Who Has My Data?
Factors Contributing to HIPAA (Non)Compliant Behaviors

Jennifer L. Basile
Buffalo State College

Joana Gaia
University at Buffalo

G.L Sanders
University at Buffalo

HIPAA noncompliance has become an increasingly regular occurrence throughout the healthcare industry, leading practitioners to seek ways to minimize the phenomenon. Healthcare workers are hired into the field with limited knowledge of the implications of sharing patient information. One of the objectives of this research was to show that providing deterrent information regarding real cases of HIPAA noncompliance will increase overall levels of HIPAA compliance. We surveyed two groups: one provided with deterrent case information regarding real-life individual healthcare workers imprisoned following HIPAA noncompliance, and one not provided with such information. We also questioned individuals about whether their compliance level would change if they were offered an incentive to be noncompliant, and explored individuals' ethical level, knowledge of HIPAA regulations, and belief in the justice system. We then developed a tool for healthcare practitioners to provide incoming healthcare workers with information that explains that being HIPAA noncompliant can impact them personally, not just the financial health of their organization. This awareness may lead to higher levels of HIPAA compliance.

Keywords: HIPAA, healthcare, data privacy, ethics, compliance

Motivation for This Study

HIPAA law and noncompliance has become a very serious problem in the world of healthcare in recent years; however, academic research on the topic is in its early stages and is lagging behind healthcare practice. Research has looked carefully at the theory of internet and organizational compliance (Li et al. 2010; Bulgurcu et al. 2010); however, little to nothing has been done to examine potential healthcare workers looking to enter the organizational structure before they enter the industry. This is a huge gap; the massive number of noncompliant acts among existing healthcare workers leads to an annual liability of $7 billion and thirty-three percent of noncompliant episodes involve criminal acts by malicious healthcare workers (DeGaspari 2012). HIPAA now offers penalties for noncompliance down to the level of imprisonment of an individual healthcare worker. Practitioners require a method to increase awareness

among incoming healthcare workers beyond traditional HIPAA training. To best serve these practitioners, academic research must respond with more advanced methodologies to provide HIPAA awareness among healthcare workers from the first day they enter the field.

Of the thirty-three percent of noncompliant acts committed by malicious healthcare workers, how many are committed by individuals who know the severity of the crime and that the punishment could cost their freedom? Organizations cannot assume that HIPAA compliance can be achieved by the mere process of providing basic HIPAA training information and expecting employees to sign documents indicating that they fully understand its requirements (Mercuri, 2004).

This study added the deterrent "fear factor" of providing information about cases of criminal HIPAA violations to the basic mandated HIPAA training provided in the healthcare industry. Fear is a natural emotion that results from the logical assessment of a risky situation. The uneasy feeling one has just before doing something wrong is the brain's way of warning us to reconsider what we are about to do.

We organized participants in our study into two survey groups: one was provided with deterrent information and one was not. Both groups were completed the ethical index scale developed by Wood (1988) and responded to questions related to their belief in the justice system (Gopal & Sanders 1998). We believe the use of these scales will help serve as a measurement tool to identify the propensity of individuals looking to become healthcare workers to be HIPAA compliant, and also provide the initial benefit of providing the newly hired with deterrent information regarding the consequences of HIPAA violations from the first day of employment. Research shows that basic HIPAA training without deterrent information cannot be expected to expose healthcare workers to understanding the severity of punishment for HIPAA noncompliant to themselves as the individual healthcare worker (Mercuri 2004).

Research Questions

This study examined the effectiveness of deterrent information in facilitating compliance in the context of the ethical propensities of the subjects. It also questioned the context of incentives and how they may reduce compliance.

Expected Contributions

The purpose of the research is to examine a method to provide healthcare workers entering the field with awareness of what the consequences HIPAA noncompliance can be for them as individuals, not just for their organizations. The "fear factor" of deterrent information indicating they can lose their freedom to imprisonment is proposed to have a bigger impact on individuals than if the impact was presented at only the organizational level. There is limited research linking theoretical structures to HIPAA compliance, and none that has modeled the correlation of HIPAA compliance with the proposed theoretical constructs in this study.

This study will assist practitioners in lowering HIPAA noncompliance by providing a method to increase awareness of the consequences of HIPAA noncompliance among all incoming healthcare workers. As mentioned earlier, research shows that basic HIPAA training without deterrent information cannot be expected to expose healthcare workers to understanding the severity of noncompliant punishment (Mercuri 2004).

Rationale for Model Structure

As stated in the introduction, HIPAA regulation includes the potential of individual punishment for any noncompliant healthcare worker in the US. Empirical studies have provided many models and theories of compliance at the organization level via employee surveys focused on measuring their level of commitment to the organization or fear of organizational punishment—with little to no attention paid to the individual's propensity to be compliant at the personal level. HIPAA is now fining and imprisoning individuals as well as organizations; thus, it is of theoretical interest to expand the theories used to study compliance at the individual level. By extending this research, practitioners will have the ability to utilize the model for future hiring of individuals who are likely to be HIPAA compliant.

OPERATIONALIZATION OF THE MODEL STRUCTURE

The following section discusses the constructs employed in the HIPAA compliance theoretical model. Most of the constructs have been previously identified in the literature. Construct definitions and measures have been modified as necessary to meet the specific needs of this research.

HIPAA

HIPAA Regulations are defined as basic privacy principles and their general rules and applications. HIPAA violations can lead to fines for individual healthcare workers of up to $250,000 and jail time of up to ten years. The literature offers many cases (Appendix A) of offenders and their punishments.

HIPAA Compliance will be defined as acting in accordance with HIPAA laws. Compliance level is assessed by identifying where an individual falls on a Likert scale within existing examples of criminal cases.

Deterrent

Deterrents are defined as an attempt to hinder individuals from committing crimes through the threat of legal sanctions. This dimension will be utilized in one survey group (exposed to examples of punishments levied for HIPAA noncompliance) but not the other (control group) to measure the effectiveness of deterrent controls.

Ethics

Ethics is defined as moral behavior in humans and describe how one should act. ***Ethical Index*** the ethical index scale will be obtained from one developed by Wood et al. (1988) to determine the ethical profile of businessmen and business students. The index will be computed by summing the responses of fifteen hypothetical situations. The ethical index scale could be a factor when hiring employees who require a high level of compliance.

Justice

US Legal (2020) defines justice as a "concept of moral rightness based on ethics, rationality, law, natural law, fairness, religion and equity." Justice is observed through the impartial administration of law, the fair representation of facts and the truthful expression of opinions.

Incentive an *incentive* is defined as something that motivates an individual to perform an action.

Age, Gender and Residency

Solomon and O'Brien (1991) found that age, gender and individuals' residency were related to software piracy. They found that women and girls engaged in less piracy, young students engaged in more, and that city residents were less likely to be compliant than suburban residents.

RESEARCH HYPOTHESIS

Hypothesis for HIPAA Regulation

A number of basic privacy principles and general rules apply under HIPAA (Erp-Payton 2006). If one has knowledge and understanding of HIPAA regulation, it is more likely they will be HIPAA compliant. Without knowledge of HIPAA law, it would be very difficult for one to know if they were being HIPAA compliant or not.

H1: *Individuals with some knowledge of HIPAA regulations will tend to be HIPAA compliant.*

Hypothesis for Ethics

It is thought that the more ethical a person is, the more likely they will be to comply with rules and policies in general (Gopal, Sanders 1998). The ethical index could be a factor when hiring employees who require a high level of compliance, and could serve as a tool for employers searching for new employees.

Based upon several studies that relate to ethical overtones in software piracy (Antonoff, 1987, Carroll, P.B. 1986, Swinyard 1990) an overall measure of ethical attitudes was added as a control variable to better determine the effect of the deterrent controls. The theory is to research the outcome of the deterrence proposition; however, we believe that an individual's HIPAA compliance level will correlate with his or her ethical index score.

H2: *Individuals with highly ethical attitudes will tend to be HIPAA compliant.*

Deterrent Variable

Regression analyses assume that the dummy variables are numerical variables. A dummy variable is a numerical variable that usually represents a binary categorical variable. For a categorical variable with multiple levels n, $n - 1$ dummy variables are required to represent it. Dummy variables are useful because they enable the use of a single regression equation for variables; they act like "switches" that turn various parameters in an equation on and off (Xiong and Meullenet, 2006).

The dummy variable approach will be used to transform each of the original surveyed group's variables into a pair of variables; these paired variables will be used to model the relationship between groups provided and not provided with deterrent information. These transformed variables can then be directly used in regression.

