



# Ethical Decision Making in Electronic Piracy: An Explanatory Model based on the Diffusion of Innovation Theory and Theory of Planned Behavior

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## Abstract

*Electronic piracy is a problem that has emerged during the last few years and has already reached global status. Several studies have been conducted trying to detect the factors that influence an individual's decision to engage in the act of electronic piracy. We consider this problem from an ethical perspective using statistical analysis on a large sample of Greek university students. We examine the influence of seven factors in ethical decision making with regard to electronic piracy: attitude, subjective norm, perceived behavioral control, moral obligation, perceived equitable relationship, deterrence effect of legislation and computer deindividuation. We employ hierarchical regression analysis to show that only some of these factors influence significantly the decision making process, while we observe notable differences between males and females.*

Keywords: Diffusion of innovation, Internet piracy, Music Piracy, Moral obligation, Theory of Planned Behavior, Multivariate model, Hierarchical Regression Analysis.

## Introduction

File sharing software has been extremely popular since the emergence of Napster, one of its most prominent representatives, in late 90s. By 2000, there were an estimated 70 million users exchanging billions of music files across the internet (Liebowitz, 2002). Internet piracy has decreased the sales revenue for software and recording companies (Hohn et al., 2006). These revenue losses were estimated to be up to 20% (Peitz & Waelbroeck, 2004). Illegal downloading of music has been highly prevalent among university students (Lysonski & Durvasula, 2008); while a 10% decrease in music purchases due to internet piracy has been observed among college students (Rob & Waldfogel, 2008). File sharing can be argued as a consequence of technological innovation. This form of sharing is illegal under copyright laws in most countries of the world.

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The illusion of anonymity over the Internet along with the significant cost the purchase of music entails, make the new Internet technologies, such as file sharing, fertile ground to download or exchange music with low risk and practically zero cost. As more and more people learn how to download files, the volume of pirated content circulated over user-created networks is growing. Such file-sharing networks pose a great threat to intellectual property and general morality.

What leads however an individual to adopt a particular technology? Rogers' Diffusion of Innovation Theory attempts to explain how new innovations are adopted. In recent years, illegal music downloading through the Internet has become a new idea or innovation. Understanding factors that could influence the individual adoption of innovation –downloading through Internet, in our case – can be explored using the Rogers' Diffusion of Innovation Theory.

Other models based on social psychological theories suggest that the most important predictor of an individual's behavior – such as adoption of the downloading music trend – is the user's intention to perform it. Nevertheless, relatively little research has been conducted, regarding the factors influencing the decision to download music illegally. Although reasons for downloading music illegally are likely to be complex, combining diffusion of innovation theory, psychological and economic factors, social science theories of decision-making can be the basis of direct research in this area. The approach taken in the present study is based upon a theory of decision making, the Theory of Planned Behavior (TPB). The TPB may be a particularly relevant framework to use in music piracy because it includes personal, normative, and control factors that may all influence the intention to download illegally.

In addition to testing the TPB model, we were also interested in examining if moral obligation has a significant impact on intention. Since Aristotle, ethicists have recognized that doing the right thing for the right reason in the right way at the right time remains a matter of decision or else, phronesis. So, how do moral and ethical issues shape the illegal downloading decision? According to Schwartz and Tessler (1972), moral obligation is a good predictor of intention. It should be noted that Ajzen (1991) indicated that moral obligation could possibly be included in the TPB model as a separate determinant of intention, while Conner and Armitage (1998) and Cronan and Al-Rafee (2008) found that moral obligation was indeed a significant predictor of intention. One of the goals of this study is to emphasize and represent an ethical factor in order to understand how this factor operates within the TPB model. Thus, this study contributes to our understanding of personal ethical decision making in music piracy.

A number of empirical studies have recognized the important role that moral values play in influencing decision making. Empirical research indicates that men and women differ in the way they perceive moral and ethical dilemmas (Gilligan, 1982; Galbraith & Stephenson, 1993; Schminke, 1997; White, 1999). Research on the role of the gender as a factor influencing software piracy has increased in recent years. Relatively few empirical studies (Al-Rafee, 2002; Chen et al., 2009; Gallup Poll, 2003; Gopal et al., 2004; Kwong & Lee, 2002; Shang et al., 2008) have focused until now on the topic of music piracy, suggesting the need for more research. Thus, an objective of the study is also to identify whether differences exist between the moral decision of male and female university students for illegally downloading music.

Our primary focus is on the individual's understanding of the determinants of the "using illegally downloaded music" behavior through the Internet. In this context, model

and theories – such as Rogers’ Diffusion of Innovation Theory and the Theory of Planned Behavior (TPB) – attempt to explain and predict individual behavior toward downloading illegally music through Internet.

#### *Rogers’ Diffusion and Theory of Planned Behavior Models*

It is necessary to briefly discuss the theoretical framework. In order to examine the innovation of sharing music illegally via Internet, the Rogers’ framework facilitated examination of innovation-dissemination in the context of downloading and sharing music between people. Thus, the concept of innovation in this study is related to the innovation of downloading music via peer-to-peer channels on the Internet.

Rogers’ diffusion model considers the “innovation, which is *communicated* through certain *channels* over time among the members of a *social system*”. Although dissemination was conceptually a subset of diffusion, Rogers used the term synonymously. Rogers explained that in the past, diffusing innovations encompassed both planned and spontaneous diffusions; whereas, dissemination included only planned or formalized communication or spreading strategies. In the study of the Diffusion of Innovations, Rogers described that “there are four critical elements in the diffusion process: (a) the innovation, (b) its communication from one individual to another, (c) the social system, and (d) over time”.

The very essence of the diffusion process is the interaction of one person communicating a new idea to another person. Based on these critical elements, one can see the applicability to the music piracy world. These critical elements are described briefly below.

An *innovation* is “an idea, practice, or object that is perceived as new by individual or other unit of adoption” (Rogers, 1995). The diffusion process is the spreading of a new idea (e.g. sharing music illegally via peer-to-peer channels on the Internet) in a social system, while the adoption process is the adoption of a new idea by an individual.

How does an individual, then, decide to adopt the innovation of downloading music via Internet? To address this question, Rogers introduces the concept of adopter categories. Adopter categories are “the classifications of members in a social system on the basis of innovativeness” (Rogers, 1995). These classifications are: innovators (around 2.5%), early adopters (13.5%), early majority (34%), late majority (34%), and laggards (16%). Based on these classifications, Rogers also postulates that the innovativeness variable is normally distributed over time and the adopter categories partition the distribution by standard deviations from the average time.

Furthermore, in order to understand who will adopt an innovation, we need to examine the factors that influence the adoption of an innovation. As these innovations, such as downloading music from Internet, are communicated to individuals, each individual will perceive the innovation differently. Rogers determined that there are five characteristics of an innovation as perceived by the individual:

- Relative Advantage: “the degree to which an innovation is perceived as better than the idea it supersedes”
- Compatibility: “the degree to which an innovation is perceived as being consistent with existing values, past experiences and needs of potential adopters”
- Complexity: “the degree to which an innovation is perceived as difficult to understand and use”

- Trialability: “the degree to which an innovation may be experimented with on a limited basis”
- Observability: “the degree to which the results of an innovation are visible to others”

The second critical element is *communication through channels*. According to Rogers and Scott (1997), “communication is the process by which participants create and share information with one another in order to reach a mutual understanding. A communication channel is the means by which messages get from one individual to another.” Communication channels “are the means through which knowledge about innovations is conveyed” and influence the rate of adoption.

