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Examining the Impact of Deterrence Factors and Norms on Resistance to Information Systems Security

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Abstract

Numerous studies have found that employees are the principal source of adverse Information Systems Security (ISS) incidents in organizational settings. Consequently, the ISS research focuses on examining factors that affect employees' behaviour towards complying with ISS policy. Most of this research, based on the theory of reasoned action, considers that employees' intention to comply with ISS policies is a good predictor of their behaviour. This paper argues that the employees' compliance with ISS policies within organizations is usually enforced, and that the non-compliance is mainly due to the resistance towards these policies. This research examines the role of organizational punishment and organizational norms in impacting employees' resistance towards the ISS policies. The data were collected from 133 employees of 10 organizations spanning four industries and the hypotheses were tested and validated using PLS-SEM analytical procedures. The results show that moral and descriptive norms are useful in reducing the resistance.

Keywords: Resistance to Information Systems Security, Information security policies, Moral norms, Organizational punishment

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Abstract

Numerous studies have found that employees are the principal source of adverse Information Systems Security (ISS) incidents in organizational settings. Consequently, the ISS research focuses on examining factors that affect employees' behaviour towards complying with ISS policy. Most of this research, based on the theory of reasoned action, considers that employees' intention to comply with ISS policies is a good predictor of their behaviour. This paper argues that the employees' compliance with ISS policies within organizations is usually enforced, and that the non-compliance is mainly due to the resistance towards these policies. This research examines the role of organizational punishment and organizational norms in impacting employees' resistance towards the ISS policies. The data were collected from 133 employees of 10 organizations spanning four industries and the hypotheses were tested and validated using PLS-SEM analytical procedures. The results show that moral and descriptive norms are useful in reducing the resistance.

1. Introduction

Several studies report that the increasing violations of Information Systems Security (ISS) policies result in a wide range of negative consequences for organizations, such as data loss or theft, computer intrusions, and privacy breaches (Ernst & Young, 2011; Ponemon Institute, 2016; Ponemon, 2017). A recent study by the Ponemon Institute found that nearly 90 percent of healthcare organizations represented in their study had experienced at least one data breach in the two years period (Ponemon Institute, 2016). Researchers have agreed that, very often, the end users are the weakest link in ensuring ISS in organizations (Kolkowska et al., 2017; Merhi & Ahluwalia, 2014; Moody et al., 2018; Safa & Von Solms, 2016). Numerous studies also show that employees' behaviour remains a major challenge for successfully implementing strict ISS policies in organizations. In a survey of IT security practitioners, nearly 56% of the participants attributed employees' resistance to comply with ISS policies as the biggest barrier to implementing effective security strategies in their organizations (Ponemon Institute, 2016). Likewise, in the "Global State of IS Survey 2018," PWC found that employees' actions remain the foremost cause of ISS incidents in organizations (PWC, 2017). Accordingly, the ISS research has focused on studying employee behaviour in the context of the compliance of ISS policies (Bulgurcu et al., 2010; Hwang & Cha, 2018; Merhi & Ahluwalia, 2013; Merhi & Midha, 2012).

Most studies in ISS research consider employees' intention to adopt or use ISS policies as the dependent variable, thereby assuming a volitional milieu in which users are free to exercise their choices in the context of compliance with ISS policies and procedures. This assumption does not truly reflect the real-world situations in which compliance of ISS policies is often mandatory, enforced either by technology or by threats of punishment. Moreover, implementation of ISS policies require behavioural changes in the way users interact with IT

systems, creating stimuli for resistance towards such changes (Kolkowska & Dhillon, 2013; Krazit, 2016; Merhi & Ahluwalia, 2015). For example, enforcement of stricter and more complex authentication passwords in an organization may invoke resistance towards the ISS policy leading some employees to write down their passwords in their notebooks or journals even though the policy may prohibit such actions (Sun et al., 2011). Therefore, a theoretically grounded understanding of factors that influence employees' resistance towards compliance of ISS policies is necessary. This paper bridges a significant gap in the existing literature as very few studies have examined the role of employees' resistance towards compliance with ISS policies.

Organizational punishment is widely utilized in organizations as a deterrence to minimize noncompliance of organizational policies (Liang et al., 2012). The concept of punishment and its three dimensions of punishment severity, certainty of punishment, and swiftness of punishment are rooted in the General Deterrence Theory (GDT). A significant proportion of ISS literature examined the role of punishment on employees' intention to comply with ISS policies, but reported divergent findings. For example, Bulgurcu and others (Bulgurcu et al., 2010; D'Arcy et al., 2009; Straub, 1990) found that the severity of the punishment improved ISS compliance. However, several recent research articles did not find a significant relationship between punishment severity and ISS compliance (Herath & Rao, 2009a; Ifinedo, 2012; Pahnila et al., 2007; Sommestad et al., 2014). Several researchers expressed the need for additional research to clarify the process through which punishment affects employees' compliance intentions (Herath & Rao, 2009a). In dealing with compliance situations, norms are said to be more effective than punishments in controlling behaviour (Tyler, 1990). In this paper, we draw from the criminology literature to examine the effect of norms on resistance towards complying with ISS policies.

The theory of reasoned action (TRA), the theory of planned behaviour (TPB), and their extensions explained that people's behaviour and intentions are influenced by social pressures in addition to their attitudes. TRA and TPB theories defined the term subjective norm as people's perceptions of others opinion about behaviour in question. This normative component is exemplified by a question – "Most people who are important to me think I should or should not perform a certain action". Other normative components were added in the subsequent extensions of TRA and TPB theories. Injunctive norms are defined as people's behaviour that is "in accordance with what they believe others think they should do" (Fishbein & Ajzen, 2010, p. 131). Thus, injunctive norms and subjective norms are equivalent to each other. Descriptive norms are distinct from injunctive norms as they refer to the perceptions about whether others are or are not performing the behaviour in question (Fishbein & Ajzen, 2010). Moreover, empirical research shows that in situations involving ethical beliefs, moral norms are a useful addition to the normative components that explain individual behaviour. Moral norms are individual's "feelings of moral obligation or responsibility to perform, or refuse to perform, a certain behaviour" (Ajzen, 1991, p. 199). A distinction, however, needs to be made between personal and moral norms (Ajzen, 1991). Whereas moral norms are perceptions about moral approval by a generalized social agent, personal norms can include one's own moral beliefs (Fishbein & Ajzen, 2010).

This paper posits that moral and descriptive norms act as mediators between the punishment factors and resistance. Thus, we examine the indirect role of punishment as a potential management practice to reduce resistance towards ISS policies in organizations.

2

Research suggests that norms are a more effective means of regulating individual behaviour compared to enforcing punishment deterrents (Kube & Traxler, 2011). The research on the Theory of Planned Behaviour (TPB) and its extensions show that subjective norms and descriptive norms influence individual behaviour. Additionally, in situations involving ethical dimensions, moral norms are a significant predictor of behaviour. The influence of moral and descriptive norms on individuals' behaviour has been widely researched (Botetzagias et al., 2015; Kaiser & Scheuthle, 2003). Also, several recent studies show that the injunctive norms do not affect employees' compliance of ISS policies (Anderson & Agarwal, 2010). Therefore, we included only the moral norms and the descriptive norms in the research model of the present paper.

This paper makes meaningful contributions to the ISS literature. Firstly, we propose employees' resistance as a dependent variable in order to understand its effect on ISS compliance. Secondly, we answer calls for additional research by various scholars to examine the role of punishment in improving compliance of ISS policies (Herath & Rao, 2009a; Hwang & Cha, 2018; Merhi & Ahluwalia, 2018). Inspired by the divergent findings in the existing literature, we look at the process view of how punitive policies work in organizational settings, and what its concomitant factors are. Specifically, we postulate that the two punishment factors namely, certainty of detection and punishment severity affect moral and descriptive norms, which in turn affect resistance. In other words, moral and descriptive norms mediate the relationship between organizational punishment and resistance to IS.

