

Interaction Effect of Gender and Neutralization Techniques on Information Security Policy Compliance: An Ethical Perspective

Full Paper

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Abstract

The study examines the following research question - does gender impact the efficacy of moral beliefs, and security policy understandability on security policy compliance intentions differently for various neutralization techniques? The empirical analysis conducted with data gathered from students using hypothetical scenarios suggest that gender does play a role in security policy noncompliance, however its significance is dependent upon the underlying neutralization technique. The paper provides several novel and important contributions. First, the study is among the first to extend the ethical decision making theory by suggesting that moral intensity is a function of neutralization, and individual factors such as perceived weight, value and one's gender. Second, and more importantly the study is among the first to emphasize on the interplay between the ethics, gender, and neutralization techniques, as different ethical perspectives appeal differently to females than to males. The study has several important managerial implications as well.

Keywords

Security compliance, ethics, gender, security policy, seniority

Introduction

In today's information intensive society, the secure management of information systems (IS) has become critically important. With the increasing likelihood, volume and cost of data breaches, companies have begun considering IS security as a serious business risk. Such breaches often lead to lost business and have serious financial consequences (Ponemon Institute 2015). Although organizations actively use security technologies and practices, information security cannot be achieved through technological tools alone. Researchers are now realizing the need for examining security compliance through formal and informal control mechanisms, including policies, procedures, and organizational culture (Herath et al. 2009). Prior research findings show that the major threat to IS security is constituted by employees who fail to comply with organizations' IS security policies and procedures (Pahnila et al. 2007) – willfully or unintentionally (Warkentin et al. 2009). Research shows that if users do not comply with IS security policies, IS security measures lose their efficacy (Puhakainen et al. 2010).

Recently Willison, Siponen, Barlow and others (Barlow et al. 2013; Siponen et al. 2010; Willison et al. 2013) have examined IS security policy compliance using the lens of criminology / neutralization theory. IS research in this stream shows that the rationalization of the compliance issue positively impacts intention to violate IS security policy. Neutralization theory (Sykes et al. 1957) suggests that individuals rationalize their violation to offset the feelings of guilt and shame associated with the act. Research shows that compliance intention could be influenced by individual factors such as gender, however a systematic examination of gender in IS security compliance research is seriously lacking. Moreover, in IS security compliance literature gender often has been used as a control variable (e.g., Ifined 2014; Siponen et al. 2010; Vance et al. 2012), and rarely modeled explicitly as a hypothesized variable with exception of studies such as Hovav et al. (2012). Research (see Table 1) that has reported gender effects on IS security compliance show mixed findings. For example, whereas Ifined (2014) found females' to have higher IS security compliance intention, there was no difference between males and females in

compliance of IS security in the context of Finnish Municipal organizations (Vance et al. 2012). Siponen et al. (2010) and Barlow et al. (2013) also support the indifference between males and females.

In this paper we build upon the following research streams and findings to understand the differences in the security policy violation intention for males and females under different neutralization scenarios.

1. Research findings suggest that neutralization scenarios (such as loyalty - LOL, denial of injury - DOI, unclear policy - UNC, unreasonable policy - UNR, necessity - NEC, metaphor of the ledger - MOL) enhance intention to violation by rationalizing the violation (Siponen et al. 2010), whereas security policy training (Barlow et al. 2013) and understandability (Whitman 2001), and moral beliefs (D'Arcy et al. 2009), lower intention to violate IS security policy.
2. Security policy violation can be argued to be an ethical issue which could be characterized in terms of moral intensity based on six factors suggested by Jones (1991) such as (a) proximity - feeling of nearness for those involved in or affected by an action, (b) the magnitude of the consequences, (c) social consensus regarding the morality of the behavior, (d) probability of the harm, (e) temporal immediacy of the consequences, and (f) the concentration of effect.
3. Using Prospect theory (Kahneman et al. 1979) lens we argue that the perceived moral intensity of the six factors (as shown above) would be influenced by individual characteristics such as gender.
4. Social role theory (Eagly et al. 2000; Franke et al. 1997) proposes that men and women behave according to the stereotypes associated with the social roles they occupy. In general, women are seen as more communal (i.e. friendly, and helping), whereas men are more assertive, independent and masterful. The theory also acknowledges that the gender differences are diminished overtime due to structural forces such as organizational roles.
5. Research in ethics and gender shows that male and female behave in ethical situations differently (Khazanchi 1995), and these gender differences get lowered with seniority in the organizational role (Harris 1990).
6. There are three primary ethical perspectives – teleological, deontological, and value ethics (Mingers et al. 2010). Females are influenced more by virtue ethics (aka feminist ethics) - (Adam et al. 2000). For instance, females might find helping someone in need (e.g., NEC) as more ethical, than excusing oneself one time for being so honest and hardworking for the rest of the time (e.g., MOL).