Rogers asserted that certain types of channels, for example media channels are effective in communicating knowledge of an innovation, while interpersonal channels are effective in influencing decisions to adopt or reject innovations. A unique dimension in the behavioral attributes of interpersonal communication is the degree of “heterophily” and “homophily”. “Heterophily” is the degree to which two or more individuals who interact are *different* in certain attributes such as beliefs, education, social status, and the like. The opposite of “heterophily” is “homophily”, the degree to which two or more individuals who interact are *similar* in certain attributes such as social status, education, interests and beliefs (Rogers, 1995).

However, the communication channels are undergoing a major transformation due to the introduction of digital technology. As a consequence, today the communication environment for individuals has changed significantly. The key player of these changes is the Internet.

The Internet has transformed the world. According to Lockard and Abrams (2004), “the Internet is a worldwide network of interconnected computer networks with millions of users”. In addition, Browning (2002) states that, “the Internet is rapidly becoming the vital link in all of our communications, political and otherwise”. He continues and argues that the Internet’s greatest strength “is its ability to support simultaneous interactive communications among many people”. Or in other words, the Internet is a modern communication technology since it contains many different configurations of communication. Thus, the Internet as a new media technology influences the users’ communication and also carries cultural implications. Moreover, the Internet, a tool of communication and technology sharing, opens new options for communication, which has important consequences for music piracy. Communication channels, including the Internet, are important means in determining the speed and shape of innovation diffusion in a social system.

*Social system* is the third critical element of the diffusion process. A social system, according to Rogers, refers to “a set of interrelated units that are engaged in joint problem – solving to accomplish a goal...the social or communication structure of a system facilitates (or impedes) the diffusion of innovation in the system”.

Rogers identifies five key dimensions of a social system with respect to diffusion research: social structure, system norms, opinion leaders and change agents, types of innovation decisions, and the consequences of innovation.

Besides understanding the actual process of making a decision, one needs to look at the rate of adoption of this decision, which is defined as “the relative speed with which an innovation is adopted by members of a social system” (Rogers, 1995).

*Time* is the last critical element of the diffusion process and refers to the rate or speed of adoption by potential users. Rogers' Diffusion of Innovation model provides a useful conceptual framework for understanding, for example, how the adoption of downloading music illegally via Internet might operate in a social network. In other words, Rogers' model seeks to identify perceived characteristics of technology which may be expected to influence user adoption of this technology. As we have seen, Rogers identifies five characteristics of an innovation as perceived by the individuals (i.e., relative advantage, compatibility, complexity, trialability, and observability). Rogers did not, however, provide measurements of these perceptions associated with the diffusion of innovation.

From another point of view, in a social-psychological framework, theorists seek to identify determinants of behavior within the individual rather than in the technology itself. In order to develop a measurement process for the diffusion of an innovation and its subsequent adoption, one needs to look at "the prediction and understanding of human behavior" (Ajzen & Fishbein, 1980). Ajzen and Fishbein (1980) developed a Theory of Reasoned Action (TRA) to explain how user beliefs and attitudes are related to individual's intentions to perform. Central to this theory is a person's intention to execute a specific behavior. Intentions are assumed to capture the motivational factors that influence a specific behavior, as well as the quantity of effort one plans to apply in order to perform a discrete behavior (Ajzen, 1991).

According to the TRA, an actual behavior is determined by behavioral intention to perform the behavior, and the behavioral intention is jointly determined by the attitude toward the behavior and the subjective norm (i.e. perceived social influence of important people to individuals) (Fishbein & Ajzen, 1975). The Theory of Planned Behavior (TPB) was developed as an extension of the TRA to overcome the main criticism of the TRA model, as the latter does not take into consideration intentions and behaviors that are not completely under volitional control (Albarracin et al., 2001). The TRA and TPB are focused on individual rather than population behaviors. Intention as the proximal determinant of a corresponding behavior under a volitional control is determined by attitude, subjective norms and volitional control. The critical factor in the Theory of Planned Behavior is the intention of an individual to perform certain behavior.

The TPB model (Ajzen, 1991, 2002) has three conceptually independent determinants of intention. These determinants include attitude toward the behavior, subjective norm, and perceived behavioral control. The first one refers to the degree to which a person has a favorable or unfavorable evaluation of the specified behavior. The second one relates to the perceived social pressure to perform or not to perform the behavior, while the third one relates to the perceived ease or difficulty of performing the behavior (Ajzen, 1991). Ajzen (1991) states that perceived behavioral control is similar to Bandura's self - efficacy theory (Bandura, 1977). Bandura's theory reasons that a person's self-referent thoughts are the foundation of one's perceived control over a situation. Additionally, Ajzen (1991) states that "an interaction between intention (motivation) and perceptions of behavioral control can occur and this action is a component of predicting behavior".

Nevertheless, TPB continues to evolve. Moral obligation has been proposed as a normative influence on behavior. One important dimension that may explain the behavior about music piracy is moral obligation, i.e. the personal obligation to perform or not to perform a behavior. Ajzen (1991) states that: "It has sometimes been suggested that, at least in certain contexts, we need to consider not only perceived social pressures but also personal feelings of moral obligation or responsibility to perform, or refuse to perform, a

certain behavior. Such moral obligations would be expected to influence intentions, in parallel with attitudes, subjective (social) norms and perceptions of behavioral control.”

In an effort to increase the performance of the TPB model, it is not uncommon to investigate model extensions. In addition, in order to provide a better understanding of the individual's music piracy behavior one must extend the TPB model. For example, Kwong and Lee (2002) have attempted to combine the TPB model with principles from other scientific fields in an effort to explain the behavioral intention of individuals to music piracy. This has led to the extension of the TPB model, concentrating on the phenomenon of downloading illegally music from Internet.

Kwong and Lee (2002) provide an example of a study that has investigated an extension of TPB simply by including three key elements. These key elements are: perceived equitable relationship adopted from the logic in Social Exchange Theory, perceived effectiveness of deterrence in the framework of criminology context, and computer deindividuation in the context of classical deindividuation theory which is a useful framework for understanding certain behavioral changes commonly seen when a person uses the Internet to communicate. When Internet users are deindividuated, they feel free to engage in behaviors they would normally deem inappropriate (Kiesler et al., 1984).

Technological innovations, such as the Internet, and their diffusion create new possibilities for humans while, at the same time, they also raise moral concerns. For example, illegal music downloading took off in the late 1990s with the popularity of file-sharing technology. Numerous studies (Jones, 1991; Leonard et al., 2004; Marshall, 1999; Oz, 1992; Rest, 1986) have focused on unethical behavior using these technologies.

We have extended the TPB model by including moral obligation as an additional determinant of intention. Moral obligation is defined as the personal obligation to perform or not to perform a behavior. Moral obligation has been used in the literature to predict ethical intention. A number of research studies have demonstrated that individuals develop increasingly sophisticated moral reasoning structures based on age and experience (Rest, 1979; Rest & Narvaez, 1994). Friedman (1997) has shown that moral sensitivity and reasoning are critical to adolescents' decisions and opinion regarding the acceptability of taking actions such as violating copyright protection by making illegal copies of programs, i.e. pirating.