For this study, deterrent information is being used as the dummy variable. Deterrent information, when provided to the individual survey taker, may or may not impact their selection when being asked certain questions about the issues at hand. We expect that the group provided the deterrent information will be more likely and the group not provided with deterrent information will be less likely to be HIPAA compliant.

H3: *Individuals provided with HIPAA deterrent information will tend to be HIPAA compliant.*

Hypothesis for Incentive

In addition to where the individual falls on the ethical index, with and without deterrent information provided, individuals will be asked if any incentive could change something they felt was "never acceptable" to "perfectly acceptable."

Hui et al. (2007) found that being provided with a monetary incentive had a "positive influence on health care workers' information disclosure." Incentives need not to monetary, but could perhaps be "a mix of coercive and normative systems" (Zald and Jacob, 1978). For this purpose of this study, an incentive would be whatever the individual would want (if anything) to be noncompliant.

H4: *Incentives will reduce the level of compliance.*

Hypothesis for Justice

Justice is a dimension of ethical predisposition. Following Gopal and Sanders (1998), four items were used to operationalize the justice construct, a latent variable comprising ethical predisposition towards laws and the justice system. The items were anchored by a seven-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (7).

H5: *Individuals with a strong belief in the justice system will have a higher likelihood of being HIPAA compliant.*

Hypothesis for Age, Gender and Residence

Gopal and Sanders (1997) found that age and gender were related to software piracy: that females engaged in less piracy and younger people engaged in more. Two additional hypotheses were included to provide corroborating evidence for the validity of the compliance measure.

H6: *Women will have a higher likelihood of compliance than men.*

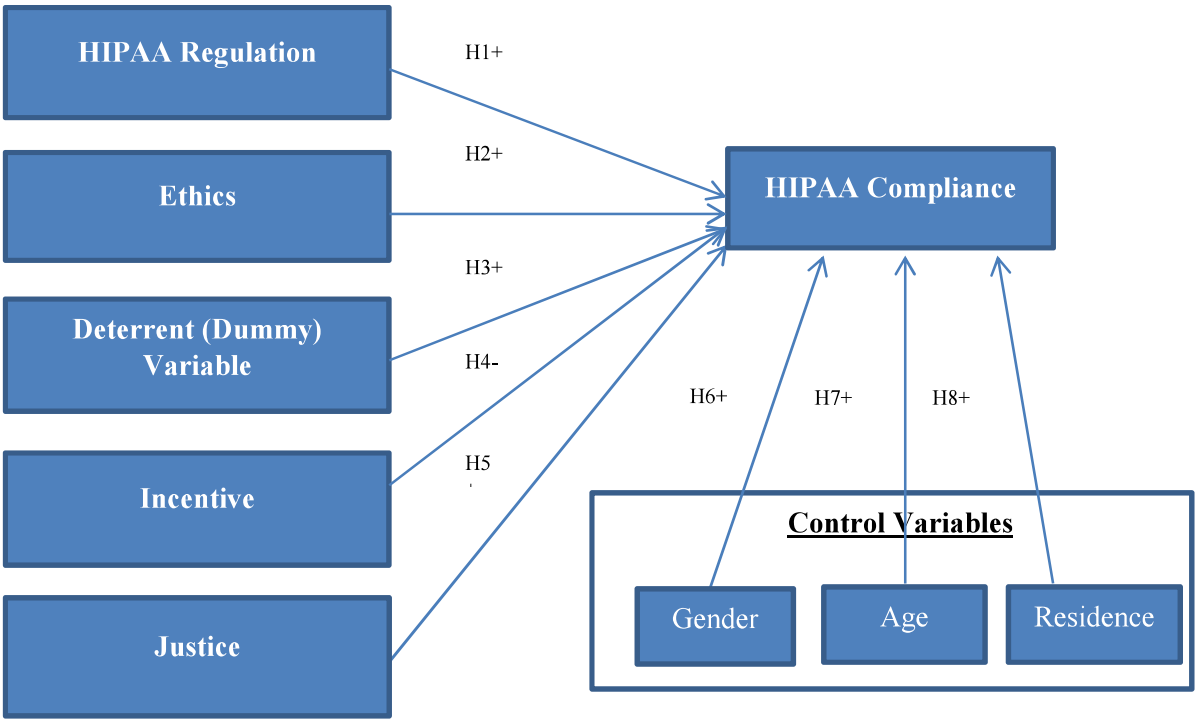
H7: *Older employees will have a higher level of compliance than younger employees.*

H8: *Urban residents will have a higher level of compliance than rural residents.*

The formal model to be tested is:

HIPAA Compliance = *f (HIPAA regulation, ethics, justice, incentive, deterrent information, age, gender, residency*)

FIGURE 1
STRUCTURAL MODEL



RESEARCH METHODOLOGY

Research Design

This study analyzed data acquired using a survey questionnaire composed of measures taken directly from or adapted from past studies on ethics, HIPAA compliance and regulation, as well as deterrent studies. The protocol and instruments of the research involve the use of human participants and therefore required review by an institutional review board. The protocol and instruments of this research were reviewed by the Human Subject Review Board at the University at Buffalo and approved with exemption

from full review. This research was exempted from the use of an informed consent form because the instruments of this research are used in the strictly anonymous context of an opinion survey.

Instrument Development

The survey instrument utilized in our research is designed to measure the effect of deterrent information on constructs relevant to HIPAA compliance. This kind of survey method has been utilized by researchers such as Ehrlich (1977), Barnett (1981) and Long (2008) to help practitioners assess the effectiveness of deterrent information and its impact on constructs.

This study has followed steps presented by Moore and Benbasat (1991) for developing and determining the validity of a survey instrument. In accordance with Moore and Benbasat, survey development occurs in three stages: item creation, scale development and instrument testing. For item creation, existing measurements' items are researched and evaluated for use in the proposed study, and new items created where needed. Content validity must be ensured during this stage. The scale development stage requires assessment of the construct validity of scales. Testing the instrument occurs in three steps: a pre-test, a pilot, and a field test of the instrument. Pre-testing "cleans" the survey by utilizing feedback from individuals posing as potential subjects for the study. The pre-test utilizes a small sample to gather respondent feedback regarding the perceived clearness and appropriateness of the measurement items.

Pilot tests are created based upon the results from the pre-test, and given in circumstances similar to those to be utilized for final data collection. Following the pilot test, the items are reevaluated and revised based on the participants' input. The following sections in this chapter will explain the stages of instrument development for this study.

DATA ANALYSIS AND RESULTS

Data Collection

Survey distribution and data collection was conducted in person at two local colleges: Trocaire College and University at Buffalo. We hand-delivered and collected eighty-eight surveys from eighty-eight students attending college specifically to earn degrees related to healthcare. The surveys were completed by participants during class-time by permission of the instructor. In this study, the response rate was 100%. All eighty-eight survey questionnaires were usable, which led a 100% usable response rate.

Sample Characteristics

The profile of sample respondents, including demographic and socioeconomic information, is provided in Table 1. Half were male and half female, with ages ranging from 18 to 66+ years of age. The majority of students were in the 26–40-year age range, most likely because the majority of the students surveyed were returning to college as adults (we surveyed two undergraduate night classes at Trocaire College, and graduate students at University at Buffalo). The ethnic breakdown of the sample is 63% white, 23% black, 9% Asian, 1% Hispanic, and 7% self-identified as "Other."

The educational level ranged from "High School" to "Graduate Degree." Although 27% of subjects answered "High School" and 44% answered "Some College," the two categories could be summed, because all subjects were surveyed in a college classroom environment. This means all 71% have "Some College." Twenty-eight percent of respondents reported holding undergraduate degrees; these individuals were enrolled in a medical school as a doctor or physician's assistant at the University at Buffalo. The remaining students were in an undergraduate healthcare-related program at Trocaire College. The residency of the participants was 25% rural and 75% urban. The higher percentage of urban dwellers is logical, as both schools are located in the city.

TABLE 1
PROFILE OF SAMPLE RESPONDENTS

Profile of Respondents		Number of Respondents	Percentage of Respondents
Gender	Male	44	50%
	Female	44	50%
Age	18–25	37	42%
	26–40	49	56%
	41–65	2	2%
	65+	0	0%
Education Level	High School	24	27%
	Some College	39	44%
	Undergraduate Degree (Graduate Students)	25	28%
	Graduate Degree	0	0%
Ethnicity	White	53	60%
	Black	20	23%
	Hispanic	1	1%
	Asian	8	9%
	Other	6	7%
Residence	Rural	22	25%
	Urban	66	75%

All respondents were college students enrolled in higher education for the primary purpose of working in the field of healthcare. Each class was asked to take the survey only if they were planning on entering the healthcare field following graduation.

