A QUANTITATIVE CORRELATIONAL STUDY OF CRIMINAL COMPUTER BEHAVIOR, CONSCIENTIOSNESS AND MORALITY AMONG STUDENTS

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Original Article

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Abstract

The present study seeks to explore the relationship between criminal computer behavior personality trait conscientiousness and morality and find out gender and family system base differences on study variables. In the present study along with demographic sheet computer crime index (CCI; Rogers, 2001) moral competence (MC; Martin, 2010) and NEO personality inventory (IPIP NEO PI-R; Costa, & McCrae, 1992) *were applied on a conveniently selected sample of 600 students(male=300 and female =300). The results of the study revealed that computer criminal activities have a negative relationship with moral choices and conscientiousness personality trait. The results also revealed that moral choices and conscientiousness were higher among female students whereas males were more engaged in computer criminal behavior than females. Similarly, students belonging to the nuclear family system exhibited more computer criminal behavior and a lower level of morality conscientiousness than students with a joint family system.*

Keywords*:* Computer criminal behavior, Morality, Conscientiousness, Gender, Family system

Introduction

The rapid development of information technology has created many problems; one of these burning issues is computer crime or cybercrime. Computer and cybercrimes are a speedily growing sub form of criminal offenses (Gercke, 2012). The terms “computer crime” and “cybercrime,” which are mostly used interchangeably, denote criminal activity committed over information systems and electronic communication networks, the publication of prohibited content over electronic media, or any other electronic networks-crime (Commission of the European Communities, 2007).The number of electronic crimes is prevailing in Pakistan which is not even considered in enacted Prevention of Electronic Crimes Act (PECA; 2016). In Pakistan, three decades ago the commission of cyber-crimes was not considered as the general population is unaware of computers or cyber-crimes (Usman, 2017).

The Pakistan internet market has shown noteworthy growth in the easy accessibility of computers and the internet providing extraordinary development in communication and learning in Pakistan. However, the internet and computer have been misused for criminal purposes as well (Maitra, 2015). In general, four main categories of cybercrime may be categorized (Gumbi, 2018). Hacking and cracking refer to the use of a computer to gain illegal access to information systems (Holt, Bossler, & Seigfried-Spellar, 2015), the term hacker refers to an individual motivated by easy and illegal access to other domains, whereas the

term cracker (i.e., criminal hacker) denotes individuals with malevolent intention (Symantec, 2015). An attacker may acquire illegal access to a computer for changing the computer data for the personal use of hacked material (Anderson et al., 2013; Bowen & Mace, 2009).

Computer terrorists may even break into a government official website or crash a website by flooding it with traffic (Dogrul, Aslan, & Celik, 2011).Similarly, attackers may involve in financial crimes such as getting access to bank employees and inserting a program into the bank's servers, to take away a small amount from the other's bank account (Antonescu & Birăub, 2015).Another possible form of computer crime against persons involves cybercriminal attacks against a particular individual or a group of people such as insulting, harassing, acts of racism, assault by threatening, and vilification (Kumar, 2016).

According to source and medium Computer crimes fall generally into two main groups: a) illegal interference into computer networks (hacking) b) interference or decreasing computer function (malware).

Malware

A computer need not be linked with the internet to attack the target; a user may unknowingly accept a non-networked system through detachable media that has been before-hand contaminated with malware (Fischer, 2016). Malware is a broad-spectrum attached with malicious software systems that integrate between computers and obstruct computer functions (Kirwan &Power, 2012). Malware may delete files or system break down but may also be used to get illegal access to personal data. There are several forms of malware.

1. Virus scan causes mild computer dysfunction, but can also wipe out hardware, software, or files. These are programs that spread within and between computers automatically (Bregant & Bregant, 2014). An invader may use a virus or worm to enterin the system by malevolent activities on the computer, of a cybercrime (Peretti, 2008). Worms have severe as they may cause damage across whole networks (Beal, 2011).
2. Trojans are with a valid program facilitates illegal access to a computer for stealing data, without the user's knowledge and may commence unknown, illegal actions (Beal, 2011).

Risk factors for computer or cybercrime

Studies have shown several factors linked equally with criminals and victimization risks for traditional crimes (e.g., Berg & Felson, 2016; Jennings et al., 2012; Rokven et al., 2016). Individuals, who spend more time with felonious friends, are more likely to be offended (Rokven et al., 2016). In addition, lack of self-control and over-emotionality can significantly increase victimization but also provides a link between low self-regulation and more time spent in the criminological environment (e.g., Bossler & Holt, 2009; Holt & Bossler, 2014; Ngo & Paternoster, 2011).

