

* Ahmed Seleim

** Omar Khalil

* Alexandria University,
Egypt

** Kuwait University, Kuwait

DETERMINANTS OF SOFTWARE PIRACY ATTITUDES, INTENTIONS, AND BEHAVIORS IN LEBANON

Key Words

Software piracy; behavioral intention; attitude; risk; religious commitment; perceived behavioral control; subjective norms; theory of planned behavior (TPB); Lebanon

Abstract

The pervasiveness of the Internet and the progression of information technology have escalated software piracy (SP) worldwide. However, effective measures to curb SP in a particular country cannot be established without knowing the factors that influence SP behaviors in that country. A research model, grounded in the theory of planned behavior (TPB), was used to test three sets of hypotheses relating a number of factors to SP attitude, intention, and behavior among college students in Lebanon. The results confirm that subjective norms influence attitudes towards SP. Attitude towards SP, perceived behavioral control, and religious commitment influence SP intention, which, in turn, influences SP behavior. Surprisingly, however, the influence of religious commitment on the intention to pirate software is positive. These findings provide partial support for the applicability of TPB in explaining the SP phenomenon in Lebanon, as SP intention is not a strong predictor of SP behavior. Research implications, limitations, and future research are further discussed in the paper.

Introduction

Software Piracy (SP) is the illegal and unauthorized duplication, sale, or distribution of software (Aleassa *et al.*, 2011). SP is a complex phenomenon that presents a significant challenge for software producers

and both national and global economies (Liao, Lin, and Lin, 2010). This problem is exacerbated by the recent prevalence of the Internet and the advancement of communication technologies, which have increased the

opportunity for further escalation of the intellectual property rights violation (Kovacic, 2007). Forty-three percent of the software installed on computers worldwide in 2013 was not properly licensed, with estimated losses at \$ 62.7 billion (BSA and IDC, 2014).

Although SP is a global phenomenon, its rates differ by world region. For instance, unethical acts (e.g., private property piracy, bribery, corruption) are prevalent in Lebanese society (Moussawer, 2004; ACRLI, 2009); Lebanon was reported with a 73% SP rate in 2011 (BSA and IDC, 2012). However, effective measures to address the SP problem in a particular country, such as Lebanon, cannot be established without knowing the underlying motivations and justifications for SP behaviors in that country (Zamoon, 2006, p. 50; Cheng, Sims, and Teegen, 1997).

Numerous studies have attempted to identify individual and situational factors that could either explain or predict SP intention and behavior in different settings. The results of these studies, however, are inconclusive (e.g., Robertson *et al.*, 2012; Alam *et al.*, 2011; Veitch and Constantiou, 2011; Liao *et al.* 2010; Ramayah *et al.*, 2009; Hsu and Shiue, 2008; Jaafar and Ramayah, 2008; Lysonski and Durvasula, 2008; Jaafar and Ra-

mayah, 2008; Goles *et al.*, 2008; Cronan and Al-Rafee, 2008; Shang, Chen, and Chen, 2008; Levin, Dato-on, and Manolis, 2007; Wang, Zhang. and Ouyang, 2005; Tang and Farn., 2005; Villazon, 2004a; Gupta, Gould, and Pola, 2004; Peace *et al.*, 2003; Kwong and Lee, 2002; Tan, 2002; Knotts, Lopez, and Mesak, 2000; Chang, 1998). As such, there are no agreed upon factors that warrant SP (Zamoon, 2006, p. 9).

Furthermore, while theories (e.g., Theory of Reasoned Action (TRA), Theory of Planned behavior (TPB)) have been used on many occasions to develop predictive models of unethical behavior (e.g. Beck and Ajzen, 1991), it cannot be simply assumed that they will predict the similar SP behavior in a particular context (Peace, 1995, pp. 115-116). National origin and culture influence how individuals perceive piracy (Zamoon, 2006, p. 10; Christensen and Eining, 1991; Swinyard, Heikki, and Kau, 1990). Similarities and dissimilarities do exist in attitudes towards ethics across cultures and in different settings within the same culture (Martinsons and Ma, 2009; Ford, Nonis, and Hudson, 2005; Axinn *et al.*, 2004; Peppas, 2002). Therefore, models and factors that have been verified to predict SP behavior in a particular culture (e.g., individualistic culture) may not validly predict SP behavior in another culture (e.g., col-

lectivistic culture). Hence, it is useful to examine the specific situation of SP (Peace, 1995, p. 115-116).

Given the prevalence of SP in Lebanon, understanding why the Lebanese engage, or may engage, in SP and how to curb the use of pirated software is therefore imperative. This study adopts the theory of planned behavior (TPB) (Ajzen, 1991) to empirically test a predictive model of SP attitudes, intentions, and behaviors in Lebanon. The model includes fourteen constructs that are proposed to explain SP as well as stimulate future research designed to build models that help predict SP intention and behavior across cultures. The findings of this research should also provide a foundation for formulating and implementing strategies that aim to curb SP in Lebanon and other similar countries.

Theoretical Foundation

SP practices may include copyright infringement, commercial piracy, corporate piracy, and individual piracy (Schwartzberg, Schwartzberg, and Reid, 1999). This study focuses on individual SP, which occurs when individuals choose to copy software for their personal use. SP is pervasive and continues to be a problem as it is committed on a regular basis (BSA and IDC, 2014; Moores and Dhillon,

2000), and young individuals (e.g., millennials) may not consider SP unethical (Khalil and Seleim, 2012; Lyonski and Durvasula, 2008; Glass and Wood, 1996). Compared to their Baby boomers and Generation X parents, millennials (also called Generation Y individuals who were born between 1978-1994) are more educated and technologically adept (Deal, Altman, and Rogelberg, 2010). They appear to be more permissive of SP, as it has no direct harm to software producers and distributors. They also do not see the direct economic consequences of their actions, and they believe that they are the victims of inflated software prices (Freestone and Mitchell, 2004).

Behavioral theories from social psychology may help explain SP. Most notable is the Theory of Planned Behavior (TPB) (Ajzen, 1991), which is an extension of the Theory of Reasoned Actions (TRA) (Fishbein and Ajzen (1975). TPB stipulates an attitude-intention-behavior relationship and explains behavior using individual and environmental factors. It hypothesizes that the behavioral intention to perform a behavior is a function of a person's attitude towards that behavior, subjective norms, and perceived behavioral control, and that behavior is a function of behavioral intention.

Software piracy (SP) attitudes, intentions and behaviors:

Drawing on TPB, the probability of performing an act such as SP is a function of a person's attitude (AT) towards SP and the intention to pirate. Behavioral intention (BI) is the subjective probability of a person's engagement in a behavior (Fishbein and Ajzen, 1975). According to Chious, Huang, and Lee (2005), BI is the most important predictor of individual behavior. Schwartzberg *et al.*, (1999) argue that the focus on BI in research minimizes the respondents' reluctance to tell the truth about their actual behaviors. BI is therefore typically hypothesized as an accurate predictor of actual behavior (Triandis 1980) and as an antecedent of software piracy behavior (SPB) (Al-Jabri and Abdul-Gader, 1997; Ajzen, 1991).