The purpose of this study is to describe an additional component of the TPB model that influences the individual's music piracy behavior: moral obligation. This extended model will support the attempt to discover what motivates an individual to select an illegal action based upon his or her obligation preservationist attitude. An individual who has an obligation preservationist attitude may seek a different kind of experience than one who does not. Figure 1 depicts diagrammatically the extended TPB model. Summarizing the aforementioned models with respect to Figure 1, the TRA model contains the  $H_1$  and  $H_2$  links or dependences, while TPB extends the TRA by incorporating the  $H_3$  link, corresponding to the perceived behavioral control (PBC) determinant. The Kwong-Lee model introduces three additional factors (links  $H_4$ - $H_6$ ), namely perceived equitable relationship (PER), deterrence effect of legislation (DEL) and computer deindividuation (CD). Our model builds on these models, taking into account a seventh determinant, moral obligation.

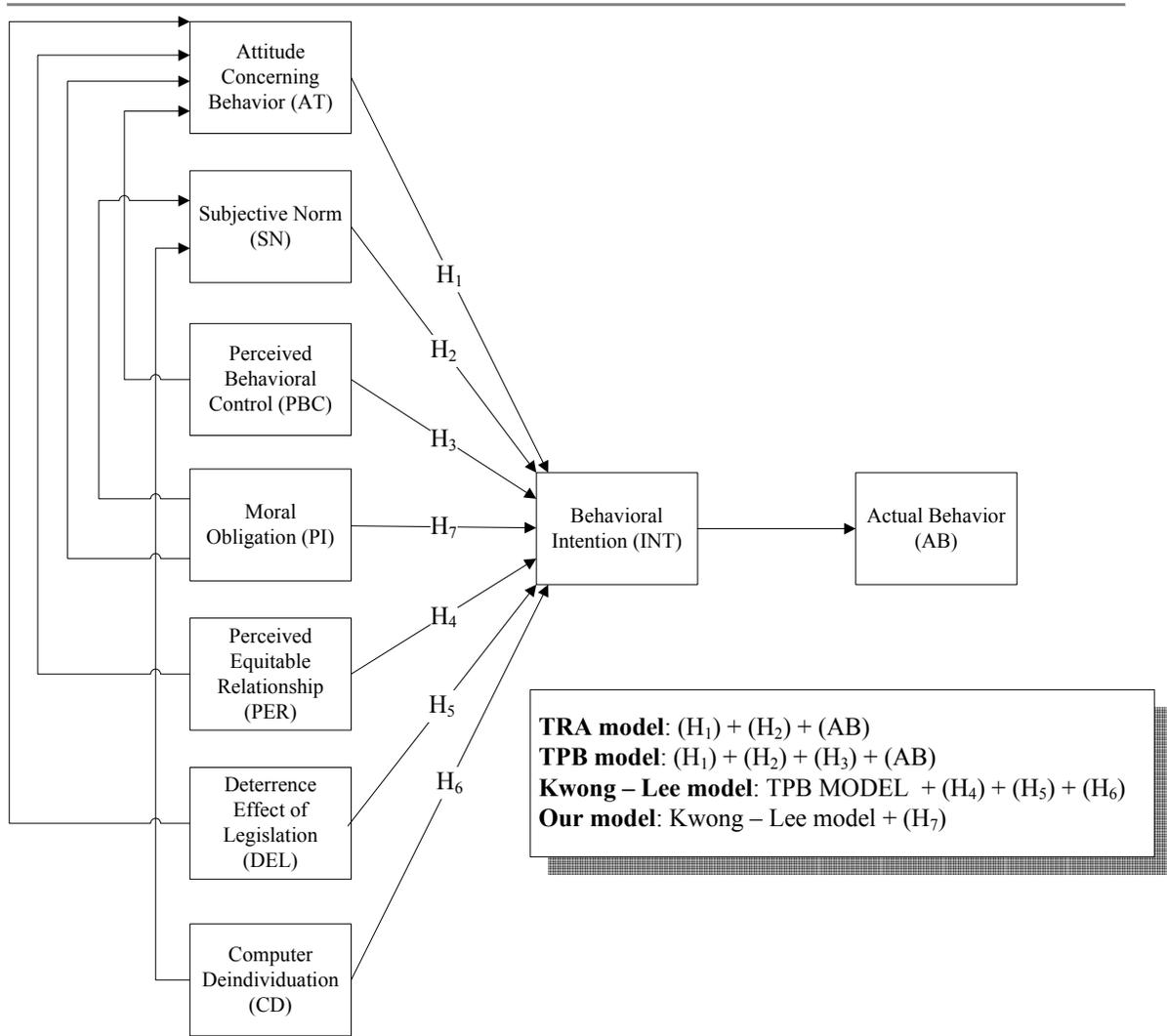


Figure 1. Family of Theory of Planned Models

## Results

The theory on innovation introduced by Rogers (Rogers, 1995) has been widely used in the literature. However, the only study in the Rogers' framework that analyzes the downloading music illegally off the Internet is that of Wright (Wright, 2005). Wright conducted research within Rogers' framework in order to "discover how people disseminated information to each other regarding the downloading of music illegally off the Internet". The purpose, therefore, is to examine Rogers' elements of diffusion (communication channels, social system, time, diffusion of consequences) in a way that reflects of how diffusion works on downloading music illegally off the Internet.

A sample of 913 undergraduate students of Athens University of Economics and Business was used in the survey. After removing 114 students who did not participate in the survey, the final sample was composed of 799. All undergraduate university students have been enrolled in a computer skills course. Out of 799 respondents, 50.7% respondents are female with the remaining 49.3% being male respondents.

Table 1 show the hypotheses as well as questions asked in the questionnaire.

**Table 1. Hypotheses**

Elements of Diffusion	Hypothesis	Variables	
		Dependent Variable (Y)	Independent Variable (X)
<b>Communication Channels</b>	H <sub>1</sub>	Are you currently downloading music illegally off the Internet? (Yes/No)	<b>Face-to-face</b> contact with others was influential in my decision to download music off the Internet <sup>a</sup>
	H <sub>2</sub>	Are you currently downloading music illegally off the Internet? (Yes/ No)	<b>Internet contact</b> with others was influential in my decision to download music off the Internet <sup>a</sup>
	H <sub>3</sub>	Are you currently downloading music off the Internet? (Yes/ No)	<b>Mass media</b> was influential in my decision to download music off the Internet <sup>a</sup>
	H <sub>4</sub>	Please estimate how often you download music illegally off the Internet. (4 or more times a week, 2-3 times a week, 3-4 times a month, once or twice a month, less than once a month, not at all)	<b>How many people</b> have you told, approximately, about the phenomenon of downloading music off the Internet? (None, about 1-10 people, about 11-24 people, 25 or more people)
<b>Social System</b>	H <sub>5</sub>	Please estimate how often you download music illegally off the Internet. (4 or more times a week, 2-3 times a week, 3-4 times a month, once or twice a month, less than once a month, not at all )	I believe that downloading music off the Internet without paying for it is ethical wrong <sup>a</sup>
Elements of Diffusion	Research Questions	Variables	
<b>Homophilous and Heterophilous Relationships</b>	H <sub>5a</sub>	Which program or service do you use to download music illegally off the Internet? (If you use different programs or services please choose the one you use most).	
	H <sub>5b</sub>	When I first downloaded music, I downloaded it from: (choose from a list of programs and services)	
	H <sub>5c</sub>	I told the following people about the ability for someone to download music off the Internet:	
<b>Time</b>	H <sub>6a</sub>	In your best estimation, how much time elapsed between the moment when you first learned that you could download music off the Internet and the moment when you actually began downloading music off the Internet?	
	H <sub>6b</sub>	In your best estimation, how much time elapsed between the moment when you first downloaded music off the Internet and the moment when you told someone else about it?	
	H <sub>6c</sub>	How many people have you told, approximately, about the phenomenon of downloading music off the Internet?	
<sup>a</sup> All items were scored on a 7–point Likert scale. Values range from 1 (strongly disagree) to 7 (strongly agree).			