The majority of the students were enrolled in an undergraduate program in nursing, radiology or a medical assistant program. The remaining students were in a graduate program and planning to work in the healthcare field after graduation. None of these students had previous "real life" HIPAA exposure, making them ideal subjects for this study. This lack of previous exposure eliminated bias stemming from the respondents dealing with HIPAA regulations in an actual healthcare environment with "live" patients.

Statistical Analysis Methods

The statistical methods applied consisted of a reliability test and assessment of the measurement and structural model. In terms of reliability and validity tests, post factor analysis was performed to evaluate constructs that were modified. Assessment of the research model was done utilizing a partial least squares (PLS) method. Cronbach's alpha and factor analysis were also used to verify the internal reliability and validity of the constructs.

Assessment of Measurement Model

Testing the appropriateness of the instrument in measuring the constructs is necessary to make conclusions based on the proposed research model. In this section, we describe testing the reliability and validity of the measurement model. The reliability was validated utilizing the internal consistency measures of Cronbach's alpha and composite reliability from SmartPLS loadings. The composite reliability (CR) assesses the internal consistency for a given block of indicators. Construct validity was

tested via PLS loadings, and average variance extracted (AVE). Discriminant validity was examined utilizing the correlation between constructs and the square root of AVE.

Reliability Tests

As mentioned above, the measurement models' reliability was examined using Cronbach's alpha and composite reliability as measures of internal consistency (Table 2).

TABLE 2
INTERNAL CONSISTENCY MEASURES

Constructs	Number of Items	Cronbach's Alpha	Composite Reliability
HIPAA Regulation (HR)	4	0.965245	0.974683
HIPAA Compliance (HC)	8	0.932078	0.949458
Ethics (ETH)	10	0.892178	0.903697
Justice (JS)	4	0.790194	0.819252
Incentive (INC)	8	0.981431	0.986251

Values of Cronbach's alpha greater than 0.70 indicate that a construct is likely to have internal consistency (Bohrnstedt and Knoke 1982, Carmines and Zeller 1979); the in this study constructs all exceeded the lower limit of 0.7. The results of composite reliability for all constructs are over 0.8, which suggests that the measurement model offers construct reliability (Bohrnstedt and Knoke 1982, Carmines and Zeller 1979).

TABLE 3
CRONBACH'S ALPHA AND ALPHA IF ITEM DELETED

Constructs and Measurement Items		Alpha	Alpha if item deleted
HR	**HIPAA Regulation**	**0.9652**	
HRPI	HIPAA allows patients to control their personal health information (PHI).		0.9435
HRPP	All patients are provided with a written notice of privacy practices.		0.9275
HRVI	HIPAA compliance is mandated and violations can carry fines and jail time.		0.9553
HRPR	HIPAA covers both electronic and paper patient records.		0.9615
HC	**HIPAA Compliance**	**0.9320**	
HCFI	A friend asks you to get them some information on a patient you have been caring for.		0.9289
HCCI	**A relative asks you to get data on a famous local celebrity from the health insurance company you work for.**		**0.9380**
HCSS	**Your spouse asked for a coworker's social security number as they knew you had access to it through patient files.**		**0.9399**
HCHS	You are very curious about a friend's health situation and know you have access to their medical records.		0.9312
HCDD	You have access to view the list of people in your town that have a deadly disease and know you can use it maliciously.		0.9298
HCCC	You are a physician and your spouse asks you to give them details on a patient you treated that day who belongs to your local country club.		0.9287

Constructs and Measurement Items		Alpha	Alpha if item deleted
HCLB	**A friend asks you to access patient information to help them in an upcoming legal battle.**		**0.9353**
HCFP	A local newspaper contacts you to ask for details regarding a famous patient you treated earlier that week.		0.9235
ETH	**Ethics**	**0.8921**	
ETHE	An executive earning $50,000 a year padded his expense account by about $1500 a year.		0.8345
ETHP	In order to increase profits, a general manager used a production process that exceeded legal limits for environmental pollution.		0.8299
ETHB	Because of pressure from his brokerage firm, a stockbroker recommended a type of bond that he did not consider a good investment.		0.8651
ETHT	A small business received one-fourth of its gross revenue in the form of cash. The owner reported only one-half of the cash receipts for income tax purposes.		0.8898
ETHC	A company paid a $350,000 "consulting" fee to an official of a foreign country. In return, the official promised assistance in obtaining a contract that should produce a $10 million profit for the contracting company.		0.8745
ETHE	A company president found that a competitor had made an important scientific discovery that would sharply reduce the profits of his own company. He then hired a key employee of the competitor in an attempt to learn the details of discovery.		0.8915
ETHH	A highway building contractor deplored the chaotic bidding situation and cutthroat competition. He therefore reached an understanding with other major contractors to permit bidding that would provide a reasonable profit.		0.8823
ETHL	**A company president recognized that sending expensive Christmas gifts to purchasing agents might compromise positions. However, he continued the policy since it was common practice and changing it might result in loss of business.**		**0.8999**
ETHA	A corporate director learned that his company intended to announce a stock split and increase its dividend. On the basis of this information, he bought additional shares and sold them at a gain following the announcement.		0.8576
ETHT	**A corporate executive promoted a loyal friend and competent manager to the position of divisional vice president in preference to a better qualified manager with whom he had no close ties.**		**0.9011**
JS	**Justice**	**0.790194**	
JSET	All individuals deserve equal treatment before the law.		0.7757
JSDN	Man's capacity for justice makes democracy possible; but man's inclination to justice makes democracy necessary. *Reinhold Niebuhr, The Children of Light and Darkness, forward, 1944.*		0.7251
JSMC	To no man will we sell, or deny or delay right to justice. *Magna Carta.*		0.7652

Constructs and Measurement Items		Alpha	Alpha if item deleted
JSDR	All human beings are born free and equal in dignity and rights. *Universal Declaration of Human Rights, 1948, Article 1.*		0.7355
INC	**Incentive**	**0.981431**	
INCF	**A friend asks you to get them some information on a patient you have been caring for. Is there any incentive you would accept that would make this perfectly acceptable (if it is not already acceptable) to you?**		**0.9910**
INCC	**A relative asks you to get them data on a famous local celebrity from the health insurance company you work for. Is there any incentive you would accept that would make this perfectly acceptable (if it is not already acceptable) to you?**		**0.9851**
INCL	**A friend asks you to access patient information to help them in an upcoming legal battle. Is there any incentive you would accept that would make this perfectly acceptable (if it is not already acceptable) to you?**		**0.9875**
INCN	**A local newspaper contacts you to ask for details of a famous patient you treated earlier that week. Is there any incentive you would accept that would make this perfectly acceptable (if it is not already acceptable) to you?**		**0.9899**
INCA	An acquaintance asked for a coworker's social security number as they knew you had access to it through patient files. They offered you enough money to pay for your mother's special care in a nursing home.		0.9735
INCR	A reporter offers you a large sum of money to cover your child's surgery in return for data on a group of patients you have access to.		0.9671
INCT	You have the access to view all the people in your town that have a deadly disease and know you can use it maliciously. One of your community members offers you enough money to cover your children's private school tuition for the information.		0.9712
INCH	You are a single parent and a local politician asks you to give them details on a patient at the office of the doctor you work for that they are running against. They offer you enough money to leave your apartment and buy your first house for your family to live in.		0.9799

Construct Validity Test

Construct validity can be defined as the degree that an indicator measures what it is expected to measure. Construct validity can be studied by discriminant validity and convergent validity. Discriminant validity can be defined as the relationship between constructs, and convergent validity is the relationship between a particular construct and its measurement item (Chin, Gopal and Salibury 1997). Discriminant validity is based upon the square root of the AVE and the correlation between the constructs. Convergent validity tests are based on PLS loadings as well as AVE. AVE measures the amount of variance that a construct gathers based on its indicators for the variance in the measurement error. This was found as a measure of reliability for the construct by Fornell and Larcker (1981) as well as a way to examine discriminant validity.

TABLE 4
AVERAGE VARIANCE EXTRACTED FOR EACH CONSTRUCT

Constructs	AVE
HIPAA Regulation	0.90592
HIPAA Compliance	0.79139
Ethics	0.79709
Justice	0.85923
Incentive	0.84718

All AVE values used in this study were greater than 0.50. This indicates that more than 50% of the indicator's variance can be accounted for by the latent variable. All of the constructs are greater than 0.70, which indicates that 70% of the variance of indicators is explained by the constructs. Any low AVE measures of latent variables were examined with individual item loadings shown in Table 5 to Table 9 from SmartPLS. Items in bold in the tables were deleted due to low SmartPLS loading.