We collected data from 133 professionals working in ten different organizations located in southwestern United States. The data were subjected to rigorous analytic methods to test the hypothesized relationships using the partial least square (PLS) procedures.

The remainder of this paper is organized as follows. We first provide a brief literature review on the factors included in the study, followed by the theoretical framework and a set of research hypotheses. We then describe the methodology followed by the discussion of the results. We finally present conclusions, implications, and future work avenues.

2. Literature Review

2.1 Resistance to Information Systems Security

Employees' resistance to change has been found to be a cause of many projects failures (Alcivar & Abad, 2016; Hsieh, 2016; Merhi & Ahluwalia, 2015). Frequently, the introduction of new ICT systems or products in organizations is accompanied by changes in business processes, responsibilities, accountability and workflows. Employees affected by these changes face significantly altered social and technical work environments. Research shows that such changes generate resistance in individuals because of their preference for status-quo. Research shows that the resistance is more because of the adverse consequences of changes brought about by the new ICT and not so much focused towards the specific ICT (Bhattacherjee & Hikmet, 2007; Hsieh, 2016). Resistance can manifest in a range of reactions – from compliance to resistance (Belanger et al. 2011). For example, people may voice opposition, protest, complain, or demand the withdrawal of the change. Individuals can also resist quietly and may sabotage the process or technology by undermining the change agent, establishing coalitions, and using social media to influence a wider group to increase non-compliance. Therefore, managing resistance is

important, and organizations need to focus on employees' beliefs and attitudes when implementing ISS policies (Thomson et al., 2006).

According to Lapointe and Rivard (2005), a review of 25 years of IT based literature had revealed 43 articles that had identified resistance as a critical implementation issue. They summarized the four models of resistance to IT. Markus (1983) argued that people resist if the changes brought about by IT implementation diminishes their power in the organization. Joshi (1991) presented an equity model of resistance where people assess variations in equity brought about by IT implementation at three levels, namely at their own individual level, at the organization level, and at referent group level. People resist when they perceive inequity. Marakas and Hornik (1996) presented a model of passive-aggressive responses because of stresses caused by a new system. Finally, Martinco et al. (1996) proposed an attributional model of resistance caused by multiple stimuli. Taxonomy research shows that when implementing ISS policies, organizations need to consider the beliefs and attitudes of their employees because IT projects affect changes in the organizational environment and culture causing anxiety and resistance in employees (Thomson et al., 2006).

In the ISS literature, few studies have examined the role of resistance in implementing ISS policies (Belanger et al., 2011; Merhi & Ahluwalia, 2015). Opposition to the ISS change may manifest by incorporating only the minimum requirements and/or waiting until the last minute to comply with the required changes. In a mandatory setting, resistance to change may include voicing opposition, formally protesting, complaining, and demanding the withdrawal of the change (Lapointe & Rivard, 2005). A spectrum of reactions may occur when the compliance is enforced, ranging from compliance to resistance, and a positive attitude towards mandatory changes decreases resistance (Belanger et al., 2011). Even though an organization may succeed in successful implementation of ISS policies by strict enforcement, the resulting resistance may cause collateral harm (Lapointe & Rivard, 2005).

2.2 Norms: Moral and Descriptive

Social norms are standards of behaviour existing in a group of people. These norms are based on individual's perceptions about beliefs of important others in a group or what they themselves would do in the given situation (Ajzen & Fishbein, 1980). Descriptive norms are the beliefs about what is being done by most others in one's social group (Cialdini et al., 1990). Moral norms are individual's "feelings of moral obligation or responsibility to perform, or refuse to perform, a certain behaviour" (Ajzen, 1991, p. 199). A distinction, however, needs to be made between personal and moral norms (Ajzen, 1991). Whereas moral norms are perceptions about moral approval by a generalized social agent, personal norms can include one's own moral beliefs (Fishbein & Ajzen, 2010).

Research shows that the descriptive norms are responsible for affecting individuals' behaviour in various domains such as littering (Kallgren et al., 2000), energy conservation (Goldstein et al., 2008), alcohol use (Rimal & Real, 2005), and student gambling (Larimer & Neighbors, 2003). Many studies found that descriptive and injunctive norms separately and independently influenced individual behaviour (Conner & McMillan, 1999; Parker et al., 1995). The criminology research shows that norms are a much more effective means of improving compliance of individuals as compared to punitive deterrents (Tyler, 1990).

The role of moral norms in influencing individuals' behaviour has also been examined extensively in the sociology and social psychology literature. Moral norms is recognized as an important factor in regulating individuals' compliance decisions and behaviours (Tyler & Lind, 1992). The expectation of employees to ISS is akin to good citizenry, thus it involves ethical dimensions when taking decision in the context of ISS compliance. In this paper, we explore whether moral and descriptive norms mediate the relationships between organizational punishment factors and resistance to ISS. We also investigate whether moral norms are influenced by descriptive norms.

2.3 Organizational punishment

Organizational punishment is used as a deterrent to reduce undesirable behaviour of employees (Ball et al., 1994). Managers need to control employees' behaviour when employees' individual interests and goals are not in harmony with organizational goals (Eisenhardt, 1989). It is often argued that the risk of receiving punishment discourages employees to take forbidden actions, but the findings of many studies that have examined this issue are mixed. Ball et al. (1994) argued that the research on organizational punishment has often led to contradictory conclusions and uncertain results.

Drawing from the GDT (Blumstein, 1978), IS scholars (e.g. Hoffer & Straub, 1989; Moody et al., 2018; Straub, 1990; Straub & Welke, 1998) have examined the role of punishment on employees' ISS behaviours. ISS scholars used two independent and distinct punishment factors, namely perceived certainty of detection and perceived severity (Herath & Rao, 2009a; 2009b; D'Arcy et al., 2009; Sims, 1980; Siponen et al., 2010; Vance et al., 2012). Although the GDT puts forward certainty of punishment as one of the deterrent factors, ISS research has consistently used certainty of detection instead of certainty of punishment. Organizations emphasize detection of non-compliance of ISS policies by deploying multiple mechanisms such as firewalls, password compliance checkers, etc. (Kankanhalli 2003; Herath & Rao 2009a,b). Therefore, in the ISS context, certainty of detection has been considered as a more appropriate deterrent factor than certainty of punishment (Kankanhalli 2003; Herath & Rao 2009a,b). Different results were found in these studies. D'Arcy et al. (2009), Vance et al. (2012), and Siponen et al. (2010) found that severity of penalty increased ISS compliance, consistent with GDT. However, Herath and Rao (2009a; 2009b) found that severity reduced ISS compliance intention. Moody et al. (2018) found no significant impact of penalty on ISS compliance. Differences were also found on the effect of certainty of detection on ISS compliance in Herath and Rao (2009a; 2009b) and D'Arcy et al. (2009). Whereas Herath and Rao (2009a; 2009b) found a positive direct relationship between detection certainty and ISS compliance, D'Arcy et al. (2009) and Moody et al. (2018) found a non-significant negative relationship.

The divergent conclusions reached by the previous studies on the role of punishments as deterrents in the context of ISS policy compliance call for additional research to shed more light on this phenomenon. Herath and Rao (2009a) and Moody et al. (2018) argue that the role of penalties in shaping ISS compliance is unclear and requires further research. In this paper, we posit that punishment factors indirectly influence resistance to ISS through normative factors namely descriptive and moral norms. To the best of our knowledge, no previous paper has examined the effect of punishment severity and certainty of detection on these normative factors.