In addition, AT- the individual's general feeling of favorableness or unfavorableness towards a certain behavior (Fishbein and Ajzen, 1975) -is believed to influence BI (Cronan and Al-Rafee, 2008), and is an important predictor of the intention to commit unethical acts such as SP (Limayem, Khalifa, and Chin 2004; Peace *et al.*, 2003). Phau and Teah (2009) found favorable AT towards downloading to influence the intention to download. Also, Peace *et al.*, (2003), Belle, Macdonald, and Wilson (2007), and Liao *et al.*, (2010) found AT towards

piracy to be a powerful explanatory variable of piracy intention. Therefore, it is postulated that a favorable AT towards SP will positively influence BI to pirate software.

Moreover, numerous researchers have adopted research models that incorporated diverse constructs that are believed to influence AT toward SP and/or BI to pirate software in different settings. Among others, these constructs include perceived risk, subjective norms (SN), perceived behavioral control (PBC), moral obligation (MO), habit (HA), religion commitment (RC), legal identity (LI), and technical identity (TI). These constructs are briefly discussed next.

Determinants of software piracy attitudes and intentions:

1. Perceived risk. A person's intention to pirate software could be influenced by the potential outcomes of such a behavior (Cheng *et al.*, 1997; Simpson, Banerjee, and Simpson, 1994). Piracy involves some degree of risk, which is multi-dimensional (Liao *et al.*, 2010; Tan, 2002; Fraedrich and Ferrell, 1992). Following Liao *et al.* (2010), only performance risk (PER), social risk (SOR), prosecution risk (PRR), and psychological risk (PSR) are investigated in this study.

PER refers to the loss incurred when the product chosen might not perform as desired (Peter and Tarpey, 1975). The use of pirated software may cause some consequences that a user may not expect such as failing to work like the original copy or containing damaging viruses (Liao *et al.*, 2010; Fraedrich and Ferrell, 1992). PER was found to negatively impact the intention to purchase pirated software (Tan, 2002) and to correlate with the willingness to pay for software products (Hsu and Shiue, 2008). Veitch and Constantiou (2011) also found that the decision to pirate a song or album was negatively associated with quality risk. However, Williams, Nicholas, and Rowlands (2010) argue that there is a very low risk that a pirated copy of a digital object (e.g., music, software, etc.) will perform poorly; Liao *et al.*, (2010) found PER to have no influence on the intention to pirate software.

SOR is related to the image that an individual wants to project to friends and peers and the desire to be identified with certain groups of people (Ratnasingam and Ponnu, 2008). Fraedrich and Ferrell (1992) add that SOR is the probability that the use of pirated software may affect how other individuals think of the individual. SOR may play a positive or negative role in a person's SP behavior (Hsu and Shiue, 2008; Tang and Farn, 2005;

e.g., Gupta *et al.*, 2004; Limayem *et al.*, 2004; Lau, 2003; Tan, 2002). If a person thinks that pirating software involves high SOR, he/she will not engage in SP. Tan (2002) found SOR to negatively impact the intention to purchase pirated software. Liao *et al.*, (2010), however, found SOR to have insignificant influence on the intention to pirate software. In addition, individuals, especially in the developing countries, may not believe piracy is wrong since everyone is doing it (Lau, 2003).

PRR is the possibility that using pirated software will subject users to legal prosecution (Tan, 2002). Effective legislation against SP will discourage individuals from pirating software (Peace *et al.*, 2003; Kwong and Lee, 2002). Although defined differently by researchers, PRR was found to influence attitude towards SP (Peace *et al.*, 2003), soft lifting (Goles *et al.*, 2008), and music piracy (Chious *et al.*, 2005; Veitch and Constantiou, 2011). PRR was also found to influence the intention to pirate (Glass and Wood, 1996), the purchase of pirated software (Tan, 2002), and the downloading of software (Robertson *et al.*, 2012; Lysonski and Durvasula, 2008; Jaafar and Ramayah, 2008). Hsu and Shiue (2008), however, found that PRR did not increase the willingness to pay for software products; Wang *et al.*, (2005) found that the chances of

being caught when purchasing pirated software in China were low.

PSR, on the other hand, refers to the loss incurred when the product chosen does not fulfill the individual's self-image or perceptions of self (Peter and Tarpey, 1975). PSR may influence a person's SP attitude and intention, as he/she may suffer from mental stress because of using pirated software (Lim, 2003). Tan (2002) found PSR to negatively impact the intention to purchase pirated software. Liao *et al.* (2010) also found PSR to be a strong predictor of attitude toward using pirated software, but to have no influence on the intention to pirate software.

Based on the discussion of the relevant research, the risks (PER, SOR, PRR, PSR) involved in SP are expected to have a negative influence on both AT towards SPB and BI to pirate software.

2. Subjective norms (SN). SN is the perceived social pressure to perform or not to perform a particular behavior (Ajzen, 1991; Triandis, 1980; Fishbein and Ajzen, 1975). A person's interactions with significant others (e.g., peers, friends, associates, family members) will influence his/her attitude towards a specific behavior (Tang and Farn, 2005).

SN may influence an individual's intention to pirate software (Al-Rafee and Cronan, 2006; d'Astous, Colbert, and Montpetit, 2005; Al-Jabri and Abdul-Gader, 1997; Simpson *et al.*, 1994). Levin *et al.* (2007) found that individuals who believed that their peers were supportive of carrying out downloading behavior were more likely to pirate than those who believed that their peers were not supportive. Tang and Farn (2005) found that the intention to pirate software was determined by group pressure.

However, SN was not found to influence piracy intention and behavior in a number of studies (Alam *et al.*, 2011; Liao *et al.*, 2010; Cronan and Al-Rafee, 2008). In addition, the earlier research on the influence of SN on behavioral intention has produced mixed results (Cronan and Al-Rafee, 2008; Peace *et al.*, 2003; Kwong and Lee, 2002; Chang, 1998). Given the findings of the reviewed studies, SN that condones SP is predicted to have a positive influence on both AT towards SPB and the BI to pirate software.

3. Perceived behavioral control (PBC). PBC refers to the perceived ease or difficulty in performing a behavior (Liao *et al.*, 2010; Ajzen, 1991). Continuously advancing information technology (IT) is easing software acces-

sibility, which provides users with sufficient opportunities to pirate software.

PBC may influence the intention to pirate software. Cheng *et al.* (1997) found the ease of pirating software to be a motive behind using pirated software. Chang (1998) concluded that PBC was the most important predictor of the intention to use illegal software. Cronan and Al-Rafee (2008) also found that individuals who were equipped with better skills and resources had a higher intention to pirate software. Therefore, PBC is postulated to have a positive influence on the BI to pirate software.

4. Moral obligation (MO). MO is the feeling of guilt or the personal obligation to perform or not to perform a behavior (Cronan and Al-Rafee, 2008). Whether or not an individual feels guilty depends on whether his or her behavior was inconsistent or consistent with the societal norms (Goles *et al.*, 2008).

MO may influence the BI to pirate software (Schwartzberg *et al.*, 1999). Babin and Babin (1996) found that high levels of ethical beliefs negatively influenced the BI to pirate software. Cronan and Al-Rafee (2008) found MO to impact the BI to pirate software. Gupta *et al.* (2004) found that the individuals who exhibited fewer ethical considerations were more

likely to participate in SP. In addition, Swinyard *et al.* (1990), Tan (2002), and Jaafar and Ramayah (2008) found that an individual's ethical attitude was a factor that negatively affects SP. However, many individuals do not think that SP is an ethical issue (Lysonski and Durvasula, 2008). On balance, however, MO is projected to have a negative influence on the BI to pirate software.