TABLE 5
INITIAL PLS LOADINGS FOR HIPAA REGULATION

HR	HIPAA Regulation	PLS Loading
HRPI	HIPAA allows the patient to control their personal health information (PHI).	0.949
HRPP	All patients are provided with a written notice of privacy practices.	0.922
HRVI	HIPAA is mandatory and violations can carry fines and jail time.	0.963
HRPR	HIPAA covers both electronic and paper patient records.	0.972

Table 5 provides the results of the SmartPLS loadings for the HIPAA Regulation construct. All of the item loadings were greater than 0.70; thus, all items will be utilized for the HIPAA Regulation construct.

TABLE 6
INITIAL PLS LOADING FOR HIPAA COMPLIANCE

HC	HIPAA Compliance	PLS Loading
HCFI	A friend asks you to get them some information on a patient you have been caring for.	0.937
HCCI	**A relative asks you to get data on a famous local celebrity from the health insurance company you work for.**	**0.687**
HCSS	**Your spouse asked for a coworker's social security number as they knew you had access to it through patient files.**	**0.612**
HCHS	You are very curious about a friend's health situation and know you have the access to their medical records.	0.923
HCDD	You have access to view all the people in your town that have a deadly disease and know you can use it maliciously.	0.714
HCCC	You are a physician and your spouse asks you to give them details on a patient you treated that day who belongs to your local country club.	0.902
HCLB	**A friend asks you to access patient information to help them in an upcoming legal battle.**	**0.399**
HCFP	A local newspaper contacts you to ask for details of a famous patient you treated earlier that week.	0.951

Table 6 shows results for PLS loadings for HIPAA Compliance. All but three loadings were greater than 0.70: "A relative asked you to get data on a famous local celebrity from the health insurance company you work for" (HCCI), "Your spouse asked for a coworker's social security number as they knew you had access to it through patient files" (HCSS) and "A friend asks you to access patient information to help them in an upcoming legal battle" (HCLB). These constructs questioned the effects of one's relatives on the participants' levels of HIPAA compliance. The personal aspect of these questions may have had a direct effect on skewing individuals' responses. HCCI, HCSS and HCLB were adapted from Erp-Payton (2006) but deleted from the construct for this study due to their low SmartPLS loadings.

TABLE 7
INITIAL PLS LOADINGS FOR ETHICS

ETH	Ethics	PLS Loading
ETHE	An executive earning $50,000 a year padded his expense account by about $1500 a year.	0.828
ETHP	In order to increase profits, a general manager used a production process that exceeded legal limits for environmental pollution.	0.849
ETHB	Because of pressure from his brokerage firm, a stockbroker recommended a type of bond that he did not consider a good investment.	0.744
ETHT	A small business received one-fourth of its gross revenue in the form of cash. The owner reported only one-half of the cash receipts for income tax purposes.	0.760
ETHC	A company paid a $350,000 "consulting" fee to an official of a foreign country. In return, the official promised assistance in obtaining a contract that should produce $10 million profit for the contracting company.	0.764
ETHD	A company president found that a competitor had made an important scientific discovery that would sharply reduce the profits of his own company. He then hired a key employee of the competitor in an attempt to learn the details of discovery.	0.744
ETHH	A highway building contractor deplored the chaotic bidding situation and cutthroat competition. He therefore reached an understanding with other major contractors to permit bidding that would provide a reasonable profit.	0.734
ETHL	**A company president recognized that sending expensive Christmas gifts to purchasing agents might compromise positions. However, he continued the policy since it was common practice and changing it might result in loss of business.**	**0.2882**
ETHA	A corporate director learned that his company intended to announce a stock split and increase its dividend. On the basis of this information, he bought additional shares and sold them at a gain following the announcement.	0.827
ETHT	**A corporate executive promoted a loyal friend and competent manager to the position of divisional vice president in preference to a better qualified manager with whom he had no close ties.**	**0.2976**

Table 7 shows SmartPLS loading for the Ethics construct. All, with the exception of "A company president recognized that sending expensive Christmas gifts to purchasing agents might compromise positions. However, he continued the policy since it was common practice and changing it might result in loss of business" (ETHL) and "A corporate executive promoted a loyal friend and competent manager to the position of divisional vice president in preference to a better qualified manager with whom he had no close ties" (ETHT) were greater than 0.70. The level of unethical described in these items could be questioned; ETHL specifically states that if they changed policy, even if positions were lost, it might result in a loss of business. An ethical person may strongly agree with this, as they may feel loss of business would be worse than loss of positions. These questions could be considered ethical to subjects

and would skew the questions which are clearly unethical. ETHL and ETHT were used by Gopal and Sanders (1998), but were not adopted in this study due to their low SmartPLS loadings.

TABLE 8
INITIAL PLS LOADING FOR JUSTICE

JS	Justice	PLS Loading
JSET	All individuals deserve equal treatment before the law.	0.857
JSDN	Man's capacity for justice makes democracy possible; but man's inclination to justice makes democracy necessary. *Reinhold Niebuhr, The Children of Light and Darkness, forward, 1944.*	0.727
JSMC	To no man will we sell, or deny or delay right to justice. *Magna Carta.*	0.786
JSDR	All human beings are born free and equal in dignity and rights. *Universal Declaration of Human Rights, 1948, Article 1.*	0.723

Table 8 shows results for SmartPLS loadings for the Justice construct; all were greater than 0.70. Thus, all items will be utilized for the Justice construct.

TABLE 9
INITIAL PLS LOADINGS FOR INCENTIVE

INC	Incentive	PLS Loading
INCF	**A friend asks you to get them some information on a patient you have been caring for. Is there any incentive you would accept that would make this perfectly acceptable (if it is not already acceptable) to you?**	**0.6198**
INCC	**A relative asks you to get data on a famous local celebrity from the health insurance company you work for. Is there any incentive you would accept that would make this perfectly acceptable (if it is not already acceptable) to you?**	**0.6463**
INCL	**A friend asks you to access patient information to help them in an upcoming legal battle. Is there any incentive you would accept that would make this perfectly acceptable (if it is not already acceptable) to you?**	**0.6734**
INCN	**A local newspaper contacts you to ask for details of a famous patient you treated earlier that week. Is there any incentive you would accept that would make this perfectly acceptable (if it is not already acceptable) to you?**	**0.6646**
INCA	An acquaintance asked for a coworker's social security number as they knew you had access to it through patient files. They offered you enough money to pay for your mother's special care in a nursing home.	0.9771
INCR	A reporter offers you a large sum of money to cover your child's surgery in return for data on a group of patients you have access to.	0.9737

INC	Incentive	PLS Loading
INCT	You have the access to view all the people in your town that have a deadly disease and know you can use it maliciously. One of your community members offers you enough money to cover your children's private school tuition for the information.	0.9767
INCH	You are a single parent and a local politician asks you to give them details on a patient at the office of the doctor you work for that they are running against. They offer you enough money to leave your apartment and buy your first house for your family to live in.	0.9667

Table 9 shows results for SmartPLS loadings for the Incentives construct. All loadings, with the exception of five—"A friend asks you to get them some information on a patient you have been caring for. Is there any incentive you would accept that would make this perfectly acceptable (if it is not already acceptable) to you?" (INCF), "A relative asked you to get data on a famous local celebrity from the health insurance company you work for. Is there any incentive you would accept that would make this perfectly acceptable (if it is not already acceptable) to you?" (INCC), "A friend asks you to access patient information to help them in an upcoming legal battle. Is there any incentive you would accept that would make this perfectly acceptable (if it is not already acceptable) to you?" (INCL) and "A local newspaper contacts you to ask for details of a famous patient you treated earlier that week. Is there any incentive you would accept that would make this perfectly acceptable (if it is not already acceptable) to you?" (INCN)—were greater than 0.70. These four items asked "if not already" and this wording may have inappropriately affected the way the subjects answered. The other four items that did not ask "if not already" were found to be more effective. INCF, INCC, INCL and INCN were newly created items and were deleted due to low PLS loadings.

AVE values can be used to assess discriminant validity. The value of AVE should be higher than the square of the construct's correlations; this indicates that the amount of variance between latent variables and its block of indicators should be higher than the variance shared between the latent variables (Fornell and Larcker 1981). In this study, the square roots of the AVE were used to check discriminant validity.