Researches have proved the psychological impacts of current forms of cyber-attacks (Gandhi et al., 2011; Dallaway, 2016). Based on the personality type of offenders and the victims the adverse effect of cyber threats on mental health may be even more challenging (Gross, Canetti & Vashdi, 2016). Studies have shown that being the victim of online attacks and crime can result in emotional distress which can even lead to severe depression (Modic & Anderson, 2015).

The impact of identity stealing can lead to feeling abused, distressed, deceived, helpless, irritated, and defenseless (Kirwan & Power, 2011). Often, computer crime can lead to extreme feelings of aggression, apprehension, over-emphasis on self-security, autonomy, and little interest in accepting new technology due to loss of trust in cyber. Even in some cases, victims may even condemn themselves and develop a sense of self-doubt (Nurse, 2018).In another study Symantec (2010) further indicated that victims feel that they are responsible for the situation, which in turn results in several other psychological problems.

Böhme and Moore (2012) found that being the victim of cybercrime drops down the probability of online banking and shopping. Modic and Anderson (2015) reported that victims of economical scams always demonstrate greater victims of emotional impact than all other fraud types. Reflecting on the literature it is evident that how even non-

destructive forms of cyber terrorism have a significant negative impact on the general beliefs and views of such victimized people (Gross, Canetti & Vashdi, 2016). Under attack, victims not only exhibit anxiety symptoms but demand security via reconnaissance and stronger policies from the government.

Morality is closely associated with ethics. The word morality is driven from the Latin word moss which refers to “standards, habits and laws” (Pedro, 2013; Weil, 2011).Morality has an important dimension, as it forces people to comply with an obligation to accept given rules (Carapeto & Fonseca, 2012). Since society anticipates higher education institutions to develop moral competence among young people to become constructive citizens it is, therefore, essential to understanding the college students’ moral-ethical way of acting, both at a general and global level (Pedro, 2013).

Moral competence as emotional inclination pushes for self-sacrificing behaviors and to judge the issues and moral dimensions in a logical way. Malle, Guglielmo and Monroe (2012) evidence supports the impression that criminals have less developed moral perceptive of personality (Cardinali & Marsh, 2015) and even element of morality is mostly absent(Marsh ,2013).Computer criminals are found to be lacking morality, were younger, more white, more female, and more educated than their non-criminal counterparts (Jennings et al., 2010).

Objectives

The present study mainly aimed at finding out inter-relationship between criminal computer behavior, personality trait conscientiousness, and moral choices secondly, exploring gender and family system base differences on criminal computer behavior, moral choices, and personality traits scales among students.

Method

Hypotheses

1. Moral competence will be a significant predictor of computer criminal behavior among students.
2. There will be a negative relationship between criminal computer behavior and moral choices.
3. Significant gender base differences will exist on computer criminal behavior, conscientiousness, and moral choices scales.
4. There will be a significant difference between computer criminal behavior, moral choices, and personality traits conscientiousness among students from the joint and nuclear family systems.

Research Design

In this research quantitative research method was used and for data for collection data, the survey method was selected.

Sample

In the present study sample of 600 students (male n=300, female n=300)was conveniently selected from the different educational institutes of Abbottabad, Mansehra, and Islamabad cities. The present sample was further divided into concerning gender and family system base differences.

Ethical Considerations

Throughout this study, all the ethical concerns were carefully considered. Particularly for getting a consent letter all the participants were briefed about the purpose and objectives of the study. While ensuring the confidentiality of the data participants were told that all the information shall be kept confidential and would be used only for research work. Before participating in the study all the participants signed a proper consent letter. For keeping their identity confidential all the participants were instructed not to state their names or any other identity confirming material. Participants were informed that in this study they were given a choice to leave the research at any time they if felt agonizing or hazardous.

Table 1. ***Demographic characteristic of the sample (N=600)***

Variables	*F*	*%*
Gender		
Male	300	50
Female	300	50
Family system		
Nuclear	280	50
Joint	320	50

Note. Demographic characteristics of gender and family system

Instrumentation

In the current study, for data collection along with a demographic sheet following instruments were used. The description of these scales is given below.

Demographic Sheet

The demographic sheet was utilized to collect basic information (gender and family system) from the students.