5. Habit (HA). HA is a situation-behavior sequence that has become automatic without self-instruction (Triandis, 1980). HA is a function of the individual's past experiences, which impact his or her attitudes, intentions, and behaviors (Ramayah *et al.*, 2009; Limayem *et al.*, 2004; Triandis, 1980). It is also the degree of past occurrences of piracy (Cronan and Al-Rafee, 2008). When an individual pirates software and does not perceive any negative consequences, the propensity to keep that behavior in the future will be higher.

HA was found to have a strong effect on students' Internet piracy behavior (Ramayah *et al.*, 2009) and to correlate with the use of pirated software (Tan, 2002). Similarly, HA was found to have a positive relationship with attitude toward SP (Goles *et al.*, 2008). In addition, Cronan and Al Rafee (2008) found that students' in-

tention to pirate in the future was higher for those who had used pirated products in the past. Ramayah *et al.* (2009) also add that HA influences actual behavior through the mediating influence of affect and intention. HA is therefore predicted to have a positive influence on the BI to pirate software.

6. Religious commitment (RC). Religious beliefs can affect behaviors (McDaniel and Burnett, 1990). RC is either intrinsically or extrinsically oriented (Allport and Ross, 1967). While intrinsically motivated individuals live their religion, extrinsically oriented individuals use their religion for appearances and social convention (Villazon, 2004a). Individuals with a high degree of intrinsic religiousness tend to have a greater concern for moral standards (Villazon, 2004a).

Kennedy and Lawton (1998) found that students who were more religious were less willing to engage in unethical behavior. Knotts *et al.* (2000) found that students who actually live their religion exerted a significant effect on their ethical judgments. Wagner and Sanders (2001) found that the individuals with conservative religious beliefs were less likely to evaluate an unethical act as fair, just, morally right, or acceptable. In addition, Simpson *et al.* (1994)

found that religion influenced the tendency to pirate software. However, Villazon (2004a) found religious beliefs to have no significant influence on the propensity to commit SP. Overall, RC is postulated to have a negative influence on the BI to pirate software.

7. Legal identity (LI). LI is the extent to which a person considers self as law-abiding. (Goles *et al.*, 2008). Awareness of the law is one thing, but respecting that law or obeying it is another. If an individual's LI is such that he or she does not consider himself or herself bound by those laws, he or she probably will not observe them. Empirically, LI was found to negatively correspond to attitude towards soft lifting (Goles *et al.*, 2008). Therefore, LI is expected to have a negative influence on the BI to pirate software.
8. Technical identity (TI). TI is the extent to which a person considers himself or herself technologically advanced (Goles *et al.*, 2008). Software publishers have tried a variety of mostly ineffective measures to copy-protect their products (Swinyard *et al.*, 1990), which do not technically challenge some individuals who have a dire need to be on the leading edge of technology or to acquire the most recent versions of software packages (Goles *et*

al., 2008). TI was found to be important for overcoming the technical challenges associated with SP (Simpson *et al.*, 1994; Sims, Cheng, and Teegen, 1996). Hence, TI is postulated to have a positive influence on the BI to pirate software.

The aforementioned review of relevant research suggests that SP attitude, intention, and behavior can be explained through a multiplicity of constructs. Nevertheless, the findings of such research are inconclusive, and the significance of each construct is contingent, among others, on the type of the piracy act, the individual characteristics of the research sample, and the environmental characteristics of the research setting. Testing more comprehensive research models in different cultures is therefore needed in order to better understand the SP phenomenon and its determinants. In addition, since SP is a serious problem in Lebanon (BSA and IDC, 2012; ACRLI, 2009; Moussawer, 2004), understanding why the Lebanese engage, or may engage in SP, is essential to curbing this phenomenon.

Research Model and Hypotheses

The research model:

Figure 1 depicts the proposed research model. It is an extension of

TPB (Ajzen, 1991; Fishbein and Ajzen, 1975). In addition to the constructs in the original TPB model, the research model incorporates other constructs that are believed to be important determinants of SP intention and behavior. It proposes that: (1) a person's behavioral intention (BI) to pirate software influences that person SP behavior; (2) BI is influenced by a person's attitude (AT), subjective norms (SN), psychological risk (PSR), prosecution risk (PRR), social risk (SOR), performance risk (PER), technical identity (TI), moral obligation (MO), legal identity (LI), habit (HA), religious commitment (RC), and perceived behavioral control (PBC); and (3) a person's AT towards SP, in turn, is influenced by SN, PSR, PRR, SOR, and PER. These relationships are formally stated in the research hypotheses.

Research hypotheses:

The postulated relationships among the research variables, presented in the foregoing section, are formalized in three groups of hypotheses:

- (1) Determinants of attitude (AT) towards SP behavior (SPB). The effect that performance risk (PER), social risk (SOR), prosecution risk (PRR), psychological risk (PSR), and subjective norms (SN) may have on AT towards SP

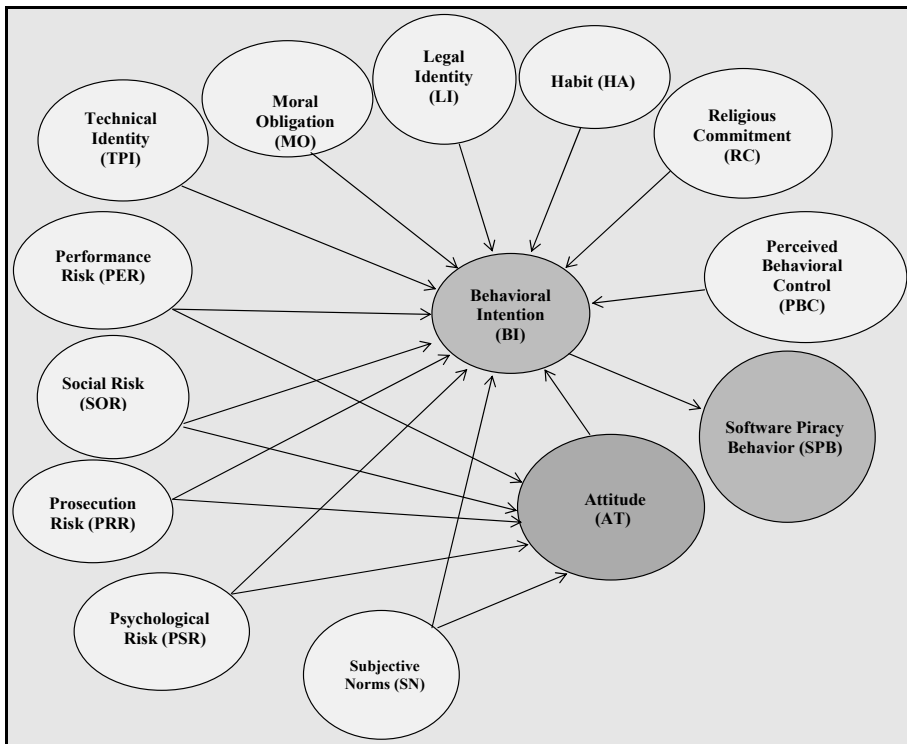


Figure 1: The Research Model

will be tested through the following hypotheses:

H1-1: The higher the PER, the less favorable the AT towards SPB.