Based on the ethical decision making model proposed by Jones (1991) and feminist ethics approach suggested by Adam et al. (2000), we argue that the neutralization techniques (Siponen et al. 2010) differ in moral intensity (Jones 1991) such that some scenarios have higher moral intensity (e.g., NEC), and some have less (e.g., MOL). Also, according to Gilligan's ethics of care theory necessity would be deemed "more" ethical than MOL, and more so for women than for men (Adam et al. 2000). Accordingly we argue that males and females would react differently to these neutralization scenarios depending on the underlying perceived moral intensity associated with these scenarios. This leads to our research question - does gender impact the efficacy of moral beliefs, and security policy understandability on IS security policy compliance intention differently for various neutralization techniques?

Based on Jones (1991) ethical decision making model, we argue that willful IS security policy violation involves an ethical decision making process and comprises of a moral component that can be defined in terms of moral intensity. Jones argue that moral intensity which comprises of six factors (as shown above) affects the ethical decision making process through its impact on the individual's recognition of the consequences of decisions. Based on the prospect theory (Kahneman et al. 1979) we extend the Jones model to argue that neutralization and individual factors (gender) might impact moral intensity by altering the perceived magnitude of the consequences, social consensus, and temporal immediacy among others.

This paper thus provides the following contributions. First, the study helps explain the inconsistencies observed in the gender differences in IS security compliance research. Second, it extends ethical decision making model by arguing that moral intensity could be influenced by individual factors such as gender. Third, it extends IS security compliance literature by analyzing the different ethical underpinnings associated with different neutralization techniques with respect to IS security policy compliance.

This paper is organized as follows. The next section briefly reviews the literature on ethics and gender, and neutralization theory in IS security policy compliance. We then present the theory development and the research model. The sections that follow show the research method and present the study’s results. Finally, we conclude by discussing the study’s contributions and implications for theory and practice.

Literature review

The following table briefly summarizes salient work that has been in the respective domains in the IS literature (Table 1). The review of the literature suggest that there is limited research in the area of ethics in IS – and still fewer focus explicitly on the gender and ethics issues.

Paper	Methodology	Sample Characteristics	Findings
Ethics and Gender in IS			
Peslak (2008)	Questionnaire with 12 statements	304 students and faculty/staff	Gender affected ethical decisions.
Adam et al. (2000)	Respondents were interviewed using scenarios	12 men and 12 women	Returning to the original question of this paper. ‘Does gender matter in computer ethics?’ We believe that it does matter both on the theoretical front and on the empirical front and also in the relationship between them. Gender and computer ethics is as yet undertheorized and underexplored.
Kreie et al. (1998)	Set of five scenarios	307 IS students	Men and women were distinctly different in their assessment of what is ethical and unethical behavior. For all scenarios, men were less likely to consider a behavior as unethical.
Khazanchi (1995)	Respondents were shown survey containing seven scenarios pertaining to unethical conduct in IS	134 students	There are gender differences such that women are better able to recognize unethical actions than men. Also, the differences vary depending upon the nature of the ethical dilemma.
Gender and IS Security Compliance			
D’Arcy et al. (2009)	4 scenarios pertaining to IS misuse with survey items	269 survey participants from 8 companies in US	Gender used as a control variable. Didn’t find any gender difference.
Ifined (2014)	Field survey	68 non-IS managers in Canadian organizations	Females had significantly higher compliance intention
Barlow et al.	Factorial survey	Used 257 usable	Gender did not have an effect on intention to

(2013)	method using scenarios. Each respondent answered questions pertaining to 4 scenarios (out of total 36 possible scenarios)	responses.	violate
Vance et al. (2012)	Six hypothetical scenarios and survey questions (respondents answered all six scenarios)	210 respondents from Finnish Municipal Organization	Did not find any difference in compliance based on gender
Hovav et al. (2012)	Four IS misuse scenarios and survey questions (respondents answered all four scenarios)	269 from US, 145 from South Korea	Gender is not a significant predictor of IS misuse by U.S. users whereas for Korean users, females are less likely to engage in IS misuse
Siponen et al. (2010)	Each participant was randomly given one of three scenarios pertaining to USB, logout, password change.	Administrative personnel from three organizations in Finland:	Gender did not have an effect on intention to violate

Table 1. Salient Literature Review

Theory Development and Research Model

Moral beliefs refer to the extent of the degree to which an act of violation is perceived to be morally offensive (D'Arcy et al. 2011; Paternoster et al. 1996). Perceived moral offensiveness of an act would deter one from committing it by creating internal conflict. Prior research shows that moral beliefs significantly deter unlawful behaviors such as corporate crime (D'Arcy et al. 2011). Hence,

H1: Moral beliefs are negatively associated with the intention to violate IS security policy.