3. Theoretical Background and Research Hypotheses

The GDT is based on the rational choice perspective, according to which people behave in order to maximize their gains and minimize their losses (Blumstein, 1978; Gibbs, 1975). In accordance with this theory, the concept of punishments and sanctions can be used to control criminal behaviour. Consistent with this principle, Tyler (1990) articulated the instrumental perspective of why people follow the law. According to this perspective, people decide whether to adopt a certain behaviour based on their assessment of tangible, immediate gains or losses linked to that behaviour. Policy makers have used this doctrine to frame laws and rules that mandate losses for illegal behaviour. The implication underlying the conceptual moorings of the GDT is that a criminal behaviour can be reduced by imposing greater punishment. The GDT provides three instruments for regulating the perceived degree of punishment. These are: perceived punishment severity, perceived punishment certainty, and perceived swiftness of punishment (celerity). In the ISS context, perceived certainty of detection has been used instead of perceived punishment certainty. Thus, even outside the field of criminology, the GDT provided a basis for designing policies, by imposing sanctions, to dissuade undesirable behaviour. According to Arvey and Ivancevich (1980), punishments are very effective in effecting behavioural change (p. 131), and Johnston (1972) (p. 1051) suggests that punishments, when properly used, can bring about faster and durable changes in behaviour. It is therefore natural that the GDT was used as a reference theory to study employees' behaviour in the context of ISS policy violations.

To dissuade employees from committing undesirable behaviours, managers use punishment as a deterrent. Higgins (1997) argues that people are motivated by gains and tend to avoid losses. Organizational punishment can be considered as a form of social control that helps to establish group norms by identifying acceptable and unacceptable behaviours (O'Reillys & Puffer, 1989). In other words, organizational punishment emphasizes the appropriate behaviour by the members of a group. Punishment, when used as a legitimate deterrent, facilitates distinction between desirable and undesirable acts. When policies are clearly communicated and accepted by the group, they help consolidate such pronouncements into normatively acceptable behaviour. High certainty of detection and severe punishments on specific behaviours communicate to the concerned individuals which are the acceptable (right) and unacceptable (wrong) behaviours. Accordingly, most studies examining ISS policy compliance modelled punishment factors as direct antecedents of behavioural intentions.

Research shows that in many situations, punishment does not act as a direct deterrence (Strelan & Boeckmann, 2006; Tyler, 1990). For example, severity of punishment is inconsequential on people who believe that there is a little chance of detection of their non-compliant actions. In organizational settings, people are generally not extensively policed for their IT use; therefore, punishment deterrents may not "directly" affect their behaviour towards ISS policy compliance. In situations where monitoring of all actions of all the people may not be feasible, social norms may have a stronger influence on people's behaviour than the effect of punitive deterrents.

The notion that punishment factors impact descriptive norms has a theoretical foundation in Social Learning Theory (SLT) (Bandura, 1971). Bandura (1971) argued that individuals adjust their own behaviour by learning from others – what behaviour incurs penalties and what behaviour does not. Moreover, widely accepted regulatory mechanisms such as deterrent policies influence the general behaviour of most participants, cascading into shaping of behavioural

norms. If employees are made aware of the reasoning underlying the formal sanctions, then a general acceptance for these sanctions may occur, which in turn is likely to affect the descriptive norms and moral norms.

However, numerous empirical studies across different disciplines have raised questions about the universal applicability of the GDT in controlling individual behaviour because of their inconsistent results. The inconsistencies reported in the ISS literature were noted earlier in this paper. As a result, researchers have looked at the alternative explanations to explain the reported inconsistencies in various empirical studies. Tyler (1990) suggests that the fear of punishment is not the only reason why people comply with laws or policies; and that normative perspective offers an alternative explanation of people's behaviour related to compliance. The normative perspective has two dimensions; legitimacy and morality. According to the legitimacy principle, people think that those who have framed the policies are competent to do so. The normative perspective of compliance is grounded in the internal beliefs of individuals instead of being a cognitive assessment of gains and losses (Tyler, 1990). According to this perspective, individuals comply with policies because of their normative beliefs, not because of their self-interest. Grounded in the legitimacy principle, punishments may help shape the shared understanding (norms) of how different actions are to be performed; thus having an indirect effect on behaviour. Punishments, when used as legitimate deterrents, clearly communicate unacceptable behaviour to members. When policies are clearly communicated and accepted by the group, they help consolidate such pronouncements into normatively acceptable behaviour. Punishment can be considered as a form of social sanction that helps to establish group norms by identifying acceptable and unacceptable behaviours and emphasizes rules that should be followed by members (O'Reillys & Puffer, 1989).

Based on this discussion, we posit that:

H1.a: Punishment severity for violating ISS policies is positively related to the descriptive norms of ISS compliance.

H2.a: Certainty of detection for violating ISS policies is positively related to descriptive norms of ISS compliance.

Moral norms represent perceived beliefs of a generalized social agent that distinguish "right" from "wrong" and that may affect an individual's "feelings of moral obligation or responsibility to perform, or refuse to perform, a certain behavior" (Ajzen, 1991 p. 199). The role of moral norms in influencing individual behaviour has been examined extensively in the sociology and social psychology literature, and is recognized as an important factor in regulating individuals' compliance decisions (Tyler & Lind, 1992). The influence of moral judgment on people's behaviour is explained by Kohlberg's Theory of Cognitive Moral Development (Kohlberg, 1969), which describes six stages of moral reasoning classified from low to high in terms of moral judgment. Ajzen (1991) and Conner and Armitage (1998) suggested that moral norms are a useful addition to the TPB in order to explain behaviour because the social norms may only partially explain people's normative behaviour in the situations involving moral dimensions (Fishbein & Ajzen, 2010). Several scholars have recommended adding moral norms as an additional predictor of behaviour in situations comprising moral dimensions (Beck & Ajzen, 1991). Numerous studies found that the predictability of behavioural intentions improved by adding moral norms as an antecedent of behaviours in situations involving moral contexts;

examples being tax compliance (Riahi-Belkaoui, 2004) and environmental protection policy compliance (Stern, 1985). A more exhaustive list of such studies is provided in Fishbein and Ajzen (2010).

H1.b: Punishment severity for violating ISS policies is positively related to the moral norms of ISS compliance.

H2.b: Certainty of detection for violating ISS policies is positively related to the moral norms of ISS compliance.

Descriptive norms refer to individuals' belief about what most people do in a particular situation. In other words, descriptive norms reflect a person's rationale for a certain action by this reasoning: "if a lot of people are doing this, then it's probably a wise thing to do" (Cialdini, 2007). This norm focuses on the tendency that an individual may have to replicate the believed behaviour and attitudes of others (Sheeran & Orbell, 1999). According to Nemeth and Goncalo (2004), the influence of majority has been extensively researched in social psychology. In fact, several studies show that people think they are in error, even when they were right, when their actions did not conform to that of the majority (Asch, 1956). Thus, among employees, the effect of beliefs about others' behaviours can be expected to affect their moral norms. Based on this reasoning, we posit that:

H.3: Descriptive norms for violating ISS policies is positively related to the moral norms of ISS compliance.

H.4: Descriptive norms for violating ISS policies is negatively related to the employees' resistance of ISS policies.

Moral norms are implicit group standards that distinguish right versus wrong (Conner & Armitage, 1998). As discussed earlier, resistance is a consequence of threat of lost freedoms (Edwards et al., 2002). In absence of moral norms, an individual facing resistance is likely to take actions to remove the threats to their freedoms. However, moral forces imbibed by people may act to diminish or aggravate the resistance based on how the group norms are framed. For example, most air passengers are seen cooperating with security agencies when entering airports despite the fact that going through these procedures adds to their travel time and sometimes even risks missing their planes. In fact, most travellers forego their concerns (resistance) for privacy as they subject themselves to deeply intrusive checks by security agencies. This is because despite the additional steps now required to undertake air travel, people in general have imbibed a common standards of right and wrong behaviour.