H1-2: The higher the SOR, the less favorable the AT towards SPB.

H1-3: The higher the PRR, the less favorable the AT towards SPB.

H1-4: The higher the PSR, the less favorable the AT towards SPB.

H1-5: The higher the SN to pirate software, the more favorable the AT towards SPB.

(2) Determinants of behavioral intention (BI) to pirate software. The effect that performance risk (PER), social risk (SOR), prosecution risk (PRR), psychological risk (PSR), subjective norms (SN), attitude (AT), perceived behavioral control (PBC), technical identity (TI), moral obligation (MO), habit (HA), religious commitment (RC), legal identity (LI), and technical identity (TI) may have on the behavioral intention (BI) to pirate software will be tested through the following hypotheses:

H2-1: The higher the PER, the lower the BI to pirate software.

H2-2: The higher the SOR, the lower the BI to pirate software.

H2-3: The higher the PRR, the lower the BI to pirate software.

H2-4: The higher the PSR, the lower the BI to pirate software.

H2-5: The higher the SN to pirate, the higher the BI to pirate software.

H2-6: The more favorable the AT towards SP, the higher the BI to pirate software.

H2-7: The higher the PBC, the higher the BI to pirate software.

H2-8: The higher the MO, the lower the BI to pirate software.

H2-9: The more the HA to pirate, the higher the BI to pirate software.

H2-10: The higher the RC, the lower the BI to pirate software.

H2-11: The higher the LI, the lower the BI to pirate software.

H2-12: The higher the TI, the higher the BI to pirate software.

(3) Determinants of SP behavior (SPB). The effect that the behavioral intention (BI) to pirate software may have on SP behavior (SPB) will be tested through the following hypothesis:

H3-1: The higher the BI to pirate software, the higher the SPB.

Research Method

Measurement:

Appendix (A) depicts the 44 items that were adapted to measure the fourteen research constructs. All items were measured using a five-point Likert scale. The scale items were tested for reliability. All items were found reliable, as all reliability coefficients (Cronbach's alpha) were greater than the recommended threshold of 0.70 (Nunnally, 1978). It should be noted that SPB was operationally defined as the 'actual use of pirated software.'

Sampling and data collection:

Students were chosen as informants in this study because they are convenient and are largely millennials. They frequently and inquisitively browse the Internet for interesting material such as information, software, games, and music. Compared to other groups in a society, students are more likely to indulge in SP (Ramayah *et al.*, 2009). Also, college students were the most frequently used respondents in earlier empirical SP studies (Cronan *et al.*, 2006). As such, using students as informants in this investigation should enable the comparison of its findings with those of earlier relevant studies.

The sampling frame for this research included the undergraduate business students at Beirut Arab University (BAU), Lebanon. The student population at BAU was approximately 10,000, of which 2,500 were business students.

A survey was designed to gather data on the research variables. In addition to the 44 questions used to gather data on the fourteen research variables, the survey includes four questions to gather demographic information on gender, marital status, income, and classification. The items included in the survey were developed, validated, and documented in the relevant literature (Appendix A).

A team of three bilingual (English/Arabic) graduate students translated the survey from English to Arabic and back to English in order to achieve linguistic equivalence. To further assess the content and face validities of the survey, earlier versions of the survey were piloted on nine faculty members and students at BAU, and a final copy of the survey was developed after taking into consideration all comments and suggested revisions.

Data were collected in the spring semester of 2012 from a convenience sample of the business undergraduate students at BAU. Students, who were present on the chosen day for data collection, were asked to voluntary

participate in the survey. They were asked to fill out the survey during class time. They were also informed that their responses would be anonymous and confidential.

Five-hundred fifty responses were collected, from which 55 incomplete responses were excluded, and 495 responses were used for data analysis. This sample size is considered adequate, as Compeau and Higgins (1995) recommend that the minimum number of required responses should be five times the number of items in the questionnaire in the research model. Since the survey consists of 44 items, the target sample should exceed 220 observations. Table 1 presents the characteristics of the research sample.

Approximately, 44% of the respondents were male and 48% were female. As for classification, 26% were freshmen, 28% were juniors, and 28% were seniors. In addition, 24% of the respondents reported high income, 39% reported medium income, and 3% reported low income. Lastly, 88% were single, 6% were married, and 2% were divorced.

Data analysis

Descriptive statistics:

Table 2 displays a statistical summary for the research constructs. As for the perceived risks associated with PS, the results show modest PER

Table 1
Characteristics of Research Sample (N = 495)

Students' Characteristics	Number of Respondents	Percentage
Classification		
Freshmen	130	26.26
Junior	141	28.48
Senior	137	27.67
Missing value	87	17.57
Total	495	100%
Gender		
Male	220	44.4
Female	238	48.08
Missing value	37	7.57
Total	495	100%
Marital status		
Single	435	87.7
Married	29	5.85
Divorced	9	1.81
Missing value	22	4.44
Total	495	100%
Income		
High	119	24.04
Medium	194	39.19
Low	16	3.23
Missing value	166	33.53
Total	495	100%

(mean = 3.1127), low SOR (mean = 2.1322), modest PRR (mean = 2.6793), and modest PSR (mean = 2.8186). Also, the results show low social pressure (SN) to pirate software (mean = 2.1121), low difficulty to pirate software (PBC) (mean = 2.3558), modest MO (mean = 3.1239), low habitual SP (HA) (mean = 2.1746), high RC (mean = 4.1196), relatively high LI (mean = 3.5523), and modest TI (mean = 3.3636). The results also indicate unfavorable AT

toward SP (mean = 2.0325), low BI to pirate software (mean = 2.0394), and approximately 36% of the respondents have used pirated software (SPB) (mean = .3568).

The measurement model:

The partial least squares (PLS) procedure was applied in order to fit a model to the data set and test the research hypotheses. The reliability of the data collection instrument was determined by using the latent vari-

ables' composite scale reliabilities (Fornell and Larcker, 1981). The values of alpha for all variables are higher than 0.80 (Table 3). Moreover, the average variance extracted (AVE) by the latent variables from the manifest variables is used as another index for internal consistency reliability. The AVEs for all variables in Table 3 exceed the threshold of 0.50 (Fornell and Larcker, 1981).