Computer Crime Index Scale

A 61-item scale designed to measure the student's activity on criminal computer behavior (Rogre, 2006). The first 8 items are scored on a 5-point Likert scale "Never=1", "5+ years ago=2", "1-4 years ago=3", "within the past year=4", "within the past month=5".These scales are divided into further different statements and different response categories. Item 9 to 16 are scored on a 5-point Likert scale "never=1", "1-2 times=2", "3-5 times=3", 6-9 times=4" and "10 or more times=5". Item 17 to 24 are scored on 5-point Likert scale "does not apply=1", "16 years old or less=2", "17-18 years old=3", "19-20 years old=4" and "21 or older=5". Item 25 to 31 are scored on 5-point Likert scale "learned nothing=1", "learned a little=2", "learned some=3", "learned a lot=4" and "learned everything=5". Item 32 to 38 are scored on 4-point Likert scale "strongly disapprove=1", "sometimes disapprove=2", "sometimes approve=3" and "strongly approve=4". Item 39 to 46 are scored on 3-point Likert scale "mainly good=1", "about as much good as bad=2" and "mainly good=3". Item47 to 61 scored on 4-point Likert scale "strongly disagree=1", "disagree=2", "agree=3" and "strongly agree=4".There is no specific time for the completion of a questionnaire. The measure has internal consistency (coefficient alpha =.86).

Moral Competence Scale

The 39-item MC (Martin, 2010) was used to measure the level of moral choice in students. Each question was answered using a five-point Likert scale with their choices being "Very inaccurate=1", "moderately inaccurate=2", "neither inaccurate nor accurate=3", moderately accurate=4", very accurate=5".The alpha for the total scale ranged from .78 (Martin, 2014).

NEO Personality inventory

In the present study keeping in view, the study objectives Conscientiousness subscale of NEO personality inventory (IPIP NEO PI-R; Goldberg, 1999) comprising of 16 items was used. Response categories ranging from strongly=1", "disagree moderately=2", "disagree a little=3", "neither agree nor disagree=4", "agree a little=5", "agree moderately=6", "agree strongly=7". The alpha for the total scale ranged from .73 was used in the present study.

Procedure

In the present research for data collection, a sample of college and university students were conveniently selected from different colleges and universities of Mansehra, Abbottabad, and Islamabad cities. After obtaining permission from the head of educational institutes and informed consent from the participants. Then distribute the demographic sheets among students. The respondents were instructed to complete questionnaires honestly and to make sure to respond to every item of each questionnaire. No specific time for completing questionnaires was there, they could complete them at their ease. So, to address the objectives of the study and to test the hypotheses of the study,

according to the nature of the data suitable statistical analysis was used through the SPSS package.

Results

Table 1. ***Alpha Reliability Coefficients of Computer Criminal Index, Moral choices questionnaire and Personality trait Conscientiousness*** **scale** ***among students (N=600)***

					Range			
Variables	*N*	*M*	*SD*	*α*	Actual		Potential		Skew
CCIQ	61	172.28	21.74	.82	38	198	61	305	.244
MCQ	39	45.13	7.57	.87	35	171	39	195	.742
CON	16	99.08	61.83	.68	47	87	16	112	.372

Note. . CCIQ = Computer crime index questionnaire; MCQ = Moral choices questionnaire; CON = Conscientiousness subscale of NEO personality inventory.

The results of table 1 indicates that Alpha reliability coefficient for computer criminal behavior, moral choices and personality trait Conscientiousness are .82 .78 and .68 that indicates that these scales have satisfactory values of reliability.

Table 2. ***Summary of Linear Regression Analysis for determining prediction effect of Morality on computer criminal behavior (N =600)***

			95% CI	
Variables	B	B	LL	UL
MCQ	-.276	-.226*	135.637	161.493
R^2	.050			
F	32.31			
Δ R^2	.051			

Note. MCQ= Moral competence questionnaire.

A simple linear regression was calculated to predict computer criminal behavior based on moral competence, b = -.276 (598) = 22.56 p<,.000 (Table 4). A significant regression equation was found (F(1,28)= 32.31 p<.000, with an R^2 of .051. Since there was a strong negative correlation between moral competence and computer criminal behavior simple linear regression result suggested that almost 51% variance in scores of computer criminal behavior can be attributed to moral competence (Δ R^2 = .51,p<.05).

Table 3. *Summary of Intercorrelations, Means, and Standard Deviations for scores on the CCIQ, MCQ, and NEO-CON*

Measure	1	2	3	*M*	*SD*
CCIQ	-	-.226**	-.083	111.44	20.85
MCS	-	-	.227**	134.32	17.02
CON	-	-	-	8.88	2.94

Note. CCIQ = Computer criminal index questionnaire; MCQ= Moral choices questionnaire; CON = Conscientiousness.

