only university students (though the pretest sample included both graduate students and executives). On the one hand, this sample is highly relevant because university students represent a major target market for music companies. On the other hand, the WTP of university students might not accurately reflect the WTP of other populations of music customers. Optimal stimulation levels tend to decrease with age (Zuckerman 1979) and employment level (Raju 1980), and therefore older consumers might be less likely to pirate under all conditions and, in particular, when getting caught might result in professional embarrassment or even a job loss. Consistent with this notion, we found that even among the student sample, older participants and those with higher incomes were significantly less likely to pirate than other participants. Because college students are more likely than other demographic groups to pirate music, we believe that our sample is highly appropriate when studying the factors that may significantly decrease piracy levels. However, because of our use of a student sample, we are unable to generalize our findings to all populations. It is possible that a consumer's age interacts with our manipulated variables in unanticipated ways, and we recommend this avenue for further research.

A surprising finding was how little social norms against piracy seemed to influence participants' responses. The threat of embarrassment did nothing to increase their WTP

for legal music (or, correspondingly, to decrease their intentions to pirate). Furthermore, we did not find significant differences between participants' own intentions to pirate and their projections of other college students' intentions to pirate (Study 3). These findings suggest that socially desirable responding was not a factor for the participants. Indeed, they did not appear to view music piracy as a transgression of social norms. If anything, digital piracy is the social norm among this segment of consumers. In support of this notion, only 5% of Generation Y consumers agreed that downloading music for free from the Internet was wrong or unethical (Freestone and Mitchell 2004). Therefore, attempts to curb piracy through appeals to consumers' sense of ethics are unlikely to be effective. Conversely, appeals to ethics and social norms might prove to be more effective among older, nonstudent populations.

Appendix
DBDC Model

To develop a framework for analyzing WTP, we define WTP* as a latent variable that represents the true WTP for downloading a song of choice. In other words, WTP* represents the amount of income forsaken by a consumer who is indifferent between a status quo state (e.g., maintaining an income of y by not purchasing a song or pirating it) and a new state (in which income is reduced to [y – WTP*] as a result of a legal purchase). To estimate the impact of covariates on WTP, we express WTP* as $WTP^* = x\beta + \varepsilon$, where x represents the vector of covariates and ε represents an i.i.d. error term with mean zero and standard deviation σ. Although WTP* cannot be observed, we can infer a range for the actual WTP by presenting respondents with a sequence of two bids and asking them whether their WTP equals or exceeds that bid (Haab and McConnell 2002; Mitchell and Carson 1989). The magnitude of the second bid depends on the answer (yes/no) to the first bid. With the initial bid denoted as B_1, respondents would be asked whether they would purchase the product if it were priced at B_1. If the answer is yes, the respondents are presented with a new bid B_H, where $B_H > B_1$. However, if the answer is no, they are presented with $B_L < B_1$. Different groups of respondents are presented with different bid sets based on a reasonable range established through prior research. Thus, the four outcomes may be represented as $D_{1i} = 1$ if $WTP_i < B_{Li}$ (no–no), $D_{2i} = 1$ if $B_{Li} \le WTP_i < B_{1i}$ (no–yes), $D_{3i} = 1$ if $B_{1i} \le WTP_i < B_{Hi}$ (yes–no), and $D_{4i} = 1$ if $B_{Hi} \le WTP_i$ (yes–yes).

Respondents indexed by D_{1i} (those with a "no" response to both the initial bid B_{1i} and the follow-up lower bid B_{Li}) represent consumers with a WTP between negative infinity and B_{Li}. Therefore, their contribution to the likelihood function can be written as

$$F\left(\frac{B_{Li} - x_i\beta}{\sigma}\right)^{D_{1i}},$$

where $F(\cdot)$ represents the standard normal cumulative distribution function. Similarly, respondents indexed by D_{2i} (a "no" response to the initial bid and a "yes" response to the follow-up lower bid B_{Li}) represent consumers with $B_{Li} \le WTP_i < B_{1i}$, whereas D_{3i} (a "yes" response to the initial bid and a "no" response to the follow-up higher bid B_{Hi}) represents $B_{1i} \le WTP_i < B_{Hi}$. Finally, respondents with a "yes" response to both bids represent consumers with $B_{Hi} \le WTP_i$ (yes–yes). Consequently, the (log-) likelihood function for the data representing the contributions of respondents in each of these four groups can be written as

$$\begin{aligned}(A1)\quad LnL = \sum_{i=1}^{N}\Bigg[& D_{1i}\ln F\left(\frac{B_{Li} - x_i\beta}{\sigma}\right) \\ & + D_{2i}\left\{\ln\left[F\left(\frac{B_{1i} - x_i\beta}{\sigma}\right) - F\left(\frac{B_{Li} - x_i\beta}{\sigma}\right)\right]\right\} \\ & + D_{3i}\left\{\ln\left[F\left(\frac{B_{Hi} - x_i\beta}{\sigma}\right) - F\left(\frac{B_{1i} - x_i\beta}{\sigma}\right)\right]\right\} \\ & + D_{4i}\left\{\ln\left[1 - F\left(\frac{B_{Hi} - x_i\beta}{\sigma}\right)\right]\right\}\Bigg].\end{aligned}$$

Each of the four terms in Equation A1 represents the probability of a (no–no), (no–yes), (yes–no), and (yes–yes) response to each pair of bids, respectively. The estimated coefficients reflect the marginal impact of the respective covariates on the WTP for downloading a single song. The WTP for the song itself is estimated as $E(WTP) = (\bar{X}\hat{\beta})$, where $\bar{X}$ is a vector of means of the independent variables.

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