Codes and policies clarify responsibility and deter unethical behavior (Harrington 1996). IS security policy training and education persuades employees by activating their thinking processes – thus helping employees internalize the importance of complying with the security policy (Puhakainen et al. 2010). User understanding of the policy and accepting necessary protections has been argued to be effective in ensuring compliance with the corporate policies (Whitman 2001). Hence,

H2: Understandability of the IS security policy is negatively associated with the intention to violate the security policy.

It can be argued that senior employees have higher degree of internalization with company policies. Research suggests that employees' tenure diminishes the difference between personal and organizational values (Harris 1990). Harris (1990) noted that senior managers may be significantly likely to not indulge in fraudulent behaviors because they are more aware of the negative impact of fraud for the company's reputation as well as for their own reputation as well. Hence,

H3: One's position in seniority is inversely related to the intention to violate IS security policy.

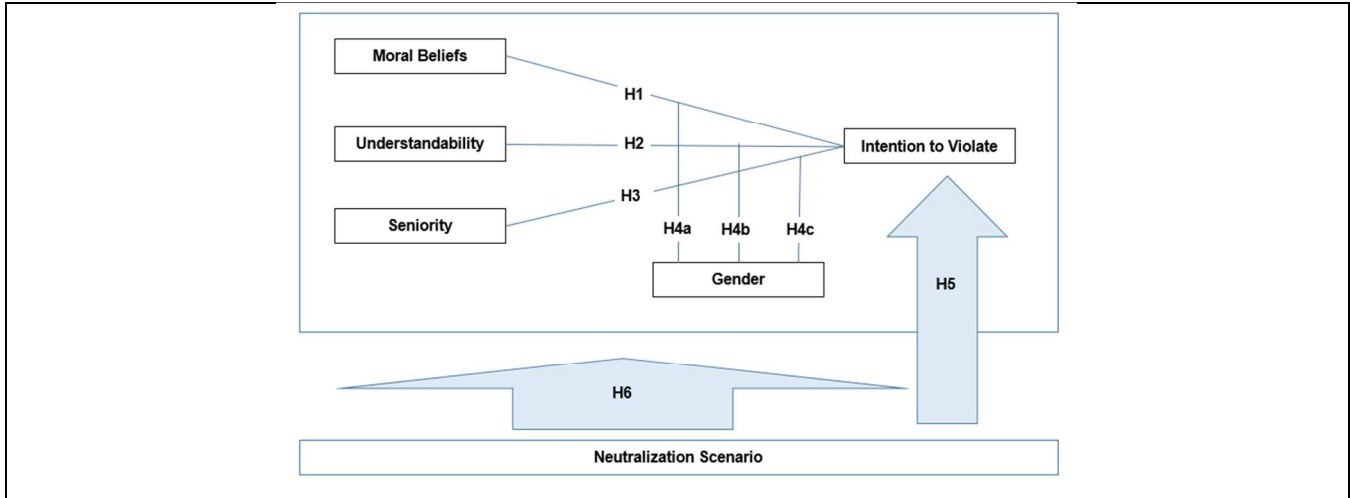


Figure 1. The Research Model

Research suggests that women are more risk averse (Chung et al. 2003). So given the same degree of ethical beliefs, it can be argued that women will have higher compliance as opposed to men. Hence,

H4a: Gender has a moderating impact on the relationship between moral beliefs and intention to violate IS security policy such that the relationship is stronger for females as opposed to males.