A distinction needs to be made between moral norms and personal norms. Ajzen (1991) introduces this concept as "personal and moral norms." The concept of moral norm is more general than the personal norm, as the latter taps into their own sense of personal obligation (as opposed to important others) of whether they should or should not perform a certain action (Fishbein & Ajzen, 2010 p. 285). The moral norm, on the other hand, refers to the belief whether "important others" should perform an action. A personal moral obligation may be influenced by contextual or personalized factors in additional to the more general belief about right and wrong.

Siponen (2000) suggested that ISS policies should take into account the notion of morality and that they *should* appear to be moral to the employees. Few subsequent studies reported empirical support for the predictability of moral belief in effecting ISS policy

compliance intention (Hu et al., 2011; Vance et al., 2012). In light of the foregoing discussion, this study posits that:

H.5: Moral norms of ISS compliance is negatively related to the employees' resistance of ISS policies.

We used gender, age, experience, education, industry, organizations' size, and job type as control variables.

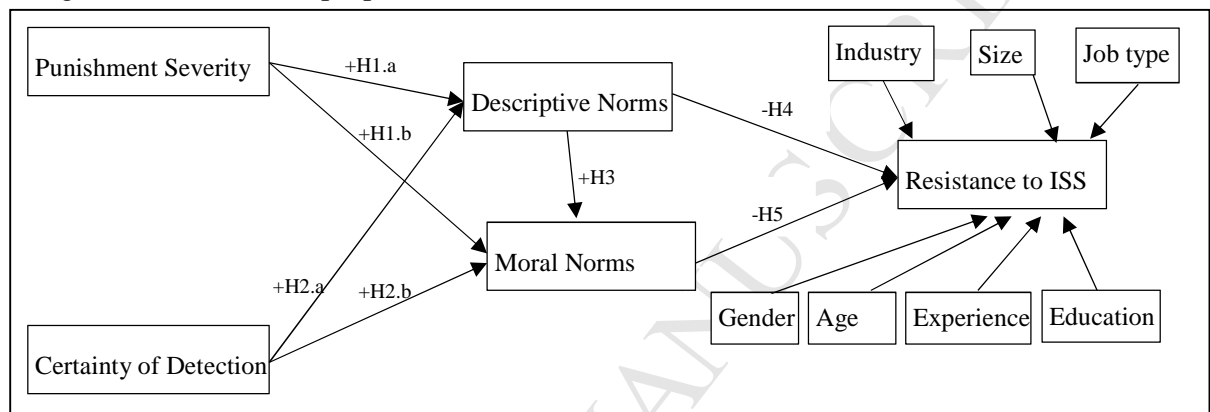Figure 1 illustrates the proposed research model.

Figure 1. Proposed Research Model

4. Methodology

4.1. Research Method and Data Collection

We used the survey method to collect the data. The sampling frame comprised of employees working in four different industries, namely education, financial, retail, and IT. The employees of ten organizations located in the South-Western United States provided the data. Two criteria were used to determine the fitness of organizations for data collection; first, the organization must have formally developed and published ISS policies; and second, the employees in the organizations must be aware of the compliance requirements of the ISS policies. The managers working at the higher levels of hierarchy in the ten organizations assisted in distributing the questionnaires to other employees in their organizations. No incentive was offered for participating in the survey. Moreover, the letter accompanying the survey clearly clarified to the respondents that their participation was voluntary. A total of 219 survey instruments were distributed, out of which 133 completed questionnaires were received yielding an overall response rate of 61%. Table 1 shows the respondents' demographic information.

9

Table 1: Participants Demographics

Measure	Frequency	Percentage
Age		
18-24	41	30.9
25-34	49	36.8
35-44	20	15.0
45-54	15	11.3
55-64	7	5.3
Education (highest level achieved)		
High School	45	33.8
College	64	48.1
Master	19	14.3
Doctoral	4	33.0
Job Type		
Operational	94	70.7
Tactical	12	9.0
Strategical	25	18.8
Job Experience		
0-1 years	17	12.8
2-5 years	45	33.8
6-10 years	29	21.8
10-20 years	25	18.8
>20 years	17	12.8
Size of Organization		
<500 Employees	65	48.9
500-999	7	5.3
1000-4999	21	15.8
5000-10000	4	3.0
>10000	30	22.6
Industry Type		
Education	56	42.1
Financial	45	33.8
Retail	21	15.8
IT	11	8.3

4.2. Measures

In order to establish rigorous measurement of the manifest variables, the instrument development process followed the prescriptions recommended in the seminal articles focused on enhancing validity of measurements in positivist studies (Straub et al., 2004). In accordance with the established conventions, the measures used in this study are based on previously validated measures in the published literature. The scale items for severity of punishment and descriptive

norms were adopted from Herath and Rao (2009a). The measures for certainty of detection were adopted from Bulgurcu et al. (2010). The scale items for moral norms were adopted from Li et al. (2010). The measures for resistance to ISS were derived from Oreg (2006). To promote consistency of the survey items, all items were designed as seven-point Likert scales ranging from "Strongly disagree" to "Strongly agree." The measures used in this study are included in Appendix A. All constructs were modeled as reflective.

Prior to actual data collection, the survey instrument was pre-tested in order to establish the content and face validities of the construct measures (Churchill, 1979; Straub, 1989). Four IS doctoral students, six faculty of Information Systems at a major university, and eleven IT and ISS practitioners participated in the pre-test. All these participants possessed adequate domain knowledge of IS and understood the potential implications of non-compliance of the ISS policies for organizations. After pretesting the instrument, a pilot test was conducted in order to assess the validity and reliability of the measures. Forty-eight employees of a major university participated in the pilot test. The reliability and validity of the measures were examined by analysing the data collected in the pilot test. Based on the results of the analyses of pilot-test data, few measurement items were further refined. At the end of this step, the instrument was ready for final data collection.

5. Data Analysis and Results

The data collected from the survey instrument were subjected to various statistical tests. We first executed descriptive analysis tests. After this, we checked for construct validity, convergent validity, and discriminant validity. We finally assessed the causal model and common method bias.

5.1. Descriptive Analysis

Table 2 presents descriptive statistics of the constructs used in this research. Results indicate that users responded negatively to resistance to ISS. As is obvious from this table, all the averages of the antecedents constructs exceeded 5.48 out seven. The participants of this study responded positively to descriptive norms, moral norms, certainty of detection, and punishment severity. Moral norms seems to be important for the individuals participating in this study.

Table 2: Descriptive Statistics

Constructs	Mean	Standard Deviation
Descriptive	5.85	1.18
Moral	6.37	0.87
Certainty	5.48	1.31
Resistance	2.35	1.64
Severity	5.48	1.32

5.2. Measurement Model Assessment

We used Partial least squares (PLS) to assess the psychometric properties of the scales. We analysed the internal consistency using composite reliabilities and Chronbach's alpha. The reliability coefficients of all the constructs ranged from 0.87 to 0.98 and the coefficients of the

Chronbach's alpha ranged from 0.79 to 0.97 all above 0.70 indicating that the items are reliable measures for their perspective constructs (Barclay, et al., 1995; Chin, 1998; Vinzi et al., 2010). Results also showed that the AVE values of all constructs are equal or higher than the threshold of 0.5 which demonstrate adequate convergent validity (Hair et al., 2010). The results are displayed in Table 3.

Table 3: Measurement Quality Indicators

Latent Construct	Item	Loading	t Value	AVE	Composite Reliability	Cronbach's Alpha
Certainty	Certainty1	0.809	27.560	0.696	0.873	0.786
	Certainty2	0.838	17.583			
	Certainty3	0.856	20.633			
Descriptive	Descriptive1	0.841	24.698	0.764	0.928	0.897
	Descriptive2	0.899	42.562			
	Descriptive3	0.853	17.426			
	Descriptive4	0.901	37.298			
Moral	Moral1	0.875	32.215	0.746	0.898	0.830
	Moral2	0.825	11.971			
	Moral3	0.891	30.029			
Resistance	Resistance1	0.957	80.488	0.925	0.980	0.973
	Resistance2	0.971	117.908			
	Resistance3	0.966	105.636			
	Resistance4	0.954	69.676			
Severity	Severity1	0.961	73.848	0.940	0.979	0.968
	Severity2	0.977	151.947			
	Severity3	0.970	134.347			

Results also indicated that the measures used in this study possess high convergent validity as the items loaded highly (greater than 0.70) on their respective factors. Results are displayed in Table 4.