The square roots of each AVE value in Table 10 are greater than the value of the off-diagonal elements. This supports the existence of reasonable discriminant validity among the constructs, and also suggests the existence of reasonable discriminant validity between constructs.

TABLE 10
CORRELATION OF LATENT VARIABLES

	Age	Deterrent (Dummy) Variable	Ethical	Gender	HIPAA Regulation	Justice	Incentive	HIPAA Compliance
Age	**1**							
Dummy	0.404	**1**						
Ethical	0.105	0.628	**0.793**					
Gender	0.234	0.091	0.015	**1**				
HIPAA Reg	0.341	0.953	0.641	0.027	**0.952**			
Justice	0.194	0.213	0.343	0.106	0.262	**0.859**		
Incentive	0.189	0.778	0.791	0.015	0.758	0.307	**0.973**	
HIPAA Compliance (Dependent variable)	0.154	0.864	0.641	0.032	0.830	0.466	0.790	**0.889**

Based upon the convergent validity tests utilizing principle factor analysis, PLS loadings and Cronbach's alpha, the items HCCI, HCSS, HCLB, ETHL, ETHT, INCF, INCL, INCC and INCN were removed before the structural model was analyzed. The number of measurement items from the questionnaire decreased by 9, from 34 to 25. The AVE values for all constructs used in this study are greater than 0.60. This supports that 60% or greater of the variance of the indicators were accounted for by the latent variables. All of the AVE measures for all constructs are greater than 0.70 (Table 11) which supports that there is a sound convergent validity for the measurement model.

TABLE 11
AVERAGE VARIANCE EXTRACTED (AVE) FOR EACH CONSTRUCT

Constructs	AVE (from SmartPLS)
HIPAA Regulation	0.90592
HIPAA Compliance	0.79139
Ethics	0.89709
Justice	0.85923
Incentive	0.947182

TABLE 12
CORRELATIONS OF LATENT VARIABLES

	Age	Dummy Variable	Ethical	Gender	HIPAA Regulation	Justice	Incentive	HIPAA Compliance
Age	**1**							
Dummy	0.413	**1**						
Ethical	0.105	0.698	**0.782**					
Gender	0.238	0.097	0.032	**1**				
HIPAA Reg	0.371	0.953	0.671	0.029	**0.936**			
Justice	0.198	0.213	0.343	0.104	0.262	**0.859**		
Incentive	0.189	0.728	0.763	0.025	0.758	0.305	**0.953**	
HIPAA Compliance (Dependent variable)	0.157	0.894	0.641	0.033	0.830	0.441	0.790	**0.889**

As shown in Table 12, the square root of the AVE is greater than the values of off-diagonal elements. This suggests that there is discriminant validity among the majority of constructs. The high correlation between HIPAA regulation and HIPAA compliance suggests that an understanding of HIPAA regulation is intertwined with HIPAA compliance.

The deterrent (dummy) variable was dichotomous: 0 for those who received deterrent information and 1 otherwise. Cross tabulations were run for analysis of this variable; an example is shown in Table 13a and 13b. This supports the theory that subjects provided deterrent information would be more likely to comply. Table 13a shows the results of asking both groups if they would access a friend's health information (which would be an instance of HIPAA noncompliance). Table 13b shows the results of asking both groups if they would access information on people with specific diseases. It is evident from these results that the majority of the group provided deterrent information found these acts "Unacceptable" to "Totally Unacceptable," meaning receiving the deterrent information led them to be more HIPAA compliant. The majority of the group that did not receive deterrent information found these acts to be some level of "acceptable." These results support the theory that subjects provided deterrent information will tend to be HIPAA compliant.

TABLE 13A
CROSSTABULATION: DETERRENT INFO PROVIDED VS. NOT PROVIDED – ACCESSING FRIEND'S INFO

		Access friend's health information						
		Totally Unacceptable	2	3	4	5	6	Total
Deterrent Information	Yes, provided deterrent info	32	12	0	0	0	0	44
	No, not provided deterrent info	0	0	4	12	22	6	44
Total		32	12	4	12	22	6	88

TABLE 13B
CROSSTABULATION: DETERRENT INFO PROVIDED VS. NOT PROVIDED –ACCESSING INFO ON PEOPLE WITH DISEASES

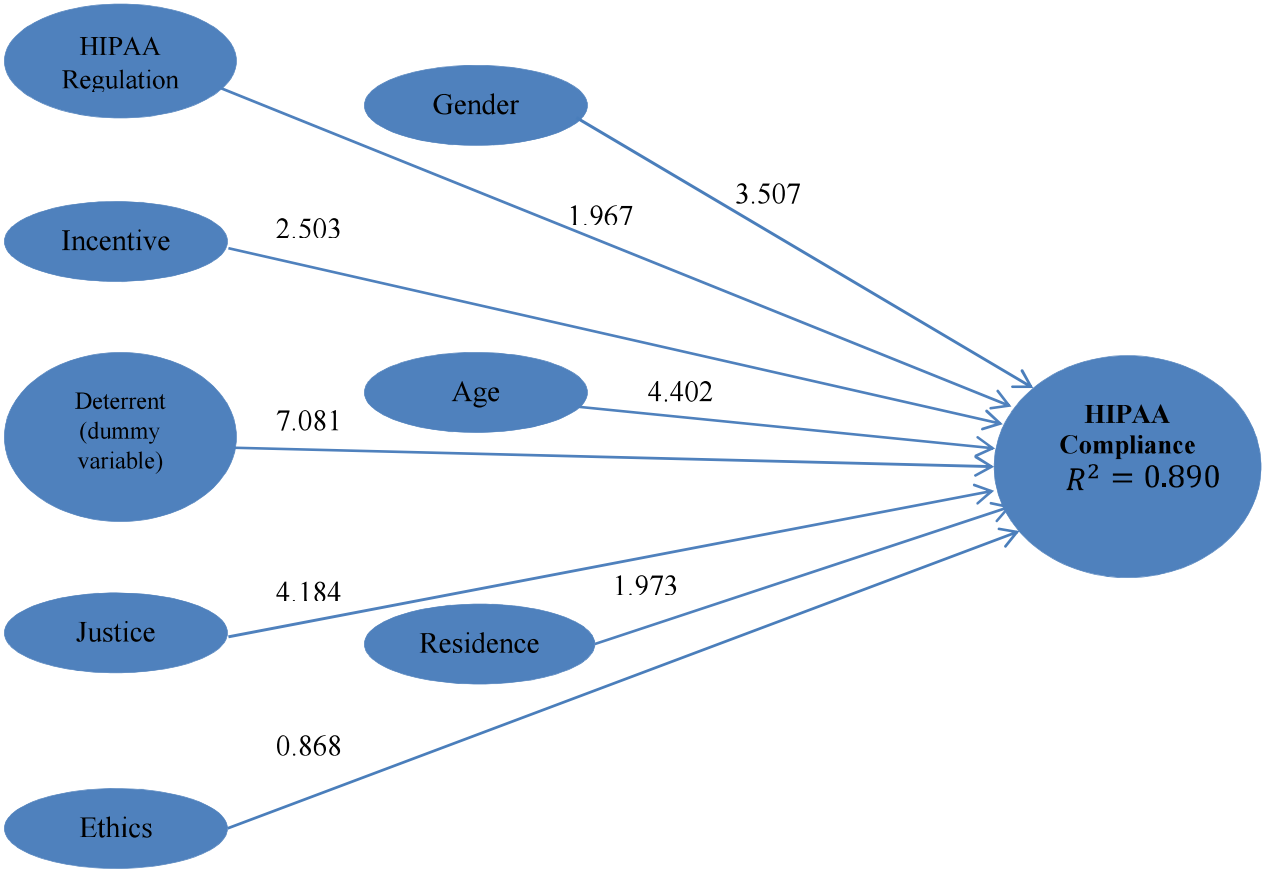
		Access to people with specific diseases						
		Totally Unacceptable	2	3	4	5	6	Total
Deterrent Information	Yes, provided deterrent info	32	12	0	0	0	0	44
	No, not provided deterrent info	0	0	4	12	22	6	44
Total		32	12	4	12	22	6	88

Assessment of Structural Model

The investigation of the structural model and its findings were done using the PLS model by utilizing SmartPLS. In SmartPLS, statistical significance can be run by the Bootstrapping process. With Bootstrapping, SmartPLS shows statistical significance with constructs path coefficients greater than 1.96.