Table 1 identify the respective hypotheses of the Rogers’ Diffusion model. A factor affecting the innovation diffusion process, according to Rogers’ model, is the

communication channels of the social system where the diffusion is being studied. The communication process includes the innovation of downloading music through Internet, a person who has the experience of downloading and a channel through which information about downloading is exchanged.

A regression model was used to evaluate each hypothesis. Table 2 provides results from the regression analysis for Hypotheses H<sub>1</sub>-H<sub>5</sub> (see Table 1).

**Table 2. Coefficients values from Regression Results for Hypotheses 1 to 5**

Hypothesis	Results		
	Male	Female	Total Sample
H <sub>1</sub>	-0.001	0.41*	0.22*
H <sub>2</sub>	0.85**	0.61**	0.82**
H <sub>3</sub>	0.008	-0.017	-0.009
H <sub>4</sub>	-0.218**	-0.49**	-0.233**
H <sub>5</sub>	-0.096*	-0.169**	-0.206**

Notes: All individual results reported are coefficients based on the simple regression model

$$Y_i = \beta_0 + \beta_1 X_i + u_i$$

(\*) p<0.05 (two - tailed); (\*\*) p<0.005 (two tailed).

Table 2 suggests that face-to-face contact with other people influences, in a statistically significant way, the decision to download music illegally off the Internet, according to the regression results for the whole sample. However, examining separately the male and female sub samples, we see that Hypothesis 1 holds only for the female sample. Hypothesis H<sub>2</sub> strongly holds for both male and female students as well as for the total sample; in other words, Internet contact with other individuals strongly affects the decision to download music illegally. On the contrary, Hypothesis H<sub>3</sub>, stating that media influence music downloading does not hold for either male or female students.

Regression results have shown that people who download music off the Internet constitute a strong diffusion factor of this innovation towards other individuals, in other words they tend to share this information with other people. As already described in the previous section, a core element of the diffusion theory is communication channels, through which people acquire their information. People normally have access to different communication channels and use them in a variety of ways. As shown from the results of Table 2, mass media are not a statistically significant factor for the decision of downloading music, while it is evident that personal and Internet communication play the most important role in the decision making process of those who are about to adopt an innovation. Finally, we see that Hypothesis H<sub>4</sub> also holds strongly, i.e. the more often someone downloads music off the Internet, the more people she informs on this innovation.

Another diffusion element in Rogers' framework is the social system. The way an individual perceives and understands social norms can influence his attitude and actions more than the exact knowledge of these actions. Hence, the emphasis here

is put on the relationship between the process of downloading music illegally and the ethical norms. This study investigates the question of how social norms and values influence the innovation of downloading music illegally through the Internet, through Hypothesis  $H_5$ . Table 2 shows the result of regression analysis.

From the regression results we see that ethical norms were found to be a significant predictor of downloading music illegally through Internet and that sex was a significant variable. Based on these results, we accept the  $H_5$  hypothesis.

Innovation diffusion is characterized as a process of imitation. According to Rogers, we have two types of social systems. The first type is a homophilous one where interacting individuals are similar, while the second type is a heterophilous one, where interacting individuals are dissimilar.

Our research has shown that 79.3% of students asked admit that they received help in downloading music illegally off the Internet from people they knew personally, while only 17.4% of them were helped by their Internet contacts. The same results show considerable variations for males and females: 72.2% of men received help from personal contacts and 23.2% of them were persuaded from Internet contacts, while 86.8% of women relied on friends' help and only 11.4% of them were advised by Internet contacts. Therefore, we see that individuals are influenced by both homophilous social systems and the Internet as well.

For the aforementioned reasons, it is interesting to examine next how the Internet is used as a means of information sharing and dissemination. For this purpose, we investigate Hypothesis  $H_{5a}$ . Our survey reveals that, for the entire sample, 26.1% of the students asked download music off websites, 14.5% use torrent technology, and 23.3% of them use other software as their primary downloading source. There is considerable difference between the preferences of male and female respondents; women tend to prefer websites (35.6% of them, to be precise), while men download torrents more frequently than women do. These facts lead us to the investigation of Hypothesis  $H_{5c}$ , which examines whether the students of the survey have shared their downloading experiences with others or not. Examining the whole sample, we see that 69% of our survey participants have shared their downloading experience with other people (mainly friends and relatives) whilst only 16% has not transmitted this knowledge to anyone. In fact, men tend to diffuse knowledge more than women (16.7% against 13.1% respectively), while women are slightly more secretive than men (18.2% and 13.4% respectively).

Time is also a critical parameter in the innovation diffusion process, as illustrated in Hypotheses  $H_{6a}$  and  $H_{6b}$ . The former considers the time elapsed between the moment a person learns about the option of Internet downloading and the moment he decides to download off the Internet, while the latter considers the time elapsed between the first downloading action and the sharing of this information with other people. Our survey reveals that 31.1% of the students asked had downloaded music off the Internet as soon as they learned about it, 23.5% waited for less than a week, while only 16.1% waited for over a year before they started downloading. Once more, men seem to be more active in this aspect (immediate downloading for 37.1% of them against 24.8% for women). Regarding Hypothesis  $H_{6b}$ , we see that 58.1% of the persons asked had informed immediately other people about the option of downloading, while it took less than a week for 23.9% of them. Finally, Hypothesis  $H_{6c}$  gives a view of the diffusion extent in a population; 47.3% of the survey participants have informed

up to 10 people on the ability to download off the Internet, with the percentage of women informing up to 10 people being significantly greater (56,6,%) than that of men (38.4%).

So far, we have empirically examined all the factors of Rogers' innovation model; however, one needs to look at the prediction and understanding of human behavior. The TPB model has been used in predicting various kinds of behavior. Testing the applicability of the extended TPB model in the prediction of illegal music downloading through the Internet is an important step in understanding an individual's illegal behavior. The variables of the TPB model were operationalized into a questionnaire that was constructed according to guidelines proposed by Ajzen (1988), Ajzen and Madden (1996), and Kwong and Lee (2002).