Table 4: Cross loadings of items

	Descriptive	Moral	Certainty	Resistance	Severity
Certainty1	0.593	0.329	**0.809**	-0.063	0.348
Certainty 2	0.370	0.334	**0.838**	-0.045	0.197
Certainty 3	0.442	0.277	**0.856**	0.099	0.327
Descriptive1	**0.841**	0.301	0.485	-0.179	0.263
Descriptive 2	**0.899**	0.374	0.502	-0.176	0.360
Descriptive 3	**0.853**	0.307	0.473	-0.111	0.261
Descriptive 4	**0.901**	0.416	0.555	-0.149	0.307
Moral1	0.336	**0.875**	0.272	-0.346	0.177

12

Moral2	0.277	**0.825**	0.345	-0.275	0.044
Moral3	0.425	**0.891**	0.364	-0.256	0.244
Resistance1	-0.170	-0.282	-0.050	**0.957**	0.031
Resistance2	-0.157	-0.309	0.037	**0.971**	0.020
Resistance3	-0.183	-0.335	-0.029	**0.966**	0.030
Resistance4	-0.167	-0.363	0.002	**0.954**	-0.030
Severity1	0.324	0.221	0.357	0.020	**0.961**
Severity2	0.333	0.131	0.351	0.023	**0.977**
Severity3	0.341	0.182	0.331	-0.009	**0.970**

By comparing the square root of the AVE to the correlations among the constructs (Table 5), each construct was more closely related to its own construct than to the others, which simply means that discriminant validity adequately demonstrated in this study. Thus, results suggest that the scales demonstrate adequate psychometric properties.

**Table 5:** Inter-Construct Correlations and Discriminant Validity

Construct	Descriptive	Moral	Certainty	Resistance	Severity
Descriptive	**0.874**				
Moral	0.404	**0.864**			
Certainty	0.578	0.378	**0.834**		
Resistance	-0.176	-0.338	-0.010	**0.962**	
Severity	0.343	0.185	0.358	0.011	**0.969**

Note: Diagonal elements are the square roots of AVE. Off-diagonal elements are correlations among constructs. For discriminant validity, diagonal elements should be larger than off-diagonal elements.

5.3. Structural Model Assessment and Hypotheses Testing

We also used PLS (SmartPLS 3) to assess the hypothesized relationships among the five latent constructs. The analysis results are graphically presented in Figure 2.

Figure 2. Model Results: Path Coefficients and R^2

13
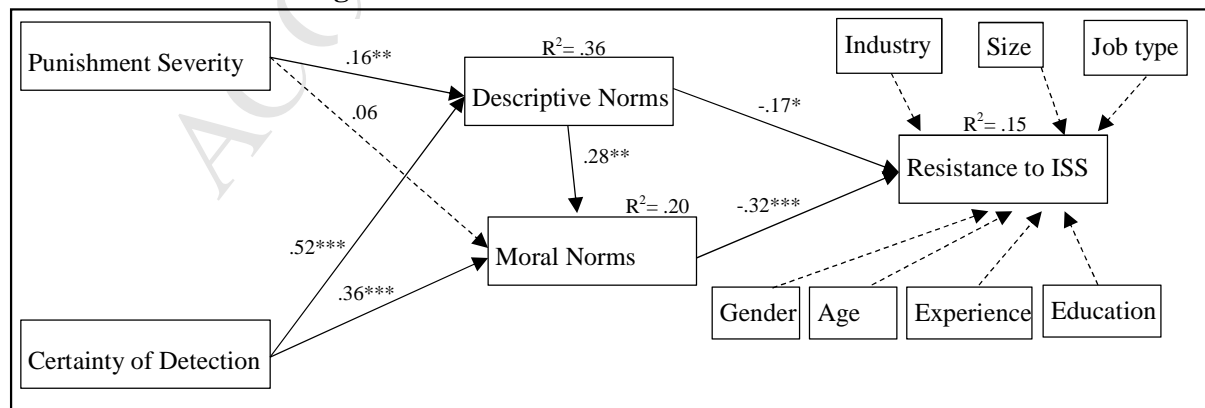
Note: ***: Significant at 0.001 level; ** at 0.05 level; * at 0.05 level; -----▶ Insignificant.

Figure 2 shows the path coefficients and the significance levels for each hypothesis as well as the variances for the three dependent constructs: descriptive norms, moral norms, and resistance to ISS policies. The significance of the paths was determined using the t-statistic and p-values generated by the bootstrapping technique.

The analysis of the data confirmed the hypothesized relationships between certainty of detection and descriptive norms (H2.a) and certainty of detection and moral norms (H2.b). The relationship between severity of punishment and descriptive norm (H1.a) was also supported by the data, but the relationship between the severity of punishment and moral norms (H1.b) was not supported by the data. The hypothesized relationship between descriptive norms and moral norms is significant (H3). The results support the hypothesis that moral norms negatively affects resistance towards ISS policies. The standardized coefficient of the relationship between moral norms and resistance (-0.317) is higher than that of the relationship between descriptive norms and resistance (-0.170), suggesting that moral norms exert greater negative influence on resistance to ISS policies. None of the control variables was found to have a significant impact on resistance to ISS policies.

5.4. Common Method Bias

We assessed the threat of common methods bias (Podsakoff et al., 2003; Straub et al., 2004). We first followed suggestions proposed by Podsakoff et al. (2003) by taking steps to assure the participants that their responses would be kept anonymous. We conducted two independent analyses to assess the effect of common methods bias. Kock (2015) argues that "The occurrence of VIF greater than 3.3. is proposed as an indication of pathological collinearity, and also as an indication that a model may be contaminated by common method bias. Therefore, if all "factor-level" VIFs resulting from a full collinearity test are equal to or lower than 3.3., the model can be considered free of common method bias" (Kock, 2015, p.7). We executed the collinearity test in SmartPLS and found that all the values are less than 3.3. The values of the VIF are 1.69 for certainty, 1.18 for severity, 1.78 for descriptive, and 1.53 for moral norms. We also examined the construct correlation matrix to check whether any two constructs correlate extremely highly (greater than 0.90) (Pavlou & Fygenson, 2006). Spurious covariance caused by methodological bias can inflate observed correlations between measures (Campbell & Fiske, 1959). The correlation matrix (table 5) does not indicate any highly correlated factors. The highest correlation is equal to 0.57. The results suggest that methodological bias did not distort the findings reported in this paper.

6. Discussion

Several studies show that behavioural factors are important to address the challenge of ISS in organizations. Organizations develop ISS policies to guide and assess employees' behaviour in order to prevent undesirable effects that may be caused by the incidents of ISS breaches. This paper highlights the role of resistance towards ISS policy as an important construct in achieving acceptable levels of compliance of ISS policies. The resistance literature shows that resistance is often caused by stimuli requiring people to change their behaviour. The

conditions imposed by organizations on their employees to comply with ISS policies can act as stimuli generating resistance in employees' behaviour toward the underlying cause of the stimuli. Therefore, we suggest that resistance is an overlooked, but pertinent factor in the research of ISS compliance.

This paper examines the role of organizational punishment and norms on employees' resistance to ISS policies. Most of the current literature focuses on intention to comply with ISS policies as the main dependent variables. A number of previous studies postulated that organizational punishment factors - namely, certainty of detection and punishment severity - directly and positively influence employees' intention to comply with ISS policies (Bulgurcu et al., 2010; D'Arcy et al., 2009; Straub, 1990). These studies reported inconsistent findings; some found punishment factors to be significant antecedents of employees' compliance intentions, and others reported no effect of punishment on compliance intention (Herath and Rao, 2009a; 2009b; Pahnila et al., 2007). This inconsistency in the literature require research to explore other potential types of relationships among the relevant factors. This paper explores the indirect impact of organizational punishment factors on ISS resistance through normative factors; namely descriptive and moral norms.