As shown in Figure 2, seven out of eight paths have statistically significant path coefficients (greater than 1.96). This indicates that hypothesis H1, H3, H4, H5, H6, H7, and H8 are supported by the data. The high HIPAA compliance dependent variable $R^2 = 0.890$, which explains 89.0% of the variance of the relationships, suggests the model offers a good fit.

FIGURE 2
STRUCTURAL MODEL RESULTS



The path coefficients for "Deterrent" (7.081) and "Justice" (4.184) are so high that their paths could be considered the main paths to HIPAA compliance. Crosstabulations shown in Tables 5-19a and 5-19b provide clear data supporting why the deterrent path is so highly significant. Justice, or knowledge and belief in the justice system could be explained by the following: those who believe in the justice system tend to believe in the law, which suggests that they believe in being legally compliant. The significance of these two constructs will be discussed in detail in Section 6.

The path coefficient for "HIPAA Regulation" (1.967) resembles the Justice system regarding knowledge and belief. Just as having knowledge and belief in the justice system has shown to lead to compliance, the theory also supports that knowledge and belief in HIPAA Regulations will tend to lead to HIPAA compliance. If participants know and believe in something, they are more likely to follow the "rules" of what they believe in (Annas 2003).

Incentive (2.503) was significant in increasing the likelihood of HIPAA noncompliance. Many studies have investigated the economics of crime (e.g. Ehrlich, 1977; Barnett 1981; Becker 1968), which have come to many different conclusions. The theory is that an incentive increases the likelihood of noncompliance; the data from the present research supports this theory.

Ethics was expected to be significant but was found not to be (0.868). The questions used to assess this construct were all based on ethical profiles of business students (Gopal and Sanders 1998; Wood et al.1988) but were used in this study to gather behavioral intentions. Some of the questions could have been misconstrued as representing good business decisions, even though they were not beneficial to everyone involved. Doing what is best for the business by choosing "Acceptable" to "Totally

Acceptable," even though they may not be the "nicest" of decisions for others involved, may not have been seen as unethical, and therefore had little impact on HIPAA compliance.

Gender was found to be significant, with women tending to be more HIPAA compliant. Similar results were found by Gopal and Sanders (1997), who showed that women were less likely to engage in software piracy. Females in general are found to be more likely to be compliant with laws (Solomon and O'Brien, 1990). It was also found by Gopal and Sanders (1997) and Solomon and O'Brien (1990) that younger people tend to be less likely to be HIPAA compliant. Urban residency was also found to have statistically significant effect, consistent with the findings of Solomon and O'Brien (1990). The majority of respondents in this study resided in cities, which may have led to this result.

DISCUSSION AND CONCLUSIONS

Summary of Findings

We found almost full support for the HIPAA Compliance Model suggested and tested in this work. Table 14 summarizes the results of hypothesis testing.

TABLE 14
SUMMARY OF HYPOTHESIS TESTING

	Hypothesis	**Support**	**Significance Level**
H1:	*Individuals with some knowledge of HIPAA regulations will tend to be HIPAA compliant.*	Yes	1.967
H2:	*Individuals with highly ethical attitudes will tend to be HIPAA compliant.*	No	0.868
H3:	*Individuals provided HIPAA deterrent information will tend to be HIPAA compliant.*	Yes	7.081
H4:	*Incentives will reduce the level of compliance.*	Yes	2.503
H5:	*Individuals with a strong belief in the justice system will have a higher likelihood of being HIPAA compliant.*	Yes	4.184
H6:	*Women will have a higher likelihood of compliance than men.*	Yes	3.507
H7:	*Older employees will have a high level of compliance than younger employees.*	Yes	4.402
H8:	*Urban residents will have a higher level of compliance than rural residents.*	Yes	1.973

The model explains over 80% of the variation of individuals tending to be HIPAA compliant ($R^2 = 0.890$). Seven of the eight paths in the model are statistically significant. Only H2, Ethics, was not found to be statistically significant.

Knowledge of HIPAA regulation was found to increase HIPAA compliance. This supports the theory that the more understanding a person has of HIPAA law, the more likely they are to be HIPAA compliant. The HIPAA regulation questionnaire items asked subjects whether or not they were familiar with HIPAA law. If they answered "Strongly Disagree" to "Disagree," they had limited to no knowledge of HIPAA. These subjects were found more likely to be HIPAA noncompliant. If they answered "Agree" to "Strongly Agree," they were found more likely to be HIPAA compliant. This was the expected finding for this construct and was supported with a SmartPLS significance level of 1.967. This supports the hypothesis that the greater the understanding participants had of the law, the more likely they were to comply with it.

Ethics was not found to be statistically significant. In this study, subjects scoring high on the ethical index were not more likely to be HIPAA compliant with a significance level < 1.96. This could be due to the wording of the questions themselves. The questions were all based on ethical profiles of business students (Gopal and Sanders 1998; Wood et al.1988) but were used in this study to gather behavioral intentions. Questions like "Because of pressure from his brokerage firm, a stockbroker recommended a type of bond that he did not consider a good investment," "A company president recognized that sending expensive Christmas gifts to purchasing agents might compromise positions. However, he continued the policy since it was common practice and changing it might result in loss of business," and "A company president found that a competitor had made and important scientific discovery that would sharply reduce the profits of his own company. He then hired a key employee of the competitor in an attempt to learn the details of discovery" may have been misconstrued by our respondents. Finding those items "Acceptable" to "Totally Acceptable" may not mean that the subject is unethical, but instead believes in making solid, profitable business decisions. Doing what is best for the business by choosing "Acceptable" to "Totally Acceptable," even though they may not be the "nicest" of decisions for others involved, may not have been seen as unethical, and therefore had little effect on HIPAA compliance.

Belief in the justice system was found to increase HIPAA compliance. Just as knowledge of HIPAA law led to statistical significance of HIPAA compliance, the Justice construct had the same effect. If subjects had knowledge and belief of the Justice System, they were found more likely to be HIPAA compliant. These results support the findings by Gopal and Sanders (1998) that individuals whom were higher on the Justice scale will pirate software less. Pirating less software and being more likely to be HIPAA compliant were both significant findings for those with a strong belief in the justice system.

The role of incentives in reducing the level of compliance was supported. Incentives, whether monetary or of some other personal benefit, have been found to convince people who may normally be compliant to be noncompliant (Zald and Jacob, 1978). This study used eight original measurement items to measure incentives. Four of the items, which were removed from the final data analysis, were yes or no questions that asked if there was any amount of money that could convince the subject to be noncompliant. There was also a space allotted for the dollar amount they would require to be noncompliant to be written. There were a few subjects that did write dollar amounts, and will be studied for future research. The four items utilized for statistical significance were measured on a seven-point Likert scale. They offered incentives for such things as "money to cover your mother's special care in a nursing home," "money to cover your children's private school tuition," "money to cover your child's surgery," and "money to leave your apartment and buy your first house for your family to live in." These items offer incentives for very specific, personal issues. Instead of being offered a lump sum incentive with nothing personal linked to it, the questions pushed the subjects to determine if personal issues such as specific family needs may sway them to consider taking incentives to be noncompliant when they otherwise may say they would never consider it. In this, study the significance level for incentives was found to be 2.503, which supports that the measurement items for incentive did increase the likelihood of noncompliance.

The effect of the deterrent (dummy) variable in this study was very strong, with a significance level of 7.081, supporting the theory that subjects provided with deterrent information would tend to be more compliant. The crosstabulations described in Section 5 also supported this high level of significance. This dichotomous variable was created from the two groups surveyed: one that was provided with deterrent information (0) and one that was not (1). The purpose of this study was to examine whether providing incoming healthcare workers with HIPAA deterrent information would increase an individual's likelihood of HIPAA compliance. The fact that the significance level for this variable is so high shows that deterrent information on HIPAA noncompliance is valuable to increase the HIPAA compliance of new healthcare workers. A similar study by Gopal and Sanders (1997) found that individuals who received deterrence information would participate less in software piracy.

HIPAA compliance was the dependent variable for this study. Its R^2 value was strong (0.890). The strong significance of the deterrent variable, as well as for the other constructs, led to the high R^2 value, which supports the model's fit (89.0%).

Limitations

As with any study, this one has limitations. For example, it only supplies a method to provide HIPAA deterrent case information to incoming healthcare workers. It does not take into consideration how to reach individuals already employed in the healthcare field with deterrent HIPAA case information.

Future Research

A possible direction for future research would be to consider ways to provide HIPAA deterrent case information to workers already employed in the healthcare field and assess the effects of such information on these workers. This study only recommends ways to present incoming healthcare workers with deterrent information, not existing healthcare workers.