On the other hand, the convergent validity can be assessed by examining the factor loading of each manifest variable on its latent variable (House, Spangler, and Woycke, 1991). The measuring scales were refined through

the results of the PLS factor loadings. One item was removed from the AT scale (X16), and one item from the SN scale (X13) in order to improve the reliability and validity of the research variables. The factor loading results exceed the .60 threshold. Each of the scale components exhibited internal consistency with PER, SOR, PRR, PSR, SN, AT, PBC, MO, HA, RC, LI, TI, BI, and SPB having composite scale reliabilities (Cronbach's alphas) of .921, .891, .912, .925, .838, .915, .871, .873, .935, .905, 1, .911, .916, and 1, respectively. The average variances explained (AVEs) are .797, .804, .838, .805, .721, .730, .575, .697, .783, .658,

Table 2
Descriptive Statistics for Research Variables

Variables	Std. Dev.	Mean	Max	Min	N
PER	.76316	3.1127	5	1	488
SOR	1.19309	2.1322	5	1	488
RC	.89145	4.1196	5	1	489
PRR	1.32699	2.6793	5	1	488
PSR	1.27134	2.8186	5	1	488
SN	1.05775	2.1121	5	1	486
AT	1.00665	2.0325	5	1	487
BI	.98629	2.0394	5	1	488
PBC	1.03909	2.3558	5	1	488
MO	1.15160	3.1239	5	1	487
LI	1.20637	3.5523	5	1	478
TI	1.08595	3.3636	5	1	485
HA	.80344	2.1746	5	1	485
SPB	.47961	.3568	1	0	440

Table 3
Factor Loadings, Composite Scale Reliability,
and Average Variance Extracted for Research Variables

Constructs and items	Factor Loadings	Composite scale reliability	Average Variance Extracted
Performance Risk (PER)			
X1	.9159	0.921	0.797
X2	.9295		
X3	.8291		
Social Risk (SOR)			
X4	.8859	0.891	0.804
X5	.9071		
Prosecution Risk (PRR)			
X 6	.9390	0.912	0.838
X7	.8910		
Psychological Risk (PSR)			
X8	.9358	0.925	0.805
X9	.8683		
X10	.8865		
Subjective Norms(SN)			
X11	.8415	0.838	0.721
X12	.8567		
Attitude (AT)			
X14	.8903	0.915	0.730
X15	.8010		
X17	.8513		
X18	.8718		
Perceived Behavioral Control (PBC)			
X19	.7862	0.871	0.575
X20	.7833		
X21	.7459		
X22	.7952		
X23	.6742		
Moral Obligation (MO)			
X24	.8360	0.873	0.697
X25	.8753		
X26	.7903		
Habit (HA)			
X27	.8408	0.935	0.783
X28	.9300		
X29	.8509		
X30	.9144		

Cont. Table 3

Constructs and items	Factor Loadings	Composite scale reliability	Average Variance Extracted
Religious Commitment (RC)			
X31	.7377	0.905	0.658
X32	.7895		
X33	.7826		
X34	.8794		
X35	.8571		
Legal Identity(LI)			
X36	1.000	1	1
Technical Identity(TI)			
X37	.8813	0.911	0.773
X38	.8970		
X39	.8590		
Behavioral intention (BI)			
X40	.984	0.916	0.732
X41	.9013		
X42	.8148		
X43	.7820		
Software Piracy Behavior (SPB)			
X44	1.000	1	1

1.0, and .773, .732, and 1, respectively (Table 3).

To assess the discriminant validity of the constructs, Gaski (1984) suggests that if the correlation between two composite constructs is not higher than their respective reliability estimates, a discriminant validity exists. The results indicated that all reliability estimates were greater than their correlation coefficients. Discriminant validity is also demonstrated if the square roots of the AVEs in the measurement model are larger than the correlation coefficients between the construct and all other constructs.

The diagonal elements are the square roots of the AVEs and off-diagonal elements are the correlations between the constructs. For adequate discriminant validity, the diagonal elements should be greater than the off-diagonal elements in the corresponding rows and columns (Fornell and Larcker, 1981). Using this criterion, the results in Table 4 suggest the existence of adequate discriminant validity for all constructs. Therefore, the convergent and discriminant validity of the measures are adequate.

Table 4
Discriminant Validity of Latent Variables in Substantive Model

	PER	SOR	PRR	PSR	SN	AT	BI	PBC	MO	HA	SPB	RC	LI	TI
PER	.892													
SOR	.157	.990												
PRR	.199	.391	.954											
PSR	.149	.418	.491	.961										
SN	-.034	.107	.068	.151	.951									
AT	-.142	-.209	-.268	-.360	.206	.956								
BI	-.232	-.260	-.283	-.391	.170	.646	.957							
PBC	-.154	-.058	-.196	-.213	.170	.373	.481	.933						
MO	.014	.064	-.038	-.012	-.040	-.028	.027	.069	.934					
HA	-.067	.062	-.062	-.043	.142	.300	.295	.435	-.017	.966				
SPB	-.143	-.298	-.320	-.428	.069	.316	.344	.277	-.009	.154	1.000			
RC	-.007	.031	.135	.177	-.079	-.153	.107	-.074	.158	-.106	.096	.951		
LI	.053	.133	.194	.210	-.089	-.198	-.243	-.157	.182	-.095	-.246	.173	1.000	
TI	.018	.003	-.015	.068	-.015	.046	.079	.128	.241	.156	.036	.271	.263	.954

Testing the research hypotheses:

The Partial Least Square (PLS) statistical procedure maximizes the explanatory power of a conceptual model by examining the R^2 values (i.e., explained variance) for the dependent (endogenous) variables. The consequential (fitted) model includes the exogenous and endogenous variables, path coefficients, t-values, and explained variances. These results are used to test three groups of hypotheses that are related to the proposed determinants of (1) attitudes (AT) towards SP, (2) behavioral intention (BI) to pirate software, and (3) software piracy behavior (SPB). Tables 5, 6, and 7 summarize the hypotheses testing results.

1. Attitude (AT) towards SP. PER, SOR, PRR, PSR, and SN are hy-

pothesized to influence AT towards SP. Table 5 summarizes the results of testing this set of hypotheses.

The results of testing the set of hypotheses on the effects of PER, SOR, PRR, PSR, and SN on AT towards SP (Table 5) suggest that only the effect of SN on AT (*H1-5*) is significant with a positive beta coefficient of .242 ($T=2.1360$). Therefore, the results support the acceptance of *H1-5* and the rejection of *H1-1*, *H1-2*, *H1-3*, and *H1-4*. In addition, the independent variables of PER, SOR, PRR, PSR, and SN collectively explain a relatively high percentage of the variance ($R^2 = .618$) in AT towards SP (Figure 2).

2. Behavioral intention (BI) to pirate software. PER, SOR, PRR,

Table 5
Results of Testing AT Towards SP Attitude Hypotheses

Dependent Variable	Independent Variables	Hypotheses	Standardized path coefficient	Test Results
AT	PER	H1-1	.16 T = 1.4684	Not Supported
	SOR	H1-2	.042 T = .3886	Not Supported
	PRR	H1-3	.310 T = 1.932	Not Supported
	PSR	H1-4	.157 T = .7885	Not Supported
	SN	H1-5	.242 T = 2.1360	Supported

Table 6
Results of Testing SP Intention Hypotheses

Dependent Variable	Independent Variables	Hypotheses	Standardized Path Coefficient	Test Results
BI	PER	H2-1	.021 T = .3491	Not Supported
	SOR	H2-2	.0676 T = 1.2055	Not Supported
	PRR	H2-3	.027 T = .4572	Not Supported
	PSR	H2-4	.034 T = .4400	Not Supported
	SN	H2-5	-.025 T = 1.0385	Not Supported
	AT	H2-6	.298 T = 2.5253	Supported
	PBC	H2-7	.27 T = 4.0791	Supported
	MO	H2-8	.116 T = 1.3169	Not Supported
	HA	H2-9	-.088 T = 1.0570	Not Supported
	RC	H2-10	.211 T = 2.1211	Not Supported
	LI	H2-11	.100 T = 1.4308	Not Supported
	TI	H2-12	.037 T = .5610	Not Supported

Table 7
Results of Testing SPB Hypothesis

Dependent variable	Independent variables	Hypotheses	Standardized path coefficient	Test Results
SPB	BI	<i>H3-1</i>	.340 T = 5.1032	Supported

PSR, SN, AT, PBC, MO, HA, RC, LI, and TI are hypothesized to affect the BI to pirate software. Table 6 summarizes the results of testing this set of hypotheses.