The GDT suggests that undesirable behaviours (e.g. crimes, IS con-compliance, piracy) can be deterred by certain and severe sanctions (Williams & Hawkins, 1986). When the probability of being caught not following the rule is high and the sanction is severe, potential violators will be deterred from committing undesirable acts (Blumstein, 1978; Hoffer & Straub, 1989). By widely communicating policies that clearly state consequences of not complying with IS policies, employees perceive policies to be the "right" thing to do.

This paper is distinct from the existing literature because punishment factors (punishment severity and certainty of detection) are postulated to exert an indirect influence on resistance to ISS through normative factors; namely, the descriptive and moral norms. The analysis of the data confirmed the hypothesized relationships between certainty of detection and descriptive norms (H2.a) and certainty of detection and moral norms (H2.b). The SLT asserts that people learn by observing others' attitudes and behaviours (Bandura & Simon, 1977). Certainty of detection can go a long way in affecting people avoiding situations that may put them at risk of receiving penalties, in-turn manifesting information of shared beliefs and norms (Bandura & Simon, 1977). To the best of our knowledge, this is the first paper that examined these relationships. The relationship between severity of punishment and descriptive norm (H1.a) was also supported by the data, but the relationship between the severity of punishment and moral norms (H1.b) was not supported by the data. Because moral norms are grounded in ethical dimensions, they are more affected by certainty of detection instead of severity of punishment. People are conscious about doing the right thing; moreover, they also want to be seen as doing the right thing. Therefore, certainty of detection, rather than severity of punishment, affects the moral norms.

The hypothesized relationship between descriptive norms and moral norms is significant (H3). The results show the importance of descriptive norms in affecting moral norms. Descriptive norms represent individual beliefs about what most others will do in a particular situation (Cialdini, 1991). The SLT suggests that individuals learn by observing others' attitudes and behaviours (Bandura & Simon, 1977). Extant literature across disciplines has shown that descriptive norms have a direct and positive statistical impact on individual's intention towards a certain behaviour (Nolan et al., 2008; Schultz, 1999). No study has examined the impact of

descriptive norms on moral norms. The data supported our hypothesis and thus the findings of this study contribute to the current literature.

The results support the hypothesis that moral norms negatively affects resistance towards ISS policies. The standardized coefficient of the relationship between moral norms and resistance (-0.317) is higher than that of the relationship between descriptive norms and resistance (-0.170), suggesting that moral norms exert greater negative influence on resistance to ISS policies. Resistance is a consequence of threat of lost freedoms (Edwards et al., 2002). Moral norms are aligned to desirable outcomes. Thus, moral forces imbibed by employees may act to diminish the resistance.

The postulated relationship between descriptive norms and moral norms (H3) is also confirmed. As descriptive norms represent the understanding about what most others do in a given situation, it also affects the shared understanding of the "correctness" of such behaviour.

7. Implications

7.1. Implications for Research

This paper makes significant contributions to theory. Numerous reports indicate that users' non-adherence to ISS policies remain a challenge because users cause the majority of the data breaches inside organizations. When implemented, ISS policies require behavioural changes in the way IT is used requiring IS users' to resist these policies. Accordingly, this paper looks into the "resistance" paradigm to understand the employee behaviour. Most research considers GDT as the main instrument that is available to the organizations in order to improve employees' compliance of the ISS policies. Research, however, shows that punishment factors are not always effective in directly improving ISS policy compliance. As such, the research community needs to seek out better theoretical explanations for inconsistency of GDT factors in improving employees' adherence to organization policies, especially the ISS policies. Accordingly, this paper advances the existing research in the ISS stream by investigating more cogent explanations of employees' behaviour that are grounded in established theories. In this respect, we take into account the legitimacy and morality paradigms first advanced by Tyler (1990) in the criminology literature. Then, we also examined the effect of moral norms on reducing employee resistance towards the ISS policies. The results show that the moral norms are not only a significant antecedent (negative effect) of employee resistance, but were also more effective (β=-0.32) in comparison to the descriptive norms (β=-0.17). Eminent scholars have suggested that people's behaviour can be better explained by adding moral norms to the TPB (Beck & Ajzen 1991). Finally, the present paper also investigates in the inter-relationship between the GDT and TPB theories in order to explain employee behaviour towards compliance of ISS policies.

7.2. Implications for Practice

This paper also makes substantive contributions to practice. The results on the effects of punishment severity and punishment certainty on normative factors have important implications for practitioners. By widely communicating policies that clearly state consequences of violating required behaviour, IS users know what is expected from them and large number of them fall in line. Stories of employees who received organizational punishment because of non-compliance can be spread-using blogs, newsletters, and e-mails, so others become aware of the consequences of non-compliance. This makes employees know that ISS policies is the right thing to do and

others around are applying these policies and not resisting them. Based on this, we believe that this study is a crucial contribution to theory and practice.

8. Limitations and Future Research

Although this paper makes substantive contributions, its limitations need to be acknowledged. These limitations also offer opportunities or future research. First, the sample was collected from organizations located in the Southern Western part of the United States. In order to confirm the generalizability of the findings, the model proposed in this study may need to be validated in diverse settings. Validating this model in other locations/countries and considering the culture will definitely enrich the body of knowledge and enhance our understanding of the factors impacting ISS resistance. Power Distance is one of the cultural factors that may affect people's resistance towards the ISS policies differently. Thus, future research may examine the moderator effect of power distance on the hypotheses presented in this study. Secondly, parsimony of the research model was emphasized in order in order to focus on the relationships between the main constructs. Finally, employee resistance can be a function of what is contained in the ISS policies. This paper, however, examines the role of social norms in managing employee resistance towards the ISS policies. We call for additional research that examines the characteristics of ISS policies and their effect of employee resistance.

9. Conclusion

This paper examines the role of behavioural resistance of employees in understanding compliance of ISS policies in organizations. Most existing research in the ISS stream focuses on the intentions of individuals to comply with organizational ISS policies, premised on the assumption that people face free choices and their actions are volitional. This is not quite the case in the real world as organizations "require" employees to adhere to the established policies. Therefore, this paper argues that employees' resistance towards the ISS policies may be an important factor underlying high levels of ISS incidents reported by various studies. This paper seeks to bridge an important gap in the existing literature on ISS because very little research has examined the role of employees resistance towards IS policies (Belanger et al., 2011; Merhi & Ahluwalia, 2015).

References

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*, Prentice-Hall, Englewood Cliffs, NJ.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179-211.

Alcivar, I., & Abad, A. G. (2016). Design and evaluation of a gamified system for ERP training. *Computers in Human Behavior*, *58*, 109-118.

Anderson, C.L. & Agarwal, R. (2010). Practicing safe computing: A multimedia empirical examination of home computer user security behavioral intentions. *MIS Quarterly*, *34*(3):613-643.

Arvey, R. D., & Ivancevich, J. M. (1980). Punishment in organizations: a review, propositions, and research suggestions. *Academy of Management Review*, *5*(1), 123-132.

Asch, S. E. (1956). Studies of independence and conformity: I. A minority of one against a unanimous majority. *Psychological Monographs: General and Applied*, 70(9), 1-70.

Ball, G. A., Trevino, L. K., & Sims Jr., H. P. (1994). Just and unjust punishment: influences on subordinate performance and citizenship. *Academy of Management Journal*, *37*(2), 299-322.

Bandura, A. K. (1971). *Social learning theory*. Stanford University Press, Palo Alto, California.