Implications for Practice

The purpose for this research is to find ways to help reduce HIPAA noncompliance. The lack of research in this area leaves the healthcare industry with a significant gap to fill in reducing the current high rate of HIPAA noncompliance.

This study can assist practitioners by providing insight into the effect of providing HIPAA deterrent case information to incoming healthcare workers along with their standard HIPAA training. HIPAA regulation states that individual healthcare workers, as well as their organizations, can be held responsible for HIPAA noncompliance. This can mean imprisonment for individuals and large fines for their organizations. Notably, the measurement tool utilized for this study found that providing new healthcare workers deterrent case information will positively influence HIPAA compliance. The tool would assist practitioners hiring new employees in assuring they are made aware of the consequences of HIPAA noncompliance via deterrent information regarding how it can affect them as individuals. This information is rarely provided to established healthcare workers, which may contribute to a higher percent of noncompliance among established workers in the field (Mercuri, 2004).

CONCLUSIONS

HIPAA noncompliance has become a very serious problem in the world of healthcare in recent years; however, academic research on the subject is in its early stages and is lagging behind healthcare practice. The massive number of noncompliant acts committed by existing healthcare workers leads to a total annual liability of $7 billion (DeGaspari 2012). This number will only increase if measures are not taken to identify and reduce the amount of incoming healthcare workers with noncompliant tendencies.

This study has attempted to provide a method to significantly reduce HIPAA noncompliance by providing new employees with an awareness of the severity of HIPAA penalties as they enter a healthcare organization. The method suggested involves providing these employees with deterrent information about instances of HIPAA noncompliance. The results confirm that provision of HIPAA deterrent case information—combined with belief in the justice system and knowledge of HIPAA regulations—reduces the likelihood of HIPAA noncompliance. In this study, these three factors explain 89% of the variance in HIPAA compliance.

It was found that incentives tend to lead to HIPAA noncompliance. Incentives may make a normally HIPAA compliant person reconsider the possibility of being noncompliant. Incentives have been found to have a significant impact on increasing the crime rate for as long as research has investigated their use (e.g. Ehrlich, 1977; Barnett 1981; Becker 1968).

The results of this study may increase attention on the value of deterrent information and the impact it can have on HIPAA compliance. It may lead to changes in the way HIPAA regulations are presented to incoming workers, which could, in turn increase overall HIPAA compliance levels.

This study should, however, be thought of as one of the many components necessary for a full understanding of HIPAA compliance. The measurement items in this study and its findings are just the beginning of a long journey to protect patient health information by increasing HIPAA compliance.

REFERENCES

Abdi, H. (2003). *Partial least squares regression* (PLS-regression) (pp. 792-795): Thousand Oaks, CA: Sage.

Anderson, J. C., & Gerbing, D. W. (1992). Assumptions and Comparative Strengths of the Two-Step Approach: Comment on Fornell and Yi. *Sociological Methods & Research*, 20(3), 321-333

Annas, G. J. (2003). HIPAA Regulations — A New Era of Medical-Record Privacy? *New England Journal of Medicine*, 348(15), 1486-1490.

Arlen, J. (1994). The Potentially Perverse Effects of Corporate Criminal Liability. *The Journal of Legal Studies*, 23(2), 833-867.

Bandes, S. (2003). Fear Factor: The Role of Media in Covering and Shaping the Death Penalty. Ohio St. *J. Crim. L.*, 585.

Barnett, A. (1981). The Deterrent Effect of Capital Punishment: A Test of Some Recent Studies. *Operations Research*, 29(2), 346-370.

Barth, A., Datta, A., Mitchell, J. C., & Nissenbaum, H. (2006, May 21-24). Privacy and contextual integrity: framework and applications. Paper presented at the Security and Privacy, *2006 IEEE Symposium on.*

Becker, G. S. (1968). Crime and Punishment: An Economic Approach. [Article]. *Journal of Political Economy*, 76(2), 169.

Bohrnstedt, G. W., & Knoke, D. (1982). *Statistics for social data analysis*. F.E. Peacock Publishers.

Bommer, M., Gratto, C., Gravander, J., & Tuttle, M. (1987). A Behavioral Model of Ethical and Unethical Decision Making. *Journal of Business Ethics*, 6(4), 265-280.

Buckler, F., & Henning-Thurau. (2008). Identifying Hidden Structures in Marketing's Structural Models Through Universal Structure Modeling: An Explorative Neural Network Complement to LISREL and PLS. *Marketing Journal of Reasearch and Management*.

Bulgurcu, B. (2010). Information security policy compliance: an empirical study of rationality-based beliefs and information security awareness. *Women*, 221(243), 243.

Cao, F., Huang, H., & Zhou, X. (2003). Medical image security in a HIPAA mandated PACS environment. *Computerized Medical Imaging and Graphics*, 27(2), 185-196.

Carmines, E. G. (1979). *Reliability and validity assessment*. Sage Publications: Beverly Hills, Calif.

Chellappa, R. K., & Sin, R. G. (2005). Personalization versus Privacy: An Empirical Examination of the Online Consumer's Dilemma. *Inf. Technol. and Management*, 6(2-3), 181-202.

Choi, Y. B., Capitan, K. E., Krause, J. S., & Streeper, M. M. (2006). Challenges associated with privacy in health care industry: implementation of HIPAA and the security rules. *Journal Of Medical Systems*, 30(1), 57-64.

Collmann, J., Lambert, D., Brummett, M., DeFord, D., Coleman, J., Cooper, T., & Dorofee, A. (2004). *Beyond good practice: why HIPAA only addresses part of the data security problem.*

Crandall, C. S., Eshleman, A., & O'Brien, L. (2002). Social norms and the expression and suppression of prejudice: The struggle for internalization. *Journal of Personality and Social Psychology*, 82(3), 359-378.

D'Arcy, J., Hovav, A., & Galletta, D. (2009). User awareness of security countermeasures and its impact on information systems misuse: a deterrence approach. *Information Systems Research*, 20(1), 79-98.

Davis, J. H., Schoorman, F. D., & Donaldson, L. (1997). Toward a Stewardship Theory of Management. *The Academy of Management Review*, 22(1), 20-47.

Dinev, T., & Hart, P. (2006). An Extended Privacy Calculus Model for E-Commerce Transactions. *Information Systems Research*, 17(1), 61-80.

Earp, J. B., & Payton, F. C. (2006). Information Privacy in the Service Sector: An Exploratory Study of Health Care and Banking Professionals. *Journal of Organizational Computing and Electronic Commerce*, 16(2), 105 – 122.