Intention (INT) to illegal downloading and music files' exchange on the Internet is the dependent variable in our study and it was measured with a 7-point Likert type scale (strongly agree=7, strongly disagree=1). Attitudes (AT) toward exchanging music files and downloading illegally music via Internet were measured via the following question: "I like the idea of exchanging music files on the Internet and downloading illegally music off the Internet". Subjective Norms (SN), in other words the person's perception of social normative pressures regarding performing or not performing the behavior in question were assessed with the question: "People who are important to me would expect me to engage in the exchange of music files on the Internet and downloading music illegally off the Internet". Perceived Behavioral Control (PBC) was measured in terms of the amount of control participants perceived, regarding music files' exchange and downloading illegally music via Internet. Thus, perceived behavioral control was operationalized in the questionnaire with the following item: "I have the resources, the knowledge and the ability to exchange music files on the Internet and download music illegally off the Internet".

In our case, we have also included the individual's moral obligation as an important factor influencing individual's behavior. While it may seem obvious in general that individuals' beliefs can influence their actions, however it is not clear that individuals' moral obligation beliefs about downloading music illegally off the Internet affect their behavior. Thus, the purpose of this study is to focus on moral obligation as a factor that should be included in the TPB framework. Specifically, this study examined whether moral obligation beliefs regarding downloading music off the Internet is a critical factor in an individual's downloading behavior.

Recently, Holm (2003) has developed a procedure to estimate an index of the "degree of ethical tolerance" regarding piracy. According to Holm (2003), "the index is based on how subjects rated the moral obligation gravity of copying compared to other illegal activities (like shoplifting, speeding, cheating on exams, etc.)". An attempt has been made to construct an index of the "degree of ethical tolerance" on the basis of Holm's framework. Each individual received the following question (the respondents were rated on a 5-point Likert-type scale, 1 = I strongly disagree to 5 = I strongly agree with this statement):

- Illegal downloading music and exchanging music files is more serious than:
- shoplifting
  - cheating on exams
  - speeding
  - hooliganism

(a) concealing income for tax reasons

Let  $x_i \in \{1,2,3,4,5\}$  denote the answer on sub-question  $i=a,b,c,d,e$ . Then

$$PI = \frac{x_a + x_b + x_c + x_d + x_e - 5}{20}$$

Thus,  $PI=1$  (0) indicates the highest (lowest) possible moral obligation concern.

One theory proposed to account for the trade of pirated material is equity theory. Equity is used in a number of cases and a common trait is that all of them involve the notion of fair dealing. Equity theory is a social exchange theory that was proposed as the tendency for individuals to search for fairness or equity in social exchanges. "Individuals determine the equity of fairness of their relationships or exchanges with others by assessing the ratio of what they receive from the exchange (outcomes) to what they bring to the exchange (inputs)" according to (Glass & Wood, 1996) research study.

Kwong and Lee (2002) suggested that "... whether a perceived equitable relationship exists between an individual and the owners of copyrighted music is a factor that affects the attitude of an individual and his/her intention to exchange pirated music files on the Internet". Perceived Equitable Relationship (PER) was operationalized in the questionnaire with the following item: "Generally speaking, exchanging music files on the Internet and downloading illegally music off the Internet does not result in any injustices".

In seeking the answer to the question "why do individuals engage in deviant acts?" many researchers focus on the Deterrence Theory in criminology. Deterrence Theory focuses in the general population. Homel (Homel, 1988) proposed that, deterrence refers to "the effects of legal sanctions on behavior through the mechanism of fear of legal punishment". Since music piracy is an illicit behavior, Deterrence Theory remains the dominant framework used in the criminology to explain the intensions. Deterrence Effect of Legislation (DEL) was operationalized in the questionnaire with the following item: "Existing laws provide effective deterrence against the exchange of music files on the Internet and downloading music illegally off the Internet".

Deindividuation Theory suggests that people lose a sense of their individual identity when they are anonymous (Zimbardo, 1969); in other words, the likelihood of deindividuation increases with the anonymity. Deindividuation has been used as an explanation in the computer-mediated communication literature for "flaming" and similar antinormative behaviors (Kiesler & Sproull, 1992). Moreover, Sproull and Kiesler (1991) suggest that anonymous use of computer would easily result in computer deindividuation and according to (Kwong & Lee, 2002), "...computer deindividuation tends to weaken the effect of subjective norm through exerting a moderating effect on the relationship between subjective norms toward exchanging music on the Internet...". Computer Deindividuation (CD) was operationalized in the questionnaire with the following item: "When you are using a computer, you know that your act might not affect others". Thus, an important issue under investigation is how do anonymity and perceived unidentifiability affect the relation between Internet and downloading illegally music.

Table 3 lists the eight variables used in this study and how we have measured them.

**Table 3. Theory of Planned Behavior components**

Concept	Definition	Measurement approach
Behavioral Intention (INT)	Perceived likelihood of performing behavior	I intend to exchange music files on the Internet and downloading illegally music off the Internet in the near future (in the next three months)*
Attitude (AT)	Personal evaluation of the behavior / A person's general feeling of favorableness or unfavorableness for that behavior	I like the idea of exchanging music files on the Internet and downloading illegally music off the Internet*
Subjective Norm (SN)	Beliefs about whether key people approve or disapprove of the behavior	People who are important to me would expect me to engage in the exchange of music files on the Internet and downloading illegally music off the Internet*
Perceived Behavioral Control (PBC)	Belief that one has and can exercise control over performing the behavior	I have the resources and the knowledge and the ability to exchange music files on the Internet and downloading illegally music off the Internet*
Moral Obligation (PI)	Assessment of possible actions and determining which is the most moral	Degree of Ethical Tolerance (PI)
Perceived Equitable Relationship (PER)	The tendency for an individual to search for fairness or equity in social exchanges	Generally speaking, exchanging music files on the Internet and downloading illegally music off the Internet does not result in any injustices*
Deterrence Effect of Legislation (DEL)	The effects of legal sanctions on behavior through the mechanism of fear of legal punishment	Existing laws provide effective deterrence against the exchange of music files on the Internet and downloading illegally music off the Internet*
Computer Deindividuation (CD)	The psychological state of separation of the individuals from others	When you are using a computer, you know that your act might not affect others*
Note: * indicates a 7-point Likert scale, with values ranging from 1 (strongly disagree) to 7 (strongly agree)		

Next, we examine whether the TPB components experience significant differences for the two genders. The components' differences between males and females were examined using t-tests. The results can be seen in Table 4.

Overall, the measurements of TPB components showed significant differences among genders; notable exceptions were the deterrence effect of legislation ( $t=0.015$ ,  $p=0.988$ ) and computer deindividuation ( $t=0.302$ ,  $p=0.763$ ) components. For example, we see that there is a statistically significant difference regarding the acceptance of exchanging music files on the Internet and downloading music off the Internet between male and female students ( $t=7.514$ ,  $p<0.001$ ). With regard to the moral obligation which was quantified in terms of the degree of ethical tolerance (=PI), there were significant differences ( $t=4.111$ ,

p<0.001) between male and female students. The results also indicate that the degree of ethical tolerance for females (PI=0.7817) scored higher than that of males (PI=0.723). Thus, in this study we found that sex does have a significant effect on moral reasoning.