Bandura, A., & Simon, K. M. (1977). The role of proximal intentions in self-regulation of refractory behavior. *Cognitive Therapy and Research*, *1*(3), 177-193.

Barclay, D., Thompson, R., & Higgins, C. (1995). The partial least squares (PLS) approach to causal modeling: Personal computer adoption and use as an illustration. *Technology Studies*, *2*, 285-309.

Beck, L. & Ajzen, I. (1991). Predicting dishonest actions using the theory of planned behavior. *Journal of Research in Personality*, *25*(3), 285-301.

Belanger, F., Collignon, S., Enget, K., & Negangard, E. (2011). User resistance to the implementation of a mandatory security enhancement. *The Dewald Roode Workshop on Information Systems Security Research,* IFIP WG8.11/WG11.13, Virginia Tech, Blacksburg, Virginia.

Bhattacherjee, A., & Hikmet, N. (2007). Physicians' resistance toward healthcare information technology: A theoretical model and empirical test. *European Journal of Information Systems*, *16*(6) 725-737.

Blumstein, A. (1978). *Introduction*, Blumstein, A., Cohen, J., Nagin, D., Deterrence and incapacitation: estimating the effects of criminal sanctions on crime rates. National Academy of Sciences, Washington, DC.

Botetzagias, I., Dima, A. F., & Malesios, C. (2015). Extending the theory of planned behavior in the context of recycling: the role of moral norms and of demographic predictors. *Resources, Conservation and Recycling*, *95*, 58-67.

Bulgurcu, B., Cavusoglu, H., & Benbasat. I. (2010). Information security policy compliance: An empirical study of rationality–based beliefs and information security awareness. *MIS Quarterly*, *34*(3), 523-548.

Chin, W. W. (1998). *Modern methods for business research*, in The Partial Least Squares Approach for Structural Equation Modeling, G. A. Marcoulides, Ed., ed Mahwah, NJ.

Churchill Jr, G. A. (1979). A paradigm for developing better measures of marketing constructs. *Journal of Marketing Research*, *16*(1), 64-73.

Cialdini, R. B., Reno, R. R., & Kallgren, C. A. (1990). A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. *Journal of personality and social psychology*, *58*(6), 1015-1026.

Cialdini, R. B., Kallgren, C. A., & Reno. R. R. (1991). A Focus theory of normative conduct: A theoretical refinement and reevaluation of the role of norms in human behavior. *Advances in Experimental Social Psychology*, *24*(20), 201-234.

Cialdini, R. B. (2007). Descriptive social norms as underappreciated sources of social control. *Psychometrika*, *72*(2), 263-268.

Conner, M., & Armitage, C. J. (1998). Extending the theory of planned behavior: A review and avenues for further research. *Journal of Applied Social Psychology*, *28*(15), 1429-1464.

Conner, M., & McMillan, B. (1999). Interaction effects in the theory of planned behaviour: Studying cannabis use. *British Journal of Social Psychology*, *38*(2), 195-222.

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.

Edwards, S. M., Li, H., & Lee, J.-H. (2002). Forced exposure and psychological reactance: Antecedents and consequences of the perceived intrusiveness of pop-up ads. *Journal of Advertising*, *31*(3), 83-95.

Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy of Management Review*, *14*(1), 57-74.

Ernst and Young (2011). Into the cloud, out of the fog: global information security survey. Available at: https://www.techzim.co.zw/wp-content/uploads/ey-global-information-security-survey-zimbabwe-report-6-december-2011.pdf.

Fishbein M., & Ajzen, I. (2010). Predicting and changing behavior: The reasoned action approach. Taylor & Francis.

Gibbs, J. P. (1975). *Crime, punishment, and deterrence*. Elsevier, New York, NY.

Goldstein, N. J., Cialdini, R. B., & Griskevicius, V. (2008). A room with a viewpoint: Using social norms to motivate environmental conservation in hotels. J*ournal of consumer research*, *35*(3), 472-482.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis: A global perspective* (7th ed.). Upper Saddle River: Prentice Hall. Pearson.

Hair, J., Hollingsworth, C.L., Randolph, A.B., & Chong, A. Y. L. (2017). An updated and expanded assessment of PLS-SEM in information systems research, *Industrial Management & Data Systems*, *117*(3), 442-458.

Herath, T., & Rao, H. R. (2009a). Encouraging information security behaviors in organizations: Role of penalties, pressures and perceived effectiveness. *Decision Support Systems*, *47*(2), 154-165.

Herath, T., Rao, H. R. (2009b). Protection motivation and deterrence: A framework for security policy compliance in organisations. *European Journal of Information Systems*, *18*(2), 106-125.

Higgins, E. T. (1997). Beyond pleasure and pain. *American Psychologist*, *52*(12), 1280-1300.

Hoffer, J., & Straub, D. W. (1989). The 9 to 5 underground: Are you policing computer crimes? *Sloan Management Review*, *30*(4), 35-43.

Hsieh, P. J. (2016). An empirical investigation of patients' acceptance and resistance toward the health cloud: The dual factor perspective. *Computers in Human Behavior*, *63*, 959-969.

Hu, Q., Xu, Z., Dinev, T., & Ling, H. (2011). Does deterrence work in reducing information security policy abuse by employees?. *Communications of the ACM*, *54*(6), 54-60.

Hwang, I., & Cha, O. (2018). Examining technostress creators and role stress as potential threats to employees' information security compliance. *Computers in Human Behavior*, *81*, 282-293.

Ifinedo, P. (2012). Understanding information systems security policy compliance: An integration of the theory of planned behavior and the protection motivation theory. *Computers & Security*, *31*(1), 83-95.

Johnston, J. M. (1972). Punishment of human behavior. *The American Psychologist*, *27*(11), 1033-1054.

Kaiser, F. G., & Scheuthle, H. (2003). Two challenges to a moral extension of the theory of planned behavior: Moral norms and just world beliefs in conservationism. *Personality and Individual Differences*, *35*(5), 1033-1048.

Kallgren, C. A., Reno, R. R., & Cialdini. R. B. (2000). A focus theory of normative conduct: When norms do and do not affect behavior. *Personality and Social Psychology Bulletin*, *26*(8), 1002-1012.

Kim, H. W., & Kankanhalli, A. (2009). Investigating user resistance to information systems implementation: A status quo bias perspective. *MIS Quarterly*, *33*(3), 567-582.

Kohlberg, L. (1969). *Stages in the development of moral thought and action*. Holt, Rinehart and Winston, New York.

Kolkowska, E., & Dhillon, G. (2013). Organizational power and information security rule compliance. *Computers & Security*, (33:March), 3-11.

Kolkowska, E., Karlsson, F., & Hedström, K. (2017). Towards analysing the rationale of information security non-compliance: Devising a Value-Based Compliance analysis method. *The Journal of Strategic Information Systems*, *26*(1), 39-57.

Krazit, T. (2016). Employees are the weakest link in computer security. Available at: http://fortune.com/2016/06/20/employees-computer-security/

Kube, S. & Traxler, C. (2011). The interaction of legal and social norm enforcement. *Journal of Public Economic Theory*, *13*(5), 639-660.

Lapointe, L., & Rivard, S. (2005). A multilevel model of resistance to information technology implementation. *MIS Quarterly*, *29*(3), 461-491.

Larimer, E., & Neighbors, C. (2003). Normative misperception and the impact of descriptive and injunctive norms on college student gambling. *Psychology of Addictive Behaviors*, *17*(3), 235-243.

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.

Liang, H., Xue, Y., & Wu, L. (2012). Ensuring employees' it compliance: Carrot or stick? *Information Systems Research*, *24*(2), 279-294.

Merhi, M. I., & Midha, V. (2012). The impact of training and social norms on information security compliance: A pilot study. In *International Conference of Information Systems (ICIS) 2012*, Orlando, FL.