Table 3 indicated that a significant negative relationship exists between computer crime index and moral competence whereas personality trait conscientiousness has a significant positive relationship with moral competence.

Table 4. ***Mean, Standard Deviation, and t-values showing significance differences among male and female scores on Computer crime index Questionnaire and Moral competence questionnaire and Conscientiousness personality trait (N=600)***

	Male (n=300)		Female (n=300)				95% *CI*		
Variable	*M*	*SD*	*M*	*SD*	*t*(598)	*P*	*LL*	*UL*	Cohn's *d*
CCIQ	113.26	21.90	109.64	19.62	2.13	.01	-2.03	2.39	.17
MCQ	132.61	17.50	136.00	16.51	2.43	.00	-2.18	2.14	.20
CON	8.60	2.97	9.15	2.89	2.29	.01	-0.52	0.14	.19

Note. CCIQ = Computer criminal index questionnaire; MCQ= moral choices questionnaire; CON = Conscientiousness.

Table 4 is indicated that gender has a significant difference in computer crime index, moral competence, and personality trait conscientiousness. Study results revealed that on the computer crime index male students scored higher than female students. Study results have also shown that regarding obtained mean scores on moral competence and conscientiousness scales females were morally stronger than male students.

Table 5. ***Mean, Standard Deviation, and t-values showing significance differences of scores of students belonging to Nuclear and Joint family system on Computer crime index Questionnaire, Moral competence, and Conscientiousness personality trait inventory (N=600)***

	Nuclear (n=280)		Joint (n=320)				95% *CI*		
Variable	*M*	*SD*	*M*	*SD*	*t*(598)	*P*	*LL*	*UL*	Cohen's *d*
CCIQ	112.2	22.23	111.98	19.86	.64	.51	-2.51	2.26	.01
MCQ	132.31	18.55	135.7	15.87	2.40	.01	-2.28	2.07	.18
CON	8.33	2.82	8.79	2.68	2.09	0.02	-0.49	0.14	.17

Note. CCI = Computer criminal index questionnaire; MCQ= Moral competence questionnaire; CON =Conscientiousness.

Results Table 5 indicates that a significant difference exists on moral competence and conscientiousness personality trait scale, suggesting that students from joint family system displayed a higher level of morality and Conscientiousness than students studying belonging to the nuclear family system. Whereas study results suggest existence that non-significant differences exist regarding scores obtained on the computer crime index questionnaire. Study results also concluded that students with nuclear family system scored relatively higher on the computer criminal index questionnaire than students with the joint family system.

Discussion

The present research aimed to look at the relationship between computer criminal behavior, personality traits, and moral choices and among students. Regression analysis (See Table 2) endorsed the predictive power of moral competence on computer criminal behavior suggesting that there could be a strong role of exhibited moral values and ethical code of conduct which could be the main cause of computer criminal behavior. Literature on computer criminal behavior across the globe corroborates these findings and has confirmed that weaker morality bounds self-monitoring and control behavior which in turn triggers the number of conduct problems (Aleixo & Norris, 2000; Antonaccio & Tittle 2008). Some of the reasons could be that in context to computer-related behavior, students have limited knowledge about the ethical consideration and quite often their home environment distresses them and eventually does not inhibit them from antisocial activities. Consistent with the hypothesis, moral competence and Conscientiousness personality trait had a statistically strong negative correlation with computer criminal behavior suggesting that high levels of morality and Conscientiousness can influence computer-related criminal behavior(see Table 3). These findings are consistent with what is reported across literature worldwide. Some previous researches have displayed that adolescent to be more violent and cybercrime offenders (Sammons, 2012). In addition, the adolescent age group is the most critical period of life thus chances of getting negatively influenced is very much high (Palmer, 2003). Another study has reported similar results which suggested that among young individuals the social communication, role-taking opportunity, and personality patterns are vital sources for the development of moral reasoning (Međedović & Petrović, 2016). In another study have demonstrated that personality trait can significantly predict different aspects of moral decision-making (Eisenberg, Zhou, & Koller, 2001).Another study has reported the same results concluding that self-reported computer criminals and non-computer criminals differed significantly on moral choice and exploitive/manipulative behaviors (Rogers et al., 2006).