**Table 4: Mean differences of TPB measures between males and females**

Variable	Male Mean±SD	Female Mean±SD	t-value	p-value (2-tailed)	Effect Size (d)
INT**	2.77±1.573	1.87±1.297	+8.701	0	0.62
AT**	2.34±1.17	1.75±1.042	+7.514	0	0.53
PBC**	3.08±1.751	2.03±1.435	+9.162	0	0.65
SN**	3.75±1.77	3.24±1.911	+3.877	0	0.28
DEL	5.46±1.489	5.445±1.703	+0.015	0.988	0
PER*	3.69±1.487	3.3±1.888	+3.133	0.002	0.23
CD	3.47±1.545	3.43±1.668	+0.302	0.763	0.025
PI**	0.723±0.17286	0.7817±0.21615	-4.111	0	0.29

Note : \*: p<0.05, \*\*: p<0.001

Spearman's rank correlation coefficient was used for the analysis of ordinal data. Correlations were calculated for every possible variable pair, for both male and female data. These results can be seen in Table 5.

**Table 5. Spearman's correlation coefficients for male and female data**

	female	AT	PBC	INT	SN	DEL	PER	CD	PI
male									
AT			0.268**	0.607**	0.417**	-0.007	0.135**	0.011	-0.295**
PBC	0.481**			0.527**	0.32**	-0.016	0.087	0.017	-0.04
INT	0.631**	0.668**			0.555**	-0.006	0.18**	0.064	-0.293**
SN	0.395**	0.371**	0.462**			0.064	0.051	-0.062	-0.024
DEL	-0.125*	-0.095	-0.15**	-0.09			-0.056	-0.049	0.22**
PER	0.282**	0.084	0.188**	0.119*	-0.074			0.187**	-0.192**
CD	0.066	0.054	0.008	0.051	-0.055	0.136**			-0.113*
PI	-0.211**	-0.148**	0.255**	0.166**	0.264**	-0.221**	-0.076		

Note : \*\*: correlation is significant at the 0.01 level (2-tailed), \*: correlation is significant at the 0.05 level (2-tailed)

The highest correlation between intension (INT) and perceived behavioral control (PBC) was 0.668 for the males. Attitude (AT), subjective norm (SN), perceived behavioral control (PBC) and perceived equitable relationship (PER) were all positively significantly

correlated with male intention to music piracy. Moral obligation was negatively significantly correlated with the male intention to music. This relationship indicates that the higher the moral obligation is, the lower males' intention to music piracy turns out to be. Deterrence effect (DEL) was also significantly related to male intention to piracy.

Table 6. Regression models for the twelve hypotheses

Hypotheses	Overall				Male				Female			
	$\hat{\beta}$	R <sup>2</sup>	F	Result	$\hat{\beta}$	R <sup>2</sup>	F	Result	$\hat{\beta}$	R <sup>2</sup>	F	Result
[H <sub>1</sub> ]	0.613 (21.7)	0.38	473.4	AT→INT	0.592 (14.1)	0.35	200	AT→INT	0.58 (14)	0.34	200	AT→INT
[H <sub>2</sub> ]	0.518 (17)	0.27	286.8	SN→INT	0.449 (10)	0.2	93	SN→INT	0.56 (13)	0.31	180	SN→INT
[H <sub>3</sub> ]	0.571 (20)	0.33	382	PBC→INT	0.577 (14)	0.33	184	PBC→INT	0.442 (11)	0.24	127	PBC→INT
[H <sub>4</sub> ]	0.174 (5.5)	0.04	31	PER→INT	0.184 (3.6)	0.03	13	PER→INT	0.18 (3.5)	0.032	13	PER→INT
[H <sub>5</sub> ]	-0.024 (-0.6)	0.001	0.4	DEL↔INT	-0.078 (-1.5)	0.006	2.2	DEL↔INT	0.03 (0.6)	0.001	0.3	DEL↔INT
[H <sub>6</sub> ]	0.005 (0.13)	0	0.2	CD↔INT	-0.02 (-0.3)	0	0.14	CD↔INT	0.025 (0.5)	0.001	0.3	CD↔INT
[H <sub>7</sub> ]	-0.209 (-5.9)	0.04	35	PI→INT	-0.166 (-3.3)	0.028	11	PI→INT	-0.156 (-3.1)	0.024	10	PI→INT
[H <sub>8</sub> ]	0.234 (6.6)	0.06	44	PER→AT	0.28 (5.6)	0.08	32	PER→AT	0.148 (3)	0.022	9	PER→AT
[H <sub>9</sub> ]	-0.024 (-0.9)	0.001	0.8	DEL↔AT	-0.06 (-4.1)	0.004	1.3	DEL↔AT	-0.016 (-0.3)	0	0.09	DEL↔AT
[H <sub>10</sub> ]	-0.245 (-7)	0.06	49	PI→AT	-0.126 (-2.5)	0.016	6	PI→AT	-0.305 (-6.3)	0.093	39	PI→AT
[H <sub>11</sub> ]	-0.1 (-3)	0.01	8	PI→SN	-0.127 (-2.4)	0.016	6	PI→SN	-0.012 (-0.2)	0	0.05	PI↔SN
[H <sub>12</sub> ]	0.372 (11.2)	0.14	127	PBC→SN	0.409 (8.6)	0.168	74	PBC→SN	0.305 (6.4)	0.1	41	PBC→SN

Notes:  $\hat{\beta}$  (standardized beta). Numbers in parentheses below coefficients denote the t-statistic

Table 7. Spearman's correlation coefficients for female data

	AT	PBC	INT	SN	DEL	PER	CD	PI
AT	1							
PBC	0.268**	1						
INT	0.607**	0.527**	1					
SN	0.417**	0.32**	0.555**	1				
DEL	-0.007	-0.016	-0.006	0.064	1			
PER	0.135**	0.087	0.18**	0.051	-0.056	1		
CD	0.011	0.017	0.064	-0.062	-0.049	0.187**	1	
PI	-0.295**	-0.04	-0.293**	-0.024	0.22**	-0.192**	-0.113*	1

Note : \*\*: correlation is significant at the 0.01 level (2-tailed), \*: correlation is significant at the 0.05 level (2-tailed)

In the case of females (Table 7), the highest correlation was 0.607 between intention and attitude. Furthermore, subjective norm (SN), perceived behavioral control (PBC), perceived equitable relationship (PER) were all significant correlated with female intention to music piracy. The DEL and CD variables were not significantly correlated with females' intention to music piracy.

In this study, the relations between attitudes toward music piracy and intention were greater than those between subjective norms and intention for both male and female students. In addition the relations of SN and INT ( $=0.555$ ) and PI and AT ( $=-0.295$ ) in the case of female students were greater than those of SN and INT ( $=0.462$ ) and PI and AT ( $=-0.211$ ) in the case of male students. The correlations between PI and INT were  $-0.255$  for the males and  $-0.293$  for the females, indicating a stronger relationship between these two variables for the female case. In order to examine potential gender differences in Spearman correlation coefficients a Fisher's Z-transform was performed.

In particular, regarding the relationship among attitude and intention to music piracy, the respective Z-score (for male  $0.631$  and  $0.607$  for female) is much smaller than  $1.96$ , hence implying that a hypothesis of a stronger relationship for males than females is not accepted. The same observation can be made for the moral obligation / intention to music piracy pair. In fact, it can be noted that in only four out of eleven cases there are significant gender differences.