We use a three prong approach to argue that gender would moderate the relationship between understandability and intention to violate IS security policy. First, understandability of the policies “persuades” and deters employees from misusing and abusing the Information Systems. The normative appeal associated with “persuasion” would appeal more to women’s as opposed to men’s communal orientation. In context of tax evasion and gender examination Chung et al. (2003) found support to their argument that friendly persuasion appeals more to female participants in positively impacting their compliance level. It can be argued that understanding is similar to persuasion – since it “persuades” one to comply. Second, research in cognitive psychology area suggests that females are more risk averse than men (Chung et al. 2003). And last, not complying with security policy is a deviant behavior that violates social norms. Research in criminology suggests that men as opposed to women are more likely to engage in criminal activities. Hence,

H4b: Gender has a moderating impact on the relationship between understandability of the IS security policy such that the relationship is stronger for females as opposed to males.

Social role theory suggests that overtime socialization forces mitigate the gender differences. Individual and gender differences decline as individuals gain experience within organizations because of structural pressures (Franke et al. 1997). Hence,

H4c: Gender has a moderating impact on the relationship between seniority and intention to violate IS security policy, such that the relationship is stronger for females as opposed to males.

It can be argued that different neutralization techniques differ in terms of moral intensity (Jones 1991), for instance NEC might be seen higher in moral intensity than MOL, which could be classified as low in terms of moral intensity. Moreover, these intensities might be perceived differently by males and females (feminist ethics theory). Based on virtue ethics it could be argued that scenarios have different degrees of virtue, deontological and / or teleological ethics ingrained in them. For instance, NEC scenario might be perceived as high in virtue ethics and deontological ethics, and low in teleological ethics. In terms of mathematical equation this phenomenon could be expressed as:

$$\text{Perceived Moral Intensity} = f(\text{Neutralization Technique, weight, value, individual characteristics such as gender})$$

The following table attempts at objectively mapping how gender differences could impact moral intensity associated with different neutralization techniques through differences in values and weights using two examples NEC and MOL and two moral intensity factors – proximity and social consensus (Table 2).

Perceived Moral Intensity Factor>>	Virtue Ethics	Proximity to the People Involved				Social Consensus			
		Value		Weight		Value		Weight	
Gender (M/F)		M	F	M	F	M	F	M	F
MOL	L	H	L	H	L	H	L	H	L
NEC	H	L	H	L	H	L	H	L	H

Table 2. Role of Individual Factors in Shaping Perceived Moral Intensity

Hence,

H5: Type of scenario is positively associated with degree of tolerance (intention to non-comply with security policy) such that there is higher tolerance for high moral intensity scenarios such as NEC than there is for low moral intensity scenarios such as MOL.

H6: Moderating role of gender on the relationships in H4 is impacted by the underlying scenario (neutralization technique).

Research Method

Data Analysis

Data was collected using Qualtrics. We crafted a hypothetical security policy, and six neutralization scenarios to measure intention to violate IS security policy. Items were operationalized based on existing literature (Table 3). We randomized the order in which the scenarios were presented and each participant was randomly assigned to view no more than four scenarios out of six total. Moreover, we incorporated three manipulation check questions to ensure the participants' attention.

Neutralization scenarios	Siponen et al. (2010)
Understandability	Bansal et al. (2008)
Noncompliance intention	Liang et al. (2013)
Moral beliefs	Vitell et al. (2005)
Seniority	Self-developed

Table 3. Operationalization

Data analysis were carried out using SPSS. Before we conducted the data analysis, we first cleaned our dataset. Those who failed the three test questions pertaining to the scenario and security policy were eliminated from the final dataset. In the final dataset there were 101 males and 120 females. Average age of males was 22.88 (standard dev of 3.58), and average age of females was 22.85 (standard dev of 5.42). Demographics and number of respondents in each scenario are given below in Table 4.

	Male #	Female #	Male Age (Mean)	Male Age (Standard Dev)	Female age (Mean)	Female age (Standard dev)
LOL	40	43	22.51	3.300	23.60	5.786
DOI	50	72	22.92	3.807	22.89	5.400
UNC	53	58	22.88	3.833	23.60	6.481
UNR	50	60	23.43	3.628	23.52	6.573
NEC	42	61	23.14	3.739	22.98	5.680
MOL	57	71	23.09	3.460	23.00	5.275

Table 4. Demographics

We used two items for moral beliefs, four items for understandability (UND), and seven items for noncompliance intention (INT). The final structure had no cross loadings, and all items loaded well onto their intended constructs. We averaged the items to create the respective latent constructs (D'Arcy et al. 2009). H1~H3 were analyzed by conducting multiple linear regressions separately for male and female for each of the six neutralization scenarios. H4a~H4c were analyzed by comparing the path coefficients and path significance from H1 ~ H3 for males and females. H5 was examined by conducting one way ANOVA analysis with pairwise Bonferroni tests – using neutralization scenario as the factor, and INT as the dependent variable. H6 was examined by contrasting the significance of moderating hypotheses (H4a~H4c) across different neutralization scenarios.