Ehrlich, I. (1975). The Deterrent Effect of Capital Punishment: A Question of Life and Death. [Article]. *American Economic Review*, 65(3), 397.
Ehrlich, I. (1977). Capital Punishment and Deterrence: Some Further Thoughts and Additional Evidence. [Article]. *Journal of Political Economy*, 85(4), 741.
Ehrlich, I., & Mark, R. (1977). Fear of Deterrence: A Critical Evaluation of the "Report of the Panel on Research on Deterrent and Incapacitative Effects". *The Journal of Legal Studies*, 6(2), 293-316.
Ellingsen, T., & Johannesson, M. (2008). Pride and Prejudice: The Human Side of Incentive Theory. *The American Economic Review*, 98(3), 990-1008.
Enders, C. K., & Bandalos, D. L. (2001). The Relative Performance of Full Information Maximum Likelihood Estimation for Missing Data in Structural Equation Models. *Structural Equation Modeling: A Multidisciplinary Journal*, 8(3), 430-457.
Evans, R. I., Rozelle, R. M., Mittelmark, M. B., Hansen, W. B., Bane, A. L., & Havis, J. (1978). Deterring the Onset of Smoking in Children: Knowledge of Immediate Physiological Effects and Coping with Peer Pressure, Media Pressure, and Parent Modeling1. *Journal of Applied Social Psychology*, 8(2), 126-135.
Farahmand, F., Navathe, S. B., Sharp, G.P., & Enslow, P.H. (2012). *Assessing Damages of Information Security Incidents and Selecting Control Measures, a Case Study Approach.*
Fornell, C., & Larcker, D. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research,* 18, 39-50
Freedman, J. L., Cunningham, J. A., & Krismer, K. (1992). Inferred values and the reverse-incentive effect in induced compliance. *Journal of Personality and Social Psychology*, 62(3), 357.
Freedman, J. L., Cunningham, J. A., & Krismer, K. (1992). Inferred values and the reverse-incentive effect in induced compliance. *Journal of Personality and Social Psychology*, 62(3), 357-368.
Garoupa, N. (2000). Corporate criminal law and organization incentives: a managerial perspective. *Managerial and Decision Economics*, 21(6), 243-252.
Gopal, R. D., & Sanders, G. L. (1997). Preventive and deterrent controls for software piracy. *Journal of Management Information Systems*, 29-47.
Gopal, R. D., & Sanders, G. L. (1998). International software piracy: Analysis of key issues and impacts. *Information Systems Research*, 9, 380-397.
Herath, T., & Rao, H. R. (2009). Encouraging information security behaviors in organizations: Role of penalties, pressures and perceived effectiveness. *Decision Support Systems*, 47(2), 154-165.
Higgins, G. E., Wilson, A. L., & Fell, B. D. (2005). An application of deterrence theory to software piracy. *Journal of Criminal Justice and Popular Culture*, 12(3), 166-184.
Hu, Q., Dinev, T., Hart, P., & Cooke, D. (2012). Managing Employee Compliance with Information Security Policies: The Critical Role of Top Management and Organizational Culture*. *Decision Sciences*, 43(4), 615-660.
Hui, K. L., Teo, H. H., & Lee, S. Y. T. (2007). The value of privacy assurance: An exploratory field experiment. *MIS Quarterly*, 31(1), 19-33.
Hunt, W. A., & Bespalec, D. A. (1974). An evaluation of current methods of modifying smoking behavior. *Journal of Clinical Psychology*, 30(4), 431-438.
Jon, K. P. (1976). The Deterrent Effect of Capital Punishment: Ehrlich and His Critics. *The Yale Law Journal*, 85(3), 359-367.
Jones, T. M. (1991). Ethical Decision Making by Individuals in Organizations: An Issue-Contingent Model. *The Academy of Management Review*, 16(2), 366-395.
Justice Law and legal Definition (N.D.) Retrieved from https://www.easybib.com/reference/guide/apa/website
Kohn, A. (1993). Why incentive plans cannot work. *Harvard Business Review*, 71(5).
Kohn, A. (1993, Sep/Oct). Why incentive plans cannot work. *Harvard Business Review*, 71(5), 54.
Lee, S. M., Lee, S-G., & Yoo, S. (2004). An integrative model of computer abuse based on social control and general deterrence theories. *Information & Management*, 41(6), 707-718.

Li, F., Zou, X., Liu, P., & Chen, J. (2011). New threats to health data privacy. *BMC Bioinformatics*, 12(Suppl 12), S7.
Li, H., Zhang, J., & Sarathy, R. (2010). Understanding compliance with internet use policy from the perspective of rational choice theory. *Decision Support Systems*, 48(4), 635-645.
Linder, D. E., Cooper, J., & Jones, E. E. (1967). Decision freedom as a determinant of the role of incentive magnitude in attitude change. *Journal of Personality and Social Psychology*, 6(3), 245.
Littenberg, B., & MacLean, C. (2006). Passive consent for clinical research in the age of HIPAA. *Journal of General Internal Medicine*, 21(3), 207-211.
Long, E. (2008). Crime Deterrents. *Ball State Undergraduate Mathematics Exchange*, 5(1).
Machin, S., & Meghir, C. (2004). Crime and Economic Incentives. *Journal of Human Resources*, XXXIX(4), 958-979.
Maybury, M., Chase, P., Cheikes, B., Brackney, D., Matzner, S., Hetherington, T., . . . & Lewandowski, S. (2005). Analysis and detection of malicious insiders. *The 2005 International Conference on Intelligence*.
Mercuri, R. T. (2004). The HIPAA-potamus in health care data security. *Commun. ACM*, 47(7), 25-28.
Mermelstein, H. T., & Wallack, J. J. (2008). Confidentiality in the Age of HIPAA: A Challenge for Psychosomatic Medicine. *Psychosomatics*, 49(2), 97-103.
Miceli, T. J., & Segerson, K. (2007). Punishing the Innocent along with the Guilty: The Economics of Individual versus Group Punishment. *The Journal of Legal Studies*, 36(1), 81-106.
Moore, I. N., Snyder, S. L., Miller, C., & Qui An, A. (2007). *Confidentiality and Privacy in Health Care from the Patient's Perspective: Does HIPAA Help?* 17 Health Matrix 215.
Moores, T. T., & Chang, J. C.-J. (2006). Ethical Decision Making in Software Piracy: Initial Development and Test of a Four-Component Model. *MIS Quarterly*, 30(1), 167-180.
Nguyen, N., Reiher, P., & Kuenning, G. H. (2003, 18-20 June 2003). *Detecting insider threats by monitoring system call activity*. Paper presented at the Information Assurance Workshop, 2003. IEEE Systems, Man and Cybernetics Society.
Phillips, D. P. (1980). The Deterrent Effect of Capital Punishment: New Evidence on an Old Controversy. *American Journal of Sociology*, 86(1), 139-148.
Rawls, J. (1971). *A Theory of Justice*. The Belknap Press of Harvard University Press.
Ringle, C. M., Sarstedt, M., & Straub, D. W. (2012). A Critical Look at the Use of PLS-SEM in MIS Quarterly. [Article]. *MIS Quarterly*, 36(1), iiv-8.
Ringle, C. M., Wende, S., & Will, A. (2008). Confirmatory tetrad analysis in PLS path modeling. *Journal of Business Research*, 61(12), 1238-1249.
Rogers, R. W., & Deckner, C. W. (1975). Effects of fear appeals and physiological arousal upon emotion, attitudes, and cigarette smoking. *Journal of Personality and Social Psychology*, 32(2), 222-230.
Sacco, V. F., & Zureik, E. (1990). Correlates of computer misuse: data from a self-reporting sample. *Behaviour & Information Technology*, 9(5), 353-369.
Siponen, M. (2000). A conceptual foundation for organizational information security awareness. *Information Management & Computer Security*, 8(1), 31-41.
Siponen, M., Pahnila, S., & Mahmood, M. A. (2010). Compliance with Information Security Policies: An Empirical Investigation. *Computer*, 43(2), 64-71.
Smith, H. J., Dinev, T., & Xu, H. (2011). Information privacy research: an interdisciplinary review. *MIS Q.*, 35(4), 989-1016.
Solomon, S. L., & O'Brien, J. (1990). The effect of demographic factors on attitudes toward software piracy. *J. COMP. INF. SYST.*, 30(3), 40-46.
Straub, D. W., Jr., & Nance, W. D. (1990). Discovering and Disciplining Computer Abuse in Organizations: A Field Study. *MIS Quarterly*, 14(1), 45-60.
Suits, D. B. (1957). Use of Dummy Variables in Regression Equations. *Journal of the American Statistical Association*, 52(280), 548-551.
Swinyard, W. R., Rinne, H., & Kau, A. K. (1990). The morality of software piracy: A cross-cultural analysis. *Journal of Business Ethics*, 9(8), 655-664.

Symonenko, S., Liddy, E., Yilmazel, O., Del Zoppo, R., Brown, E., & Downey, M. (2004). Semantic Analysis for Monitoring Insider Threats. Intelligence and Security Informatics. In H. Chen, R. Moore, D. Zeng & J. Leavitt (Eds.), (Vol. 3073, pp. 492-500): Springer Berlin / Heidelberg.
Thornton, D., Gunningham, N. A., & Kagan, R. A. (2005). General Deterrence and Corporate Environmental Behavior*. *Law & Policy*, 27(2), 262-288.
Williams, K. R., & Hawkins, R. (1986). Perceptual Research on General Deterrence: A Critical Review. *Law & Society Review*, 20(4), 545-572.
Wolf, M. S., & Bennett, C. L. (2006). Local perspective of the impact of the HIPAA privacy rule on research. *Cancer*, 106(2), 474-479.
Wong, K. K-K. (2013). *Partial Least Squares Structural Equation Modeling (PLS-SEM) Techniques Using SmartPLS*. Marketing Bulletin.
Wood, J., Longenecker, J., McKinney, J., & Moore, C. (1988). Ethical attitudes of students and business professionals: A study of moral reasoning. *Journal of Business* Ethics, 7(4), 249-257.
Xiong, R., & Meullenet, J.-F. (2006). A PLS dummy variable approach to assess the impact of jar attributes on liking. *Food Quality and Preference*, 17(3–4), 188-198.
Zald, M. N., & Jacobs, D. (1978). Compliance/Incentive Classifications of Organizations Underlying Dimensions. *Administration & Society*, 9(4), 403-424.