**Table 8. Hierarchical Regression Analysis of student variables predicting intentions toward piracy**

		Male		Female	
		beta	t	beta	t
Step 1	AT	0.557	12.657	0.591	14.032
Step 2	AT	0.457	10.017	0.433	10.316
	SN	0.26	5.691	0.381	9.084
Step 3	AT	0.35	8.035	0.379	9.626
	SN	0.155	3.555	0.311	7.83
	PBC	0.369	8.429	0.298	7.911
Step 4	AT	0.343	7.872	0.362	8.739
	SN	0.149	3.431	0.316	7.925
	PBC	0.365	8.355	0.3	7.97
	PI	-0.072	-2.844	-0.048	-1.303
Step 5	AT	0.343	7.847	0.361	8.698
	SN	0.148	3.4	0.316	7.905
	PBC	0.366	8.359	0.3	7.964
	PI	-0.067	-1.855	-0.053	-1.389
	DEL	-0.019	-0.48	0.021	0.586
Step 6	AT	0.335	7.425	0.354	8.549
	SN	0.149	3.412	0.316	7.949
	PBC	0.367	8.36	0.295	7.872
	PI	-0.063	-1.648	-0.042	-1.103
	DEL	-0.019	-0.461	0.024	0.676
	PER	0.029	0.723	0.077	2.151
Step 7	AT	0.335	7.434	0.355	8.59
	SN	0.149	3.418	0.321	8.061
	PBC	0.369	8.421	0.296	7.901
	PI	-0.063	-1.54	-0.038	-1.005
	DEL	-0.02	-0.509	0.024	0.668
	PER	0.036	0.889	0.069	1.989
	CD	-0.059	-1.523	0.056	1.583

Note: beta is standardized

For example, the magnitude of correlation between male students' perceived behavioral control and intention to music piracy was significantly different from that of female students ( $Z=3.06$ ). Similarly, the magnitude of correlation between male students' perceived equitable relationship and attitude was significantly different than that of female students ( $Z=2.1$ ).

Spearman's correlation coefficient allows us to examine the relationship between intention and independent variables, without assuming any particular structure to that relationship. For example, we can measure whether increases in attitude toward music piracy lead to increases in behavioral intentions to music piracy, without assuming that these are, for examples, linear increases. Thus, we cannot use it to find whether we can improve our understanding of the behavioral intentions to music piracy by combining the variables AT, SN, PBC, PI, PER, DEL and CD. Thus, in order to examine the hypotheses, the statistical method of choice for analysis is that of simple and hierarchical regressions.

Based on the discussion of the TPB model (see Figure 1), there are altogether twelve research hypotheses developed for this study:

[H<sub>1</sub>]: Attitude toward the music piracy behavior will positively affect individual's behavioral intentions to music piracy

[H<sub>2</sub>]: Subjective norms toward the music piracy behavior will positively affect individual's behavioral intentions to music piracy

[H<sub>3</sub>]: Perceived behavioral control toward the music piracy will positively affect individual's behavioral intention to music piracy

[H<sub>4</sub>]: The lack of a perceived equitable relationship between an individual and music copyright owners will positively affect individual's behavioral intention to music piracy

[H<sub>5</sub>]: The perceived effectiveness of deterrence will negatively affect individual's behavior intention to music piracy

[H<sub>6</sub>]: Computer deindividuation will positively affect individual's behavioral intention to music piracy

[H<sub>7</sub>]: Individuals with higher moral obligation will have a lower intention towards music piracy

[H<sub>8</sub>]: The lack of a perceived equitable relationship between an individual and music copyright owners will positively affect individual's attitude to music piracy

[H<sub>9</sub>]: The perceived effectiveness of deterrence will negatively affect individual's attitude to music piracy

[H<sub>10</sub>]: Individuals with higher moral obligation will negatively affect individual's attitude to music piracy

[H<sub>11</sub>]: Individuals with higher moral obligation will negatively affect the individual's subjective norms to music piracy

[H<sub>12</sub>]: Perceived behavioral control will positively impact the subjective norm on the behavioral intention to music piracy

Simple regression was used for testing hypotheses [H<sub>1</sub>] to [H<sub>12</sub>]. In Table 6, we present regression results using only two variables. The regression analysis provide support of [H<sub>1</sub>], suggesting a positive attitude and intention to music piracy with a stronger relationship for males than females. Hypotheses [H<sub>2</sub>] and [H<sub>3</sub>] are both supported providing evidence of the relationships suggested in TPB model. As indicated in Table 6, perceived equitable (PER) has a significant influence on intention toward music piracy. Contrary to expectations, [H<sub>5</sub>] and [H<sub>6</sub>] did not emerge as a statistical significant relationship with this

sample. In other words, the hypotheses derived from Kwong and Lee model were not supported. Support was provided for [H<sub>7</sub>], the hypothesis proposing a negative relationship between moral obligation (PI) and intention toward music piracy. This suggests that moral obligation influences individual's decision to illegally downloading music via Internet. Consequently, moral norms are expected to directly influence those behaviors with moral or ethical dimensions and higher moral standards will negatively affect the individual's behavior in music piracy. From the results, it follows that male students are more affected by the moral obligation factor than female ones. Hypotheses [H<sub>10</sub>] and [H<sub>11</sub>] stated that moral obligations would have significant negative influences on attitude toward piracy and subjective norm. As indicated in Table 6, PI is negatively significant and has a strong negative influence on AT and SN. Therefore, hypotheses [H<sub>10</sub>] and [H<sub>11</sub>] are both supported. To summarize, we can conclude that introduction of the moral obligations had a considerable impact on students' attitude, subjective norms and behavior toward music piracy.

The correlation analyses showed that the three variables AT, SN and PBC had strong relationships for male and female's intention toward music piracy. Therefore, it was anticipated that these three variables would account for most of the variance within the model in predicting male and female behavioral intention toward music piracy. In order to examine the roles of the components suggested by theory of planned behavior and the expanded model (see Figure 1), hierarchical regression analyses were conducted using intention as the dependent variable.

Hierarchical modeling represents the most appropriate statistical method for dealing with the unique contribution made by each independent variable of interest. In order to test our hypotheses, a hierarchical regression analysis was conducted for each gender. In the hierarchical regression analysis attitude (AT) was entered first, in the second step attitude (AT) was followed by subjective norm (SN), while in the third step we have the TPB model. In the next steps numbered from 4 to 7, we have added the variables PI, DEL, PER and CD respectively. Table 8 report the outcome of the hierarchical regressions.

We can see that step 3 of Table 8 provides supporting evidence for TPB model for both male and female samples. For the males' sample, when the variable PI was entered into the regression, it was negatively significant ( $t = -2.844$ ), unlike the female case, where PI was not significant. The negative coefficient of PI indicates that behavioral intention toward music piracy falls as moral obligations rise. When the PI was entered in the case of males, the percentage of variance explained increased from a third step  $R^2$  of 0.473 to a fourth step  $R^2$  of 0.488. The analysis indicates that the fourth model (created by the addition of moral obligations) accounted for an increase of 0.015 in  $R^2$  and this was statistically significant. Additionally, in the case of males, the variables DEL (step 5), PER (step 6) and CD (step 7), were found not to be statistically significant. Thus, the hypotheses relating perceived equitable relationship, deterrence effect of legislation and deindividuation did not emerge as statistically significant with males' sample.

Hierarchical regression for the female data indicates that perceived equitable relationship (PER) is a statistically significant predictor (see Table 8, Step 6) of behavioral intention toward music piracy. The analysis indicates that model of Step 6 accounted for a 0.09 change in  $R^2$  and this was statistically significant. The hierarchical analysis in the case of female did not provide support of hypotheses [H<sub>5</sub>], [H<sub>6</sub>] and [H<sub>7</sub>].