The results of testing the set of hypotheses on the effects on BI indicate that AT, PBC, and RC are the only significant determinants of BI. *H2-6* examines the effect of AT on BI, and the results show a positive significant beta coefficient of .298 ($T = 2.5253$). *H2-7* examines the effect of PBC on BI, and the results show a positive significant beta coefficient of .27 ($T = 4.0791$). Also, *H2-10* examines the effect of RC on BI, and the results show a positive significant beta coefficient of .211 ($T = 2.1211$). Nonetheless, the detected positive effect of RC on BI is contrary to the hypothesized negative relationship between the two variables. Therefore, these results support the acceptance of *H2-6* and *H2-7* and the rejection of *H2-1*, *H2-2*, *H2-3*, *H2-4*, *H2-5*, *H2-8*, *H2-9*, *H2-10*, *H2-11*, and *H2-12*. In addition, the independent variables of PER, SOR, PRR, PSR, SN, AT, PBC, MO, HA, RC, LI, and TI collec-

tively explain a high percentage of the variance ($R^2 = .855$) in the BI to pirate software.

- Software piracy behavior (SPB). BI is hypothesized to affect SPB (*H3-1*). The results in Table 7 show a positive significant beta coefficient of .340 ($T = 5.1032$). This result supports the acceptance of *H3-1*. BI, however, explains a relatively low percentage of the variance ($R^2 = .115$) in SPB.

Discussion

This research was designed to empirically test a model (Figure 1) including a number of proposed determinants of SP attitude, intention and behavior in a Lebanese context. Three sets of hypotheses were tested. Figure 2 depicts the consequential model that summarizes the research findings. The model explains approximately 61% of the variance in AT towards SP, 86% of the variance in the intention (BI) to pirate software, and 12% of the variance in SP behavior. Although the explained variance in SP

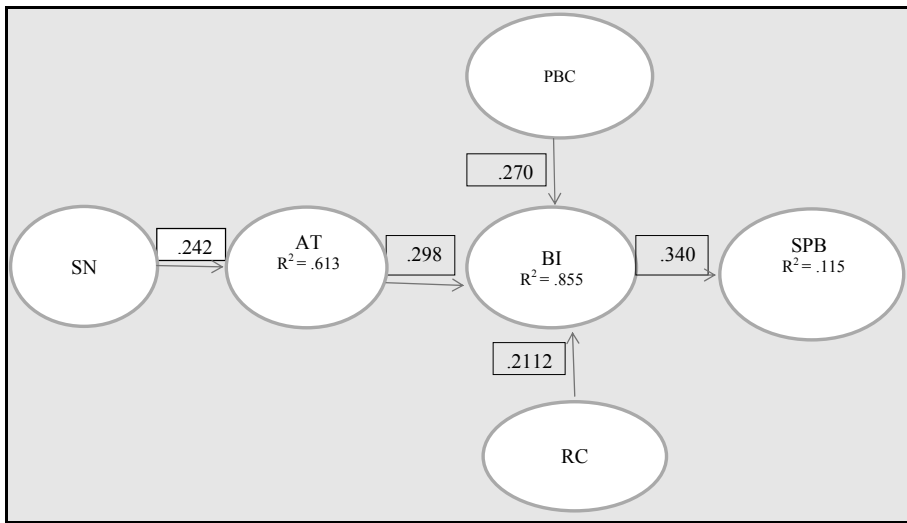


Figure 2: The Consequential Model

behavior is relatively low, the results generally substantiate the explanatory power of the model.

Among the five independent variables that were hypothesized to affect AT toward SP, only SN was found to be significant. The higher the pressure that an individual is subjected to by significant others (e.g., friends, classmates, relatives) to pirate software, the more favorable the attitude that (s)he will hold about SP. SP, however, does not appear to be a common practice or acceptable behavior among Lebanese students, and the pressure of friends, peers, and family members to use pirated software is rather low (Table 2).

Nevertheless, a rise of that social pressure in favor of pirating software would drive young Lebanese to form

favorable attitudes toward SP. Lebanese college students are mostly collectivists (Ayyash-Abdo, 2001), and it is rather difficult to suppress a favorable attitude toward SP in a society where social groups and networks are effective in formulating such an attitude. This finding is consistent with those of a number of earlier studies (Alam *et al.* 2011; e.g., Al-Rafee and Cronan, 2006), as SN was found to influence piracy attitude.

SN, however, was found to have no effect on BI. In Lebanon, and due to a culture that generally supports conformity and conventionality (Boustani, 2006), the rules established by a group may affect a person's attitude towards SP. But these rules are not strong enough to affect his or her intention to pirate software. This

finding contradicts a number of earlier studies that found subjective norms to be a significant determinant of BI (Liao *et al.*, 2010; Al-Rafee and Cronan, 2006; e.g., d'Astous *et al.*, 2005; Tang and Farn, 2005; Peace *et al.*, 2003; Kwong and Lee, 2002; Chang, 1998). However, it is consistent with the findings that subjective norms are not related to piracy intentions (Cronan and Al-Rafee, 2008).

AT, BPC, and RC were found to be significant determinants of BI to pirate software. The more favorable the AT that an individual holds towards SP, the greater the BI to pirate software. Young Lebanese, however, appear to hold unfavorable attitudes towards SP (Table 2). Therefore, the less the favorable AT that young Lebanese hold towards SP, the lower their BI to pirate software. This finding is in agreement with those of a number of previous studies (Liao *et al.*, 2010; Phau and Teah, 2009; e.g., Cronan and Al-Rafee, 2008; Belle *et al.*, 2007; Chiou *et al.*, 2005; Higgins and Makin, 2004; Peace *et al.*, 2003).

Young Lebanese also reported that they experience low difficulty (PBC) when pirating software. Therefore, the higher the confidence that an individual has in his or her software pirating ability (i.e., perceived ease of pirating), the greater the intention to pirate software. This finding is consis-

tent with those of a number of previous studies that used different types of informants and settings (Cronan and Al-Rafee, 2008; e.g., d'Astous *et al.*, 2005; Peace *et al.*, 2003; Al-Jabri *et al.*, 1997).

In addition, young Lebanese reported high religious commitment (RC) (Table 2). Surprisingly, however, religious commitment (RC) was found to positively influence BI. Therefore, the higher the religious commitment of an individual, the greater the intention to pirate software. This finding is inconsistent with those of a number of previous studies (Villazon, 2004b; Wagner and Sanders, 2001; Knotts *et al.*, 2000; e.g., Kennedy and Lawton, 1998; Simpson *et al.*, 1994).

Perhaps young Lebanese are not intrinsically motivated to appropriately understand their religions and live accordingly. Instead, and as Villazon (2004a) advocates, they use their religion more for appearance and social convention. They could have reported deceitful responses, as gaps exist between beliefs and practices. In other words, it appears that they generally claim to be religious, but their religious commitments have no manifestation in their SP intention and behavior.