Merhi, M.I., & Ahluwalia, P. (2013). Information security policies compliance: The role of organizational punishment. *Proceedings of Americas Conference on Information Systems*, Chicago, Illinois

Merhi, M.I., & Ahluwalia, P. (2014). Country environments and e-commerce adoption: A cross-country analysis. *Proceedings of Decision Sciences Institute*, Tampa, Florida

Merhi, M.I., & Ahluwalia, P. (2014). The role of punishment and task dissonance in information security policies compliance. *Proceedings of Americas Conference on Information Systems*, Savannah, Georgia

Merhi, M.I., & Ahluwalia, P. (2015). Top management can lower resistance toward information security compliance. *Proceedings of International Conference on Information Systems* 2015, Fort Worth, Texas.

Merhi, M.I., Ahluwalia (2018). Moral and subjective norms: How do they effect information security compliance? *Proceedings of Americas Conference on Information Systems*, New Orleans, Louisiana.

Moody, G. D., Siponen, M., & Pahnila, S. (2018). Toward a unified model of information security policy compliance. *MIS Quarterly*, *42*(1), 285-311.

Nemeth, C., & Goncalo, J. (2004). Influence and Persuasion in Small Groups. *UC Berkeley: Institute for Research on Labor and Employment*. Retrieved from https://escholarship.org/uc/item/9n8060j4

Nolan, J. M., Schultz, P. W., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2008). Normative social influence is underdetected. *Personality and Social Psychology Bulletin*, *34*(7), 913-923.

O'Reillys, C. A., & Puffer, S. M. (1989). The impact of rewards and punishments in a social context: A laboratory and field experiment. *Journal of Occupational Psychology*, *62*(1), 41-53.

Oreg, S. (2006). Personality, context, and resistance to organizational change. *European Journal of Work and Organizational Psychology*, *15*(1), 73-101.

Pahnila, S., Siponen, M., & Mahmood, A. (2007). Employees' behavior towards is security policy compliance. In *40th Annual Hawaii International Conference on System Sciences (HICSS)* Waikoloa, HI.

Parker, D., Manstead, A. S. R., & Stradling, S. G. (1995). Extending the theory of planned behaviour: The role of personal norm. *British Journal of Social Psychology*, *34*(2), 127-138.

Podsakoff, P. M., MacKenzie, S. B., Lee, J-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of applied psychology*, *88*(5), 879-903.

Ponemon Institute (2016). Sixth annual benchmark study on privacy & security of healthcare data. Available online at: https://www.ponemon.org/local/upload/file/Sixth%20Annual%20Patient%20Privacy%20%26%20Data%20Security%20Report%20FINAL%206.pdf

Ponemon, L. (2017). 2017 Ponemon Institute cost of a data breach study. Available online at: https://securityintelligence.com/media/2017-ponemon-institute-cost-of-a-data-breach-study/

PWC (2017). The global state of information security survey 2018. Available online at: https://www.pwc.com/us/en/cybersecurity/information-security-survey.html

Riahi-Belkaoui, A. (2004). Relationship between tax compliance internationally and selected determinants of tax morale. *Journal of International Accounting, Auditing and Taxation*, *13*(2), 135-143.

Rimal, R. N., & Real, K. (2005). How behaviors are influenced by perceived norms: A test of the theory of normative social behavior. *Communication Research*, *32*(3), 389-414.

Safa, N. S., & Von Solms, R. (2016). An information security knowledge sharing model in organizations. *Computers in Human Behavior*, *57*, 442-451.

Schultz, P. W. (1999). Changing behavior with normative feedback interventions: A field experiment on curbside recycling. *Basic and Applied Social Psychology*, *21*(1), 25-36.

Sheeran, P., & Orbell S. (1999). Augmenting the theory of planned behavior: Roles for anticipated regret and descriptive norms. *Journal of Applied Social Psychology*, *29*(10), 2107-2142.

Sims, H. P. (1980). Further thoughts on punishment in organizations. *Academy of Management Review*, *5*(1), 133-138.

Siponen, M. T. (2000). A conceptual foundation for organizational information security awareness. *Information Management & Computer Security*, *8*(1), 31-41.

Siponen, M., Pahnila, S., & Mahmood, M. (2010). Compliance with information security policies: an empirical investigation. *Computer*, *43*(2), 64-71.

Sommestad, T., Hallberg, J., Lundholm, K., & Bengtsson, J. (2014). Variables influencing information security policy compliance: A systematic review of quantitative studies. *Information Management & Computer Security*, *22*(1), 42-75.

Stern, P. C., Dietz, T., & Black, S. (1985). Support for environmental protection: The role of moral norms. *Population and Environment*, *8*(3–4), 204-222.

Straub, D. W. (1990). Effective is security: An empirical study. *Information Systems Research*, *1*(3), 255-276.

Straub, D. W. (1989). Validating instruments in MIS research. *MIS Quarterly*, *13*(2), 147-169.

Straub, D. W., & Welke, R. J. (1998). Coping with systems risk: Security planning models for management decision making. *MIS Quarterly*, *22*(4), 441-470.

Straub, D., Boudreau, M. C., & Gefen, D. (2004). Validation guidelines for IS positivist research. *The Communications of the Association for Information Systems*, *13*(1), 380-427.

Strelan, P. & Boeckmann, R. J. (2006). Why drug testing in elite sport does not work: Perceptual deterrence theory and the role of personal moral beliefs. *Journal of Applied Social Psychology*, *36*(12), 2909-2934.

Sun, J., Ahluwalia, P. & Koong. K. S. (2011). The more secure the better? A study of information security readiness. *Industrial Management & Data Systems, 111*(4), 570-588.

Thomson, K. L., von Solms, R., & Louw, L. 2006. Cultivating an organizational information security culture. *Computer Fraud and Security*, *2006*(10), 7-11.

Tyler, T. R. (1990). *Why people obey the law*. Yale University Press.

Tyler, T. R., & Lind, E. A. (1992). A relational model of authority in groups. *Advances in Experimental Social Psychology*, *25*, 115-191.

Vance, A., Siponen, M., & Pahnila, S. (2012). Motivating IS security compliance: Insights from habit and protection motivation theory. *Information & Management*, *49*(3), 190-198.

Venkatesh, V. & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science*, *46*(2), 186-204.

Vinzi, V. E., Chin, W. W., Henseler, J., & Wang, H. (2010). *Handbook of Partial Least Squares: Concepts, Methods and Applications*. Springer Handbooks of Computational Statistics.

Williams, K. R. and Hawkins, R. (1986). Perceptual research on general deterrence: A critical review. *Law & Society Review*, *20*(4), 545-572.

Appendix A: Scale Items

Punishment Severity

In my organization…

… employees who are found violating information security policies are severely punished

… employees who are found violating information security policies receive severe penalty

… employees who are found violating information security policies are severely reprimanded

Certainty of Detection

In my organization…

… employees are effectively monitored for information security policies compliance

… violations of information security policies are mostly known to the relevant IT department

… people who violate security policies are definitely known to the relevant IT department

Descriptive Norm

In my organization…

… it is common to find other employees complying with information security policies

… most employees generally comply with the information security policies

… it is likely that most employees follow the information security policies

… I believe other employees comply with the information security policies

Moral Norms

In my organization…

… I think it is morally right for employees to comply with information security policies

… I think complying with information security policies is the right thing to do

… I think employees should always adhere to information security policies

Resistance to ISS

In my organization…

… I am upset by the changes brought about because of information security policies

… I complain to my friends about the changes that are necessitated because of information security policies

… I express my resistance to changes that are necessitated because of information security policies to my friends

… I believe the changes that are brought about because of information security policies do not personally benefit me

- Non-compliance is mainly due to the resistance towards Information Security policies.
- Changes associated with implementation of Security policies create stimuli for resistance.
- Moral and descriptive norms reduce the resistance towards Information Security policies.
- Certainty of detection and punishment severity affect moral and descriptive norms.