An inspection of Table 8 indicates that the coefficients of TPB model change considerably between males and females. For example, the standardized coefficient for SN in the female TPB model (Step3) 0.311 is larger than the corresponding coefficient in the male TPB model (0.155). It is, thus, of some interest to compare the coefficients of the TPB model between male and female. The empirical evidence presented here supports the idea that behavioral intention toward music is determined and it is related to a different set of variables with respect to gender. In order to actually test whether the variables of the models were the same or not between male and female, we applied stepwise regression as the most appropriate technique. Using stepwise multiple regression analysis, the estimated parameters for each gender are presented in Table 9.

**Table 9. Estimated Parameters of the overall stepwise regression analysis**

Variables	Male		Female	
	$\hat{\beta}$	t-value	$\hat{\beta}$	t-value
AT	0.343	7.87	0.368	9.32
SN	0.149	3.44	0.313	7.91
PBC	0.365	8.36	0.294	7.84
PI	-0.072	2.844		
PER			0.081	2.3
R <sup>2</sup>	0.478		0.554	
F	81		113	

Note: beta is standardized

The strength of the goodness of fit statistics, the generally high levels of statistical significance, correct signs and plausible magnitudes of estimated parameter values all indicate that there exists a gender difference behavior in music piracy. The implication is that gender reflects some important behavioral intention toward music piracy differences.

We have found four variables contributing to the behavior intention. These variables are summarized in Table 9. The results are striking. First, the independent variables AT, SN and PBC involved in the TPB model have very high utility as general indicators of the behavioral intention toward music piracy for both males and females. Second, for these variables, their order of significance differs among the male and female samples. According to standardized coefficients, the order from the highest to the lowest is (AT, SN, PBC, PER) in the case of females and (AT, PBC, SN, PI) in the case of males.

### Discussion and Conclusion

With the rapid expansion and the use of information technology, music piracy is emerging as a common feature amongst youth worldwide (see Bhattacharjee, Gopal & Sanders, 2003; Gunter, Higgins & Gealt, 2010; Higgins, 2007; Kini, Ramakrishna & Vijayaraman, 2003). This study investigated the factors that affect the intention illegally download music among Greek University students. In conclusion, in regard to illegally download music, two different approaches were used. The first approach used the Rogers' Diffusion Innovation Theory. Rogers' Diffusion model is a complex yet useful model. Knowledge about the behavior of the intention to illegally download music could be increased through the second approach, the Theory of Planned Behavior.

Thus, this study used Rogers' Diffusion of Innovation Theory and the Theory of Planned Behavior in order to investigate illegal music downloading off the Internet. Through Rogers' innovation model we could understand the basic forces which affect the adoption rate of a particular innovation of downloading music illegally using Internet. Diffusion is a communication process which concerns a new idea. The Internet is viewed as an electronic community that interacts for leisure, commerce and research (Davison et al., 2003). Given the rapid diffusion of Internet among university students, Internet is becoming an important medium of communication.

Furthermore, it was discovered that 79.3% of the students had downloaded music off the Internet from people they knew personally. Thus, it is not surprising that university students would rely on homophilous relationships and Internet as well. On the basis of the survey answers, the accepted Rogers' model predicted that, depending on its gender, an individual behaves differently with respect to the adoption of innovation (the diffusion through Internet, in our case). Within Rogers' framework, we found that the number of adopters of an innovation is larger than the number of laggards. Moreover, frequency results showed that 20.2% of women perceive themselves as laggards, while the respective figure for men is only 12.2%.

Our study suggested that men and women have differences in the manner in which Internet communication influences their intention to download music illegally. In short, homophilous communication and Internet medium were found to be crucial for transmitting knowledge about downloading music illegally. Results indicate that Rogers' innovation diffusion model can accurately describe university students' behavior during the process of adopting downloading innovations. Hence Rogers's predictions regarding factors that regard adoption of an innovation - downloading using the Internet - were strongly supported.

The second approach, the TPB model, has been applied in order to investigate the determinants underlying the intentions to perform an illegal behavior. In our study, TPB has further extended, with the addition of four factors: moral obligation, perceived equitable relationship, deterrence effect of legislation and the computer deindividuation.

For males, four major components - attitude (AT), perceived behavior control (PBC), subjective norms (SN) and moral obligations (PI) - explained the intention toward music piracy. However, moral obligations did not predict the intention toward music piracy for females. For females, the appropriate model for explaining the intention toward music piracy include four major components - attitude (AT), subjective norms (SN), perceived behavior control (PBC), and perceived equitable relationship (PER). These findings imply that two different expanded TPB models may be appropriate for explaining the male and female students' intention to music piracy. Therefore, the expanded TPB models are better to explain the intention to music piracy compared to the three component TPB model. This study provides more detailed assessment of how differences among male and female influence the behavioral intention toward music piracy, by performing separate analysis for each gender.

According to La Rose and Kim (2007) music downloading is a consumption behavior were downloader face moral, legal and ethical challenges. We found that the personal moral obligation have a significant impact on the intension to illegally downloading music. This finding is consistent with Gopal, Sanders, Bhattacharjee, Agrawal and Wagner (2004) conclusion "more ethical individuals are less inclined to download online music". We found that, personal moral obligation influence negatively the intention to illegally

download music. Thus, any attempt to decrease the illegally downloading music without considering the ethical dimension is unlikely to yield the desired results.

In the case of female, the perceived equitable relationship was significant factor that affect the individuals' intention to illegally download music. According to Kwong and Lee (2002) deindividuation may impact upon individuals' behavioral intention toward illegally downloading music. Deindividuation and intention to illegally downloading music wasn't support both for males and females. That is deindividuation appeared not to significantly affect the intention to illegally download music. This supports the finding of Plowman and Goode (2009).

Another goal of the present study was to determine whether different patterns appeared for each gender in hierarchical regression analysis. Each model accounted for different amounts of variance. According to the hierarchical analysis, males and females reported different patterns in the model. For males, the most significant variables associated with male intention toward music piracy were attitude (AT), perceived behavioral control (PBC), subjective norm (SN) and moral obligation (PI). For females, attitude (AT), subjective norm (SN), perceived behavioral control (PBC) and perceived equitable relationship (PER) were found to be most significant. This means that gender is an important dimension of behavioral intention toward music piracy differences. This finding is confirmed by the stepwise regression model. In other words, the fundamental conclusion of this study is the fact that behavioral intention toward music piracy is tightly related with gender.

The issue of illegally downloading music piracy among Greek University students does exist although music piracy is criminal behavior. Music piracy – as a result of both Rogers' and TPB approaches – is considered to be a socially acceptable behavior amongst undergraduate students. One of the most important features of this study was the finding that the students' intentions to illegally downloading music would not react identically to the same combination of various factors.

Despite its contribution, there are two limitation deals with the fact that our sample is exclusively covered by undergraduate students. Instead, we have to extend the analysis to different populations. Second, the use of regression analysis to evaluate our hypotheses and TPB model represent another possible limitation. Additional, the data must be analyzed using the structural equation modeling (SEM) procedure.

### **Acknowledgement**

*We are deeply indebted for the anonymous reviewers' comments and suggestions.*

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