This finding can be further explained in light of Butt and Butt's

(2007) inference that there is no one way of understanding piracy behavior across different cultures. Culture does matter and the applicability of Western constructs (e.g., attitude and intention) must be carefully examined before using them to predict behaviors, such as SP, in other dissimilar cultures (Butt and Butt, 2007).

Nevertheless, SP related performance, social, prosecution, and psychological risks were found to have no effect on the attitudes towards SP and the intention to pirate software. Young Lebanese appear to believe that using pirated software causes them only marginal technical problems, has no effect on the way the others think of them, carries no or low risk of punishment, and does not lead to any felt psychological pressure. These reported low to modest perceived SP related risks influence neither the attitudes toward SP nor the intentions to pirate software. Therefore, holding unfavorable attitude toward SP and refraining from pirating software in Lebanon may be attributed to other reasons rather than fearing the consequences of pirating. This finding is consistent with those of Liao *et al.* (2010), and Wang *et al.* (2005); and is inconsistent with the findings of Veitch and Constantiou (2011), Hsu and Shiue (2008), Chiou *et al.* (2005), Tan, 2002, and Robertson *et al.* (2012). These inconsistencies

may be attributed to differences in the studies in comparison in terms of their settings (e.g., culture, place, time), samples employed (e.g., students, non-students), and/or the operationalization of the dependent variable (SP) (e.g., downloading software, purchasing original software copies, willingness to pay for software products, using pirated software).

Similarly, legal identity, moral obligation, technical identity, and habit were found to have no effect on SP intention. It appears that young Lebanese are law abiding and morally obligated individuals, have the requisite technical skills to pirate, and could have habited pirating software in the past. However, these beliefs have no effect on their intention to pirate software in the future. The intentions of young Lebanese to pirate software may be more influenced by social and situational factors rather than by ethical considerations. These findings are inconsistent with those of a number of previous studies (Ramayah *et al.*, 2009; Goles *et al.*, 2008; Jaafar and Ramayah, 2008; Cronan and Al-Rafee, 2008; Gupta *et al.*, 2004; Limayem *et al.*, 2004; Tan, 2002; Babin and Babin, 1996; Sims *et al.*, 1996; Simpson *et al.*, 1994; e.g., Swinyard *et al.*, 1990), which investigated similar determinants of different types of piracy (e.g., software, music) in diverse settings. Hence, differences in research

contexts, sampling procedures, and variable definitions and measurement may account for much of the found differences in research outcomes.

Lastly, BI was found to be a predictor of the young Lebanese's SP behaviors. Nevertheless, the explained variance is rather low (11.5%). One plausible reason for this finding is that, as Schwartzberg *et al.* (1999) suggest, the respondents were a bit reluctant to tell the truth about their actual SP behaviors. Perhaps the respondents under-reported the use of pirated software because of their need to be viewed favorably by others (i.e., social desirability bias). In addition, the relationship between intention and behavior is rather complex (Limayem *et al.*, 2004), and there may be other factors (e.g., national culture, demographics, life style, socio-economic factors, legal environment, corruption index, cost of living, etc.) that do moderate the relationship between intention and SP behavior in Lebanon.

This finding is consistent with those of a number of earlier studies which hypothesized and confirmed behavioral intention as an important predictor of behavior (e.g., Al-Jabri and Abdul- Gader, 1997; Ajzen, 1991). It also supports the notion that in order to understand behaviors such as SP, it is necessary to recognize how behavioral intentions develop (Fish-

bein and Ajzen (1975). These findings, summarized in Figure 2, are used as a foundation for proposing a number of implications.

Implications

The present study is considered one of the first empirical SP studies in Lebanon. The findings should be of interest to both researchers and practitioners. For researchers, while SP is prevalent, its causes appear to vary from one situation to another. The findings provide support for the applicability of the theory of planned behavior (TPB) to the understanding of SP and its determinants in Lebanon. They confirm attitude as a main determinant of the behavioral intention to pirate software, which, in turn, influences the young Lebanese's SP behaviors. These empirical evidences, therefore, should contribute to the ongoing efforts aiming at developing a global perspective on understanding why individuals pirate software.

The findings also provide a foundation for a number of implications for the Lebanese educators and government officials as well as for software vendors. Today's students are tomorrow's professionals and leaders. For educators, although the very concepts of 'business' and 'ethics' do not easily sit together (Davison *et al.*, 2009), business students should devel-

op appropriate ethical values and attitudes towards information ethics (e.g., software copyright) and behave like responsible professionals (Chow, 2001).

Ethics education aims to make students aware of the importance of social responsibility in their professional conduct (Lehman 1988). The Lebanese educational institutions should effectively adopt the Western ethics' know-how and clarify and acknowledge the differences in perception, applicability, and sensitivity to religious beliefs, and to the way business is conducted in Lebanon (Hejase and Tabch, 2010). In particular, the educational programs should focus on shaping students' moral beliefs and increasing their awareness of the unethicity and illegality of SP.

Religious commitment was surprisingly found to positively influence the intention to pirate software. Lebanese students do not seem to practice what they preach when it comes to SP. They see themselves as religiously committed, but religion appears to be disconnected from their 'lived' ethics when it comes to resolving ethical dilemmas such as SP. The individuals' moral systems, however, should not simply be applied to concrete situations but rather applicable to all situations (Peterson (2001, p. 4). It is therefore critical to engage stu-

dents through their educational programs in ethical decision-making scenarios that help them develop sensitivity toward SP behaviors.

Middle Eastern individuals (e.g., Lebanese) differ significantly from individuals living in other regions, such as the US, in terms of their social, political, and religious values (Ford *et al.*, 2005). In addition, Lebanon, like many other countries, is considered a mosaic religious community (Hejase and Tabch, 2010), and religions are expected to impact social issues, history, politics, science, and anthropology (Kim, Fisher, and McCalman., 2009). Therefore, teaching ethics from different religious perspectives in the Lebanese educational and religious institutions should help students learn not only how ethical theories are related to religion, culture, and values but also how to put them into practice in ethical decision situations. Education should expand the range of learning of ethical principles beyond the traditional Western canon of ethical theories to include a wide spectrum of non-Western theories (Fleischmann, Robbins, and Wallace, 2011). Such learning should increase awareness of the unethicity of SP and help students prepare for the ethical challenges of a globalized world.

Moreover, although they appear to be generally law-abiding indivi-

duals, young Lebanese believe that the risk of getting caught and prosecuted when pirating software is low. Low prosecution risk, however, may encourage the formation of a favorable attitude towards SP, which, in turn, raises the intention to pirate. Therefore, the use of severe threats (Levin *et al.*, 2007) can be an effective way to reduce SP. Laws with specific articles to protect intellectual property right are necessary but are considered insufficient in curbing SP. The Lebanese government should effectively enforce the relevant copyright laws to capture and prosecute software pirates in order to properly affect the individuals' SP attitudes and curtail the trading and use of the illegally copied software products in the Lebanese market. In addition, the educational programs should be adapted and/or revised to help create a culture that promotes compliance with the intellectual property laws and raises awareness of what is right and wrong.

Lastly, high software prices is an important factor in determining an individual's willingness to pirate software (Lau, 2003), especially in a developing country such as Lebanon. Therefore, the Lebanese educational institutions should consider allocating more resources to provide students with the software packages that they need for their studies. In addition, given that GNP and income inequality

affect SP (Khalil and Seleim, 2012; Hsu and Shiue, 2008), software vendors should consider using discriminant pricing strategies for their software products in order to take into consideration the relatively low average incomes of young Lebanese and ease the economic pressure to pirate software.