Neutralization	Gender	R square	Moral	UND	Seniority
LOL	Female	.153	-.291 (p=.03)	ns	ns
	Male	.188	-.438 (p=.01)	ns	ns
DOI	Female	.173	-.180 (p=.005)	-.164 (p=.083)	ns
	Male	.234	-.319 (p=.002)	ns	.160 (p=.051)
UNC	Female	.186	-.158 (p=.073)	-.370 (p=.005)	ns
	Male	.112	ns	ns	ns
UNR	Female	.101	ns	-.230 (p=.086)	ns
	Male	.225	-.313 (p=.001)	ns	ns
NEC	Female	.191	-.236 (p=.020)	-.310 (p=.047)	ns
	Male	.182	-.280 (p=.032)	ns	ns
MOL	Female	.183	-.127 (p=.038)	-.277 (p=.005)	ns
	Male	.028	ns	ns	ns

Table 5. Regression Results (H1~H3)

Results from One-way ANOVA analysis (H5):

	Mean	LOL [1]	DOI [2]	UNC [3]	UNR [4]	NEC [5]	N
1. LOL	4.72						83
2. DOI	2.78	0.000 [1>2]†					122
3. UNC	3.40	0.000 [1>3]	0.272				109
4. UNR	2.60	0.000 [1>4]	1.000	0.041 [3>4]			110
5. NEC	4.91	1.000	0.000 [5>2]	0.000 [5>3]	0.000 [5>4]		103
6. MOL	2.26	0.000 [1>6]	0.530	0.000 [3>6]	1.000	0.000 [5>6]	128

Note†: For example [1>2] implies that intention to violate was significantly higher for LOL [1] than for DOI [2]

Table 6. Pairwise Bonferroni Results for H5 - p values (One way ANOVA)

Result summary:

Hypotheses	LOL	DOI	UNC	UNR	NEC	MOL
H1: Moral	Supported	Supported	Only for F	Only for M	Supported	Only for F
H2: UND	ns	Only for F	Only for F	Only for F	Only for F	Only for F
H3: Seniority	ns	Only for M	ns	ns	ns	ns
H4a: Moral	ns	ns	Supported	Reverse	ns	Supported

				Supported		
H4b: UND	ns	Supported	Supported	Supported	Supported	Supported
H4c: Seniority	ns	Reverse Supported	ns	ns	ns	ns
H5	Supported					
H6	Supported					

Table 7. Result Summary (H1~H6)

We examined the regression assumptions (normality, equal variance, and linearity) for each neutralization group separately, and found no issues. Since the sample size used in this study is small, we set significance at .10 level. Table 5 shows the results for hypotheses H1 ~ H3. Result for H5 are presented in Table 6. All the results are summarized in Table 7.

Result

H1 was supported for both the genders in LOL, DOI, and NEC scenarios. It was supported in MOL and UNC only for females, and was supported in UNR only for males. H2 was supported only for females and for all scenarios except for LOL. H3 was supported only for males in DOI scenario.

The moderating hypotheses (H4a ~ H4c) were supported by structural differences such that the path coefficients were significant for one gender and not significant for the other (Bansal et al. 2008). There was moderating role of gender on relationship between moral beliefs and INT. For same degree of moral beliefs, females had significantly lower degree of INT in UNC and MOL scenarios. Contrary to the hypothesis, males had significantly lower degree of INT in UNR scenario. The findings show that for a given degree of UND females had significantly lower degree of INT for all scenarios except for LOL where the path was insignificant for both the genders. H4c shows that for males as seniority goes up INT increases in DOI scenario particularly.

The pairwise Bonferroni results from one-way ANOVA analysis conducted for H5 are shown in Table 5. The findings show that INT was highest in LOL scenario such that [LOL > (DOI, UNC, UNR, MOL)]. MOL had lowest INT. INT in UNC was higher than INT in UNR and MOL scenarios. INT in NEC was higher than INT in UNC, UNR, and MOL.

For H6 we compared the path coefficients for males and females from different scenarios (Table 7). H6a was supported – gender moderated the relationship between moral beliefs and INT differently for different scenarios. For instance, the relationship had no gender moderation for LOL, DOI and NEC, and had stronger path for females in UNC and MOL, and had stronger path for males in UNR. Similarly, H6b was supported as the underlying moderating (H4b) was significant in all scenarios except for LOL. H6c were supported as the underlying moderation in H4c was significant only in DOI but not in other scenarios.