Self-reported based evidence has suggested that criminals were higher on exploitive, manipulative behaviors and lower on internal moral choices (Bissett, Andy & Shipman, 2000). Exploring the prevalence rate and contributing factors related to Cybercrime in the Pakistani population Zia UL Islam, Khan, and Zubair (2019) concluded that in context to Pakistani culture cyber-criminal acts are being reported more frequently in recent years. Exploring cyber bullying tendencies among young adults it was found that individuals with stronger morality standards had also exhibited stronger self-control. In Pakistan, lack of check and balance and legal reforms have contributed a lot in causing misuse of internet service for criminal and unlawful acts (Mohiuddin, 2006; DAWN, 2018).

The results of the present study have also shown that the male students were more involved in computer criminal activity whereas, female students and exhibited higher mortality (Table 4). The ratio of computer criminal activities in males was found to be higher as compared to female students. Consistent with the present study result Solaka and Topaloglu (2014) also suggested that significant difference exists among males and females regarding computer criminal behavior and ethical consideration. Another research exploring the types of roles female computer crime offenders take on, and their respective social skills; finding of the study suggests that, as compared to males, they experience more adverse life events. Reasons for the lack of female engagement in cybercrime or computer crime include the gender base barriers that females experience while encountering the primarily masculine online communities which are vital for the learning process (Chu, Holt, &Ahn,2010). Moreover, the present study results also exhibited those female participants scored high on the scale of the moral choice than males. These findings are in line with findings of study results suggesting that women have higher, more determined ethical standards and they act more ethically than men in a diverse behavior pattern (Kray, Kennedy & Ku, 2017). Literature mainly focuses on the in-depth exploration of the overall ratio of criminal acts among the general population it was found that male participants scored high on criminal activities

than females (Albladi, & Weir, 2017). Similarly, another study has established gender-based variance in moral identity strength specifically in two facets of negotiator ethics moral disengagement and opportunism (Chubb & Derrick, 2020).

The results of the present study have also shown that significant family system base differences exist in criminal computer behavior, moral choices, and personality traits among students in the joint and nuclear family systems (see Table 5). Present study results show that join family system students were high scores on criminal computer behavior and personality traits subscales than the nuclear family system. The joint family system scored less on the scale of moral choice than students from the nuclear family system. Elgar et al., (2014) have concluded that family members' inter-communication is an identifying factor that results in several psychological problems that children and adolescents may be undergoing. Research has revealed that the quality family time spent in open conversation dialogue, especially at meals or dinners may enable parents to detect possible child-related conflicts and issues more easily (Napoletano, 2014).Similarly, another study focused on the focused how family time is related to a child's psychological health mental health and social identity concluded that quality family time and individualized concern are necessary for the healthy development of an individual (Fiese, Foley, & Spagnola, 2006).

Conclusion

The present study concluded significant negative correlation between computer criminal behavior and moral choices. The results also suggested that female's students in college and university have been found less involved in criminal computer activities with higher level of morality than the males. The current study also concluded that students belonging to nuclear family system also displayed lower level of morality and criminal computer behavior than students from joint family system.

Limitations and Suggestions

The current research is having some limitations and suggestions. Most of the factors of current study are considered and recognized as limitations and are necessary to mention for the consideration of future research. These limitations along with their suggestions are as follows:

1. The sample taken for present research purpose was limited to only college and university students of Mansehra, Abbottabad and Islamabad cities only. It is suggested that to make it more generalizable to whole student population, future research that should be conducted covering all other areas.
2. In current study convenient sampling technique was used only. So, for future research it is suggested that the researcher must use random sampling technique in order to get better representatives of the study population.
3. The present research only studied gender and family system. So for future research it is suggested that they should study other demographics (i.e., socio economic status, academic disciplines etc).

Implications

Results of the present study contribute significantly in terms of offering empirical evidence against computer criminal behavior in context to morality and personality trait Conscientiousness. Concerning future research, it is recommended to carry out further research into how school environment and peer pressure can be contributory factors of computer criminal behavior among students. The current research suggests looking into further variables such as the family size/ economic status and academic discipline of these students as influential forces on their social life and other facets. Particularly, it is very important to collect research evidence related to this issue at the national level as well. The current situation suggests that nowadays there is heavy usage computer and over-dependency on internet services thus the need of the hour is to examine these issues and their impact and to come up with effective strategies to control it. Parents and community members need to be aware of the importance of monitoring children's activities, both on- and off-line computer crimes. The results are much useful in understanding the extent of computer crime activities, moral choices mean the ethics of society, and personality traits. The current study is also beneficial for other researchers in the sense that they can develop and strengthen their knowledge base.

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