Conclusions and future research

The pervasiveness of the Internet and the progression of information technology (IT) has escalated the phenomenon of SP worldwide, and Lebanon is no exception. A causal model of software piracy attitudes, intentions, and behaviors in Lebanon was tested using a data set collected from college students.

The results summarized in the consequential research model suggest that subjective norms is the only antecedent of attitude towards SP; attitude towards SP, perceived behavioral control, and religious commitment are three antecedents of the intention to pirate software; and intention to pirate software is an antecedent of SP behavior. The model exhibits a relatively high explanatory power for attitude towards SP and intention to pirate software, but has a relatively low explanatory power for SP behavior. These findings provided partial support for the applicability of TPB in

explaining the SP phenomenon in Lebanon, and served as a foundation for proposing a number of implications to curb SP among young Lebanese.

Nevertheless, the findings of this research should be cautiously interpreted since students in the sample were generally millennials (generation Y), who make poor surrogates for older Lebanese professionals (e.g., generation X individuals). Students also lack work experience and relative immaturity (Davison *et al.*, 2009). Differences in the perception of business ethics between business students and practitioners do exist, and therefore, findings drawn based on students may not be generalizable to actual business professionals and managers. In addition, the consequential re-

search model explains a relatively low percentage of the variance in SP behavior.

Similar future research designs should employ samples from working professionals and managers in different Lebanese private and public sectors in order to verify, validate, and generalize the findings of the present study. They should also explore other possible moderating factors--e.g., national culture, demographic variables, lifestyle, prices of pirated and legitimate software, country-specific legal environment, enforcement of intellectual property rights, and country-specific corruption index--in an attempt to explain higher percentages of the variance in SP intention and behavior in Lebanon.

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Appendix A

Research Constructs and Measurements

Construct	Measurement
Performance Risk (PER)	Three items (very low/very high) were adapted from Liao <i>et al.</i> 2010): the probability that pirated software will (1) fail to work like the original one (X1); (2) malfunction or damage your computer system (X2); and (3) fail to function (X3).
Social Risk (SOR)	Two items (very low/very high) were adapted from Liao <i>et al.</i> (2010): if your friends, relatives or associates are aware that you have used pirated software, (1) what is the probability that they will look down on you because they think that you cannot afford original software (X4); (2) what is the probability that you will lose their respect because they will regard you as unethical (X5)?
Prosecution Risk (PRR)	Two items (very low/very high) were adapted from Liao <i>et al.</i> (2010): if you have used pirated software, what is the probability that you will be (1) caught (X6) and (2) arrested for the infringement of copyright laws (X7)?
Psychological Risk (PSR)	Three items (Strongly disagree/strongly agree) were adapted from Liao <i>et al.</i> (2010): using pirated software (1) makes me feel psychologically uncomfortable (X8), (2) gives me a feeling of unwanted anxiety (X9), and (3) causes me to experience unnecessary tension (X10).
Subjective Norms (SN)	Three items (Strongly disagree/strongly agree) were used. Two items were adapted from Teo (2009): (1) people who influence my behavior would think that I should use pirated software (X11), and (2) people who are important to me would think that I should use pirated software (X12); and one item was adapted from Bearden, Netemeyer, and Teel, (1989): my family would think that I should use pirated software (X13).
Attitude (AT)	Five items were used. Four items from Liao <i>et al.</i> (2010): using pirated software is a very bad/very good idea (X14); using pirated software is a very foolish/very wise idea (X15); I really dislike/ really like the idea of using pirated software (X16); and using pirated software would be very unpleasant/ very pleasant (X17). And one item from Cronan and Al-Reftee (2008): my attitude toward software piracy is favorable /unfavorable (X18).
Perceived Behavioral Control (PBC)	Five items (Strongly disagree/strongly agree) were adapted from Cronan and Al-Reftee (2008): (1) for me to pirate software, it would be very easy/ very difficult (X19); (2) if I wanted to, I could easily pirate software (X20); (3) I believe that I have the ability to pirate software(X21); (4) I have the resources necessary to pirate software (X22); and (5) I can find software material to pirate if I wanted to (X23).
Moral Obligation (MO)	Three items (Strongly disagree/strongly agree) were adapted from Cronan and Al-Reftee (2008): (1) I would feel guilty if I pirated software (X24); (2) piracy goes against my principles (X25); and (3) it would be morally wrong to pirate software (X26).

Cont'. Appendix A

Construct	Measurement
Habit (HA)	Four items (Strongly disagree/strongly agree). Two were adapted from Limayem <i>et al.</i> (2004): (1) I have copied software in the past (X27); and (2) I only use software that I purchase or is authorized for my use (X28). Two items from d'Astous <i>et al.</i> (2005): (3) software piracy is a part of my habit (X29); and (4) I pirate software frequently (X30).
Religious Commitment (RC)	Five items (Strongly disagree/strongly agree) were adapted from Villazon (2004a): (1) I enjoy reading about my religion (X31), (2) it is important to me to spend time in private thought and prayer (X32), (3) I have often had a strong sense of God's presence (X33), (4) I try hard to live all my life according to my religion (X34), and (5) my whole approach to life is based on my religion (X35).
Legal Identity (LI)	One item (Strongly disagree/strongly agree) was adapted from Goles <i>et al.</i> (2008): I see myself as someone who is law-abiding (X36).
Technical Identity (TI)	Three items (Strongly disagree/strongly agree) were adapted from Goles <i>et al.</i> (2008): (1) I see myself as someone who needs to have the latest version of software (X37); (2) I see myself as someone who needs to be on the leading edge of technology (X38); and (3) with respect to computer software, for me having more is always better (X39).
Behavioral Intention (BI)	Four items (Strongly disagree/strongly agree) were adapted from Cronan and Al-Reftee (2008): (1) I may use pirated software in the future (X40); (2) If I have the opportunity, I will use pirated software (X41); (3) I will use pirated software (X42); (4) I would make an effort to pirate software in the near future (X43).
Software Piracy Behavior (SPB)	One item (Yes/no) was used: do you use pirated software? (X44)

Ahmed Seleim is Assistant Professor in the Buisness Administration Department, College of Commerce, Alexandria University, Egypt. He holds B. com., MBA, and Ph.D. degrees from Alexandria University, Egypt. His research interest includes management information systems, knowledge management, and intellectual capital.

Omar Khalil is currently a Professor of Information Systems at the Quantitative Methods & Information System (QMS) Department, College of Business Administration, Kuwait University. Has a Ph.D. in Information Systems from the University of North Texas. His research interest includes information systems effectiveness, global information systems, information quality, knowledge management, and information ethics

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Nasima Rashed Al -Ghaith

ص.ب: 26585 الصفاة 13126 الكويت- هاتف: (965)24817689 - (965)24815453 فاكس: (965) 24812514

P.O. Box 26585 Safat, 13126 Kuwait - Tel.: (965) 24817689 - (965) 24815453 - Fax: (965) 24812514

Email: ajh@ku.edu.kw - [http:// www.pubcouncil.kuniv.edu.kw/ajh](http://www.pubcouncil.kuniv.edu.kw/ajh)