Discussion

Moral Beliefs: Findings show that the relationship between moral beliefs and intention to violate is both context and gender dependent. There is a significant negative relationship between the moral beliefs and intention to violate for both the genders in LOL, DOI, and NEC scenarios. However, the moral beliefs lower intention to violate only for females in both UNC and MOL scenarios, and only for males in UNR scenario. Perhaps, males are more aggressive hence in case of UNC and MOL they have “earned” the “violation right”. Females are more logic driven and hence in UNR scenario they think that they have “earned” the “violation right”.

Understandability: The results show that understandability does lower intention to violate, but surprisingly the effect is supported only in case of females in all scenarios except for LOL. This does support H4b strongly, but provides partial support for H2. This also points to the contextual and gender orientation of this relationship. We conducted posthoc analysis by median splitting UND in two groups – low and high. We created univariate analysis plot using SPSS (Fig. 2) for LOL scenario to show the effect of low and high UND (shown on horizontal axis) on

INT (shown on vertical axis) differently for males (graph is almost horizontal) and females (the graph has a steep downward trend). The posthoc analysis for LOL (H4b) in figure 2 shows that there is directional support for females (intention decreases for corresponding increase in UND), but the effect is not big enough to be significant at .05 or .10 level.

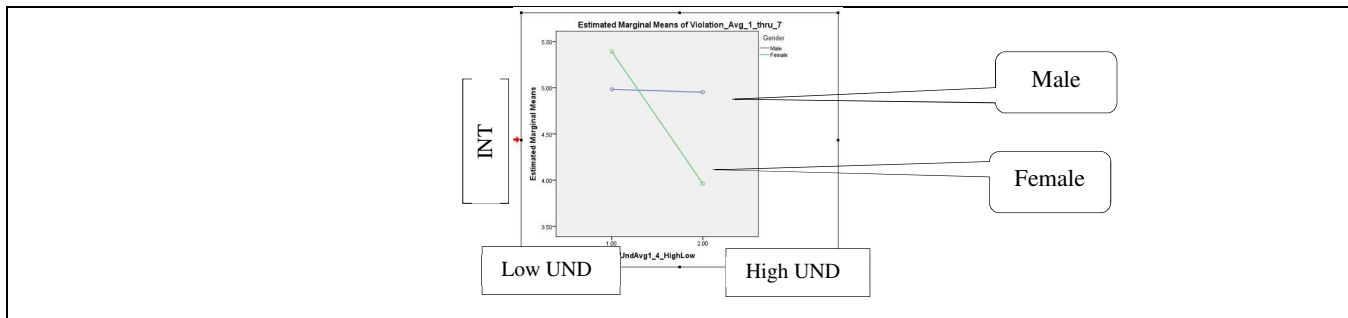


Figure 2. Posthoc Analysis (H5b – LOL)

Seniority: The results show that seniority is positively associated with intention to violate for males particularly in DOI context. The findings point to the fact that males ranking high in organizations, under conditions that things do not cause harm to others, are more likely to violate the IS security policy.

Neutralization scenarios: The findings from this study are very insightful. Results for H5 show that LOL and NEC scenarios have the highest moral intensity, and MOL the lowest. Findings from H5 also underscore the importance of clear security policies. The findings also suggest that organizations should attempt at lowering the rationalization associated with LOL and NEC. Perhaps training and revamping organizational culture could help in lowering instances associated with LOL and NEC. Findings from H6 also show that underlying scenarios impact moderating role of gender differently based on the scenario.

Conclusion

The paper provides the following novel and important contributions. First, the study is among the first to extend the ethical decision making theory by suggesting that moral intensity is a function of neutralization, and individual factors such as perceived weight, value and one's gender. Second, the results add to the existing security compliance literature by suggesting that gender does play a role in IS security policy noncompliance, however the role's significance is dependent upon the underlying neutralization scenario. This way it helps explain inconsistencies pertaining to the role of gender in IS security compliance studies. Third, and more importantly, the study is among the first to emphasize on the interplay between the ethics, gender, and neutralization techniques. The study advocates that the utilitarian and deontological perspectives cannot explain all the ethical dilemmas out there. There is also a need to consider value ethics approach since value ethics appeal more to females in general than to males. The study has several important managerial implications as well. The fact that gender and naturalization technique or underlying context moderates the compliance intention could help security managers frame security policies and devise training programs more effectively.

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